# Appendices

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# Appendix A

Notice of Intent

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## DEPARTMENT OF THE INTERIOR

### Bureau of Reclamation

### Notice of Intent To Prepare an Environmental Impact Statement for the Systems Conveyance and Operations Program

**AGENCY:** Bureau of Reclamation, Department of the Interior.

**ACTION:** Notice of Intent to Prepare an Environmental Impact Statement for the Systems Conveyance and Operations Program.

**SUMMARY:** Under the provisions of the National Environmental Policy Act (NEPA) of 1969, as amended, and the Council on Environmental Quality's regulations for implementing the procedural provisions of NEPA, the Bureau of Reclamation, Lower Colorado Region (Reclamation) and the National Park Service (NPS), Lake Mead National Recreation Area, propose to prepare an Environmental Impact Statement (EIS). Reclamation and the NPS are preparing the EIS as joint-lead Federal agencies to evaluate the potential impacts associated with the construction, operation, and maintenance of the Systems Conveyance and Operations Program (SCOP), which may include process improvements, supplemental treatment facilities, and/or a transmission facility to convey treated effluent directly into and under the surface of the Colorado River system within the Lake Mead National Recreation Area.

Current effluent discharge is causing erosion problems to wetlands within the Las Vegas Wash, especially within the Clark County Wetlands Park where wetland restoration is underway. The SCOP is intended to maintain the integrity and quality of the treated effluent as it increases through time and is conveyed into Lake Mead. The project will also reduce erosion within Las Vegas Wash and the Clark County Wetlands Park aiding in their restoration.

**ADDRESSES:** You may submit comments concerning the EIS's scope, the issues to cover, the alternatives to consider, and other resource concerns. Your comments may be submitted by mail or hand delivered to Mr. James Green, Regional Environmental Officer, Bureau of Reclamation, Lower Colorado Region, LC–2530, P.O. Box 61470, Boulder City, NV 89006–1470; or Mr. William K. Dickinson, Superintendent, National Park Service, Lake Mead National Recreation Area, 601 Nevada Way, Boulder City, NV 89005. Comments will be accepted for 45 days after publication of this notice and will conclude on September 1, 2002.

Written comments received by Reclamation and the NPS become part of the public record associated with this action. Accordingly, Reclamation and the NPS make these comments, including names and home addresses of respondents, available for public review. Individual respondents may request that we withhold their name and address from public disclosure, which we will honor to the extent allowable by law. There also may be circumstances in which we would withhold a respondent's identity from public disclosure, as allowable by law. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment letter. We will make all submissions from organizations or businesses, and from individuals themselves as representatives or officials of organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public disclosure in their entirety. Anonymous comments will not be considered.

Hearing impaired, visually impaired, and/or mobility impaired persons planning to attend these meeting may arrange for necessary accommodations by contacting Ms. Carrie Stewart at telephone (702) 939–6101, extension 222 or faxogram (702) 939–6108, no later than two weeks prior to the meeting date.

**DATES:** Reclamation, the NPS, and the Clean Water Coalition will conduct public meetings in open house format to involve the public in issue identification and the alternative development processes. Oral and written comments will be accepted at the public scoping meetings to be held at the following locations:

August 12, 2002, 6:30–8:30 p.m., Henderson Convention Center, 200 S. Water St., Henderson, Nevada.

August 13, 2002, 6:30–8:30 p.m., Winchester Community Center, 3130 S. McLeod Dr., Las Vegas, Nevada.

August 14, 2002, 6:30–8:30 p.m., West Flamingo Senior Center, 6255 W. Flamingo Road, Las Vegas Nevada.

August 15, 2002, 6:30–8:30 p.m., West Sahara Library, 9600 W. Sahara Avenue, Las Vegas, Nevada.

August 19, 2002, 6:30–8:30 p.m., Tempe Mission Palms Resort, 60 E. 5 St., Tempe, Arizona.

August 20, 2002, 6:30 to 8:30 p.m., Black Canyon Conference Center, 9440 N. 25th Ave., Phoenix, Arizona.

August 22, 2002, 6:30 to 8:30 p.m., Regency Room, Radisson in Mission Valley, 1433 Camino del Rio So., San Diego, California.

August 23, 2002, 6:30 to 8:30 p.m., Hyatt Regency Conference Center, 285 N. Palm Canyon Dr., Palm Springs, California.

**FOR FURTHER INFORMATION:** Contact Mr. James Green, Bureau of Reclamation; or Mr. William K. Dickinson, National Park Service at the addresses provided above under **ADDRESSES.**

**SUPPLEMENTARY INFORMATION:** The project proponent of the SCOP is the Clean Water Coalition, which is comprised of the City of Las Vegas, City of Henderson, and the Clark County Sanitation District, Las Vegas, Nevada. Construction activities and infrastructure associated with the SCOP would be located on private land, City of Las Vegas land, City of Henderson land, Clark County land, Reclamation lands in the area of the Las Vegas Wash, and lands administered by the NPS.

Currently, about 150 million gallons of treated effluent are discharged daily into the Las Vegas Wash, which then flows into Lake Mead. By 2030 it is estimated that this amount will increase to about 300 million gallons per day. The treated effluent meets Environmental Protection Agency and Nevada Department of Environmental Protection quality and quantity standards and will do so into the future. Before this treated effluent reaches Lake Mead, perchlorate and other contaminants in the Las Vegas shallow aquifer, and other non-point source contaminants, discharge into the Las Vegas Wash and mix with the treated effluent.

The EIS will address a range of alternatives, which include the no-action alternative and a number of action alternatives. The action alternatives will have a common physical element, which is an 84-inch to 114-inch diameter buried pipeline referred to as the Effluent Interceptor. It would have a capacity of about 300 million gallons per day of treated effluent derived from the three treatment facilities, and would end at a point located upstream of Lake Las Vegas. The action alternatives would diverge at the terminus of the Effluent Interceptor. The EIS will evaluate the potential environmental impacts associated with the Effluent Interceptor and the various alternatives including: no action (there will be no change to the current treatment processes and discharge locations); process improvements at the three treatment facilities; construction and operation of supplemental treatment facilities; and, construction and operation of a pipeline

that would transport highly-treated effluent from the three treatment facilities to one or more receiving areas underwater within the Colorado River system. An impairment analysis will be conducted for the portion of the project that will be located on NPS-administered land. The EIS will evaluate the alternatives to determine their effects on a number of resource issues including but not limited to the following: water quality, surface water hydrology, groundwater, biological resources/endangered species, cultural resources, recreation, land use, air quality, noise, socioeconomics, and other appropriate resource issues identified during the scoping process.

Dated: July 1, 2002.

**Lorri Gray,**

*Assistant Regional Director, Lower Colorado Region.*

[FR Doc. 02–18911 Filed 7–25–02; 8:45 am]

**BILLING CODE 4310–MN–P**

## INTERNATIONAL TRADE COMMISSION

**[Inv. No. 337–TA–474]**

### Certain Recordable Compact Discs and Rewritable Compact Discs; Notice of Investigation

**AGENCY:** International Trade Commission.

**ACTION:** Institution of investigation pursuant to 19 U.S.C. 1337.

**SUMMARY:** Notice is hereby given that a complaint was filed with the U.S. International Trade Commission on June 24, 2002, under section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. 1337, on behalf of U.S. Philips Corporation of Tarrytown, New York. Letters supplementing the complaint were filed on July 10, 2002 and July 16, 2002. The complaint, as supplemented, alleges violations of section 337 in the importation into the United States, the sale for importation, and the sale within the United States after importation of certain recordable compact discs and rewritable compact discs by reason of infringement of claims 1, 5, and 6 of U.S. Letters Patent 4,807,209, claim 11 of U.S. Letters Patent 4,962,493, claims 1–3 of U.S. Letters Patent 4,972,401, claims 1, 3, and 4 of U.S. Letters Patent 5,023,856, claims 1–6 of U.S. Letters Patent 4,999,825, and claims 20, and 23–34 of U.S. Letters Patent 5,418,764. The complaint further alleges that there exists an industry in the United States as required by subsection (a)(2) of section 337.

The complainant requests that the Commission institute an investigation and, after the investigation, issue a permanent exclusion order and a permanent cease and desist order.

**ADDRESSES:** The complaint, except for any confidential information contained therein, is available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street, SW., Room 112, Washington, DC 20436, telephone 202–205–2000. Hearing impaired individuals are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on 202–205–1810. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202–205–2000. General information concerning the Commission may also be obtained by accessing its Internet server at *http://www.usitc.gov.* The public record for this investigation may be viewed on the Commission's electronic docket (EDIS-ON–LINE) at *http://dockets.usitc.gov/eol/public.*

**FOR FURTHER INFORMATION CONTACT:** Jeffrey R. Whieldon, *Esq.,* Office of Unfair Import Investigations, U.S. International Trade Commission, telephone 202–205–2606.

**Authority:** The authority for institution of this investigation is contained in section 337 of the Tariff Act of 1930, as amended, and in § 210.10 of the Commission's rules of practice and procedure, 19 CFR 210.10 (2002).

### Scope of Investigation

Having considered the complaint, the U.S. International Trade Commission, on July 19, 2002, *ordered that*—

(1) Pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, an investigation be instituted to determine whether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain recordable compact discs or rewritable compact discs by reason of infringement of claims 1, 5, or 6 of U.S. Letters Patent 4,807,209, claim 11 of U.S. Letters Patent 4,962,493, claims 1, 2, or 3 of U.S. Letters Patent 4,972,401, claims 1, 3, or 4 of U.S. Letters Patent 5,023,856, claims 1–5 or 6 of U.S. Letters Patent 4,999,825, or claims 20, 23–33, or 34 of U.S. Letters Patent 5,418,764, and whether there exists an industry in the United States as required by subsection (a)(2) of section 337.

(2) For the purpose of the investigation so instituted, the following are hereby named as parties upon which this notice of investigation shall be served:

(a) The complainant is: U.S. Philips Corporation, 580 White Plains Road, Tarrytown, New York 10591.

(b) The respondents are the following companies alleged to be in violation of section 337, and are parties upon which the complaint is to be served:

Acme Production Industries, Room B & C, 7/F, Tai Chi Factory Building, 25–29 Kok Cheung Street, Tai Kok Tsui, Kowloon, Hong Kong.

Bregusa Micro International LLC, 22622 Lambert Street, Suite 306, Lake Forest, California 92630.

Digital Storage Technology Co., Ltd., 42 Kung 4 Road, LinKou 2nd Industrial Park, Taipei Hsien, Taiwan.

DiscsDirect.Com, 2165 South Bascom Avenue, Campbell, California 95008.

GigaStorage Corporation Taiwan, 2, Kuang Fu South Road, Hsinchu Industrial Park, Hsinchu, Taiwan.

GigaStorage Corporation USA, 174 Lawrence Drive, Suite C, Livermore, California 94550.

Jacsonic Group, 246 Clary Avenue, San Gabriel, California 91776.

J&E Enterprises, Inc., 7900 San Fernando Road, #B1, Sun Valley, California 91352.

KingPro Mediatek Inc., No 28, Chung Cheng 1st Street, Yung Kang City, 71042, Tainan Hsien, Taiwan.

Linberg Enterprise Inc., 1 Charles Avenue, Building 130 B, West Orange, New Jersey 07052.

NewEgg.Com, Inc., 132 South 6th Avenue, La Puenta, California 91746.

PNY Technologies, Inc., 299 Webro Road, Parsippany, New Jersey 07054.

QTC Computer Systems, Inc., 1374 East Edinger Avenue, Santa Ana, California 92705.

STI Certified Products, Inc., 42982 Osgood Road, Fremont, California 94539.

Symmetry Group, Inc., 11–27 44th Road, Long Island City, New York 11101.

Tiger Direct, Inc., 7795 West Flagler Street, Suite 35, Miami, Florida 33144.

TKO Media Inc., 9440 Telstar Avenue, Suite 2, El Monte, California 91731.

U.S. DigitalMedia, Inc., 21430 North 20th Avenue, Phoenix, Arizona 85027.

Xtraplus Corporation, 38929 Cherry Street, Newark, California 94560.

(c) Jeffrey R. Whieldon, *Esq.,* Office of Unfair Import Investigations, U.S. International Trade Commission, 500 E Street, SW., Room 401–A, Washington,

Washington, Windham and Windsor Counties, VT.

*Summary:* EPA has no objections to the proposed project, but supports alternatives C, D or E as those that best address resource protection.

*Rating LO*

*EIS No. 20050226, ERP No. D–FHW–B40095–RI,* U.S. Route 6/Route 10 Interchange Improvement Project, To Identify Transportation Alternative, Funding, City of Providence, Providence County, RI.

*Summary:* EPA has environmental concerns about the impacts to water and air quality as well as environmental justice issues.

*Rating EC2*

*EIS No. 20050247, ERP No. D–SFW–K64025–AZ*, Cabeza Prieta National Wildlife Refuge, Comprehensive Conservation Plan, Wilderness Stewardship Plan, Implementation, Ajo, AZ.

*Summary:* EPA has no objection to the proposed project.

*Rating LO*

*EIS No. 20050256, ERP No. D–AFS–J65446–MT*, Beaverhead-Deerlodge National Forest Draft Revised Land and Resource Management Plan, Implementation, Beaverhead, Butte-Silver Bow, Deerlodge, Granite, Jefferson, Madison Counties, MT.

*Summary:* EPA generally supports the forestwide aquatic strategy, watershed restoration and revised management practices. However, EPA expressed environmental concerns about continued impacts to water quality, the level of watershed protection and restoration, management direction for roads and other resources, and environmental protection management measures.

*Rating EC2*

*EIS No. 20050301, ERP No. D–FAA–A12043–00*, PROGRAMMATIC—Horizontal Launch and Reentry of Reentry Vehicles, Facilitate the Issuance of Licenses in United States.

*Summary:* EPA has no objection to the proposed action.

*Rating LO*

*EIS No. 20050315, ERP No. D–AFS–J65449–UT*, Fishlake National Forest Off-Highway Vehicle Route Designation Project, Proposes to Designate a System of Motorized Road, Trails, and Areas to Revise and Update the Existing Motorized Travel Plan, UT.

*Summary:* EPA expressed environmental concerns about the preferred alternative because of potential adverse impacts to source water, streams and water quality, wetlands and aquatic resources. EPA supports the transition from unmanaged motorized recreation to restricted travel and suggests the final EIS include specific analyses of the direct, indirect and cumulative impacts of this proposed plan.

*Rating EC2*

*EIS No. 20050240, ERP No. DS–FTA–B54007–WA*, Silver Line Phase III (previously known as South Boston Pier) Project, Updated Information to Physically Integrate Silver Line Phase I and II, Massachusetts Bay Transportation Authority's, Funding, MA.

*Summary:* EPA has no objections to the proposed project.

*Rating LO*

**Final EISs**

*EIS No. 20050341, ERP No. F–COE–G32058–00*, Arkansas River Navigation Study, To Maintain and Improve the Navigation Channel in Order to Enhance Commercial Navigation on the McCellan Kerr Arkansa River Navigation System (MKARNS), Several Counties, AR and Several Counties, OK.

*Summary:* No formal comment letter was sent to the preparing agency.

Dated: October 4, 2005.

**Robert W. Hargrove,**

*Director, NEPA Compliance Division, Office of Federal Activities.*

[FR Doc. 05–20207 Filed 10–6–05; 8:45 am]

**BILLING CODE 6560–50–U**

## ENVIRONMENTAL PROTECTION AGENCY

**[ER–FRL–6668–1]**

## Environmental Impacts Statements; Notice of Availability

*Responsible Agency:* Office of Federal Activities, General Information (202) 564–7167 or *http://www.epa.gov/compliance/nepa/.*

Weekly receipt of Environmental Impact Statements

Filed 09/26/2005 Through 09/30/2005

Pursuant to 40 CFR 1506.9.

*EIS No. 20050401, Draft Supplement, SFW, CA,* Southern Sea Otters (Enhydra lutris nereis) Translocation Program, New and Updated Information, San Nicolas Island, Southern California Bight, CA, Comment Period Ends: 01/05/2006, Contact: Greg Sander 805–644–1766 Ext. 315.

*EIS No. 20050402, Final EIS, FHW, UT,* Iron County Transportation Corridors, Construction from Station Road 56 to Exit 51 on Interstate 15, Funding and Right-of-Way Grant, Southwest of the Cedar City Limits, Iron County, UT, Wait Period Ends: 11/07/2005, Contact: Gregory S. Punske 801–963–0182.

*EIS No. 20050403, Final EIS, AFS, CA,* Watdog Project, Proposes to Reduce Fire Hazards, Harvest Trees, Using Group Selection Methods, Feather River Ranger District, Plumas National Forest, Butte and Plumas Counties, CA, Wait Period Ends: 11/07/2005, Contact: Susan Joyce 530–532–6500.

*EIS No. 20050404, Draft EIS, DOI, OH,* First Ladies National Historic Site General Management Plan, Implementation, Canton, OH, Comment Period Ends: 11/30/2005, Contact: Nick Chevance 402–661–1844.

*EIS No. 20050405, Draft EIS, NPS, NV,* Clean Water Coalition Systems Conveyance and Operations Program, Construction, Operation and Maintenance, City of Las Vegas, City County, NV, Comment Period Ends: 12/06/2005, Contact: Michael Boyles 702–293–8978.

*EIS No. 20050406, Draft EIS, FHW, WA,* South Park Bridge Project, Proposes to Rehabilitate or Replace the Historic South Park Ridge over the Duwamish Waterway at 14th/16 Avenue S, U.S. Coast Guard Permit and U.S. Army COE Section 10 and 404 Permits, King County, WA, Comment Period Ends: , 11/21/2005, Contact: Jim Leonard 360–753–9408.

*EIS No. 20050407, Final EIS, NPS, AZ,* Saguaro National Park Fire Management Plan, Implementation, Tucson, AZ, Wait Period Ends: 11/07/2005, Contact: Sarah Craighead 520–733–5101.

*EIS No. 20050408, Final EIS, FHW, WI,* US 41 Highway Corridor Project, Transportation Improvement between the Cities of Oconto and Perhtigo, Funding, Marinette and Oconto Counties, WI, Wait Period Ends: 11/07/2005, Contact: Johhny Gerbitz 608–829–7500.

*EIS No. 20050409, Final EIS, AFS, OR,* Joseph Creek Rangeland Analysis Project, Proposal to Allocate Forage for Commercial Livestock Grazing on Eleven Allotment, Wallowa-Whitman National Forests, Wallowa Valley Ranger District, Wallowa County, OR, Wait Period Ends: 11/07/2005, Contact: Alicia Glassford 541–426–5689.

*EIS No. 20050411, Draft EIS, IBR, CA,* Central Valley Project, West San

Joaquin Division, Long-Term Water Service Contract Renewal, Cities of Avenal, Coalinga and Huron, Fresno, King and Merced Counties, CA, Comment Period Ends: 11/25/2005, Contact: Joe Thompson 559–487–5179.

*EIS No. 20050412, Final EIS, FHW, UT,* US 6 Highway Project, Improvements from Interstate 15 (I–15) in Spanish Fork to Interstate (I–70) near Green River, Funding, Right-of-Way Permit and U.S. Army COE Section 404 Permit, Utah, Wasatch, Carbon, Emery Counties, UT, Wait Period Ends: 11/07/2005, Contact: Jeff Berna 801–963–0182.

*EIS No. 20050413, Draft Supplement, FHW, NC, NC* 12 Replacement of Herbert C. Bonner Bridge (Bridge No. 11 ) New and Updated Information, over Oregon Inlet Construction, Funding, U.S. Coast Guard Permit, Special-Use-Permit, Right-of-Way Permit, U.S. Army COE Section 10 and 404 Permit, Dare County, NC , Comment Period Ends: 11/23/2005, Contact: John F. Sullivan 919–856–4346.

*EIS No. 20050414, Draft EIS, NRC, NY,* Generic—License Renewal of Nuclear Plants for Nine Mile Point Nuclear Station, Units 1 and 2, Supplement 24 to NUREG 1437, Implementation, Lake Ontario, Oswego County, NY, Comment Period Ends: 12/22/2005, Contact: Leslie C. Fields 301–415–1186.

*EIS No. 20050415, Draft EIS, FRA, PA,* Pennsylvania High-Speed Maglev Project, Construction between Pittsburgh International Airport (PIA) and Greensburg Area, The Pennsylvania Project of Magnetic Levitation Transportation Technology Deployment Program, Allegheny and Westmoreland Counties, PA, Comment Period Ends: 12/06/2005, Contact: David Valenstein 202–493–6368.

*EIS No. 20050416, Draft EIS, NOA, TX,* PROGRAMMATIC—Texas National Estuarine Research Reserve and Management Plan, Mission-Aransas Estuary, Site Designation, Federal Approval, TX, Comment Period Ends:11/23/2005, Contact: Laurie McGilvray 301–563–1158.

*EIS No. 20050417, Final Supplement, COE, MD,* Poplar Island Environmental Restoration Project, Habitat Restoration and Dredged Material Capacity, Chesapeake Bay, Talbot County, MD, Wait Period Ends: 11/07/2005, Contact: Mark Mendelsohn 410–962–9466.

Dated: October 4, 2005.

**Robert W. Hargrove,**

*Director, NEPA Compliance Division, Office of Federal Activities.*

[FR Doc. 05–20208 Filed 10–6–05; 8:45 am]

**BILLING CODE 6560–50–P**

## FEDERAL COMMUNICATIONS COMMISSION

**[Report No. AUC–05–64–A (Auction No. 64); DA 05–2423]**

## Television Station Construction Permits

**AGENCY:** Federal Communications Commission.

**ACTION:** Notice.

**SUMMARY:** This document announces the auction of 11 full power television station construction permits scheduled to commence on March 15, 2006 (Auction No. 64). This document also seeks comments on reserve prices or minimum opening bids and other procedures for Auction No. 64.

**DATES:** Comments are due on or before October 14, 2005, and reply comments are due on or before October 21, 2005.

**ADDRESSES:** Comments and reply comments must be sent by electronic mail to the following address: *auction64@fcc.gov*. Parties who file also by paper must file an original and four copies of each filing. U.S. Postal Service first class, express or priority mail must be addressed to the Office of the Secretary, 445 12th Street, SW., Washington, DC 20054.

**FOR FURTHER INFORMATION CONTACT:** *For legal questions:* Lynne Milne at (202) 418–0660. *For general auction questions:* Debbie Smith or Lisa Stover at (717) 338–2888. *For service rule questions:* Shaun Maher at (202) 418–2324 or Shaleim Henry at (202) 418–1600.

**SUPPLEMENTARY INFORMATION:** This is a summary of the *Auction No. 64 Comment Public Notice* released on September 23, 2005. The complete text of the *Auction No. 64 Comment Public Notice*, including attachments and any related Commission documents, is available for public inspection and copying from 8 a.m. to 4:30 p.m. Monday through Thursday or from 8 a.m. to 11:30 a.m. on Friday at the FCC Reference Information Center, Portals II, 445 12th Street, SW., Room CY–A257, Washington, DC 20554. The *Auction No. 64 Comment Public Notice* and related Commission documents may also be purchased from the Commission's duplicating contractor, Best Copy and Printing, Inc. (BCPI), Portals II, 445 12th Street, SW., Room CY–B402, Washington, DC, 20554, telephone 202–488–5300, facsimile 202–488–5563, or BCPI Web site: *http://www.BCPIWEB.com*. When ordering documents from BCPI, please provide the appropriate FCC document number, for example, DA 05–2423 for the Auction No. 64 Comment Public Notice. The *Auction No. 64 Comment Public Notice* and related documents are also available on the Internet at the Commission's Web site: *http://wireless.fcc.gov/auctions/64/*.

### I. Television Construction Permits in Auction No. 64

*A. Open Construction Permits*

1. By the *Auction No. 64 Comment Public Notice*, the Wireless Telecommunications Bureau and the Media Bureau (collectively referred to as the Bureaus) announce that the ten construction permits listed in Attachment A of the *Auction No. 64 Comment Public Notice* as open are available to any interested party. Long-form applications (FCC Forms 301) were filed previously for some of these stations. The pending applications for these stations are listed in Attachment A of the *Auction No. 64 Comment Public Notice*. Any party filing for a station with a pending application should understand that it is likely that its application will be mutually exclusive with the previously-filed application. Even if there is no pending long-form application for a station listed in Attachment A of the *Auction No. 64 Comment Public Notice*, applicants specifying the same construction permit will be considered mutually exclusive for auction purposes. Once mutual exclusivity exists for auction purposes, even if only one applicant for the same construction permit in Auction No. 64 submits an upfront payment, that applicant is required to submit a bid in order to obtain the construction permit. Any applicant that submits a short-form application that is accepted for filing but fails to timely submit an upfront payment will retain its status as an applicant in Auction No. 64 and will remain subject to the Commission's anti-collusion rule, 47 CFR 1.2105(c), but, having purchased no bidding eligibility, will not be eligible to bid.

2. The Commission's competitive bidding rules will be used to select among mutually exclusive applicants for these 10 construction permits in Auction No. 64. Those wishing to participate in the auction, including those entities listed in Attachment A of the *Auction No. 64 Comment Public*

Dated: September 9, 2005.

**Monica Farris,**

*Senior Permit Biologist, Branch of Permits, Division of Management Authority.*

[FR Doc. 05–19971 Filed 10–4–05; 8:45 am]

**BILLING CODE 4310–55–P**

## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

### Emergency Exemption: Issuance of Permit for Endangered Species.

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Notice of emergency issuance of permit for endangered species.

**SUMMARY:** The following permit was issued.

**ADDRESSES:** Documents and other information submitted for this application are available for review, subject to the requirements of the Privacy Act and Freedom of Information Act, by any party who submits a written request for a copy of such documents to: U.S. Fish and Wildlife Service, Division of Management Authority, 4401 North Fairfax Drive, Room 700, Arlington, Virginia 22203, telephone (703) 358–2104 or fax (703) 358–2281.

**FOR FURTHER INFORMATION CONTACT:** Division of Management Authority, telephone (703) 358–2104.

**SUPPLEMENTARY INFORMATION:** On September 16, 2005, the U.S. Fish and Wildlife Service (Service) issued a permit (PRT–109802) to the Virginia Polytechnic Institute and State University (CVM Phase 2), Blacksburg, VA, to import carcasses from wild chimpanzees (*Pan troglodytes*) collected in Tanzania for the purpose of scientific research. This action was authorized under Section 10(c) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*). The Service determined that an emergency affecting the health and life of the chimpanzees existed, and that no reasonable alternative was available to the applicant for the following reasons.

Virginia Polytechnic Institute and State University requested a permit to import carcasses from deceased animals found in the Mahale Mountains National Park in Kigoma, Tanzania and the Rubondo Island National Park in Mwanza, Tanzania for emergency and ongoing health and disease evaluation purposes. The carcasses will be utilized exclusively for diagnostic and scientific purposes. The specimens from these animals will be used to run diagnostic tests in order to determine the cause of illness and death related to an ongoing disease outbreak at the National Parks within the past several weeks. The necessary diagnostic testing is not available in Africa. The results of health and disease testing involving these chimpanzees will help determine what caused the outbreak in order to develop interventions to help prevent reoccurrence.

Dated: September 16, 2005.

**Michael S. Moore,**

*Senior Permit Biologist, Branch of Permits, Division of Management Authority.*

[FR Doc. 05–19970 Filed 10–4–05; 8:45 am]

**BILLING CODE 4310–55–P**

## DEPARTMENT OF THE INTERIOR

### National Park Service

### Isle Royale National Park Wilderness and Backcountry Management Plan/ Environmental Impact Statement; Correction

**AGENCY:** National Park Service.

**ACTION:** Notice of availability of the draft wilderness and backcountry management plan/draft environmental impact statement, Isle Royale National Park, Michigan; correction.

**SUMMARY:** In the December 28, 2004, **Federal Register**, the National Park Service (NPS) announced the availability of the draft wilderness and backcountry management plan/draft environmental impact statement (WBMP EIS) for Isle Royale National Park. Due to technical review delays the document will not be available until October.

Correction: The draft WBMP EIS will be made available for public review for 60 days following the publishing of the notice of availability in the **Federal Register** by the Environmental Protection Agency. The NPS will notice the draft WBMP EIS availability in local media. The NPS will notice the Draft WBMP EIS availability and public meetings in local media and on the Planning, Environment, and Public Comment Web site at the following address: *http://parkplanning.nps.gov/publicHome.cfm.*

**ADDRESSES:** Copies of the WBMP EIS will be available on CD by request by writing to Phyllis Green, Superintendent, Attn: WBMP, Isle Royale National Park, 800 East Lakeshore Drive, Houghton, MI 49931, or by e-mail message at *isro_wbmp@nps.gov.* A CD–ROM of the document can be picked up at the park's headquarters at the same address, or viewed over the Internet at the park's Web site at *http://www.nps.gov/isro/home.htm.* Finally, the document can be found on the Internet at the NPS Planning, Environment, and Public Comment (PEPC) Web site at: *http://parkplanning.nps.gov/publicHome.cfm.* This Web site allows the public to review and comment directly on this document.

Dated: August 26, 2005.

**David N. Given,**

*Acting Regional Director, Midwest Region.*

[FR Doc. 05–19959 Filed 10–4–05; 8:45 am]

**BILLING CODE 4312–92–P**

## DEPARTMENT OF THE INTERIOR

### National Park Service

### Bureau of Reclamation Draft Environmental Impact Statement for Clean Water Coalition Systems Conveyance and Operations Program; Lake Mead National Recreation Area; Clark County, NV; Notice of Availability

*Summary:* Pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969, and the corresponding Council of Environmental Quality implementing regulations (40 CFR parts 1500–08), the National Park Service and Bureau of Reclamation, as lead agencies for the Department of the Interior, announce the availability of the Clean Water Coalition Systems Conveyance and Operations Program (SCOP) Draft Environmental Impact Statement. Consistent with applicable laws and National Park Service and Bureau of Reclamation regulations and policies, the Draft SCOP EIS describes and analyzes four alternatives including the no action alternative.

The Draft SCOP Environmental Impact Statement evaluates the potential environmental impacts associated with three action (pipeline) alternatives, as well as a No-Action (no pipeline) Alternative. The three action alternatives include an Effluent Interceptor (EI) and Lake Conveyance System (LCS) that would collect and convey the highly treated effluent from the three treatment facilities to the Las Vegas Wash at a point upstream of Lake Las Vegas or to Lake Mead. The action alternatives would allow for flexible management of the highly treated effluent. A controlled amount of effluent would continue to be discharged to the Las Vegas Wash at each facility or at the EI Terminus. The discharge amount, velocity, and direction from the LCS diffuser would also be flexibly operated depending on the conditions of Lake Mead.

The Draft SCOP EIS evaluates effects of the alternatives on both visitor experience and park resources including: surface water hydrology, groundwater, water quality, biological resources/endangered species, cultural resources, recreation, land use, air quality, noise, socioeconomics, and other appropriate resource issues identified during the public scoping phase. An impairment analysis was also conducted for the portion of the proposed actions located on land administered by the National Park Service (NPS).

*Purpose and Need For Federal Action:* The purpose of implementing the proposal is to put into operation a treatment and conveyance system that will allow for flexible management of wastewater flow in the Las Vegas Valley, while maintaining water quality standards. Clark County, Nevada is one of the fastest growing counties in the U.S., and it is projected that the population in the area will be approximately 3,130,000 by 2035. The quantity of effluent treated and discharged in the Las Vegas Valley will increase as the population of the Valley increases. The treatment and conveyance facilities must accommodate the additional flows while continuing to meet current or future water quality standards for the Las Vegas Wash, Las Vegas Bay, and Lake Mead.

The Clean Water Coalition proposes to build and implement a system that provides maximum flexibility for management of treated effluent to:

- Meet current and future water quality standards for known pollutants, and as yet unknown standards for additional contaminants that may be regulated in the future;
- Protect and enhance the Lake Mead National Recreation Area (LMNRA) by continuing to meet beneficial uses and recreational and resource values of the LMNRA, while more than doubling the treated effluent flows discharged to Lake Mead;
- Recognize Lake Mead's likely lowering water levels, which are important because the amount of mixing and dilution available in the inner Las Vegas Bay are also decreasing as the Lake level decreases; and
- Avoid possible impacts to source-water quality at the Southern Nevada Water System intake structures.

*Alternatives To Be Considered:* The alternatives in the Draft SCOP EIS include expansions of the three treatment plants and the continued discharge of current and projected effluent flows to the Las Vegas Wash, with the use of conventional treatment processes to meet water quality standards (no action alternative); and construction and operation of a pipeline that would transport highly treated effluent from the three treatment facilities to a receiving area underwater within the Colorado River system (three action alternatives).

In addition to the No Action Alternative, the NPS and Bureau of Reclamation (BOR) have analyzed the potential impacts of three action alternatives: the Boulder Islands North Alternative, the Boulder Islands South Alternative, and the Las Vegas Bay Alternative. Under the No Action Alternative, the Clean Water Coalition would not construct pipelines to transport effluent from the treatment facilities. The three treatment agencies (City of Las Vegas, City of Henderson, and Clark County Water Reclamation District) would expand their facilities to handle the increasing quantities of wastewater through 2050. Current, conventional treatment processes and plant optimization would be used to meet the requirements set by the Nevada Division of Environmental Protection through the National Pollutant Discharge Elimination System permitting program. Facility expansions and modifications would occur on lands currently owned by the City of Las Vegas, Clark County, and City of Henderson.

Under the Boulder Islands North Alternative and the Boulder Islands South Alternative, the three treatment agencies would expand their facilities to handle the increasing quantities of wastewater through 2050, and current, conventional treatment processes and plant optimization would be used to meet water quality requirements. A pipeline would be constructed to convey highly treated effluent from the three treatment facilities to an alternate discharge location in the vicinity of the Boulder Islands in Lake Mead. The majority of the Boulder Islands North LCS and the Boulder Islands South LCS would be installed in a tunnel through the River Mountains.

Under the Las Vegas Bay Alternative, the three treatment agencies would expand their facilities to handle the increasing quantities of wastewater through 2050, and current, conventional treatment processes and plant optimization would be used to meet water quality requirements. A pipeline would be constructed to convey highly treated effluent from the three treatment facilities to an alternate discharge location in the Las Vegas Bay in Lake Mead.

*Public Review and Comment:* The Draft SCOP EIS will be available for public review for 60 days following the publication in the **Federal Register** of the Environmental Protection Agency's notice of the filing of this document (immediately upon confirmation of this date it will be announced on the LMNRA Web site and via local and regional press media). The NPS and BOR will hold public meetings to obtain oral comments during a two-week period in October 2005, as follows:

- October 17, Henderson Convention Center, 200 S. Water Street, Henderson, NV from 6:30–8:30 p.m.
- October 18, West Las Vegas Library, 951 W. Lake Mead Blvd., Las Vegas, NV from 6:30–8:30 p.m.
- October 19, West Flamingo Senior Center, 6255 W. Flamingo Road, Las Vegas, NV from 6:30–8:30 p.m.
- October 20, Summerlin Library, 1771 Inner Circle Drive, Las Vegas, NV from 6:30–8:30 p.m.
- October 24, Powerhouse Visitors Conference Center, 120 W. Route 66, Kingman, AZ from 6–8 p.m.
- October 25, Tempe Mission Palms Hotel, 60 E. 5th Street, Tempe, AZ from 6–8 p.m.
- October 26, Hilton Suites, 10 E. Thomas Road, Phoenix, AZ from 6–8 p.m.
- October 27, Radisson in Mission Valley, 1433 Camino Del Rio South, San Diego, CA from 6–8 p.m.
- October 28, Hyatt Regency Conference Center, 285 N. Palm Canyon Drive, Palm Springs, CA from 6–8 p.m.

All written comments on the Draft SCOP EIS must be postmarked or transmitted not later than 60 days after the EPA's notice of the filing published in the **Federal Register**; upon confirmation of this date it will be announced on the LMNRA Web site and via local and regional press media. Comments are to be addressed to the SCOP EIS Project Manager, PBS&J and may be sent either electronically to *eis@cleanwatercoalition.com*, via facsimile at (702) 990–7262, or by mail to 2270 Corporate Circle, Suite 100, Henderson, NV 89074.

Please note that names and addresses of people who comment become part of the public record. If individuals commenting request that their name or/and address be withheld from public disclosure, it will be honored to the extent allowable by law. Such requests must be stated prominently in the beginning of the comments. There also may be circumstances wherein the NPS will withhold from the record a respondent's identity, as allowable by law. As always: the NPS will make available to public inspection all submissions from organizations or businesses and from persons identifying

themselves as representatives or officials of organizations and businesses; and, anonymous comments may not be considered.

Copies of the Draft SCOP EIS may be obtained by contacting SCOP EIS Project Manager, PBS&J, 2270 Corporate Circle, Suite 100, Henderson, NV 89074 (or e-mailing to *eis@cleanwatercoalition.com* or telephone (702) 263–7275 extension 3014). The document will also be posted on the Internet at *http://www.cleanwatercoalition.com*, as well as made available at public libraries in the following locations:

Nevada—Boulder City Library, Las Vegas Public Library, Searchlight Library, Community College of Southern Nevada, Sahara West Library, Mesquite Library, University of Nevada-Las Vegas, James I. Gibson Library, Clark County Library, James R. Dickinson Library, Moapa Valley Library, Green Valley Library, Sunrise Public Library, Laughlin Library.

Arizona—Burton Barr Central Library, Tempe Public Library, University of Arizona Library, Meadview Community Library, Mohave County Library.

Utah—Washington County Library.

California—Environmental Services Library in San Diego, Palm Springs Public Library.

For further information about the public meetings or for obtaining copies of the document, please contact the SCOP EIS Project Manager, PBS&J, 2270 Corporate Circle, Suite 100, Henderson, NV 89074; e-mail *eis@cleanwatercoalition.com*; or call (702) 263–7275 extension 3014. For additional information regarding the alternatives to be considered or other matters pertaining to the conservation planning and environmental impact analysis process, please contact: Mr. Michael Boyles, National Park Service, Lake Mead National Recreation Area, 601 Nevada Way, Boulder City, NV 89005, telephone (702) 293–8978; or Mr. Anthony Vigil (LC–2621), Bureau of Reclamation, P.O. Box 61470, Boulder City Nevada 89006–1470, telephone (702) 293–8674.

*Decision:* After public review of the Draft SCOP EIS, the National Park Service and Bureau of Reclamation will carefully assess and consider all written comments and information obtained at the public meetings. A Final SCOP EIS will be prepared, which at this time is anticipated to be completed during summer 2006. Subsequent to release of the Final SCOP EIS and following a 30-days ''no action'' waiting period a Record of Decision will be prepared.

Dated: September 22, 2005.

**Robert W. Johnson,**

*Regional Director, Lower Colorado Region, Bureau of Reclamation.*

Dated: September 22, 2005.

**Jonathan B. Jarvis,**

*Regional Director, Pacific West Region, National Park Service.*

[FR Doc. 05–19960 Filed 10–4–05; 8:45 am]

**BILLING CODE 4312–52–P**

## DEPARTMENT OF THE INTERIOR

### National Park Service

### Cape Cod National Seashore, South Wellfleet, MA; Cape Cod National Seashore Advisory Commission; Two Hundred Fifty-Fifth Notice of Meeting

Notice is hereby given in accordance with the Federal Advisory Committee Act (Pub. L. 92–463, 86 Stat. 770, 5 U.S.C. App 1, Section 10), that a meeting of the Cape Cod National Seashore Advisory Commission will be held on December 5, 2005.

The Commission was reestablished pursuant to Public Law 87–126 as amended by Public Law 105–280. The purpose of the Commission is to consult with the Secretary of the Interior, or her designee, with respect to matters relating to the development of Cape Cod National Seashore, and with respect to carrying out the provisions of sections 4 and 5 of the Act establishing the Seashore.

The Commission members will meet at 1 p.m. in the meeting room at Headquarters, Marconi Station, Wellfleet, Massachusetts for the regular business meeting to discuss the following:

1. Adoption of Agenda
2. Approval of Minutes of Previous Meeting (September 26, 2005)
3. Reports of Officers
4. Reports of Subcommittees
5. Superintendent's Report
   Salt Pond Visitor Center Update
   Highlands Center Update
   Update on Dune Shack Report
   ORV's
   Herring River Restoration Project
   Wilderness Areas
   Wind Turbines/Cell Towers
   News from Washington
6. Old Business
7. New Business
8. Date and agenda for next meeting
9. Public comment and
10. Adjournment

The meeting is open to the public. It is expected that 15 persons will be able to attend the meeting in addition to Commission members.

Interested persons may make oral/written presentations to the Commission during the business meeting or file written statements. Such requests should be made to the park superintendent at least seven days prior to the meeting. Further information concerning the meeting may be obtained from the Superintendent, Cape Cod National Seashore, 99 Marconi Site Road, Wellfleet, MA 02667.

Dated: September 27, 2005.

**George E. Price, Jr.,**

*Superintendent.*

[FR Doc. 05–19961 Filed 10–4–05; 8:45 am]

**BILLING CODE 4312–52–P**

## DEPARTMENT OF THE INTERIOR

### National Park Service

### National Capital Region

**ACTION:** Notice/Request for Comments—The Christmas Pageant of Peace.

**SUMMARY:** The National Park Service is seeking public comments and suggestions on the planning of the 2005 Christmas Pageant of Peace.

**SUPPLEMENTARY INFORMATION:** The National Park Service is seeking public comments and suggestions on the planning of the 2005 Christmas Pageant of Peace, which opens on December 1, 2005, on the Ellipse (President's Park), south of the White House. The meeting will be held at 10:30 a.m. on November 3, 2005, in Room 234 of the National Capital Region Headquarters Building, at 1100 Ohio Drive, SW., Washington, DC (East Potomac Park).

Persons who would like to comment at the meeting should notify the National Park Service by October 31, 2005 by calling the White House Visitor Center weekdays between 9 a.m., and 4 p.m., at (202) 208–1631. Written comments may be sent to the Park Manager, White House Visitor Center, 1100 Ohio Drive, SW., Washington, DC 20242, and will be accepted until November 3, 2005.

**DATES:** The meeting will be held on November 3, 2005. Written comments will be accepted until November 3, 2005.

**ADDRESSES:** The meeting will be held at 10:30 a.m. on November 3, 2005, in room 234 of the National Capital Region Headquarters Building, at 1100 Ohio Drive, SW., Washington, DC (East Potomac Park). Written comments may be sent to the Park Manager, White House Visitor Center, 1100 Ohio Drive, SW., Washington, DC 20242. Due to delays in mail delivery, it is

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# Appendix B

Scoping Comments

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# Department of Parks & Recreation

2601 E Sunset Rd • Las Vegas NV 89120
(702) 455-8200 • Fax (702) 455-8234


December 20, 2001

James P. Green
Regulatory Compliance Officer
USDA, Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470

Dear Mr. ~~Green~~ Pat:

The purpose of this letter is to provide comments on the proposed effluent interceptor as requested during the December 4 and 5, 2001 public scoping meetings. Clark County Parks and Recreation comments are as follows:

1. Establishment of a minimum in-stream flow for phreatophyte and hydrophyte use within the Las Vegas Wash must be addressed in the environmental assessment (EA) for the effluent interceptor project. Consumptive water use within the Wetlands Park is summarized in the attached *Memorandum on Consumptive Water Use Investigation for the Clark County Wetlands Park* prepared by the Harry Reid Center for Environmental Studies, University of Nevada, Las Vegas. Water use issues have been explained, described, and/or predicted in the Final Program Environmental Impact Statement for the Clark County Wetlands Park (December 1998), the Wetlands Park Master Plan (July 1995), the Planning Process Report (July 1995), the Pabco Road EA (February 1996), the Nature Center EA (December 1999), and a memo from Montgomery Watson entitled, "Estimated Reclaimed Water Requirements for D-14 Dike Wetlands Area" (1998).

2. Management of in-stream flows within the Las Vegas Wash must be addressed. Las Vegas Wash discharges above the minimum consumptive use requirement must be maintained for wildlife, recreation, and aesthetic values. While consumptive water use by phreatophytes and hydrophytes may fluctuate significantly by season, other management issues may remain relatively constant.

3. To mitigate impacts to the Wetlands Park, it is proposed that water turnouts be incorporated into the project at strategic locations along the pipeline. Water provided by these turnouts will be used to create wetlands down gradient from the effluent interceptor.


BOARD OF COUNTY COMMISSIONERS
DARIO HERRERA, Chairman • MYRNA WILLIAMS, Vice-Chair
YVONNE ATKINSON GATES • ERIN KENNY • MARY KINCAID-CHAUNCEY • CHIP MAXFIELD • BRUCE L. WOODBURY
THOM REILLY, County Manager

These wetlands should be designed as part of the project to ensure their viability and that erosional head-cutting will not occur. These wetlands would offset recreational, aesthetic, and wildlife values lost as a result of the pipeline corridor.

4. The completed grade of the pipeline corridor should match existing natural contours, and engineered structures should be designed to minimize visual impacts. Large rock rip rap should be strategically placed to minimize unauthorized vehicular use of the corridor.

5. It is requested that a complete scope for any energy recovery system and associated engineered structures be provided to Clark County Parks and Recreation prior to release of the final draft EA. If an energy recovery system is to be added to the project, it is recommended that impacts be addressed in the EA.

6. It is requested that the timing of this project be coordinated closely with park development issues.

Thank you for the opportunity to comment on the proposed effluent interceptor project. I look forward to working with you and the project sponsors to coordinate this project with ongoing Wetlands Park activities and would like to provide future comments on the official draft EA. If you have any questions, please contact me at 455-8113.

Sincerely,

Jeff Harris
Manager of Parks Planning

Attachment

cc w/att:
Clean Water Coalition

cc w/o att:
Bruce Sillitoe

# MEMORANDUM ON CONSUMPTIVE WATER USE INVESTIGATIONS FOR THE CLARK COUNTY WETLANDS PARK

Prepared for

Clark County Parks and Recreation

By

Rowena González and James E. Pollard

Harry Reid Center for Environmental Studies
University of Nevada, Las Vegas
4504 Maryland Parkway
P.O. Box 454009
Las Vegas, Nevada 89154-4009

Final Report
July 27, 2000
HRC-ELR-3-4-2

## BACKGROUND

Consumptive water use by phreatophytes and hydrophytes is considered a major consumptive water use issue for the Clark County Wetlands Park (Park). Therefore a considerable effort has been expended to define the potential impact that this water use may have upon the Colorado River water return flow credits calculated by the Bureau of Reclamation (BOR). In 1994, the Southwest Wetlands Consortium (SWC) prepared an estimate of consumptive water use by plants and compared it to estimates made in 1975, 1982, and 1986 by BOR. The results have been cited in numerous planning documents which were used as primary sources of information for this investigation regarding the adequacy of data on consumptive water use estimates for the proposed Clark County Wetlands Park. We have examined the five major publically available documents in which water use issues are explained, described, and/or predicted as well as one internal memo from Montgomery Watson to Clark County Parks and Recreation. The documents which were reviewed are:

1. The Final Program Environmental Impact Statement for the Clark County Wetlands Park (EIS) (December 1998).

2. The Park Master Plan Report (MPR.), July 1995;

3. The Planning Process Report (PPR), July 1995;

4. The Pabco Road Environmental Assessment (PREA), February 1996; and

5. The Nature Center Environmental Assessment (NCEA), December 1999; and

6. Estimated Reclaimed Water Requirements for D-14 Dike Wetlands Area, Memo from Montgomery Watson to Clark County Parks and Recreation, 1998.

We searched these documents for references to consumptive water use, evapotranspiration, acreages of plantings projected for the park and corresponding estimates of water use. We have used additional sources available from the UNLV library system and interlibrary loans to develop independent estimates of evapotranspiration ranges in desert environments and compared them to the consumptive water use estimates contained in the public planning documents.

Table 1 presents summaries of both the EIS and other literature values for ET Rates including ranges for various species and habitat types. The EIS column in this table is a composite of information presented in Tables 3.3.5 and TR3-1 in the EIS and is therefore not entirely consistent with either source of information. Table 2 presents consumptive water use estimates in acre feet per year (afy) based on the ET and acreages presented in Table 1.

**TABLE 1**: Evapotranspiration Estimates (Feet/year) for Community Assemblages and Acreages Projected for the Clark County Wetlands Park.

| Community/Species | Acreage | EIS | Literature |
|---|---|---|---|
| Hydroriparian | 202 | | |
| Cattail | | 4.92–9.84[5] | 4.92-9.84[9] |
| Cattail | | | 5.04[3] |
| Bullrush | | | 6.53-7.03[3] |
| Enhanced riparian | 130 | | 4.18-6.61* |
| Tamarisk, 40% | 52 | | 4.92–6.89[7,9,14] |
| Native species, 40% | 52 | (Fre. cottonwood) | 5.40–8.80[12] |
| Open area, 20% | 26 | | 0.25–1.67[10] |
| Open Water (Evaporation only) | 6 | | 8.3[16] |
| Strand | 17 | | |
| Fre. Cottonwood | | | 5.40–8.1[1,12] |
| Goodding Willow | | | 2.54–4.40[2,12] |
| Big saltbush | | | 3.67[10] |
| Fourwing saltbush | | | 3.17[10] |
| Common Reed | 278 | 3.28–4.92[5] | 3.28–4.92[9] |
| Tamarisk | 786 | 4.92–6.70[5] | 4.92–6.89[7,9,14] |
| Alkali | 181 | 2.70–4.01[5] | |
| Saltgrass | | | 0.82–2.62[17] |
| | | | 1.12–4.07[12] |
| | | | 2.74[3] |
| Alkali sacaton | | | 3.44–3.94[2] |
| Russian thistle | | | 0.60–0.65[2] |

* ET values for the combined enhanced riparian habitat were calculated by taking weighted averages of literature values for the three species.

**TABLE 2.** Consumptive Water Use Due to Evapotranspiration (Acre-feet/year for Acreages and Vegetation Communities Projected for the Clark County Wetlands Park

| Community/Species | Acreage | EIS | Literature |
|---|---|---|---|
| Hydroriparian | 202 | | |
| Cattail * | | 993.8–1987.7 | 993.8–1987.7 |
| River bulrush | | | |
| Enhanced riparian | 130 | 543.4-859.3 | |
| Tamarisk, 40% | 52 | | 255.8-358.3 |
| Native species, 40% | 52 | | 280.8–457.6 |
| Open area, 20% | 26 | | 6.5–43.3 |
| Open Water | 6 | | 49.8 |
| Strand | 17 ** | | 62.8-106.3 |
| Fre. Cottonwood | | | |
| Goodding Willow | | | |
| Big saltbush | | | |
| Fourwing saltbush | | | |
| Common Reed | 278 | 911.8–1367.8 | 911.8–1367.8 |
| Tamarisk | 786 | 3867.1–5266.2 | 3867.1–5415.5 |
| Alkali | 181 | 488.7–725.8 | |
| Saltgrass *** | | | 175.6–605.4 |
| **Totals** | | **6805–10,207** | **6604–10,392** |

* Range of values for cattails only was used in ET estimates.

** Average values of low and high literature values for all species in Table 1 were used.

*** Average values of low and high literature values of *Distichlis* were used for Alkali acreage estimates.

## CONSUMPTIVE WATER USE ESTIMATES FROM PARK PLANNING DOCUMENTS

In the MPR. (pg. 85) and the EIS (pg. 3.3-15, Integrated Alternative), the estimated consumptive water use for phreatophytes and hydrophytes for the completed Park is given as 10,440 afy. This estimate was derived from "the estimated acreages impounded by erosion control structures and other water impoundments." (EIS, pg. 3.3-15). However, it was not clear in the EIS how these acreages were calculated.

The PPR states (pg. 28), "...sufficient water allocation for the park's maintenance and enhancement will depend on the Master Plan adopted for the Park...[which] will depend on desired future vegetative conditions and other water needs including sanitary use or irrigation of landscaping...." The enhancements in vegetation planned for the Park in the Integrated Alternative are estimated within the EIS (Table 2.6) as increases of existing wetlands (158 acres) and riparian habitats (130 acres). In addition, further estimates of "conserved" acreages of wetland plants are presented in Table TR3-1 - Topical response No. 3 of the EIS (p.F-10). This table contains additional categories of wetland plant types but is not consistent with the acreages presented in Table 2.6. Since additional detail on projected acreages was provided in Table TR3-1, this information was deemed the best available detail of projected acreages for the park.

## EVAPOTRANSPIRATION ESTIMATES DERIVED FROM LITERATURE

The following methodology was used for determination and comparisons of ET rates:

1) The ET rates in the EIS (EIS, 3.3.10) were first noted and the applicable references for these obtained. The plants for which rates were found were: cattail, ({Young and Blaney, 1942; McNaughton, 1966; McDonald and Hughs, 1968} cited in Jackson and Patten, 1988; Christensen and Low, 1970), Bullrush (Christiansen and Low, 1970), tamarisk (Jackson and Patten, 1988; Gay and Hartman, 1981; Sala et.al., 1999); Fremont Cottonwood (Anderson, 1982; Muckel and Blaney, 1945), Willows (Blaney and Hansen, 1965; Muckel and Blaney, 1945), saltbush (McDonald and Hughes, 1968) common reed (Jackson and Patten, 1988; Haslam, 1970; Shay and Shay, 1986) and saltgrass (Muckel and Blaney, 1945; USBOR, 1973; Christiansen and Low, 1970); Russian Thistle and Alkali Sacaton (Blaney and Hansen, 1965).

2) References cited in the EIS were examined for ET rates and, using appropriate conversion factors, the rates re-calculated from the literature. These values were compared with those reported in the EIS and, as would be expected, the agreement was excellent, indicating the original calculations performed by the authors of the EIS were valid.

3) ET rates for all pertinent plant communities mentioned in the EIS as were also sought to develop a more detailed park-wide ET estimate. Information on the Fremont cottonwood and Goodding willow was especially sought, since these are anticipated replacement plants for tamarisk. Rates for Fremont cottonwood appear to be very similar to those for

tamarisk ({Anderson, 1982; Muckel and Blaney, 1945} cited in Robinson's Phreatophytes, 1958). No rates for Goodding willow were found, but data from two localities, Santa Ana, Calif. and Isleta, New Mexico, for *salix laevigata* and "willows" were found ( Blaney et al, 1933; Young and Blaney, 1942). It should be mentioned that some studies found no significant difference in stream flows or other indications of success after removal/replacement of tamarisk (Weeks et al., 1987; Culler et al., 1982).

Estimates of accuracy were generally not made in these studies. The determination of ET rates is affected by a large number of variables, many of which do not lend themselves well to quantitative studies, and the comparison of results produced using one method of ET rate determination to data produced using another is not always possible. Extrapolating measurements in time and transferring them in space, even to nearby areas, requires that assumptions of uncertain reliability be made (Weeks et al., 1987; Ward and Elliot, 1995). The rate for open water was taken from that for lake evaporation, stated in Thompson (1999) as exceeding "100 inches per year in the deserts of southeastern California." No further data useful for meaningful comparison was found although references were searched. Consumptive water use due to evapotranspiration or evaporation was calculated by multiplying the rates by the appropriate acreage from the table TR-3-1 - Topical Response No. 3 of the EIS.

## DATA GAPS

Wetlands will develop behind the planned erosion control structures and a varying amount of open water habitat will be created along with the developing wetlands. Tamarisk and common reed will be removed from the areas to be flooded and within a 20-ft zone around the planned planting areas. No estimates of planting acreages are given within the text of the planning documents but rather a statement is made that "a detailed planting plan will be required for each erosion control structure at the time of construction." It is assumed that these plans would include estimates of extent of upstream innundation and wetland creation as well as estimates of the number of acres of each wetland plant type that will be created. These data do not currently exist and therefore cannot be specifically evaluated for potential effects on evapotranspiration losses in the Park.

Riparian and landscape enhancements will occur around the erosion control structures and will involve the removal of tamarisk and reed to allow establishment of willow, cottonwood, mesquite, and other trees, shrubs, and grass. "The objective is ...a community of 40 percent tamarisk, 40 percent planted native riparian species, and 20 percent open area....Native trees will be planted in an average density of 60 per acre over the entire riparian enhancement area. The actual number of trees per acre of converted riparian habitat will vary from zero in the open patches to over 100 trees per acre in some of the planted patches" (MPR., A-6). It is not known at present which species of trees and shrubs will thrive in the newly created habitats nor in what densities. Finally, no estimates are evident in any of the planning documents for consumptive water use of "other water needs including sanitary use and irrigation of landscaping". Given this level of uncertainty in the final configuration of the Park, the planning document acreage estimates

of general habitat types represent the most realistic base of information for use in estimation of water loss from these sources.

## CONCLUSIONS AND RECOMMENDATIONS

Following the review of existing planning document information on consumptive water use for the Park, it was evident that the most commonly cited estimates of phreatophytes and hydrophyte water consumption in the Las Vegas Wash (10,300 afy BOR return flow calculation), or the somewhat larger number presented in the EIS for the Integrated Alternative (10,440 afy - Table 3.3-7) could be criticized for a number of reasons. While the EIS cites a number of literature sources for ET rates, most of those studies are quite dated and some would be difficult and/or time consuming to obtain through normal library channels. There are inconsistencies in the figures presented in the planning documents for acreages and ET rates which are difficult to resolve. For example, the only available estimates of acreages of total wetland plant types within the park are contained in Table 2.6 (Specific Components of the Integrated Alternative) and Table TR3-1 (Topical Response No. 3) of the EIS which are not completely consistent with each other. However, even given this level of potential error, the maximum ET rates presented herein (Table 2), which were independently derived from a larger more current literature base, were remarkably similar to those presented in the planning documents.

Ultimately to refine the water consumption estimates for the Park, it would be necessary to define more specifically the types and acreages of phreatophytes and hydrophytes which will be created in the mature park and then compare the use of these plant assemblages to those that are currently present. Ideally a table similar to Table 2 in the NCEA which provides species-specific planned acreages of wetland enhancements would be available for all portions of the park. This could be a fairly large task that may not provide substantially more accurate information than currently exist. ET rates for a given species in a given environment can be quite variable and so a refined Park-wide ET estimate will probably have error bounds that are similar to those presented in the EIS or are noted in Table 2 of this document. Therefore we would not recommend additional effort at this time to refine the information contained in Table TR3-1 in the EIS or to obtain additional information regarding species-specific ET rates.

There still remains one element of consumptive water use in the Park which has not been addressed. The PPR states (pg. 28), "...sufficient water allocation for the park's maintenance and enhancement will depend on the Master Plan adopted for the Park...[which] will depend on desired future vegetative conditions *and other water needs including sanitary use or irrigation of landscaping*..." There is no mention in any of the planning documents of sanitary water use or irrigation needs of the park. Drinking and sanitary water would be supplied as city supplied water which will be a function of facilities which are constructed in each portion of the park. We do not believe that planning documentation has been prepared to date which would allow a detailed estimate of the future needs for this water source.

Irrigation needs would presumably be obtained from effluent water or the Park ponds and

would become part of the consumptive water use totals that have been previously estimated. Although this is probably not a large number compared to the ET figures, it should be investigated in the future to determine the magnitude of this potential water use. This effort would require an estimate of the total irrigation needs of the park to determine defensible potential consumption figures. Possibly this information is available in generalized planting plans or other documents that have been produced for you in the past which could be extrapolated to Park wide estimates. Additional information on irrigation needs of the park might become available in the Programmatic Biological Assessment effort currently underway. We would recommend these data be requested from your contractors, or that a request be included in the PBA to provide total irrigation needs based on the projected impact analysis which will be an outcome of the PBA.

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KENNY C. GUINN, *Governor*
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STATE OF NEVADA

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BRYAN NIX, *Commissioner*
ROLAND D. WESTERGARD, *Commissioner*
MYRNA WILLIAMS, *Commissioner*

# COLORADO RIVER COMMISSION
## OF NEVADA

December 10, 2001

Clean Water Coalition
C/O PBS&J
Attn: Carrie Stewart
901 N. Green Valley Parkway, Suite 100
Henderson, Nevada 89074

Re: Scoping Comments regarding CWC's Proposed Effluent Interceptor Project

Dear Ms Stewart:

Pursuant to your invitation in the notice of public information and scoping meeting for the Clean Water Coalition's ("CWC") Proposed Effluent Interceptor, the Colorado River Commission offers the following comments:

Nevada's Colorado River Return Flow Credit:

In 1975, the Nevada State Engineer issued Permit Number 29814 to the State of Nevada, Division of Colorado River Resources, now the Colorado River Commission of Nevada ("CRC") for the right to appropriate the waters of the Las Vegas Wash, including all water tributary to the Wash, whether from ground water, surface water or precipitation, in the amount of 683 cfs or 461,890 afy, provided the permit does not guarantee delivery of water to the Wash from wastewater treatment plants. ("CRC Permit 29814") CRC Permit 29814 was issued primarily for the purpose of protecting the water that returns through the Las Vegas Wash and becomes a basis of Colorado River return flow credit pursuant to Article V of the Supreme Court Decree in *Arizona v. California*. Any significant interference with the volume of Nevada's Colorado River return flow credit should be avoided.

Accordingly, in developing the environmental assessment for the Proposed Effluent Interceptor Project, the Bureau of Reclamation should consider whether the Project will have any effect upon the return Colorado River flow available to the State of Nevada for purposes of obtaining return flow credits from the Bureau. In particular, the Bureau should analyze what, if any, effect the project will have on the relative rights and

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responsibilities of the CWC members and the CRC under their respective permits for appropriation of waters from and tributary to the Wash and any related secondary permits. For your convenience, we have attached hereto two tables that list the surface water rights and permit applications related to the Las Vegas Wash and Colorado River return flow of which we are aware. If the Bureau concludes the project will have no effect on Nevada's Return Flow Credit, this should be stated in the environmental assessment.

Integration of Effluent Interceptor and Other CWC Effluent Projects:

The CWC's Effluent Interceptor Project was developed as a component of a cooperative "Alternative Discharge Study," following on a recommendation of the 1997 Las Vegas Valley Watershed/Wastewater Needs Assessment Study calling for a feasibility study of alternate discharge locations, i.e., alternatives to discharging treated wastewater effluent into the Las Vegas Wash. The project alternatives listed in the Alternate Discharge Study Implementation Plan included several other elements, including Off Channel Wetlands Element, Sediment Impoundment Element, Floating Wetlands Element, Effluent Interceptor Element, Downstream Conveyance with Outfall/Diffuser Element, and Process Enhancement Element. The Effluent Interceptor Project was selected for immediate attention, as it could be evaluated independent of the others and developed without mutual exclusion of the alternatives elements.

We are particularly concerned that representatives of Lower Colorado River Basin states and the Republic of Mexico be permitted to express their views regarding the Downstream Conveyance with Outfall/Diffuser Element of the Alternate Discharge Study Implementation Plan. It is important that the process for consideration of the Downstream Conveyance Element, and the Effluent Interceptor Project to the extent it is related to the Downstream Conveyance Element, include an opportunity for other Lower Colorado River Basin state representatives to be heard. It is unclear at this time whether the Effluent Interceptor Project and the Downstream Conveyance Element are connected. A Boulder Basin Limnological Study, Colorado River Outfall Location Analysis and Colorado River Outfall Model are planned steps toward further consideration of the Downstream Conveyance Element. Inasmuch as other discharge alternatives continue to be considered, the Bureau should discuss in its Effluent Interceptor environmental assessment the extent to which the Effluent Interceptor environmental assessment will establish the Bureau of Reclamation's compliance with the National Environmental Policy Act, and CEQ Regulations with respect to its actions, if any, necessary to the Downstream Conveyance Element. The Effluent Interceptor environmental assessment should thus discuss whether these actions are "connected," 40 C.F.R. 1508.25 (a)(1), whether the impacts of them would be "cumulative," 40 C.F.R. 1508.7, or appropriate for "tiering," 40 C.F.R. 1502.20. "Tiering" is appropriate "when it helps the lead agency to focus on the issues which are ripe for decision and exclude from consideration issues already decided or not yet ripe." 40 CFR 1508.28.

If you have any questions or need additional information, please contact me at (702) 486-2689.

Sincerely,

James H. Davenport
Chief Water Division
Colorado River Commission of Nevada

cc w/encl: Mr. Doug Karafa
Clark County Sanitation District
5857 E. Flamingo Road
Las Vegas, NV 89122

Ms. Leslie Long
City of North Las Vegas
2829 Fort Sumter Drive
North Las Vegas, NV 89030

Mr. James (Pat) Green
Regional Environmental Officer
U.S. Bureau of Reclamation
Lower Colorado Region, LC-2530
P.O. Box 61470
Boulder City, NV 89006-1470

Mr. David Mendenhall
Division Chief
City of Las Vegas
6005 E. Vegas Valley Drive
Las Vegas, NV 89142

Mr. Dennis Porter
Public Works Director
City of Henderson
240 Water Street
Henderson, NV 89015

JHD/cg

# Table 3.1
## Summary of Surface Water Rights Related to the LV Wash and Colorado River Return Flow

| App. No. | Date App. Filed | Application Owner[2] | App. Status[3] | Water Source[4] | Annual Duty (afy) | Secondary Use | | Comments |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Contracted Amount (afy) | Available (afy) | |
| 722 | 11/07/07 | Albert L. J. Clark | CER | SPR | 480 | | | Source is spring; point of diversion is near Lake Mead Dr. and Valley Verde Rd. |
| 2299 | 12/26/11 | Ed W. Clark | CER | STR | 160 | | | Point of diversion near Duck Creek/Pittman Wash confluence. |
| 4775 | 12/12/17 | Hotel Nevada Mining Co. | PER | SPR | 18 | | | |
| 5395 | 02/20/19 | D. P.Stadelman; R. R. Stadelman | CER | STR | 474 | | | Point of diversion at Duck Creek |
| 7726 | 04/24/26 | Edward M. Taylor Estate | CER | STR | 183 | | | |
| 11511 | 03/08/46 | Frank Seibert | CER | STR | 240 | | | Source is Las Vegas Creek |
| 11744 | 01/10/47 | BMI | CER | EFF | 50 | 50 | 0 | |
| 11757 | 01/22/47 | Margie Grubb | CER | EFF | 25 | 25 | 0 | Source is Las Vegas Wash |
| 17199 | 03/07/57 | CLV | PER | EFF | 10,000 | 4,106 | 5,894 | |
| 21014 | 02/04/63 | CLV | PER | EFF | 33,600 | 0 | 33,600 | |
| 21364 | 06/13/63 | BMI | CER | EFF | 120 | 120 | 0 | |
| 21587[1] | 10/23/63 | CC | PER | EFF | 11,900 | 2,000 | 9,900 | |
| 21635 | 11/18/63 | BMI | PER | EFF | 800 | 800 | 0 | |
| 21728 | 01/02/64 | CCSD | PER | EFF | 12,000 | 6,917 | 5,083 | |
| 24684 | 09/13/68 | Stewart Brothers | CER | EFF | 120 | 120 | 0 | |
| **General Permit Rights Senior to CRC General Permit** | | | | | **1,555** | | | |
| **Primary Permit Rights Issued Prior to CRC General Permit** | | | | | **68,615** | **14,138** | **54,477** | |
| 29814 | 11/28/75 | CRC | PER | OSW | 461,891 | | | Source is Las Vegas Wash; point of diversion at Saddle Island, SNWS Intake |
| 45746 | 06/02/82 | CC | PER | EFF | 110,897 | 0 | 110,897 | |
| 46158 | 09/16/82 | NLV | RFP | EFF | 11,201 | 0 | 11,201 | |
| 47242 | 09/12/83 | CC | RFA | OSW | 1,086 | | | Point of diversion at Las Vegas Wash |
| 47734 | 02/27/84 | HEND | PER | EFF | 9,120 | 9,120 | 0 | |
| 51838 | 02/18/88 | CCSD | PER | EFF | 41,498 | 4,455 | 37,043 | |
| 52099 | 05/17/88 | CC | PER | EFF | 100 | 100 | 0 | |
| 53111 | 04/10/89 | CC | WDR | EFF | 11,900 | 0 | 0 | |
| 53883 | 09/25/89 | DUMPCO Inc. | WDR | EFF | 100 | 0 | 0 | |
| 55508 | 12/07/90 | HEND | PER | EFF | 12,740 | 12,740 | 0 | |
| 56247 | 04/29/91 | CLV | PER | EFF | 30,356 | 5,605 | 24,751 | |
| 56341 | 05/22/91 | CCSD | RFA | EFF | 0 | 0 | 0 | |
| 58390 | 12/11/92 | LLV | CER | OSW | 2,029 | | | Source is the Las Vegas Wash |
| 61485 | 08/28/95 | CC | PER | EFF | 49 | 49 | 0 | |
| V07659 | 04/25/96 | LVVWD | VST | SPR | 6,000 | | | |
| 64436 | 09/04/98 | CLV | PER | EFF | 13,450 | 13,450 | 0 | |
| 64853 | 02/16/99 | CLV | PER | EFF | 1,680 | 1,115 | 565 | |
| 65000 | 04/02/99 | CCSD | RFA | EFF | 11,200 | | | |
| **General Permit Rights Junior to CRC General Permit** | | | | | **2,029** | | | Totals do not include permit applications 47242, 53111, 53883, 56341, V07659, or 65000 |
| **Primary Permit Rights Issued After CRC General Permit** | | | | | **219,890** | **46,633** | **173,257** | |

Source: NDWR Water Rights Database, 09/27/99 (basin 212), 10/01/99 (basin 215)

[1] Permit application changed by permit numbers 52099, 53883, and 53111.

[2] Application Owner
- BMI - Basic Management Inc.
- CC - Clark County
- CCSD - Clark County Sanitation District
- CLV - City of Las Vegas
- HEND - City of Henderson
- NLV- City of North Las Vegas

[3] Application Status
- ABR - Abrogated
- CAN - Cancelled
- CER - Certified right
- EXP - Expired
- PER - Permitted right
- RFA - Ready for Action
- RFP - Ready for Action - Protested
- WDR - Withdrawn

[4] Water Source
- EFF - Effluent
- OSW - Other Surface Water
- SPR - Spring
- STR - Stream



PRELIMINARY INFORMATION ONLY

# Table 3.2
## Surface Water Permit Applications Related to the Las Vegas Wash and Colorado River Return Flows

| App. No. | Date App. Filed | Application Owner[3] | App. Status[4] | Water Source[5] | Diversion Rate (afy) | Annual Duty (afy) | Secondary App. No. | Date App. Filed | Application Owner | App. Status[4] | Type of Use[6] | Diversion Rate (afy) | Annual Duty (afy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 722 | 11/07/07 | Albert L. J. Clark | CER | SPR | 724 | 480 | | | | | | | |
| 2299 | 12/26/11 | Ed W. Clark | CER | STR | 290 | 160 | | | | | | | |
| 4775 | 12/12/17 | Hotel Nevada Mining Co. | PER | SPR | 18 | 18 | | | | | | | |
| 5395 | 02/20/19 | D. P.Stadelman; R. R. Stadelman | CER | STR | 474 | 474 | | | | | | | |
| 7726 | 04/24/26 | Edward M. Taylor Estate | CER | STR | 243 | 183 | | | | | | | |
| 11511 | 03/08/46 | Frank Seibert | CER | STR | 290 | 240 | | | | | | | |
| 11744 | 01/10/47 | BMI | CER | EFF | 579 | 50 | | | | | | | |
| 11757 | 01/22/47 | Margie Grubb | CER | EFF | 36 | 25 | | | | | | | |
| 17199 | 03/07/57 | CLV | PER | EFF | 0 | 10,000 | S01 | 11/21/57 | LDS | CER | IRR | 4,344 | 752 |
| | | | | | | | S02 | 06/16/60 | LDS | CER | IRR | 3,620 | 766 |
| | | | | | | | S03 | 10/12/61 | LDS | CER | IRR | 7,240 | 1,600 |
| | | | | | | | S04 | 11/16/62 | J. Wollenzien | CAN | IRR | 0 | 0 |
| | | | | | | | S05 | 11/16/62 | L. Wood | CAN | IRR | 0 | 0 |
| | | | | | | | S06 | 06/16/64 | NPCo | WDR | PWR | 0 | 0 |
| | | | | | | | S07 | 05/14/65 | NPCo | CER | PWR | 2,458 | 987 |
| | | | | | | | S08 | 02/28/91 | Breslin Builders | WDR | OTH | 0 | 0 |
| 21014 | 02/04/63 | CLV | PER | EFF | 0 | 33,600 | S01 | 10/27/70 | NPCo | CAN | IND | 32,260 | 32,260 |
| 21364 | 06/13/63 | BMI | CER | EFF | 434 | 120 | | | | | | | |
| 21587[1] | 10/23/63 | CC | PER | EFF | 11,900 | 11,900 | S01 | 12/27/72 | International Community Development | WDR | IRR | 0 | 0 |
| | | | | | | | S02 | 07/17/78 | Paradise Valley CC; Summa Corporation | WDR | REC | 1,260 | 1,228 |
| | | | | | | | S03 | 07/03/80 | CC | RFA | REC | 724 | 260 |
| | | | | | | | S04 | 12/09/82 | CCPR | PER | IRR | 0 | 2,000 |
| 21635 | 11/18/63 | BMI | PER | EFF | 0 | 800 | | | | | | | |
| 21728 | 01/02/64 | CCSD | PER | EFF | 0 | 12,000 | S01[2] | 10/14/65 | NPCo | CER | IND | 6,087 | 6,087 |
| | | | | | | | S02 | 10/27/70 | NPCo | CAN | IND | 0 | 0 |
| | | | | | | | S03 | 01/04/71 | United Venturers | WDR | REC | 0 | 0 |
| | | | | | | | S04 | 03/21/71 | CC | CER | IRR | 1,086 | 496 |
| | | | | | | | S05 | 05/11/73 | International Community Development | CAN | IRR | 0 | 0 |
| | | | | | | | S06 | 04/14/77 | Paradise Valley CC | WDR | REC | 1,260 | 400 |
| | | | | | | | S07 | 08/04/93 | CC | PER | REC | 304 | 304 |
| | | | | | | | S08[2] | 03/03/94 | NPCo | PER | PWR | 30 | 30 |
| 24684 | 09/13/68 | Stewart Brothers | CER | EFF | 742 | 120 | | | | | | | |
| 29814 | 11/28/75 | CRC | PER | OSW | 461,891 | 0 | | | | | | | |
| 45746 | 06/02/82 | CC | PER | EFF | 110,897 | 0 | | | | | | | |
| 46158 | 09/16/82 | NLV | RFP | EFF | 11,201 | 0 | | | | | | | |
| 47242 | 09/12/83 | CC | RFA | OSW | 1,086 | 0 | | | | | | | |
| 47734 | 02/27/84 | HEND | PER | EFF | 9,120 | 9,120 | S01 | 10/04/84 | HEND | WDR | IRR | 9,120 | 9,120 |
| | | | | | | | S02 | 12/07/90 | HEND | PER | MUN | 9,120 | 9,120 |



PRELIMINARY INFORMATION ONLY

# Table 3.2
## Surface Water Permit Applications Related to the Las Vegas Wash and Colorado River Return Flows

| App. No. | Date App. Filed | Application Owner[3] | App. Status[4] | Water Source[5] | Diversion Rate (afy) | Annual Duty (afy) | Secondary App. No. | Date App. Filed | Application Owner | App. Status[4] | Type of Use[6] | Diversion Rate (afy) | Annual Duty (afy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 51838 | 02/18/88 | CCSD | PER | EFF | 41,498 | 0 | S01 | 10/19/89 | Breslin Builders | CER | REC | 7,964 | 2,891 |
| | | | | | | | S02 | 01/22/90 | Washington Construction Co. | EXP | OTH | 840 | 224 |
| | | | | | | | S03 | 04/26/90 | NPCo | CER | IND | 660 | 660 |
| | | | | | | | S05 | 10/06/97 | National Golf Operating Partnership | PER | REC | 629 | 629 |
| | | | | | | | S04 | 05/26/98 | Palm City Developers, LLC | PER | CON | 724 | 275 |
| 52099 | 05/17/88 | CC | PER | EFF | 0 | 100 | S01 | 10/06/89 | DUMPCO Inc. | PER | OTH | 0 | 100 |
| 53111 | 04/10/89 | CC | WDR | EFF | 11,900 | 11,900 | | | | | | | |
| 53883 | 09/25/89 | DUMPCO Inc. | WDR | EFF | 0 | 100 | | | | | | | |
| 55508 | 12/07/90 | HEND | PER | EFF | 12,740 | 12,740 | S01 | 12/07/90 | HEND | PER | MUN | 12,740 | 12,740 |
| 56247 | 04/29/91 | CLV | PER | EFF | 30,356 | 30,356 | S01 | 08/13/97 | CLV | PER | REC | 2,244 | 2,244 |
| | | | | | | | S02 | 02/05/98 | Golf Club of Nevada; Stallion Mountain CC | PER | REC | 5,719 | 3,360 |
| 56341 | 05/22/91 | CCSD | RFA | EFF | 0 | 0 | | | | | | | |
| 58390 | 12/11/92 | LLV | CER | OSW | | 2,029 | | | | | | | |
| 61485 | 08/28/95 | CC | PER | EFF | 49 | | | | | | | | |
| V07659 | 04/25/96 | LVVWD | VST | SPR | 6,000 | 6,000 | | | | | | | |
| 64436 | 09/04/98 | CLV | PER | EFF | 16,832 | 13,450 | S01 | 12/16/98 | LLWD | PER | MUN | 16,832 | 13,450 |
| 64853 | 02/16/99 | CLV | PER | EFF | 3,620 | 1,680 | S01 | 02/16/99 | CLV | PER | IRR | 1,115 | |
| 65000 | 04/02/99 | CCSD | RFA | EFF | 11,200 | | | | | | | | |

Source: NDWR Water Rights Database, 09/27/99 (basin 212), 10/01/99 (basin 215)

[1] Primary permit changed by permit numbers 52099, 53883, and 53111.

[2] Point of diversion for 30 afy of secondary permit number S01 changed by S08.

[3] Application Owner
- BMI - Basic Management Inc.
- CC - Clark County
- CCSD - Clark County Sanitation District
- CLV - City of Las Vegas
- HEND - City of Henderson
- NVL - City of North Las Vegas

[4] Application Status
- ABR - Abrogated
- CAN - Cancelled
- CER - Certified right
- EXP - Expired
- PER - Permitted right
- RFA - Ready for Action
- RFP - Ready for Action - Protested
- WDR - Withdrawn

[5] Water Source
- EFF - Effluent
- OSW - Other Surface Water
- SPR - Spring
- STR - Stream

[6] Type of Use
- CON - Construction
- IND - Industry
- IRR - Irrigation
- MUN - Municipal
- REC - Recreation
- PWR - Power
- OTH - Other

TO PBSJ 2/13/02 JR

OFFICIAL OFFICE COPY
DATE 2/5/02
DATE | INITIALS | CODE
2000
2/5/02 JPGreen 2530
2/6/02 AVigil 2532
CONTROL NO.
FOLDER ID.
KEYWORD

February, 2002

Mr. James (Pat) Green
Regulatory Compliance Officer
U.S. Bureau of Reclamation
Lower Colorado River Region
P.O. Box 61470
Boulder City, NV 89006-1470

Dear Mr. Green,

The City of Henderson, City of Las Vegas, and Clark County sanitation districts plan on building a $50 million pipeline to transport treated sewage effluent around the upper end of Las Vegas Wash, hastening the flow of treated sewage into Lake Mead.

The Bureau of Reclamation currently is evaluating environmental aspects of the proposed pipeline. I request that you carefully assess the impact of the proposed pipeline on algae blooms in Lake Mead. I further ask that you consider whether the resources to be spent on this pipeline would be better spent toward other actions including

1. Treat all wastewater entering Lake Mead to higher quality standards.
2. Alternative discharge of wastewater to other locations in the lake, to promote mixing.
3. Remove nutrient-laden, fouled sediment from Las Vegas Wash and the delta at Las Vegas Bay.
4. Capture and treat urban runoff from the Las Vegas Valley

Sincerely,

Ernest L. Hardin
8544 Summer Vista Ave.
Las Vegas, NV 89145

702/243-6489

Mr. Green,
I understand that effluent wastewater phosphate limits (concentrations) were exceeded in 2001 according to publicly available monitoring data. Is this true and what can be done about it?

ELH.

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# IRRIGATION & ELECTRICAL DISTRICTS ASSOCIATION OF ARIZONA

W.A. DUNN
CHAIRMAN OF THE BOARD

R. GALE PEARCE
PRESIDENT

R.D. JUSTICE
VICE-PRESIDENT

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GERALD GOULD
SECRETARY-TREASURER

ROBERT S. LYNCH
ASSISTANT SECRETARY-TREASURER

9/3/02
MR OFFICIAL OFFICE COPY
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9/4 JPeyton 2000 3530
CLASSIFICATION
PROJECT
CONTROL NO.
FOLDER I.D.
KEYWORD
1050-4

August 28, 2002

Mr. James Green
Regional Environmental Office
Bureau of Reclamation
Lower Colorado River Region, LC-2530
P.O. Box 61470
Boulder City, Nevada 89006-1470

Re: Scoping of the Proposed Environmental Impact Statement on the Las Vegas Wash Systems Conveyance and Operations Program (SCOP), 67 Fed.Reg. 48947-8 (July 26, 2002)

Dear Mr. Green:

While we have no substantive comments on the necessary scope of the draft Environmental Impact Statement being prepared on this project, we would appreciate being kept advised of the development of the EIS and listed as an interested party to receive further communications on the subject. Our interest in the process is generated by Central Arizona Project diversions from the Colorado River to central and southern Arizona and water quality considerations with regard to Central Arizona Project water.

Thank you for consideration of this request.

Sincerely,

Robert S. Lynch
Asst. Secretary/Treasurer

RSL:psr
cc: Lorri Gray, Assistant Regional Director, Lower Colorado River Region, USBR
IEDA Presidents/Chairmen and Managers

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# COMMENT FORM

## EFFLUENT INTERCEPTOR
## PUBLIC INFORMATION & SCOPING MEETING

Please provide the requested information and place the completed form in the box marked "Comments" at the meeting, or mail to:

James (Pat) Green, Regulatory Compliance Officer
U.S. Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470
Or
Clean Water Coalition
C/O PBS&J
Carrie Stewart
901 N. Green Valley Parkway, Suite 100
Las Vegas, NV 89074-7105

**NOTE:** Name, Address, Phone, and E-mail information is optional. However, without that information, we will be unable to send you responses to your comments/questions or additional information pertaining to this project.

ROBERT W. HALL, PRESIDENT

**Name:** NEVADA ENVIRONMENTAL COALITION, INC.

**Address:** 10720 BUTTON WILLOW DR., LAS VEGAS, NV 89134

**Phone:** 702 - 360 - 3118

**E-Mail:** RWHKC @ EARTHLINK. NET

**Please list your comments below and on the next page.**

THE MEETING WAS ADVERTISED AS A PUBLIC INFORMATION AND SCOPING MEETING. THE U.S. BUREAU OF RECLAMATION, REGULATORY COMPLIANCE OFFICER TOLD

**Comments continued**

THE MEETING AT THE OUTSET THAT THERE WOULD BE NO QUESTIONS FROM THE FLOOR AND NO ANSWERS. THE COMPLIANCE OFFICER INSISTED THAT THOSE ATTENDING HAD TO DISCUSS THE ISSUES ONE ON ONE. I INFORMED THE COMPLIANCE OFFICER THAT THE MEETING DID NOT MEET ANY FEDERAL REQUIREMENT AND COULD NOT BE CONSIDERED FOR ANY LAWFUL PURPOSE. THE PUBLIC HAS BEEN AND IS BEING MISLED BY THE PUBLIC NOTICES AND THE LACK OF A FULL, FEDERAL ADMINISTRATIVE PROCEDURES ACT PROCESS. THE PROJECT IS A MAJOR, NEPA ACTION AT THE OUTSET.

Al Wolf PRESIDENT

NEVADA ENVIRONMENTAL COALITION, INC.

# Nevada Wildlife Federation, Inc.

*An Affiliate of the National Wildlife Federation*

Post Office Box 71238
Reno, Nevada 89570


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CLASSIFICATION
PROJECT
CONTROL NO.
FOLDER I.D.
KEYWORD

James Green, Regulatory Compliance Officer
U.S. Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470

Dear Mr. Green:

The Nevada Wildlife Federation has a number of concerns with the proposed pipeline that would convey treated effluent from sewage treatment plants to a lower point in the Las Vegas Wash, where the effluent would be discharged into a riparian area. A number of those concerns were expressed by Dr. Larry Paulson and Jeff van Ee at scoping meetings in Las Vegas. This letter reiterates many of those concerns in a more formal manner and identifies additional concerns with the proposal and environmental assessment process.

**THE EIS PROCESS**

The federation firmly believes that an environmental impact statement (EIS) is required for this project. The Bureau of Reclamation is the "lead agency" in evaluating the proposed pipeline that will be constructed by local governments. The pipeline may be considered as a part of a larger effort to:

- reduce erosion of the Las Vegas Wash,
- improve the ability of reconstructed wetlands to handle flood waters and urban runoff,
- and to convey larger amounts of effluent to the Las Vegas arm of Lake Mead for assimilation.

Additional projects are expected in the future to ensure that water quality in Lake Mead is not degraded further and that the primary drinking water supply for Las Vegas is further protected. In addition, return flow credits are an issue with respect to the withdrawal of water from Lake Mead for the state of Nevada. The interrelationship of the proposed pipeline to these other issues and to the plans of other agencies needs to be examined through the development of an EIS. An environmental assessment is not sufficient to gather the information that is needed to look at the proposed pipeline as part of a larger effort; nor is the environmental assessment the vehicle to obtain review and comments from a broad group of parties and the public.

The fact that the Bureau of Reclamation held "scoping" meetings for the proposed pipeline suggests that more than a perfunctory environmental assessment seems to be a consideration for

the Bureau of Reclamation. Scoping is mandated in the preparation of EISs, but may be used in the preparation of environmental assessments. Should the Bureau decide, or be required, to do an EIS at a later date, another more formal scoping is required[1]. We do not wish to see additional, unnecessary delays to badly needed changes to the management of Las Vegas Wash and Lake Mead water that might result from the Bureau's failure to embark on an EIS at an early stage when an environmental assessment is likely to be judged to be inadequate.

The Bureau of Reclamation appears intent on not preparing an environmental impact statement by indicating that the environmental assessment will be inclusive, comprehensive and reference additional documents and materials. While we laud this goal, it sounds more like the goal for an environmental impact statement. The Council on Environmental Quality has provided guidance on what an environmental assessment should look like, compared to an EIS.

> Since the EA is a concise document, it should not contain long descriptions or detailed data, which the agency may have gathered. Rather, it should contain a brief discussion of the need for the proposal, alternatives to the proposal, the environmental impacts of the proposed action and alternatives, and a list of agencies and persons consulted. Section 1508.9.
>
> While the regulations do not contain page limits for EAs, the Council has generally advised agencies to keep the length of EAs to not more than approximately 10-15 pages. Some agencies expressly provide page guidelines (e.g., 10-15 pages in the case of the Army Corps). To avoid undue length, the EA may incorporate by reference background data to support its concise discussion of the proposal and relevant issues. [36a A.., "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," 46 Fed. Reg. 18026 (Mar. 23, 1981)]
>
> Agencies should avoid preparing lengthy EAs except in unusual cases where a proposal is so complex that a concise document cannot meet the goals of Section 1508.9 *and* where it is extremely difficult to determine whether the proposal could have significant environmental effects. In most cases, however, a lengthy EA indicates that an EIS is needed. [36b A.., "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," 46 Fed. Reg. 18026 (Mar. 23, 1981)]

We believe the following questions regarding technical and environmental aspects of the proposed pipeline must be carefully evaluated in an EIS:

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[1] = "...scoping that is done before the assessment, and in aid of its preparation, cannot *substitute* for the normal scoping process after publication of the NOI, unless the earlier public notice stated clearly that the possibility was under consideration, *and* the NOI expressly provides that written comments on the scope of alternatives and impacts will still be considered. [13. A., "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," 46 Fed. Reg. 18026 (Mar. 23, 1981)]

1) What is the purpose of the proposed pipeline, and how does its construction affect ongoing efforts of other agencies to improve water quality in Las Vegas Wash and develop the Clark County Desert Wetlands Park?

2) Lake Mead provides 88 percent of the drinking water for the Las Vegas Valley. The drinking water intakes are located six miles downstream of inflows from Las Vegas Wash. How will the proposed pipeline affect drinking water quality at existing and projected water elevations in Lake Mead?

3) Serious algae blooms occur in Lake Mead, especially Las Vegas Bay, as a result of inflows from Las Vegas Wash. The distribution and mixing of nutrients from wash inflows in Las Vegas Bay are directly influenced by temperature and salinity. How will the proposed pipeline affect temperature and salinity in Las Vegas Wash, as well as mixing patterns and availability of nutrients, and algae blooms, in Las Vegas Bay?

4) The Nevada Division of Environmental Protection (NDEP) has established water quality standards and requires the cities of Henderson and Las Vegas and Clark County Sanitation District to monitor water quality in Las Vegas Wash and Lake Mead. How will the proposed pipeline affect existing water quality monitoring programs and water quality standards? Will the water quality standards and monitoring programs in Las Vegas Wash and Lake Mead be reviewed by NDEP before the pipeline is implemented?

5) Treated wastewater currently comprises most of the perennial flow in Las Vegas Wash. How much base flow will there be in the upper reaches of the wash if the proposed pipeline is constructed? Will the water quality in the remaining base flows support beneficial uses established for those reaches by the Nevada Division of Environmental Protection? What criteria will be used to decide how much water flows through the pipeline versus the wash? Who will decide, from day to day, how the flows will be regulated?

6) Flow data from Las Vegas Wash are used by the Southern Nevada Water Authority and Colorado River Commission to calculate Nevada's return flow credits. Will the proposed pipeline require changes in flow measurements or calculations of return flow credits?

7) Erosion is a serious problem in Las Vegas Wash. Downstream, sedimentation at the head of Las Vegas Bay has formed an extensive delta that now encroaches on the Las Vegas Bay Marina. How will the proposed pipeline affect flow rates and erosion patterns in various reaches of Las Vegas Wash and sedimentation in Las Vegas Bay?

8) Lake Mead is used extensively for swimming, boating and fishing. Las Vegas Bay is one of the most heavily used parts of the Lake Mead National Recreation Area. How will the proposed pipeline affect those recreational uses?

We look forward to being a part of the NEPA process initiated by the Bureau. We believe the proposed project will have a significant impact on the environment of Las Vegas Wash and Las Vegas Bay of Lake Mead. We believe a comprehensive review of this project by the public and regulatory agencies will help ensure that the proposed project achieves its intended benefits.

Please feel free to contact me with any questions, comments.

Sincerely,

Elsie Dupree

Elsie Dupree
Nevada Wildlife Federation
President
216 E. Hampton Dr.
Carson City, NV 89706
(775) 885-7965
dupree@pyramid.net

# Nevada Wildlife Federation, Inc.

*An Affiliate of the National Wildlife Federation*

Post Office Box 71238
Reno, Nevada 89570


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| KEYWORD | | |

James (Pat) Green
Regulatory Compliance Officer
U.S. Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470

Dear Mr. Green:

The Nevada Wildlife Federation provided written comments in January , 2002 on an environmental assessment (EA) for the wastewater effluent receptor. In our letter, we urged the preparation of an environmental impact statement (EIS) for the wastewater effluent receptor because we felt that it was part of a larger system that would have significant impacts on Las Vegas Wash, Lake Mead, and the Colorado River. We felt that the preparation of an EIS would allow potential stakeholders in the decision-making process for the discharge of wastewater effluent into Lake Mead to better review and comment on this significant project. We are pleased to be providing additional written comments for the preparation of the draft EIS on the Systems Conveyance and Operations Program (SCOP).

A great number of issues and questions need to be addressed in the EIS. The proposal to increase, and possibly relocate, wastewater flows into Lake Mead is seemingly simple, but actually complex. Water quality may first appear to be a driving factor in the decision-making process, but water quantity and secondary environmental impacts are also of great importance to the Federation. We hope that our comments will assist the cooperating agencies to better analyze the impacts of their proposed actions and to produce an EIS that will adequately and succinctly identify the best course of action to protect our environment in the face of tremendous growth in the Las Vegas metropolitan area.

## WATER QUALITY

### Discharges into Lake Mead

Water quality in Lake Mead, particularly the Las Vegas arm, is of great concern to the Federation. Algal blooms in the Las Vegas arm, in recent years, have once again become worrisome. Fish abnormalities in Lake Mead are being linked to chemicals, which are being conveyed into the lake by our sewage effluent, that are largely unregulated by the Federal government at this time. Salinity loads into the lake and Colorado River system have been a concern for decades. Drinking water for the Las Vegas metropolitan area is drawn from the lake

approximately six miles downstream from where sewage effluent, storm water runoff, and other nonpoint contaminant sources enter Lake Mead.

While a strong case can be made for relocating the discharge of sewage effluent into the lake and dispersing the effluent over a larger volume of water, the Federation does not endorse the idea that dilution is the solution. The total mass of contaminants entering the Lake and Colorado River system must be examined for the impacts on fish and humans that may be far removed from the discharge point. The discharge of pharmaceuticals and personal care products into a body of water that is relatively clean, and serves as the primary source of drinking water for millions of people along the lower Colorado River, should concern anyone. We expect the EIS to consider non-criteria, as well as criteria, pollutants in the waters discharged into the lake as consideration is given to moving the discharge point for effluent into the Lake.

We expect some consideration will be given to turbidity levels at proposed, alternative discharge points where turbidity levels at those locations are presently better than in the Las Vegas arm of Lake Mead.

We encourage the cooperating agencies to look at the operation of the wastewater treatment plants in the Las Vegas metropolitan area, the Las Vegas wash, and the lake as an entire system. We understand that modeling is being undertaken to do this and that the modeling results will be provided in the EIS. We ask that the operating criteria, for the entire system, be addressed and highlighted in the EIS as well. Just as we have an operations plan for the dams and reservoirs on the Colorado River, we need a more sophisticated operating plan for the discharge of effluent into the Lake than we presently have. The troublesome algal blooms and fish abnormalities in Lake Mead should be evidence enough that our current operating plan is inadequate.

The EIS should provide the statements, and logic, for how the cooperating agencies will balance the need for more water to fuel population growth in the metropolitan area with increased demands for water along the entire Colorado at the same time the Lake Mead reservoir is being managed for flood control and power generation. How will the future availability of water from the Colorado River impact wastewater volumes and quality into Lake Mead? What criteria will cooperating agencies use to decide that more water can be obtained from the lake, more wastewater can be discharged into the lake, and that environmental quality is adequately protected? While statements have been made that federal standards will be observed, we have seen that the existing federal standards have not been enough to protect the Lake and sensitive receptors. It may very well be that site-specific, tougher standards will be needed to protect the lake and users of the waters from undue harm

The Federation supports the use of the Las Vegas wash and wetlands to further polish the wastewater from the treatment plants. Properly maintained wetlands, of sufficient size, can reduce the impacts of stormwater runoff on Lake Mead and provide habitat for a variety of species. Erosion that threatens various structures can be reduced through a well-designed and operated wetlands.

A critical question is: how much stormwater runoff and sewage effluent will be funneled through

the wetlands and what the wetlands capacity to treat those discharges will be? We would like the EIS to contain a summary for how the wetlands will be used and criteria for the amount of wastewater and flood waters that will flow through the wetlands on a daily, seasonal, and yearly basis. Will reservoirs be utilized to intercept high-peak stormwater runoff flows for later conveyance through the wetlands and further polishing? How will the flows of wastewater through the wetlands and, alternatively directly to the Lake, be determined, and who will determine them? These are some of the operating criteria that we would like to see covered in the EIS.

**Drinking Water**

As more wastewater is discharged into Lake Mead at different points and different conditions, the impact on our drinking water must be examined. We understand that increased treatment of our drinking water has been, and is being, implemented because of increased contaminants in our lake, e.g. cryptosporidium. What are the plans and criteria for treatment of our drinking water as more effluent is being discharged into the lake - possibly at new locations?

**Downstream Users**

While the alternate discharge of effluent into the lake below our water intake may be beneficial for further protection of our drinking water supply, what impact will this discharge have on users of the river below the discharge point? Will recreational use of the lake and river in the vicinity of the discharge point be adversely affected? Just as we are beginning to see evidence of the effect of sewage effluent from a major metropolitan area on flora and fauna in our present discharge area, will we see the same effects at another discharge point, e.g., fish abnormalities?

The Lake Mead National Recreation Area is part of the national park system; consequently, we would expect water quality criteria for the lake to be better than other water bodies. Water quality standards may be established in many different ways for a variety of purposes. Compliance with those standards can be measured in many different ways, e.g. annually or seasonally, averaged over a specified volume, or measured at a specific point. We expect a complete discussion of the various standards and criteria that may be used to assure that water quality in this important national recreation area is not further degraded.

**WATER QUANTITY**

A presumption with the proposal to increase and redirect wastewater effluent into Lake Mead is that southern Nevada will continue to withdraw increasing amounts of water from the Colorado River in excess of our original water allocation. Return flow credits is a critical factor. While the Federation supports increased flexibility in complying with the Law of the River and in seeing that water efficiency is increased to the point where surpluses may be reallocated for additional growth, the Federation strongly believes that greater emphasis must be given to environmental protection. Among the concerns are: endangered species of fish in the river, endemic species of fish in the Colorado, riparian zones, and the Colorado River delta. Return Flow Credits have been of benefit to Nevada in the past, but the present water quality problems in the Las Vegas arm

of Lake Mead illustrate our contention that there are limits.

A limit that should be addressed in this EIS is the quantity of water that Nevada will be able to withdraw from the river. A serious discussion of this limit is needed because it affects the amount of wastewater that must be disposed, and it affects how the system, outlined earlier in this letter, for treating our wastewater must be sized and operated. We expect the EIS to contain a serious discussion of how much water southern Nevada will be able to withdraw from the river in the future, particularly under long-term drought conditions. (Similarly, we expect the EIS to convey the analysis of wastewater impacts on a lake that may be at low levels never seen in its history, but possible under long-term changes in our climate.)

**FLOOD WATERS**

Development in the Las Vegas valley and flood control structures above the Las Vegas wash have an impact on water quality and water quantity through the wash. We expect the EIS will discuss how the SCOP and flood control efforts to stabilize flows through the wash will improve the ability of the wash to cleanse stormwater runoff and sewage effluent.

How much stormwater will be allowed to pass through the wash and at what rate? How will water quality discharged from the wash into Lake Mead be monitored, and what standards will be used to judge the quality? What steps will be taken to ensure that floodwaters do not destroy structures and wetlands in the wash? What steps can be taken to improve water quality in storm water runoff before it reaches the wash?

**SECONDARY IMPACTS**

**Air Quality**

Attainment of federal, primary national ambient air quality standards has been problematic in southern Nevada for years. Attainment of health standards for carbon monoxide, particulate matter has been difficult. While improvements in these pollutant levels over the years may be touted by some, the rapid population growth of the Las Vegas metropolitan statistical area and the continued growth in vehicle-miles traveled makes future attainment of these standards difficult. Emissions of ozone precursors within the valley and upwind of the valley makes attainment of the new, lowered standard for ozone questionable. Measures to preserve and improve visibility in the Southwest, in light of the growth in population in southern Nevada and major sources of fine and large particulates, must be considered in with the amendment of the Clean Air Act in 1987. A question to be considered in the EIS is to what extent air quality regulations and federal land constraints will limit growth in population and growth in water needs and wastewater production?

**Interception, Containment and Treatment of Major Non-Point Sources**

Presently, perchlorate is being intercepted from the Las Vegas wash and being treated. Plans are underway to develop settling pond areas previously owned by the Basic Metals Industries for

residential, commercial and light industrial uses. We would like to see some discussion of how cleanup plans for these properties will ensure that additional releases of contaminants into the wash will be prevented.

There are plans for Clark County to acquire from the Bureau of Land Management (BLM) the Sunrise landfill. This municipal landfill was not built to present day standards and has been reported in the news media to have released materials beyond its borders, particularly after rainfall events. The Federation would like some assurances, in the EIS, that development of this landfill will not release contaminants into the wash and Lake Mead and that construction of the proposed wastewater effluent receptor will not significantly change the hydrogeologic conditions in the vicinity of the landfill to where contaminants might be more easily conveyed away from the landfill along the constructed wastewater effluent excavation.

## CONSTRUCTION AND FINANCING IMPACTS AND ISSUES

We expect the EIS will present the proposed timing of construction activities as well as how the construction of various components of the total system, e.g. impoundments in the Las Vegas wash and reconstruction of the wetlands, will be linked to water quality criteria. Will the constructed works be oversized and built well before they are needed, or will they be built just in time? Will wastewater flows into the lake be allowed to exceed water quality criteria and bring about further degradation of the Las Vegas wash before satisfactory solutions are implemented?

We also expect financing for the proposed treatment and conveyance system will be discussed.

## ALTERNATIVES

### Conservation

There has been little effort to reduce wastewater generation in the valley through conservation. While it may be argued that there has been an emphasis on conservation of drinking water, much of the emphasis has been on the supply side - either through pricing or through incentives aimed at reducing water use in landscaping. Much more can be done inside residences, such as changing the fees structure for wastewater generation and encouraging the use of retrofits to reduce wastewater generation, e.g. low-flush toilets and faucets. The cost of these measures, on a dollars per gallon saved basis, should be compared to the costs of constructing and operating the system being considered in this EIS.

### Increased Reuse of Wastewater

An alternative to increasing discharges of stormwater and wastewater into the wash and into Lake Mead is reuse of those waters. While increased efforts are being made in the valley to reuse water for golf courses and landscaping, it appears that greater efforts may be made in this area. What are the tradeoffs and advantages in promoting greater reuse of wastewater versus increasing discharges of wastewater into the lake?

Since wastewater is likely going to be used in close proximity to where it was created and captured, a benefit may be reduced infrastructure and energy costs in reducing the amount of drinking water that must be conveyed at long distances to supply the total water needs of an area.

**RELOCATION OF OUR WATER INTAKE**

An alternative to the expensive relocation of our discharge of wastewater effluent into the Las Vegas Wash and six miles upstream of our water intake would be the relocation of our water intake upsteam of the Las Vegas wash. This option has been examined before, but it needs to be examined and discussed in this EIS. While the problem of decreasing water quality in the Las Vegas arm of Lake Mead will not be addressed by this alternative, the increased safety afforded to our drinking water supply is apparent. The lower water level of Lake Mead has exacerbated some of the problems that we've been having in the Las Vegas arm of Lake Mead. The marina is reported to be moving, and the sediments already deposited in the Las Vegas arm will not go away with the proposed relocation of our sewage effluent into the lake. If enhanced protection of our drink water supply is an important decision-making criteria for SCOP, then this alternative should be examined. What is the difference in the cost of piping sewage effluent to the vicinity of Hoover dam in comparison to the cost of moving our water intake upstream from the Las Vegas arm of Lake Mead?

**CLOSING REMARKS**

We believe one of the most useful aspects of the draft EIS would be the succinct listing of important decision-making criteria for the proposed action. Prioritization of those factors is important along with a discussion of the costs, benefits, and risks associated with each of the criteria. What importance is given to the protection of the interests of downstream users of the Colorado River, e.g. indian tribes, other states, and other cities? What importance is given to reducing salinity levels in the Colorado River by intercepting and redirecting flows from the Las Vegas wash? What importance is given to attaining a variety of water quality criteria? What importance is given to protecting fish? These questions, and more, need to be considered in presenting to the reader the criteria that are driving this proposed action versus maintaining the status quo, or rejecting other alternatives. If the authors of the EIS are successful in clearly presenting these decision-making criteria, we believe the EIS process will have been well worth the time and effort.

The Federation looks forward to reviewing the draft EIS. We expect to provide more specific comments at that time. We hope that the EIS will prove to be a useful decision-making document for a complex situation. Our hope is that water quality in the lake and in our taps will be improved with minimal delay.

Sincerely,

Jeff van Ee

Jeff van Ee

# COMMENT FORM

## EFFLUENT INTERCEPTOR
## PUBLIC INFORMATION & SCOPING MEETING

Please provide the requested information and place the completed form in the box marked "Comments" at the meeting, or mail to:

James (Pat) Green, Regulatory Compliance Officer
U.S. Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470
Or
Clean Water Coalition
C/O PBS&J
Carrie Stewart
901 N. Green Valley Parkway, Suite 100
Las Vegas, NV 89074-7105

**NOTE:** Name, Address, Phone, and E-mail information is optional. However, without that information, we will be unable to send you responses to your comments/questions or additional information pertaining to this project.

**Name:** Larry Paulsen

**Address:** 904 San Edward Avenue
Henderson NV 89015

**Phone:** 566-1466

**E-Mail:** lars45@lv.rmci.net

**Please list your comments below and on the next page.**

- Need to be very careful that the pipeline doesn't make the overflow of treated sewage in Las Vegas Bay worse than now by increasing wash temperatures during fall, winter and spring

**Comments continued**

- Need to clearly define the objectives of the proposed pipeline and how it will be integrated with other ongoing water quality improvement programs in Las Vegas Wash.
- Need to do a three year review of water quality standards for Las Vegas Wash and Lake Mead
- Need to reviews return flow credit calculations for Las Vegas Wash and determine whether the pipeline will change the method of calculating return flow credits.
- Need to determine how the pipeline will affect velocity, temperature, salinity, suspended sediments, and other water quality standards for Las Vegas Wash
- Need to determine how the pipeline will affect water quality standards in Lake Mead.

I ran out of room. I will submit more comments when I receive more detailed information

Base flows in the wash?

SOUTHERN NEVADA
WATER AUTHORITY

*Administrative Office*
*1001 S. Valley View Blvd.*
*Las Vegas, Nevada 89153*
*Telephone: (702) 258-3939*
*Fax: (702) 258-3268*

*Project Office*
*1900 E. Flamingo, Ste. 170*
*Las Vegas, Nevada 89119*
*Telephone: (702) 862-3400*
*Fax: (702) 862-3470*

*Southern Nevada Water System*
*243 Lakeshore Road*
*Boulder City, NV 89005*
*Telephone: (702) 564-7697*
*Fax: (702) 564-7222*

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September 11, 2002

Mr. James Green
Bureau of Reclamation
Lower Colorado Regional Office
P.O. Box 61470
Boulder City, NV 89006-1470

Dear Mr. Green:

RE: SCOPING COMMENTS AND COOPERATING AGENCY STATUS FOR THE SYSTEMS CONVEYANCE AND OPERATIONS PROGRAM ENVIRONMENTAL IMPACT STATEMENT

The Southern Nevada Water Authority (Authority) appreciates the invitation from the Bureau of Reclamation, National Park Service and member agencies of the Clean Water Coalition to be a cooperating agency on the Systems Conveyance and Operations Program (SCOP) Environmental Impact Statement (EIS). The Authority has assisted the Clean Water Coalition's efforts from the beginnings of the Alternate Discharge Study process that has lead to the SCOP, and strongly supports actions which will protect the quality of water in the Las Vegas Wash and Lake Mead and provide for the management of increasing treated wastewater flows in Southern Nevada.

Because the Authority does not have jurisdiction or responsibility for the SCOP, we decline the invitation to be a formal cooperating agency on the EIS. The Authority intends to continue to be involved in the EIS process, and provide assistance to the agencies in our areas of technical expertise. We would like to provide the following comments for consideration as part of the scoping process for this project.

Promoting Public Input

The agencies have put forth substantial effort to inform the public about the SCOP and solicit public input. Sparse attendance at these meetings reinforces the need for continued efforts to assure that the public both understands what is planned and that their participation is critical to the success of the project. The Authority fully supports the agencies' plans to develop a comprehensive public outreach plan that includes a citizen's advisory committee, public workshops, stakeholder interviews, and other activities that are geared to achieving full stakeholder participation.

*BOARD OF DIRECTORS*

*Amanda M. Cyphers, Chair*
Henderson Councilman

*Mary Kincaid-Chauncey, Vice Chair*
County Commissioner

*Shari Buck*
North Las Vegas Councilman

*Oscar Goodman*
Las Vegas Mayor

*Dario Herrera*
County Commissioner

*Bryan Nix*
Boulder City Councilman

*Myrna Williams*
County Commissioner

*Patricia Mulroy*
General Manager

Alternatives Development

The Authority endorses the efforts of the agencies to develop a broad range of alternatives for the SCOP project. In addition to new transmission facilities to convey treated effluent into Lake Mead, other alternatives which have been identified for consideration include process improvements and supplemental treatment facilities. The Authority encourages the agencies in pursuing a broad range of reasonable alternatives for the draft EIS, and is interested in also learning more about these other options. It is important to fully evaluate all reasonable options in order to have broad public support for this project.

Discharging Effluent into Boulder Basin Near Hemmenway Wall and Promotory Point

The Authority encourages the agencies to thoroughly evaluate any new effluent discharge locations. From a drinking water treatment perspective, bringing wastewater effluent discharge into Boulder Basin, closer to the drinking water intake, could present potential risks under varying environmental conditions. Some of these conditions include seasonal stratification, destratification, and lower lake levels. Risks from these conditions could include increased potential for algae blooms which impact treatment processes and increased total organic carbon which not only represent a concern in elevated trihalomethanes, but can cause taste and odor problems. These factors will have to be evaluated in detail to understand the potential impact to Boulder Basin.

We look forward to continuing our participation in the SCOP Project. Please contact me if you have any questions.

Sincerely,

Kay Brothers
Deputy General Manager
Engineering/Operations

KB:KSZ:pe

c: William K. Dickinson, National Park Service
Kurt Segler, City of Henderson
Doug Karafa, Clark County Sanitation District
Dave Mendenhall, City of Las Vegas

SCOPING PROCESS AND MEETING

FOR THE

SYSTEMS CONVEYANCE AND OPERATIONS SYSTEM

ENVIRONMENTAL IMPACT STATEMENT

TRANSCRIPT OF PUBLIC MEETING

MONDAY, AUGUST 12, 2002

6:30 P.M. - 8:30 P.M.

HENDERSON CONVENTION CENTER

200 SOUTH WATER STREET

HENDERSON, NEVADA

CERTIFIED COPY

REPORTED BY: DIANE PRATT, RPR, CCR #328

APPEARANCES

Anne Smith, Smith-Culp Consulting
Anthony Vigil, U.S. Bureau of Reclamation
James Green, U.S. Bureau of Reclamation
Bill Burke, National Park Service
Nancy Hendricks, National Park Service
Doug Karafa, Clark County Sanitation District
Dan Fischer, City of Las Vegas
Mike Neher, City of Henderson
Lisa Luptowitz, Southern Nevada Water Authority
Dana Reel, Black & Veatch
Ira Rackley, Black & Veatch
Bill Van Stone, Black & Veatch
Eric Hawkins, Alpha Communications
Carrie Stewart, PBS&J
Ken MacDonald, SWCA

ORAL STATEMENTS


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WRITTEN STATEMENTS


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HENDERSON, NEVADA, MONDAY, AUGUST 12, 2002

6:30 P.M. - 8:30 P.M.

ANNE SMITH: Good evening. I'd like to welcome you to our Scoping Meeting for the Systems Operations and Program here in the Las Vegas valley. And I would like to welcome you on behalf of a few agencies that are hosting this.

First is the U.S. Bureau of Reclamation, the National Parks and the Clean Water Coalition which consists of the cities of Henderson, Las Vegas and the Clark County Sanitation District.

My name is Anne Smith, and I am going to be the facilitator tonight for this process and the guide for the meetings, you can call me. These meetings are being conducted in compliance with the National Environmental Policy Act, NEPA, for the Environmental Impact Statement Scoping Meeting. So we are going to be conducting four this week here in the valley.

There are some fact sheets on the tables. If you haven't got them already, they refer to this process in more detail. And also there are some instructions on how to comment this evening if you choose to.

The agenda for tonight I will go through in a minute. And then before that I do that, I would like to introduce all the people that are here that represent the agencies that are

hosting this. So if you, when I read your name, if you can maybe wave so we can see who you are.

From the Bureau of Reclamation, we have Anthony Vigil and James Green. From the National Parks Service, we have Bill Burke and Nancy Hendricks. Clark County Sanitation District, we have Doug Karafa. From the City of Las Vegas, Dan Fischer. From the City of Henderson, Mike Neher. And from the Southern Nevada Water Authority, we have Lisa Luptowitz.

And then we have some consultants here that are working on the project. And from Black and Veatch, Dana Reel, Ira Rackley, and Bill Van Stone. From Alpha Communications we have Eric Hawkins. And from PBS&J we have Carrie Stewart. And then from SWCA, we have Ken MacDonald.

Over here we have Diane Pratt, the court reporter here tonight. So she is going to have a major role here.

And the way we are going to do this meeting is, to start off here, we will have approximately half an hour where we will have an opportunity for anybody who has any questions or comments related to any of the boards and the displays that we have or questions that you brought regarding the project. You will have an opportunity to ask those questions of all the agency personnel that are here tonight. Now, during this period you can ask anything you want, and the agency people will be happy to answer your questions. The only proviso here is none of that will be recorded. So if there is something

specific that you want recorded up front, then either you can come over during the half hour, talk to the court reporter directly on a one-to-one basis, and you can either write it down or verbally give that. But any questions at that time, that's the only way it is going to be recorded.

After that period of time, we will get together and we are going to show a video which is background and description of the project that this is what this meeting is all about. So there is a 15-minute video. So after that we are going to open it up for an open comment period. What we'll do then is anybody who wants to speak can come up to the microphone and give their comments or ask their questions.

Now, there are some cards you need to fill out if you want to speak tonight, and they look like this. So if you want to speak, you need to fill out a yellow card, because they will come to me, and then I will be calling people up by name to come up to the microphone to speak. There is also a blue form which, if you just want to get copies of the documentation afterwards, then you can get one of those. So those are two ways to comment. There's also a blank comment form that you can put your comments in writing. And you can either hand them in tonight to the court reporter, or you can submit them in writing. And there is a sheet on your tables that tells who to submit them to in writing, and that needs to be done before September the 1st.

So when you are called up here, you can address everybody in the room. There is no particular person that you need to speak to. You can speak to anything because the court reporter is going to be recording everything that you say.

We will be trying to keep to some time limits although it looks like you might have an opportunity to talk, say your piece. But if your time is up, then what we'll do is, you can fill out another card if there is a lot of people that come, and then maybe you will have another chance at the end to speak if we have extra time. If not, then you can put any extra comments or questions in writing.

I will be giving you kind of some time. You don't need to keep track of the time while you were talking. I will. So I will be showing you a card that says you have got one minute left, and then 15 seconds left, and then time is up. I apologize in advance if we need to use those because I may need to say, you know, we need to allow someone else to come up and talk.

During that time you may have some questions to ask during this meeting. We won't be answering any questions on open comment. Those will be addressed later at a later date. So any comment or question will be taken down tonight, but we won't be having any discussion about it during the open comment period.

Then we will be finishing up that period at 8:30. And

if there is any final comments then, we have a little bit of time, the court reporter will still be around to take a few comments down, and they will be done on a one-to-one basis.

So that is kind of how the evening is going to go. And what we want to do is start off by having a display, having you take a look at the displays and asking any questions of anybody who is available. So I will I have a chime. When you hear a chime go, that will be about a five-minute warning to get ready to sit down and watch the video.

Okay. So why don't you take a look around when you get a chance.

-o0o-

ERNEST BUSCHMAN
Sun City MacDonald Ranch
2185 Tiger Willows Drive
Henderson, Nevada 89012
(702) 361-6420
buschmanep@aol.com

ERNEST BUSCHMAN: I'm Ernie Buschman, and I'm from Henderson, Nevada. I live at Sun City, MacDonald Ranch. I moved here about four years ago from Monroe County, Michigan. I lived on the shore of Lake Erie. And Lake Erie was one of those lakes that at one point was dead, or at least people thought it was dead, back in the northwest.

I took water for granted, and I brought those attitudes with me out here. I still take it for granted. I represent a group called Hillside Preservation Committee at Sun City MacDonald Ranch. And we have been trying to do just that, preserve the hillsides. And in the two years we have been trying to do that, we failed miserably.

And part of the knowledge that we gained in that effort was that there was an impact of those of us who lived in the hillsides on the water problem that's developed and developing here. The more of us that move up into the hills, the more water, the more efluent. And we tried to do a coalition with the Sierra Club, and they identified us as part of the problem. If you hadn't brought houses here, this problem wouldn't exist, so don't talk to us about preserving hillsides.

Well, I hope that attitude doesn't exist in trying to preserve this precious resource that's called Lake Mead. And I guess I don't want to go into too much detail because I haven't until now been interested in preserving any aspect of Lake Mead. And the Sierra Club is right. And until we do something about the mountain developments that's occurring here, I'm afraid the efluent is just going to continue to increase and you're going to have to continue to try to deal with this. And I know we didn't have this problem in Lake Erie.

There really is a limited amount of water out there. I don't know if anybody recognizes it, but you can get all the credits you want for putting the efluent back in there, but there's got to be a point of diminishing returns here. So, please, give serious consideration, very serious consideration to stop us midwesterners from moving out here, because I guess we are a big part of the problem. And I hope that my identifying myself that way has some meaning and it is not just an old fool, because I really did take water for granted on the shores of Lake Erie. So thank you.

-oOo-

KEN MATTHEWS
1133 Henderson
Henderson, Nevada 89015
(702) 461-7738

KEN MATTHEWS: My name is Ken Matthews. I'm just a concerned citizen. I live in Henderson in the Calico Ridge Development down near the wash. I just want to say that there are alternatives to helping out the wash in the amount of total water we actually put back into Lake Mead. I know there is a high quality standard that our waste water facility do put back in, and I guess myself and many other citizens do thank you for that. Environmental people that like the shore birds, like the fish and all the other species that enjoy the river, agriculture down the river, we all appreciate the content in which you are putting water back.

I just want to be the guy that stands up here in front of everyone and says there are alternatives to using salt water softening systems. And just because of some research I have done in the past years, I have found systems that actually work just as good, electronic conditioning. And we don't use the salt. We don't put the salt back in the sewer, and it's not going back to the lake.

And we are taking a lot of water out of the lake, as I was told earlier, that the actual -- we are putting the water back in less salt ratio than we are actually taking out. Not

so much as putting on the golf courses and other places, what water is actually turning back the sewer is just what we are actually using in our house and what comes to the storm drains, gutters and street.

I just want to be one guy to say I have been concerned, and I have been trying to put some new information to the public and let them know there are alternatives to using methods for big evaporative coolers, cooling towers, residential softeners, big industrial softeners. There's alternatives to putting all this salt back into our water system. Thank you.

-oOo-

ERNEST BUSCHMANN
2185 Tiger Willow Drive
Henderson, Nevada 89012
(702) 361-6420
buschmanep@aol.com

I want to know if the Environmental Impact Study will have various models for the dramatic changes in Lake Mead levels. Is there some concern to be given to the impact upon the environment by the rate of growth in the population?

-o0o-

REPORTER'S CERTIFICATE

STATE OF NEVADA )
:ss
COUNTY OF CLARK )

I, the undersigned, a Certified Court Reporter of the State of Nevada, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that a verbatim record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; further, that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: 8-17-02

Diane Pratt

DIANE M. PRATT
NV CCR No. 328

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SCOPING PROCESS AND MEETING

FOR THE

SYSTEMS CONVEYANCE AND OPERATIONS SYSTEM

ENVIRONMENTAL IMPACT STATEMENT

TRANSCRIPT OF PUBLIC MEETING

TUESDAY, AUGUST 13, 2002

6:30 P.M. - 8:30 P.M.

WINCHESTER COMMUNITY CENTER

3130 SOUTH MCLEOD DRIVE

LAS VEGAS, NEVADA

CERTIFIED COPY

REPORTED BY: DIANE PRATT, RPR, CCR #328

APPEARANCES

Anne Smith, Smith-Culp Consulting
Anthony Vigil, U.S. Bureau of Reclamation
James Green, U.S. Bureau of Reclamation
Bill Burke, National Park Service
Kent Turner, National Park Service
Doug Karafa, Clark County Sanitation District
David Mendenhall, City of Las Vegas
Tim Smith, City of Henderson
Lisa Luptowitz, Southern Nevada Water Authority
Dana Reel, Black & Veatch
Eric Hawkins, Alpha Communications
Judie Brailsford, Alpha Communications
Carrie Stewart, PBS&J
Ken MacDonald, SWCA

ORAL STATEMENTS


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WRITTEN STATEMENTS
(None)

RUSTY COLEMAN
Boy Scouts of America - Troop 69
3115 Camelback Drive
Las Vegas, Nevada 89109
(702) 794-0249
rcoleman@ci.las-vegas.nv.us

RUSTY COLEMAN: My name is Rusty Coleman. I am here with Troop 69. And am I representing 69? Not really. Maybe in a learning experience.

I also work for the City of Las Vegas, engineering design, for Public Works. I am familiar with installation of large pipes.

The big question that popped into my mind when I see the presentation -- there's a couple of large items. One, on a day-to-day basis, who is going to pay for the whole thing? Where is all this money going to come from? I have been told that this was par for the course and sales tax that has started funding this. Even just the study I know is going to run into the millions of dollars before it is even done. With the consultants' little logos I saw on the bottom of the screen and stuff, I know this has already cost a lot of money just to get to this point. So will we have enough to get all the way through with budgetary constraints?

We talked about, or they explained to us about the modeling that is going to be done for the three different efluent run outs. Will that model rule the day? The model shows it should go one place. Is that the end-all answer to it

and would anything change that? And kind of how much father should we put in the modeling that the consultants are doing?

Other issues I would have is: This shows the major pathway of this efluent pipeline is essentially through the wash itself. Being a wetlands park, which is pretty fragile anyway, and to put the kind of construction project that's going to be running right through the middle of this park, the size of pipes they are talking about sticking in are monstrous. Those are ten-foot pipes, eight- and ten-foot pipes. The kind of ditches you need to stick those in, the equipment you need to dig that stuff in is big, big equipment. And to roll all that stuff right through the middle of Wetlands Park and mobilize a construction project through the middle of Wetlands Park, I would want to know who is going to administer that contract. How do we know that Wetands Park will be for the better after this? We assume, because the water is washing it all down. But what if it doesn't?

They talk about one of the main outfalls of this pipe being at the head of the Lake Las Vegas. Right now there is so much sediment running into the lake at that area that the owners of that marina have already made application to move the marina, I hear. If we are only taking this outfall further down the wash, that's not going to really stop a lot of that sediment. So I would want to know about that.

The other thing I would have is who is going to manage

this construction contract. If we are hiring consultants to manage a contract that they don't have any vested interest in, I would have a problem with that. I would think entities directly involved would have a hands-on approach to managing this contract so that it is not let out to a construction management firm whose only real interest is making sure that they are covering their butt with the paperwork and have no real vested interest to protect that wetlands like the entities that are involved with the water project would be. So I would want to see that the direct management of that construction contract is done by the City and the Water Authority and the City that make that happen.

And that's what I have. Thank you very much.

-o0o-

JEFF VAN EE
Nevada Wildlife Federation
2092 Heritage Oaks
Las Vegas, Nevada 89119
(702) 733-2021

JEFF VAN EE: Tonight I am representing the Nevada Wildlife Federation. The Nevada Wildlife Federation provided comments on environmental assessment that began at the waste water efluent receptor, and one of the comments we made, we felt that environmental assessment for that project was inadequate; that we needed to look at the efluent receptor together with all the other parts to this package that are being proposed and so look at it as a whole. So I am very pleased tonight that the coalition has decided to do an Environmental Impact Statement to look at the whole project before we make some of these significant decisions that we are going to be making in the future.

The Federation will be providing written comments on this proposal. It's a very complex proposal. There are a lot of questions to be addressed, a lot of factors to look at, and it's just impossible to provide comments off the cuff on a project this significant.

One significant comment I have tonight, though, that I wanted to make during this oral presentation is my concern about the deadline for the written comments. It's listed in the Federal Register as being September 1st, 45 days after the

publication of Federal Register. It was published in the Federal Register July 26th. And by my calendar, that's not 45 days. And I think it's going to be important, given the significance of this proposal, the size of the proposal, that the meetings will be coming after this meeting in other states, that some consideration be given to extending that deadline for written comments beyond September 1st. I would suggest maybe September 15th at a minimum.

So that's my major concern that I would like to express tonight; being the short deadline that exists for written comments, and the Nevada Wildlife Federation will be providing written comments.

-o0o-

WEN BALDWIN
LMBOA
365 Dooley Drive
Henderson, Nevada 89015
(702) 566-5010
wenbald@earthlink.net

WEN BALDWIN: I just have one quick question, and I think we have all got to be aware of, we are talking increase 150 million gallons a year; correct?

DAVID MENDENHALL: A day.

WEN BALDWIN: For a day. Where is this water coming from? It's -- that's my question.

-o0o-

CHRISTOPHER MASHMAN
Boy Scouts of America
895 Sierra Vista Drive #304
Las Vegas, Nevada 89109
(702) 732-7881

CHRISTOPHER BALDWIN: I am with the Boy Scouts of America, Troop 69. And my question is, if they don't get the water, like, flowing and all that stuff, will they have to put in another pipe somewhere to get it coming in here some more? Because if they only have one pipe and we are not getting that much water in and we are losing water each day to get it in there, what is going to happen to all the water that we are going to have to drink and the energy we are going to get over here to come in here in Nevada?

-oOo-

REPORTER'S CERTIFICATE

STATE OF NEVADA )
:ss
COUNTY OF CLARK )

I, the undersigned, a Certified Court Reporter of the State of Nevada, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that a verbatim record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; further, that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: 8-17-02

Diane Pratt

DIANE M. PRATT
NV CCR No. 328

SCOPING PROCESS AND MEETING

FOR THE

SYSTEMS CONVEYANCE AND OPERATIONS SYSTEM

ENVIRONMENTAL IMPACT STATEMENT

TRANSCRIPT OF PUBLIC MEETING

WEDNESDAY, AUGUST 14, 2002

6:30 P.M. - 8:30 P.M.

WEST FLAMINGO SENIOR CENTER

6255 WEST FLAMINGO ROAD

LAS VEGAS, NEVADA

CERTIFIED COPY

REPORTED BY: DIANE PRATT, RPR, CCR #328

APPEARANCES

Anne Smith, Smith-Culp Consulting
Anthony Vigil, U.S. Bureau of Reclamation
Bill Burke, National Park Service
Nancy Hendricks, National Park Service
Doug Karafa, Clark County Sanitation District
Dan Fischer, City of Las Vegas
Dennis Porter, City of Henderson
Lisa Luptowitz, Southern Nevada Water Authority
Dana Reel, Black & Veatch
Bill Van Stone, Black & Veatch
Eric Hawkins, Alpha Communications
Judie Brailsford, Alpha Communications
Carrie Stewart, PBS&J
Ken MacDonald, SWCA
James Green, U.S. Bureau of Reclamation (Name added after transcript was signed)

ORAL STATEMENTS

| SPEAKER | PAGE |
|---|---|
| (None) | |

WRITTEN STATEMENTS

| SPEAKER | PAGE |
|---|---|
| (None) | |

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I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: 8-17-02

Diane Pratt

DIANE M. PRATT
NV CCR No. 328

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SCOPING PROCESS AND MEETING

FOR THE

SYSTEMS CONVEYANCE AND OPERATIONS SYSTEM

ENVIRONMENTAL IMPACT STATEMENT

TRANSCRIPT OF PUBLIC MEETING

THURSDAY, AUGUST 15, 2002

6:30 P.M. - 8:30 P.M.

WEST SAHARA LIBRARY

9600 WEST SAHARA AVENUE

LAS VEGAS, NEVADA

CERTIFIED COPY

REPORTED BY: DIANE PRATT, RPR, CCR #328

APPEARANCES

Anne Smith, Smith-Culp Consulting
Anthony Vigil, U.S. Bureau of Reclamation
James Green, U.S. Bureau of Reclamation
Bill Burke, National Park Service
Doug Karafa, Clark County Sanitation District
David Mendenhall, City of Las Vegas
Mike Neher, City of Henderson.
Kim Zigmund, Southern Nevada Water Authority
Dana Reel, Black & Veatch
Bill Van Stone, Black & Veatch
Eric Hawkins, Alpha Communications
Judie Brailsford, Alpha Communications
Carrie Stewart, PBS&J
Ken MacDonald, SWCA

ORAL STATEMENTS

| SPEAKER | PAGE |
|---|---|
| (None) | |

WRITTEN STATEMENTS

| SPEAKER | PAGE |
|---|---|
| (None) | |

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COUNTY OF CLARK )

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I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: 8-17-02

Diane Pratt

DIANE M. PRATT
NV CCR No. 328

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**SCOPING PROCESS AND MEETING**
**FOR THE**
**SYSTEMS CONVEYANCE AND OPERATIONS SYSTEM ENVIRONMENTAL IMPACT STATEMENT**

# TRANSCRIPT OF PUBLIC MEETING

Monday, August 19, 2002

6:30 P.M. – 8:30 P.M.

Tempe Mission Palms Resort
60 E. 5 St.
Tempe, Arizona

Recorded, then transcribed by: Carrie Stewart, PBS&J

Anne Smith: Could you state your name and the organization you represent.

Robert Hollander: Sure, My name is Bob Hollander and I am the Compliance Regulatory Affairs Administrator for the City of Phoenix Water Services Department. The reason I am here tonight is the City of Phoenix obtains water from the Colorado River via the Central Arizona Project Canal. That water enters the canal at the Havasu pumping station, near Lake Havasu City. So this project if it discharges especially the alternative that discharges down stream of the dam, the U.S. opportunity for diversion. The presentations I have heard indicate that the affluent is of a high quality and I am sure it is. But again, specific concerns would include low levels of contaminants in the future to include things like any metals at low levels and maybe even some emerging contaminants like the endocrine disruptors, pharmaceutical reactive compounds where we don't know what the health effects are right now at very low levels. So this and other issues would, should be considered in conducting the Environmental Impact Statement. Basically the main sticking points here right now are we want to be involved with the development of this project and I understand that I will get copies of the documents EIS as it proceeds along and so we consider ourselves a stakeholder. Thank You.

Anne Smith: Anybody else?

END OF TAPE

**SCOPING PROCESS AND MEETING**
**FOR THE**
**SYSTEMS CONVEYANCE AND OPERATIONS SYSTEM ENVIRONMENTAL IMPACT STATEMENT**

# TRANSCRIPT OF PUBLIC MEETING

Tuesday, August 20, 2002

6:30 P.M. – 8:30 P.M.

Black Canyon Conference Center
9440 N. 25th St.
Phoenix, Arizona

Transcribed by: Robin Jasper, Certified Court Reporter

MR. DANOS: My name is Val Danos. I'm the Technical Program Manager for the Arizona Municipal Water Users Association here in Phoenix. The Arizona Municipal Water Users Association, or AMWUA, consists of nine major cities here in the Valley. They represent 80 percent of the municipal water customers located in Maricopa County.

The membership has -- at the present time the membership has four sources of water that they provide to their customers within their water service areas, Colorado River water delivered through the CAP, Salt and Verde River water delivered by the Salt River Project, native ground waters, and also effluent. We have a very extensive waste water reuse program ourselves.

Our concern and my concern from what you appear to be doing, planning or looking at is that the discharge below Hoover Dam is probably something that we would find problematic. We would be very concerned about trace elements and some of the other constituents that might be in the waste water, in the treated effluent, that would pass through the treatment process, as we currently understand you have implemented up in the Valley.

I won't go into and repeat what Mr. Bob Hollander said. I guess he was at the Tempe Mission Palms yesterday. But I would like to endorse his comments. I would also like to make two other comments about discharge

below Hoover Dam. First -- and they are both related to selenium. As you know, there are numeric bonapary criteria for selenium in the lower Colorado River. There should be an analysis as to whether or not the lower -- the solidity numbers, I think it's above Parker Dam, would be affected by this discharge.

Secondly, I would be concerned about the fact that there would be waste water being discharged below Hoover Dam and what that means in terms of the possibility that that waste water, the molecules will end up in the CAP intake. Clearly, from what I understand you are doing, it does not seem possible, but it's certainly an analysis which I think should be taken.

I will admit to you, I came here tonight with a certain amount of trepidation that you may be considering discharging directly into Lake Havasu. Stranger things have happened. But I think if you keep it above upstream of Hoover Dam, I'm not so sure we would have all that many problems. However, we would like to obviously keep in touch and have an idea of what you folks are doing.

I would like to welcome you all to Phoenix. Hope you have had a nice time. And I hope maybe we'll do this again someday. That's it.

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**SCOPING PROCESS AND MEETING**
**FOR THE**
**SYSTEMS CONVEYANCE AND OPERATIONS SYSTEM ENVIRONMENTAL IMPACT STATEMENT**

# TRANSCRIPT OF PUBLIC MEETING

Thursday, August 22, 2002

6:30 P.M. – 8:30 P.M.

Regency Room, Radisson in Mission Valley
1433 Camino del Rio So.
San Diego, California

## ORAL STATEMENTS

None

August 22, 2002

Goodman Reporting Services
1010 Tamarisk Road
Palm Springs, California 92262
(760) 323-3482

# CLEAN WATER COALITION

## SCOPING MEETING FOR E.I.S.

## LAS VEGAS VALLEY

PLACE: HYATT REGENCY SUITES
285 North Palm Canyon Way
Palm Springs, CA
August 23, 2002

TIME: 6:30 P.M. to 8:30 P.M.

REPORTER: Rhonda K. Goodman
CSR No. 8857

ORIGINAL

GOODMAN REPORTING SERVICES
1010 E. Tamarisk Road
Palm Springs, CA 92262

* * *

I, Rhonda K. Goodman, a certified shorthand reporter in and for the County of Riverside, State of California, do hereby respectfully certify:

That a conference for the Clean Water Coalition was had at the above date and time;

That at the end of the video presentation, no one from the audience chose to participate in "recorded" questions or statements;

That at the time of 8:30 p.m. at the request of Ms. Carrie Stewart, I left without going on record.

* * *

I hereby certify that I am not of Counsel to any of the parties herein, nor in any manner interested in the outcome of such action.

In witness whereof, I have hereunto subscribed my name this date, September 5, 2002.

Rhonda K. Goodman, C.S.R.

Rhonda K. Goodman, C.S.R.

Certificate No. 8857

# COMMENT FORM

## SYSTEMS CONVEYANCE AND OPERATIONS PROGRAM PUBLIC INFORMATION & SCOPING MEETING

Please provide the requested information and place the completed form in the box marked "Comments" at the meeting, or mail to:

James (Pat) Green, Regulatory Compliance Officer
U.S. Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470
Or
Clean Water Coalition
C/O PBS&J
Carrie Stewart
2270 Corporate Circle, Suite 100
Las Vegas, NV 89074-6382
Or
William K. Dickinson, Superintendent,
National Park Service
Lake Mead National Recreation Area
601 Nevada Way
Boulder City, NV 89005

**NOTE:** Name, Address, Phone, and E-mail information is optional. However, without that information, we will be unable to send you responses to your comments/questions or additional information pertaining to this project.

**Name:** IRIS BERNIKOW

**Address:** PO 70482

LAS VEGAS 89170

**Phone:**

**E-Mail:**

**Please list your comments below and on the next page.**

I WOULD LIKE TO KNOW WHY OZONATION PROCESS WAS NOT IMPLEMENTED THIS SUMMER & IF IT REALLY BE OFFERED TO THE VALLEY — & WHEN?

# COMMENT FORM

## SYSTEMS CONVEYANCE AND OPERATIONS PROGRAM PUBLIC INFORMATION & SCOPING MEETING

Please provide the requested information and place the completed form in the box marked "Comments" at the meeting, or mail to:

James (Pat) Green, Regulatory Compliance Officer
U.S. Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470
Or
Clean Water Coalition
C/O PBS&J
Carrie Stewart
2270 Corporate Circle, Suite 100
Las Vegas, NV 89074-6382
Or
William K. Dickinson, Superintendent,
National Park Service
Lake Mead National Recreation Area
601 Nevada Way
Boulder City, NV 89005

**NOTE:** Name, Address, Phone, and E-mail information is optional. However, without that information, we will be unable to send you responses to your comments/questions or additional information pertaining to this project.

**Name:** Ernest Buschmann

**Address:** 2185 Tiger Willow Dr.
Henderson N.V. 89012

**Phone:** 702-361-6420

**E-Mail:** BuschmanEP@Aol.Com

**Please list your comments below and on the next page.**

I want to know if the Environmental Impact Study will have various models for the dramatic changes in Lake Mead levels?

Is there some concern to be given to the impact upon the environment by the rate of growth in the population?

# Appendix C

Native American Scoping Comments

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# Native American Coordination Meeting

## Systems Conveyance and Operations Program Environmental Impact Statement

Taken on Wednesday, March 31, 2004

at the Avi Resort & Casino

Laughlin, Nevada

at 2:00 p.m.

Reported by: Sharon E. Bradley, CCR, RMR, CRR
Arizona CCR #50040 / California CCR #4003 / Nevada CCR #101

Appearances:

Doug Karafa, Program Administrator

Carrie Stewart, PBS&J

Bill Shephard, Clark County Water Reclamation District

Tim Smith, City of Henderson

Anthony Vigil, Bureau of Reclamation

Chad Smith, Fort Mojave Tribe

Gloria Hernandez, Tribal Chair Paiute Tribe, Las Vegas

Pat Hicks, Bureau of Reclamation

MS. STEWART: Welcome, everyone. I'd like to thank everyone for coming here today. I'm Carrie Stewart. I'm the PBS&J Project Manager for the Environmental Impact statement.

Right now I would like to ask Chad to give a lesson.

(A Tribal blessing was given by Mr. Smith.)

(A presentation was presented.)

MS. HERNANDEZ: Some of the Tribal Members were wondering if it's possible to get this DVD to bring to their Tribal Councils to show a copy of this?

MS. STEWART: Sure.

MR. KARAFA: I think I have -- How many -- I've got one with me.

MS. STEWART: Gloria wanted one definitely. Did you want one?

MR. KARAFA: I think I've got a spare in the briefcase. There's one in the computer. I've got more in the office.

MS. STEWART: And we can have one made.

MR. KARAFA: We can always send more.

MR. SMITH: If you could send one to the Colorado River Indian Tribes as well.

MS. STEWART: Okay. Doug right now is going to talk about the project in more detail, and he's going to

describe some things that have happened since that video was made.

(Mr. Karafa made his presentation.)

MS. STEWART: I'm going to leave it to you as to whether or not you want to take a break ask one-on-one questions or you can ask questions now or we can just move into the public comment period if somebody would like to speak.

(No response.)

MS. STEWART: Does anybody have a preference?

MS. HERNANDEZ: Let's take a break for a minute.

MR. KARAFA: We can always, if you'd like to, look at any of the pictures around the room. We can discuss individual questions.

MS. STEWART: The pipeline alignment, although Doug showed them in the presentation that display, does show the alignment for the proposed alignments that would be analyzed in the EIS so you can get a closer look at those.

Okay. Let's take ten minutes.

(There was a short break taken at 3:06 p.m. until 3:24 p.m.)

MS. STEWART: Okay. I'd like to open up -- I'd like to open up the meeting now for public comment.

Would anybody like to make a comment?

(No response.)

MR. SMITH: I just have some questions. We didn't do questions.

MS. STEWART: Okay. Well, Doug can answer -- or several people here --

MR. KARAFA: Shoot.

MS. STEWART: -- can probably ask -- or answer them.

MR. SMITH: It's not that he went through the DVD real fast, you know, and -- But somewhere in there it said these three groups collectively represent anyone who has anything to do with water shed management in Southern Nevada; and I didn't see tribes mentioned or even BIA, Bureau of Indian Affairs, of the interior.

And just this as an aside, I noticed one acronym in there, about the time when it showed Oscar Goldman at the one public meeting and one of the perhaps county supervisors for Clark County that's now in hot water, if you'll excuse the pun; and the acronym was D-A-F-T, DAFT.

Do you know what -- And it was up on a board in the meeting.

MR. KARAFA: Yeah. That shot was just of a -- It was really portraying some of the tours that citizens had around the plant.

And DAFT is just one of the processes in the treatment plant. That stands for dissolved air flow thickening sources, but it was just -- it doesn't have any political significance or anything. It's just a name for a treatment process.

MR. SMITH: Sometimes they call it the flocculation?

MR. KARAFA: It's a little bit different, but when the solids came out of case water. They have a way of concentrating the solid, so they that can eventually dry them up and haul them off to a land fill.

MR. SMITH: Do you know what it means in England?

MR. KARAFA: I'm afraid to ask.

MR. SMITH: So often people will pick an acronym for something or that's just the name of what the process is. And DAFT means off your rocker or crazy.

MR. KARAFA: Oh, that kind of DAFT, yes.

MR. SMITH: Yeah. I think some of the folks would chuckle a little bit on that one.

MR. KARAFA: A lot of the people that work in wastewater treatment plants are a little DAFT anyway.

MR. SMITH: So the ADS alternatives relates to the dissolved --

MR. KARAFA: Well now, the term ADS used in

this was -- it stood for Alternative Discharge Study, which eventually would change the name of that to SCOP, which is the thing up there which stands for Systems Conveyance and Operation Program.

The early phase of this, we were just essentially studying alternative places to go with the wastewater effluents; and as that turned into more of a program and started to be more than just a study phase in terms of moving forward with EIS and so on, we just renamed it to SCOP to be a little more fitting for what was going on.

MR. SMITH: And wasn't there an algae bloom two years ago?

MR. KARAFA: In 2001?

MR. SMITH: Maybe three years.

MR. KARAFA: 2001, yes, a major one.

MR. SMITH: It's interesting.

MR. KARAFA: That's one of the things we're trying to prevent from happening.

MR. SMITH: I know that one concern and it's a little maybe naive or unrealistic on the part of City of San Diego.

They have regulations, I think, ordinance, that no waters can be used in the city municipal water system that contain effluent that has effluent discharged into the source; and yet they run a three- to five-mile five-foot

diameter pipeline out into the Pacific Ocean from San Diego.

And San Diego County Water Authority is one of the major players in the downstream river issues, the quantification settlement agreement, and other water exchanges of water rights with the farmers in Imperial and Coachella Valleys to supply the very southern part of Southern California with water that's exchanged for other waters.

And several years ago, one of the county people was talking about that at one of our Inter-Tribal Waters Protection Network meetings that -- we've had several, including one here at the Avi.

And we try to have one each year of tribes that are within the catchment or water shed of the Colorado River, which is really from Wyoming with the Green River on down to and further south of the Mexican border with Cocopah being south of the border, and the Continental divide over in New Mexico, which includes many of the Pueblo Tribes, and over to the Pacific Ocean really or at least this side of the coastals.

And then finally, you may not know the exact construction technique -- and it's just more curiosity on my part -- of the construction of the pipeline on out into the lake, let's say to Boulder Islands, which is what, seven miles?

They'll do that with barges and assembled parts of it and then drop it.

MR. KARAFA: Well, that's a good question.

There's -- The route would be from someplace along the Las Vegas Wash all the way out to here.

This entire area from here to here would all be tunneled through the mountain. There would be nothing on the surface.

The only thing on the surface would be, obviously, the holes where they started and where they came back out on the other end.

And then we're still talking about construction techniques down here where we surface with a tunnel getting across through the Boulder Beach area and out to Boulder Islands.

This, of course, as you know, a highly used area by recreationists, particularly in the summer.

We're talking about possibly doing some tunneling here. We may do some open construction off season, the park -- We're working with the park service -- correct me if I'm saying this wrong.

We haven't exactly settled how we're going to do this, but there's three or four construction techniques.

Once we get out under water, a hundred feet under water or so, then we would actually just lay a pipeline

along the bottom of the lake.

And so at -- When everything's done, of course, this would all be out of sight. There may be some temporary disturbances like in this area here along Boulder Beach because of construction.

MR. SMITH: The tunneling, though, would be tunnel boring machine --

MR. KARAFA: Yeah. We use like a 12- or 14-foot diameter tunneling boring machine, yes.

MR. SMITH: And then it would lay a pipe at the time within that tunnel or just case it?

MR. KARAFA: Yeah. Usually -- Especially in the mountains here, the good thing about the mountains there, they're solid rock and -- which is actually wonderful for tunneling. They don't have to do any shoring, anything.

So they would just bore a hole through the mountain, and then they would go would go back through and either put a pipe inside that area and then grout around it or actually just line the walls of the tunnel, one of the two.

MR. SMITH: Any idea on dollar amount, cost of the entire project?

MR. KARAFA: Yes. What we call the net present worth is -- which is, if you put all the money in the bank today, at today's value of dollars to do the

project, it's in the neighborhood of about $700 million.

MR. SMITH: Seven hundred million?

MR. KARAFA: Yes.

MR. SMITH: -- and possibly a million --

MR. KARAFA: Oh, yeah. Give or take -- At this point, give or take 50 million easy. And these are engineering estimates.

We're in the planning level, so a lot of these estimates, you know, are based on so much dollars per foot of tunnel and those kinds of things.

MR. SMITH: Do you know in the EIS will there be consideration of carrying capacity of population growth and other issues?

You know, you anticipate up to 300 million gallons per day by 2030 or so. And how many acre feet is that? Do you know offhand?

I figured it's --

MR. KARAFA: Now you're going to make use a calculator.

MR. SMITH: -- 90 or so? Thirty-two thousand acre feet a year.

MR. KARAFA: A million gallons a day is 1100 acre feet per year, so 1100 times 300 is 300,000 acre feet roughly.

MR. SMITH: I don't know if that's correct.

That would equal Nevada's entire water allocation.

MR. KARAFA: Yes. But see, some of that water goes in a circle.

That -- The water that we return, if we return 200,000 acre feet then over here at Saddle Island, they can divert the 300 diversion right -- or consumptive right plus 200,000 that got returned, so they'll actually divert 500,000 acre feet.

And then 200,000 acre feet will come back around the sewer system and circle around. So that's why those -- It's not directly regulated to Nevada's consumptive limit but actually to how much we divert, which is a different number.

MS. HERNANDEZ: I have one here. You just said that -- He just mentioned that that allocation would be similar to Nevada's allocation, but are you saying that that water --

THE COURT REPORTER: I'm sorry. I can't hear her.

MS. HERNANDEZ: -- along the Colorado River.

Gloria Hernandez, Tribal Chair, Las Vegas Paiute Tribe.

I was just asking a question off of his statement in that that -- the allocation would be similar to Nevada's allocation; and I was just wondering. So it's not for

Nevada only, but it's for all the --

MR. KARAFA: Well, the water that we return is not an allocation. It's still our waters.

MS. HERNANDEZ: For everybody? Everybody's consumption; not just Nevada?

MR. KARAFA: No. Nevada has the right -- has a right to the river to 300,000 acre feet; to consume that water, take it out of the river forever.

To the extent that we'd return water to the river, that water is ours, for Nevada's, to use over again and adds to our total amount of water that we can divert.

So no, it doesn't just go back to the system for everybody. It goes back in the system for Nevada.

MS. HERNANDEZ: Okay. So this whole thing, the EIS, is just for the State of Nevada? Is that --

MR. KARAFA: Well, no. I couldn't say that the EIS is just for the state of Nevada. The project is.

I mean, but obviously, you know, people that are looking at the project are in the state and outside the state.

MS. HERNANDEZ: The reason why I ask that because if it's just for Nevada, I was just wondering -- He had mentioned that the Colorado River serves all the way down to New Mexico, so if we're doing -- Are we doing it just for the State of Nevada?

How would the other people benefit from this proposal, if any?

MR. KARAFA: Two issues. One is water quantity, as far as the amount of water. The fact that we continue to return -- get return flow present, bring it back, that belongs to Nevada.

The other issue is that -- you know, really the bigger issue for us is environmental protection.

Now, the environmental protection benefits not only Nevada, but those folks downstream; Indian tribes, States of California and Arizona. All those folks are -- have been, you know, tracking with this concern in terms --

MS. HERNANDEZ: They're not going to be able to get any additional waters, are they?

MR. KARAFA: Not because of this project, no.

MS. HERNANDEZ: Okay.

MR. KARAFA: This project won't affect anybody else's -- any other state's water rights.

MS. HERNANDEZ: Just Nevada.

MR. KARAFA: Yeah. And again, this doesn't really change our allocation under the law of the river. It's just within the state that we get to reuse our water.

MR. VIGIL: That won't change with or without the project?

MR. KARAFA: That's not going to change.

MR. VIGIL: If the project doesn't happen, it's still -- they're still going to get their same water?

MS. HERNANDEZ: Nevada would still get the 300 --

MR. VIGIL: With or without the water.

MS. HERNANDEZ: With or without it?

MR. KARAFA: Right.

MR. VIGIL: It won't impact any water rights.

MS. HERNANDEZ: So the main reason we would do it is prevent the erosion of that wash?

MR. KARAFA: It's mainly for environmental reasons.

MS. HERNANDEZ: For environmental reasons?

MR. VIGIL: This is just a pipeline to move the water from one place to another so it gets the water in the -- you know.

(The court reporter interrupted the proceedings to obtain the speaker's name.)

MS. HERNANDEZ: I thought that by doing this, that the Tribes, along with the communities, would be able to get more water, but it's --

MR. KARAFA: No.

MR. SMITH: But Southern Nevada, or Nevada -- really we're talking Las Vegas. These other communities

right there.

At present, they put around a hundred fifty million gallons a day back in, which if 300 million is 11,000 acre feet per year -- I mean, 300,000 acre feet, then it would be around a hundred fifty thousand acre feet.

So their actual annual usage, the 300,000 acre foot allocation and the 150,000 acre foot credits with effluent discharge into the Colorado River, into Lake Mead, the real water usage is around 450,000.

MR. KARAFA: Exactly right. Exactly right.

MR. SMITH: The Tribes consulted I know are pretty much Tribes that could be affected along the Colorado River; and Tribes like Navajo and Hopi, whose waters that originate on their reservations flow into the Colorado River; and then they -- and White Mountain Apache Tribe is not on this list, and not that we would necessarily comment from there on this issue -- although White Mountain being one of the last Tribes to not sign a water agreement with the State of Arizona holding the position that a much greater acre footage is due the White Mountain Apache Tribe than what was offered by the Feds and the State should be consulted.

MR. KARAFA: Okay. That's --

MR. SMITH: And I can provide that information.

MR. KARAFA: If you'd provide that to Carrie.

MR. SMITH: Because they are -- We are interested in water issues in general.

And then as well, probably the Inter-Tribal Water Protection Network would wish to be consulted; and I'm sure you've heard from some of the environmental groups --

MR. KARAFA: Yes.

MR. SMITH: -- as well or you will --

MR. KARAFA: We will.

MR. SMITH: -- on the issues.

MR. KARAFA: Do you have -- Is there a contact for the Inter-Tribal; the water group that you're talking about?

MR. SMITH: Me.

MR. KARAFA: Okay.

MR. SMITH: We're -- Well, I wouldn't say dormant, but there's been some restructuring, and it's not an official organization. I don't think we're even a 501-C yet, you know.

But it does have the authorization of the various Tribal governments; and most of the people are either -- Their representatives are either in water -- municipal water distribution for Tribes or Tribal EPA's or that.

MR. KARAFA: So if we contact you, would that be -- would you then relay our objective?

MR. SMITH: Yeah.

And we've participated in the consultations at the lake -- I mean -- Well, at Lake Las Vegas when it was BLM and there was land exchange and there's Mohave cultural resources there that are of great concern to the Tribe.

And then the Las Vegas Wash archaeological study that took place recently, too; and we noted that much of the impacts to those sites at Las Vegas Wash were as a result of the effluent discharge; and, of course, it was pretty obvious that the effluent was going back in close to the outtake at the Saddle Island. Of course, it being upstream.

So really, this -- this project isn't going to facilitate a further effluent discharge that would not go through Las Vegas Wash into the lake were there to be the no action alternative chosen.

MR. KARAFA: That's right.

MR. SMITH: But, you know, we do have some concerns, as some in the Las Vegas area do, of the unfettered growth aspect and urban sprawl.

And I know it can be a headache for people on both the water providing side and the water treatment side, too.

Like here's another 5,000 person subdivision going in miles out there, and they're gonna want water and sewage and paved roads and the rest of that; and when we found out recently that Southern Nevada Water Authority gets ten

percent of all BLM land sales money that are generated in Southern Nevada, it seemed like a vicious cycle fostering unfettered development and growth.

And the new plans for hundred plus mile long pipelines that come from Lincoln County and some of the other ground water sources, were those to be built and large quantities of effluent from that water use going into Lake Mead -- Of course, the other side of that is that it would to an extent raise the water level in Lake Mead and then be drawn back out.

Some of those issues, would they be considered under cumulative effects or related effects?

MS. STEWART: The EIS will analyze the impact of putting the 450 million gallons per day -- and that's just off the top of my head. I know that's not the exact number -- into the lake.

And that is based on population growth. What -- As the city continues to grow at the rate it has been, that's the amount of effluent that would need to be treated.

MR. SMITH: Some of the concerns about a ceiling on growth or attempts to limit growth, would they be addressed in some of the --

MS. STEWART: No.

MR. SMITH: -- portions of the EIS?

MS. STEWART: No. That is beyond this

project.

MR. SMITH: It could even be that another conveyance system would be necessary in the future?

MS. STEWART: Well, we're hoping no. We're hoping that this will take care of it.

MR. KARAFA: And I think you alluded early on actually I think the planning period for the EIS is 50 years?

MS. STEWART: Yes.

MR. KARAFA: So I mention things that are at 30 years out, but the size of this facility is actually based on 50 years predictions, as good as we can project.

MR. SMITH: Were it to be within three years or so of the studies done and all -- everything ready to go, five years construction? Three years construction?

MR. KARAFA: Probably like something around five years.

Our goal would be to try to get this project constructed by about 2010 or 2011. That is the window where the treat -- if we don't get this project done, the existing wastewater treatment plants will be put in the position of having to do something drastic about their treatment status, so...

MR. SMITH: Well, we often comment -- and I'm with the Cultural Office, you know -- on NEPA documents,

environmental assessments, and even Environmental Impact Statements, which will have a section on cultural resources that are addressed with the requirements of the National Historic Preservation Act; that we can't really comment on the NEPA study until we receive and review the archaeological survey report and whether there's sites found and effects anticipated to those sites and treatment plans for those sites.

And with the proposed tunneling through the mountain itself, it seems that well, why would they do an archaeological survey up over the mountains if they're going to tunnel through it? But there could be indirect effects to -- from maybe vibrations or other things.

So going into it, I can tell you we would probably recommend that the area of potential effect of the tunneling would be the surface of the earth even if it's to be at some depth.

And there might be other activities related that could have the potential to effect cultural resources, so we would recommend an archaeological survey and a -- some sort of an ethnographic study and traditional cultural places study.

And with some of the pipeline itself before the tunnel and out of the beach end, were sites to be found and be not avoidable in the construction phase or possibly even

in proximity to the exact impact zone, we would recommend Native American monitoring like was conducted at Las Vegas Wash excavation.

MR. KARAFA: One of the things that's kind of lucky for us, the part of this area goes near the Las Vegas Wash; and what's happened, there's been a lot of survey work done on that area, and so we can build on a lot of that work already. That's one good thing for us.

MR. SMITH: The southern alternative depicted there that would go, I guess, to the Boulder Islands, it would go in proximity to the Lake Las Vegas development?

MR. KARAFA: The first leg would stop about a mile or mile and a half upstream on the Las Vegas Wash from where the Lake Las Vegas development is; and then -- We wouldn't actually be going near it. We would be going south of it.

Here's Lake Las Vegas right here. And this is -- The route that we take actually would be fairly south from there.

We literally would be tunneling from this point all the way down to -- in the mountains up back behind Boulder Beach.

There's a water tank in area here that's already disturbed for some pits and things in there.

MR. SMITH: There's a little bit of Boulder

City is -- Yeah.

MR. KARAFA: See a little bit of Boulder City there.

MR. SMITH: Yeah.

MR. KARAFA: Obviously, in a project like this, we're looking for -- where we have to do things on the surface, for areas that have already been disturbed and surveyed and so on as much as we can.

So we've had pretty good, I guess, luck at finding those kind of areas for this project.

MS. STEWART: And there are archaeological studies being done and reports will be furnished will be provided to the Federal agencies, so...

MR. SMITH: There's archaeological surveys ongoing?

MS. STEWART: Yes.

MR. SMITH: We might like to either participate or go to some of the sites that are found; field trip type of activities with the other Tribes at some point in the process. We often do.

MR. KARAFA: That can be done as well.

MS. STEWART: I think you would coordinate through Reclamation and National Park Service.

MR. SMITH: Mm-hmm.

MS. HICKS: Las Vegas -- The Las Vegas

inventory reports, the wash inventory reports, those apply? The east and west sites? Those documents?

MR. SMITH: The anticipated total cost of EIS preparation, of which cultural is a small part of the dollar amount, in comparison with the cost of the entire undertaking, what are you looking at overall for EIS with in-house staff time expenditure that is covered by the project proponents, I think.

Because often, you get the -- Like with the proposed bridge, second bridge, up between Laughlin and Bullhead City, some public sentiment that -- These environmentals and cultural studies hold up the show and they cost an arm and a leg.

And I mean, what are you looking, million and a half maximum or five hundred thousand or something like that?

MR. KARAFA: The cost of the entire EIS?

MR. SMITH: Yeah. Is there a tracking going on?

MR. KARAFA: It's more than a million dollars.

MS. STEWART: I can tell you what the consultant portion is; but I don't know how you add in the Federal agency portion of that.

MR. KARAFA: Oh, I can tell you -- I can

answer that part.

We have reimbursement contracts with both the Park Service and Bureau of Rec. Those two contracts total $500,000.

MR. SMITH: Yeah.

MR. KARAFA: And then we have our contract with the consultants, which is something around a million and a half, I believe.

MR. SMITH: So if it's 2 million and it cost a billion to build it --

MR. KARAFA: As a percentage of the project, yeah.

MR. SMITH: -- you're looking at 1/50th or less of the cost; and it's often not that way in the general public's mind.

MR. KARAFA: Yes.

MR. SMITH: And then, of course, the idea behind NEPA, to not foul your own nest to such an extent or the unforeseen consequences, things like that.

MS. STEWART: Does anyone have anything else? Any other Comments? Questions?

(No response.)

MS. STEWART: Okay. I want to reiterate that comments can be provided in writing.

Comments will be accepted throughout the process;

but comments as a result of what you've heard here today, if you could get them to us by April 30th, which is a little bit over 30 days -- or a little bit under 30 days. I guess this is the 31st.

Let me -- If I can get back to the slide that has all the addresses on it.

MR. SMITH: We got some of that in the handout?

MS. STEWART: You do have it in the handout. It's in the middle of the presentation. It's probably the fifth or the sixth slide.

MR. SMITH: So I take it there won't be the alternative of cessation of effluent discharge into the Colorado River --

MS. STEWART: (Shakes head.)

MR. SMITH: -- and into Lake Mead --

MS. STEWART: No.

MR. SMITH: -- as an alternative? Of course, that could be -- No, that wouldn't be in the no action because with the no action you would still -- Well, we very likely are going to comment that that should be an alternative that would be considered because of downstream water quality and cumulative discharges of other communities into the river.

Because by the time much of it gets over to the

end user, you've got a lot of problems that are somewhat added to by the amount -- You know, this is a massive amount of effluent.

A quantification in comparison with the City of Needles, which the entire -- Of course, it goes by population. I'm sure there's a formula in there of how many gallons of effluent are produced per day --

MR. KARAFA: Per person, yes.

MR. SMITH: -- ball park for a population of such and such people with such and such technology of water treatment, sewage treatment, and --

MR. KARAFA: Just to help you out, the flow right now is about two to three percent -- The flow that comes out of the Las Vegas Wash is about two or three percent of the total Colorado River flow.

MR. SMITH: And that was one of the comments that one of the tribal leaders had at the meeting when I was instructed to attend this meeting, was the great concerns about the perchlorate issue and the effluent issue.

And there really would have been even further increased concerns if it were to have been put into the Colorado River south of Hoover Dam, you know; so -- And then to the other side of it, it can be a real problem with the community.

What do you do? You know. And we've come a long

way in terms of water quality and the rest of that, but you sure couldn't tell it when you turned on the tap up there in Vegas.

But I'm sure it has to be treated; and most people now days, as I do, drink bottled water; that processing and that.

So we will provide written comments through our Tribal Environmental Office separately from the Cultural as well.

MS. STEWART: Okay. Good. Well, I appreciate you all coming today if you have any additional questions, they won't be recorded unless you talk to the Court Recorder (sic) directly, but there are plenty of people here to answer questions.

Thank you very much for coming.

(The proceedings were concluded at 3:58 p.m.)

Certificate of Reporter

State of Arizona)
)
County of Mohave)

I, Sharon E. Bradley, CCR, RMR, CRR, do hereby certify that I took down in shorthand (stenotype) all of the proceedings had in the above-entitled matter at the time and place indicated, and that thereafter said shorthand notes were transcribed into typewriting at and under my direction and supervision, and the foregoing transcript constitutes a full, true and accurate record of the proceedings had, all done to the best of my skill and ability.

In Witness whereof, I have hereunto affixed my hand the 1st day of May, 2004.

ORIGINAL

Sharon E. Bradley, CCR, RPR, RMR, CRR
AZ CCR #50040 / CA CCR #4003 / NV CCR #101

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# Appendix D

Water Quality Technical Report

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# D.0 Water Quality Technical Report

This report is a summary of the *Final Las Vegas Wash Modeling Report* dated August 2003 (Black & Veatch 2003a), the *Lake Mead Water Quality Modeling Report* (Black &Veatch 2005b), and the *Lake Mohave Modeling Report* (J.E. Edinger 2003). These reports describe the modeling efforts conducted for the Systems Conveyance and Operations Program (SCOP) to determine the effects of the SCOP to the watershed. The modeling effort encompassed the Las Vegas Wash, Lake Mead, and downstream through Lake Mohave.

The Las Vegas Wash was modeled to determine what effects to water quality the projected amounts of effluent and removal of effluent would have on the Las Vegas Wash. The water quality in Lake Mead and downstream of Hoover Dam was modeled to determine the effects of the SCOP alternatives on the water quality in the Las Vegas Bay, Boulder Basin, and at the Southern Nevada Water Authority (SNWA) intakes, the Hoover Dam intakes, and downstream of Hoover Dam. The Las Vegas Wash Model output defines some of the input parameters for the Boulder Basin (Lake Mead) model.

Table D.0-1 presents the concentration and mass loading for parameters in the effluent (discharge) that were considered in the modeling effort. The parameters presented are consistent with the parameters addressed throughout the modeling process, and values presented are based on projected flow increases. Also presented in the table are the mass loading for parameters that are removed from Lake Mead via the SNWA intakes. The concentrations are used for comparison purposes only and not intended to represent proposed final concentrations. The final concentrations of all parameters discharged into Lake Mead will be determined through the permitting process administered by the Nevada Division of Environmental Protection (NDEP).

It is important to note that the effluent parameters would be mixed with Lake Mead waters and dilution of the concentrations would occur. Therefore, the concentrations presented in Table D.0-1 are not necessarily the concentrations that would be observed at the inner Las Vegas Bay, Boulder Beach, SNWA intakes, or Hoover Dam Discharge.

## D.1 Las Vegas Wash Model

The Las Vegas Wash Model was created to determine the effects of various effluent quantities to Las Vegas Wash water quality and to determine the amount of effluent that should remain in the Las Vegas Wash. The Las Vegas Wash is generally known as the reach from Vegas Valley Drive downstream to Lake Las Vegas and is the drain for the entire Las Vegas Valley. It collects urban runoff, treatment plant effluents, and groundwater seeps.

The SCOP Water Quality Modeling Subcommittee decided to model the Las Vegas Wash using a mass balance approach. The mass balance approach assumes whatever enters the cell is equal to what exits the cell plus any losses through the cell. Two constituents, temperature and phosphorus, were modeled using methods other than flow-weighted mass balancing.

Temperature is modeled using three methods in the Las Vegas Wash Model. To calculate the total wetland influent, a flow-weighted mass balance is used on all of the wetland cell's influent sources to determine the composite influent into the wetland cell. Temperature change within the wetland cell is calculated using temperature equations that calculate the effect of air temperature on the water

Table D.0-1 Mass Loading of Discharge and Intake Parameters.

| | | | Las Vegas Wash | Current Flows | | | Projected 2030 Flows | | | Projected 2050 Flows | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 30 MGD flow | 383 MGD Influent | 153 MGD Effluent | | 750 MGD Influent | 300 MGD Effluent | | 1000 MGD Influent | 400 MGD Effluent | |
| **Parameter** | **Intake Concentration (mg/L)** | **Effluent Discharge Concentration (mg/L)** | **Mass Loading (lbs/day)** | **Mass Loading (lbs/day)** | **Mass Loading (lbs/day)** | **Net Loading (lbs/day)** | **Mass Loading (lbs/day)** | **Mass Loading (lbs/day)** | **Net Loading (lbs/day)** | **Mass Loading (lbs/day)** | **Mass Loading (lbs/day)** | **Net Loading (lbs/day)** |
| Total Dissolved Solids | 570.00 | 1,144.00 | 286,229 | 1,820,705 | 1,459,767 | (360,939) [1] | 3,565,350 | 2,862,288 | (703,062) [1] | 4,753,800 | 3,816,384 | (937,416) [1] |
| Total Phosphorus | 0.0045 | 0.14 (2030)<br>0.10 (2050) | 50 | 14 | 255 | 241 | 28 | 334 | 306 | 38 | 334 | 296 |
| Soluble Phosphorus | 0.0044 | 0.11 (2030)<br>0.075 (2050) | 38 | 14 | 191 | 177 | 28 | 375 | 348 | 37 | 500 | 464 |
| Total Nitrogen | 0.48 | 16.70 | 4,178 | 1,533 | 21,310 | 19,776 | 3,002 | 41,783 | 38,781 | 4,003 | 55,711 | 51,708 |
| Ammonia | 0.015 | 0.26 | 65 | 48 | 332 | 284 | 94 | 651 | 557 | 125 | 867 | 742 |
| Bromide | 0.081 | 0.20 | 50 | 259 | 255 | (4) [1] | 507 | 500 | (6) [1] | 676 | 667 | (8) [1] |
| Sulfate | 240 | 330 | 82,566 | 766,613 | 421,087 | (345,526) | 1,501,200 | 825,660 | (675,540) [1] | 2,001,600 | 1,100,880 | (900,720) [1] |
| Chloride | 82 | 250 | 62,550 | 261,926 | 319,005 | 57,079 | 512,910 | 625,500 | 112,590 | 683,880 | 834,000 | 150,120 |

Note:

[1] A greater mass loading of these substances is removed from Lake Mead through the SNWA drinking water intakes than is added through the effluent discharge.

temperature. Finally, a modification to the effluent temperature may be made by applying a temperature change due to evaporation. Within the Las Vegas Wash Model, it is expected that phosphorus is removed from the system through sedimentation. A sedimentation rate constant of 2.74 centimeters per day was used to determine how much phosphorus is removed in each wetland cell.

The Las Vegas Wash Model was created in a Microsoft Excel workbook format.

## D.1.1 Las Vegas Wash Model Methodology and Assumptions

The SCOP Water Quality Modeling Subcommittee identified five parameters for modeling. Members of the subcommittee included representatives from the Clean Water Coalition, City of Henderson (COH), City of Las Vegas (CLV), Clark County Water Reclamation District (CCWRD), National Park Service, U.S. Bureau of Reclamation (Reclamation), and SNWA. The parameters selected for evaluation include:

- Flow,
- Temperature,
- Total inorganic nitrogen (TIN),
- Total phosphorus (TP),
- Total dissolved solids (TDS), and
- Selenium.

The Las Vegas Wash model accounts for wetlands formed or expected to form behind the 22 erosion control structures (ECSs) and the potential for the creation of wetland areas outside the main channel. It was assumed that these off-channel wetlands would most likely be created in the Duck Creek Channel and along the northern side of the Las Vegas Wash between the outlets of the Monson Channel and Duck Creek.

The inflows to the Las Vegas Wash, accounted for in the Las Vegas Wash Model, include flows from the Las Vegas Creek, Sloan Channel, Flamingo Wash, three wastewater treatment facilities, Monson Channel, Duck Creek, groundwater seep, and C-1 Channel. A base flow, not including effluent, of 20 million gallons per day (mgd) in the Las Vegas Wash was assumed based upon the Las Vegas Wash Comprehensive Adaptive Management Plan (Las Vegas Wash Coordination Committee 2000).

Once the model was created in the spreadsheets, it was necessary to compare the results calculated within the model to those measured at the lower end of the Las Vegas Wash. Data is regularly collected at Northshore Road, which is just downstream of Lake Las Vegas, and thus downstream of the area covered by the Las Vegas Wash Model. Since only five ECSs were in place when the data were collected, those were the only ECSs included in the calibration/verification model runs.

## D.1.2 Las Vegas Wash Model Input Data

Effluent data were collected directly from the three treatment plants for the years from 1997 to 2001 and were input to the model for calibration purposes. Year 2002 data was used as baseline conditions (Table D.1-1). Water-quality data from the Las Vegas Wash and its tributaries were collected from the COH. Weather data were collected from the United States Geological Survey (USGS) website. Groundwater quality information was gathered from the groundwater seeps by SNWA.

Table D.1-1 Baseline Water Quality Conditions in the Las Vegas Wash.

| Parameter | LW0.55 |
|---|---|
| Temperature (°C) [°F] | 22.6 [72.7] |
| Perchlorate (µg/L) | NA[1] |
| Conductivity (µS/cm) | 2344 |
| Total Dissolved Solids (mg/L) | 1,675 |
| Dissolved Oxygen (mg/L) | 8.9 |
| Chlorophyll (µg/L) | NA |
| Total Phosphorus (mg/L) | 0.2 |
| Soluble Phosphorus (mg/L) | 0.1 |
| Total Inorganic Nitrogen (mg/L) | 16 |
| Nitrate (mg/L) | 15.8 |
| Total Ammonia Nitrogen (mg/L) | 0.1 |
| Un-ionized Ammonia (mg/L) | NA |
| Bromide (mg/L) | NA |
| Sulfate (mg/L) | 633 |
| Chloride (mg/L) | 309 |
| Fecal Coliform (MPN/100mL) [2] | 231 |
| pH | 8.3 |
| Selenium (µg/L) | 2.5 |

Notes:

[1] NA = Not available.

[2] Most probable number per 100 ml (1 deciliter).

*Source: COH 2002d.*

The CLV, CCWRD, and COH each provided compiled wastewater effluent data for inclusion in the model. The data set included water quantity and quality. The CLV also provided Las Vegas Wash and Lake Mead water quality data, which were used in the preliminary model runs and for verification of the model results. Weather data, including rainfall, evapotranspiration, wind, and solar radiation data were obtained via the internet.

## D.2 Lake Mead Model

The Lake Mead Model was created to determine the effects of various effluent quantities and discharge locations to the water quality of Lake Mead. Boulder Basin, located immediately upstream of Hoover Dam, is the main study area of this project. The principal inflows to Boulder Basin are from the Colorado River via the Narrows, from the Virgin and Muddy rivers, and from the Las Vegas Wash, which discharges into Boulder Basin through the Las Vegas Bay. There are also two principal outflows from

Boulder Basin, through four outlet towers at Hoover Dam and through the SNWA intakes located at Saddle Island.

The goals of the data collection and analysis efforts for the Lake Mead Water Quality Model are to:

- Develop an understanding of the reservoir mixing and biochemistry,
- Prepare input data files for the Boulder Basin model, and
- Calibrate and validate the model.

## D.2.1 Lake Mead Model Methodology, Calibration, and Confidence Level

Water-quality impacts to Lake Mead from each of the alternate discharge locations were analyzed using two steps: a hydrodynamic simulation and a biochemical simulation. Two separate models were used to perform the analysis: the Estuary and Lake Computer Model (ELCOM) and the Computational Aquatic Ecosystem Dynamic Model (CAEDYM).

The ELCOM is a stand-alone three-dimensional hydrodynamic code, whereas CAEDYM is a water-quality module that uses ELCOM as its hydrodynamic "driver". The outcome of the hydrodynamic simulation, ELCOM, is a detailed characterization of water movement and mixing in the Lake, coupled with a description of the thermal stratification.

The bio-chemical simulation, CAEDYM, computes interactions between biological organisms and the chemistry of their nutrient cycle. The ELCOM/CAEDYM model is a fully three-dimensional model that accounts for variation in water chemistry and biology as a function of depth, as well as horizontal position. The coupled models proved to be an effective tool to study the spatial and temporal relationships between physical, biological, and chemical variables in Lake Mead. These models are described in detail in *the Lake Mead Water Quality Modeling Report* (Black & Veatch 2005b).

The ELCOM/CAEDYM model has been validated and applied in numerous instances, many of which have been published in peer reviewed journals. ELCOM/CAEDYM has been verified for the specific application to Boulder Basin The widely used EPA PLUMES algorithm was incorporated into the model to account for the near-field dilution and insertion elevation of the diffuser plume. The EPA PLUMES algorithms have been in development for over 30 years, and are approved by the U.S. Environmental Protection Agency (EPA) for prediction of plume evolution and dilution in arbitrarily stratified water bodies. The modeling has been closely coordinated with the SNWA and their plans for new intakes and how they would manage Lake withdrawals in the future. All of the modeling was conducted jointly with SNWA.

The SCOP Water Quality Modeling Subcommittee identified the parameters and conditions that would be included in the modeling effort. Two Lake elevations and three effluent flow quantities were modeled. The two Lake elevations selected for modeling include:

- 1,178 ft (359 m) – The Lake elevation on January 1, 2002; and
- 1,000 ft (305 m) – The elevation selected by the Subcommittee to represent the probable lowest elevation of Lake Mead considering the historic 15-year below-normal precipitation cycle.

Variations of effluent flows were addressed by modeling three scenarios.

- 150 mgd - The effluent flow quantities in 2002 (baseline),
- 300 mgd - The projected effluent flows for year 2030, and

- 400 mgd – The projected effluent flows for year 2050.

The parameters modeled for the previously mentioned scenarios include:

- Chlorophyll *a,*
- Secchi Depth,
- Nitrates ($NO_3$)and TIN,
- Ammonia
- Un-ionized Ammonia ($NH_3$),
- Dissolved Oxygen (DO),
- Tracer for Effluent,
- Fecal Coliform (FC),
- Conductivity,
- Bromide,
- TP,
- Perchlorate,
- Chloride,
- Sulfate,
- Temperature,
- pH,
- Biological Oxygen Demand (BOD), and
- Total Nitrogen (TN).

The selection of modeled parameters was determined by the following factors:

- Ability of the code to model the parameter,
- Availability of sufficient data to calibrate the simulation, and
- Importance of the parameter to the Lake Mead study.

For example, total organic carbon (TOC) was not simulated in Lake Mead because the model does not include a variable specifically for TOC and, thus, it cannot be modeled directly. Insufficient measured data for zooplankton and total suspended solids in the inflows and the Lake made their simulation impractical. Furthermore, parameters such as iron, manganese, and aluminum were not modeled because of their relatively minor impacts on the water quality of Lake Mead.

The analysis of water quality includes the highest and lowest Lake levels, 1,178 and 1,000 feet respectively, with effluent flows of 300 mgd and 400 mgd projected for years 2030 and 2050. This provides a modeled prediction of the optimal (2030) and the most restrictive conditions (2050). A maximum phosphorus loading of 334 pounds per day (lbs/day) was analyzed for the pipeline alternatives based on the total maximum daily load waste load allocation for the Las Vegas.

Model sample locations were also determined by the Subcommittee. The complete list of model sample locations is presented in the *Lake Mead Water Quality Modeling Report* (Black & Veatch 2005b). The model locations most relevant to the alternatives analyzed in the SCOP Environmental Impact Statement (EIS) are the Inner Bay (LVB1.85 M), Inner Bay (LVB2.7), Boulder Basin (CR346.4), Boulder Beach, Hoover Dam Discharge, and SNWA Intake (Figure D.2-1). It is important to note that LVB1.85M is mobile and located at a depth of 16 to 18 meters (m) (52 to 59 feet [ft]) near the confluence of the Las Vegas Wash and Lake Mead. All other locations are stationary. The Hoover Dam discharge data

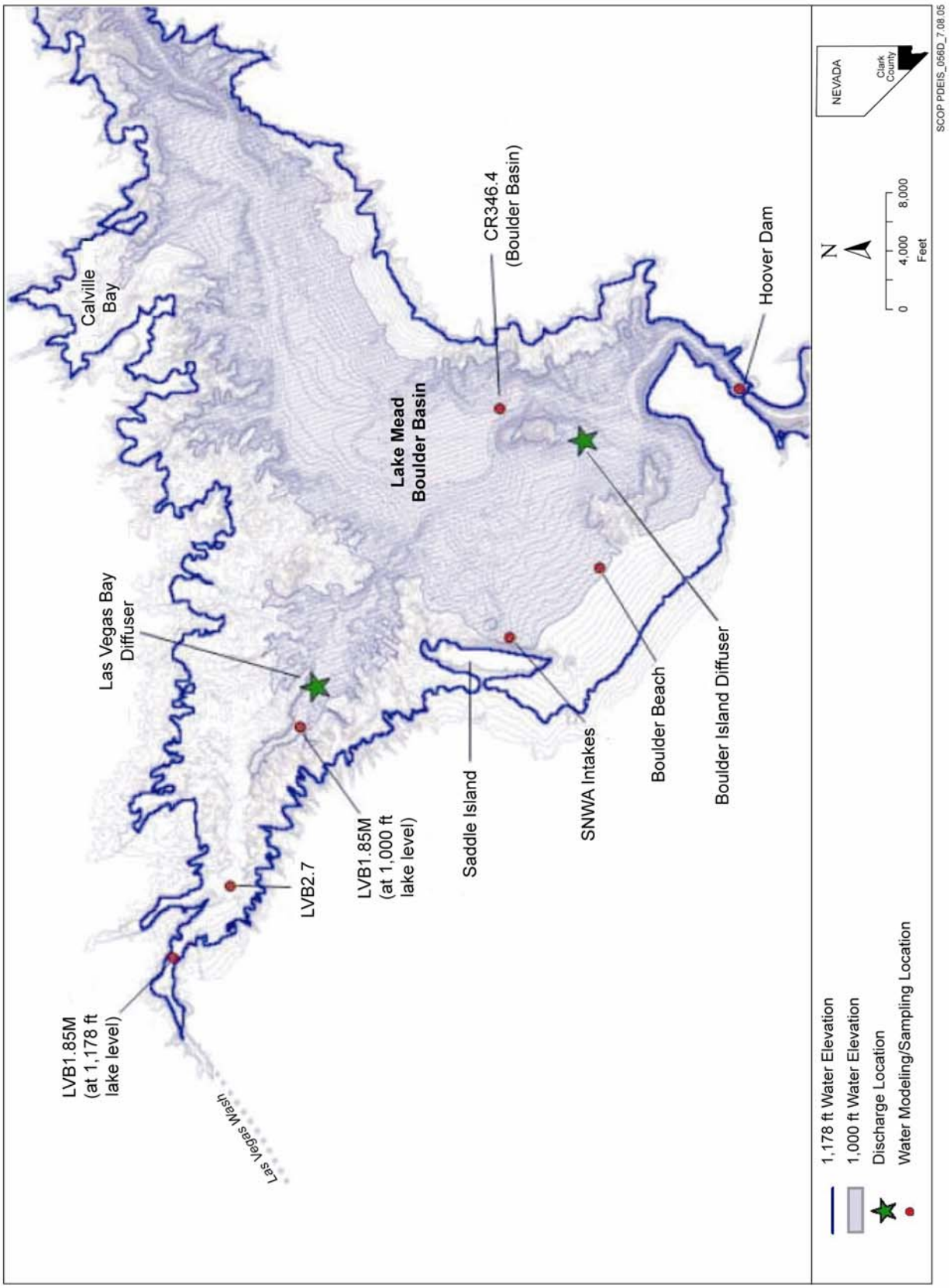



Figure D.2-1 Water Quality Modeling/Sampling and Discharge Locations in Lake Mead.

considered the upper and lower intakes combined, and the SNWA intake data considered the lower intake only.

Extensive data collection and model calibration was conducted. Model calibration and validation were required prior to applying the model to the analysis of the alternatives. Model calibration was conducted in two phases: an ELCOM calibration followed by a CAEDYM calibration. The ELCOM calibration focused on physical parameters such as temperature, conductivity, perchlorate, and FC. The CAEDYM calibration considered chemical and biological parameters such as chlorophyll, nutrients, DO, and pH. The model calibration was complete when the agreement between the model results and the field data was considered adequate. Model Calibration is discussed in detail in the *Lake Mead Water Quality Modeling Report* (Black & Veatch 2005b).

A medium grid (600-m grid size) was used for the modeling effort (Figure D.2-2). The ELCOM water quality variables that were included in the simulations are temperature, conductivity, perchlorate, FC, chloride, sulfate, bromide, and salinity. The ELCOM tracers that were included in the simulation were tracers for the effluent, Las Vegas Wash baseflow, stormwater, and Colorado River inflow. The CAEDYM variables that were included in selected simulations are BOD, DO, TP, soluble phosphorus, $NO_3$, $NH_3$, TN, pH, and chlorophyll.

For initial screening purposes, the original alternate discharge locations evaluated for the ELCOM/ CAEDYM runs were Las Vegas Bay, Callville Bay, Promontory Point, Hemenway Wall, and Boulder Islands. The results of the modeling indicated that the discharge locations that best meet the purpose and need for the SCOP and maintain water quality standards are the Boulder Islands and Las Vegas Bay discharge locations.

The Boulder Islands and Las Vegas Bay scenarios consist of discharging 270 mgd of the effluent through a diffuser located at one of these locations, with the remaining 30 mgd of effluent being discharged into the Las Vegas Wash. The discharges are assumed to always be located below the thermocline unless specified otherwise. A surface discharge through the Las Vegas Wash (No Action Alternative) was also simulated, consisting of discharging the future 300 mgd of effluent flow into the Las Vegas Wash. In addition, several Las Vegas Wash/Las Vegas Bay Combined and Las Vegas Wash/Boulder Islands Combined cases were simulated to evaluate the effects of a range of scenarios with varying proportions of effluent being discharged through the Las Vegas Wash and a diffuser located at either Las Vegas Bay or Boulder Islands. These Combined case simulations are discussed further in the *Lake Mead Water Quality Modeling Report* (Black & Veatch 2005b).

All of these alternative simulations used meteorological data, Colorado River inflow volumes, water quality, tracer concentrations, and Hoover Dam release volumes from 2002. The limnology of Lake Mead was also considered and additional information regarding Lake Mead limnology is presented in the *Lake Mead Water Quality Modeling Report* (Black & Veatch 2005b).

Simulations using the ELCOM/CAEDYM model were performed for the years 1999 through 2003 (Black & Veatch 2005b). Of those years, complete destratification of Lake Mead occurred in 1999, 2001, and 2002. Complete destratification did not occur in 2000 and 2003 (LaBounty & Burns 2005). The modeling indicates that there is no accumulation of effluent when it is discharged into the hypolimnion through a diffuser, whether complete destratification of the Lake occurs or not. This is mainly a result of the effluent being significantly warmer and thus less dense than the ambient reservoir water. Additional information regarding destratification is presented in Attachment 1 of this Appendix.

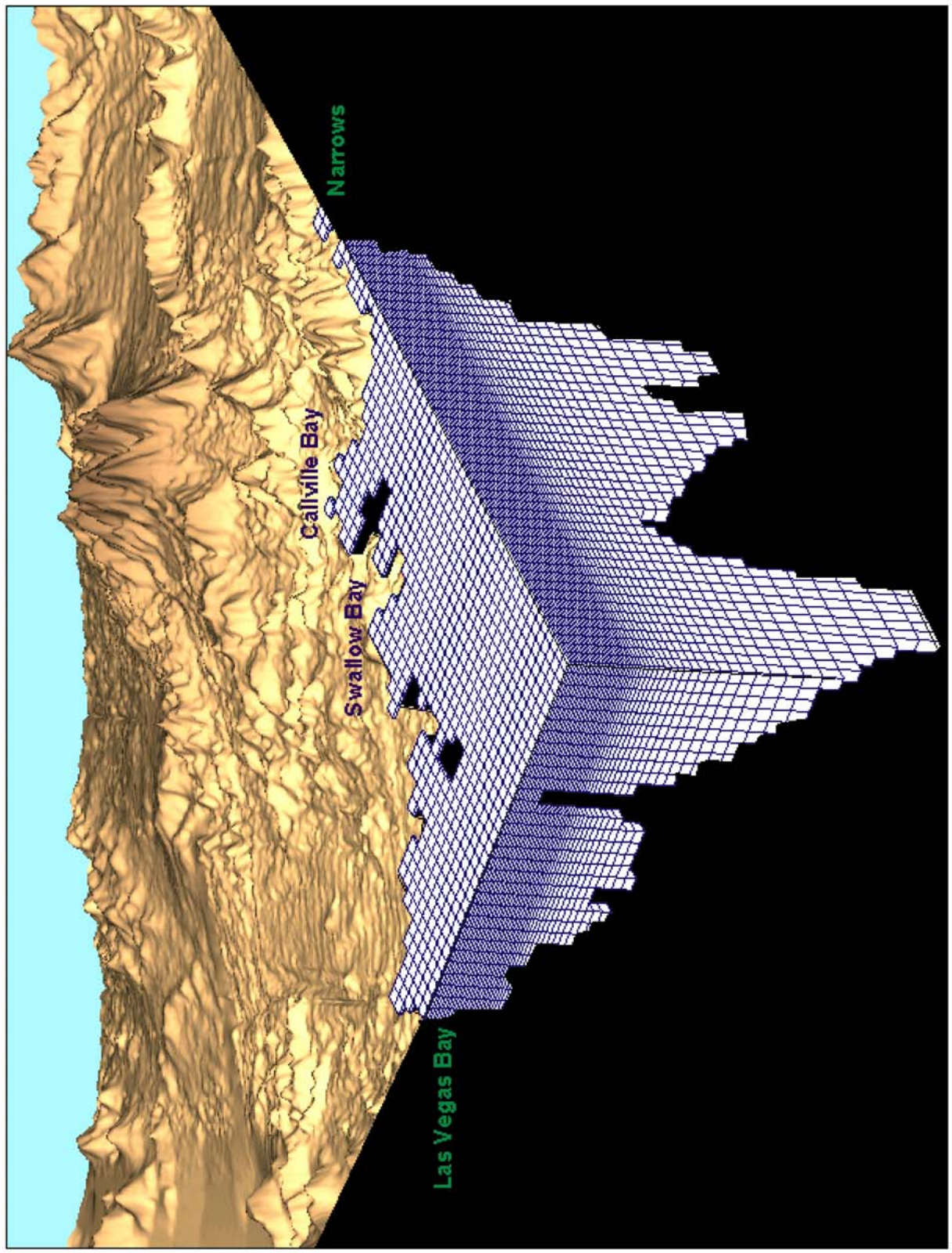



Figure D.2-2 600-meter Grid.

The confidence levels for ELCOM/CAEDYM predictions of yearly averages for various modeled substances (except chlorophyll *a*) were estimated based upon comparisons of perchlorate field data and calibration model results for a 3-year period (2000 through 2003). Initially, confidence levels for perchlorate yearly averages were computed based on a method of analysis that closely follows that used in determining model confidence level estimates for chlorophyll *a*. The computed confidence levels for perchlorate were then used to determine confidence levels for other substances that are considered in the ELCOM/CAEDYM model. Perchlorate was chosen since it is a conservative substance that enters Boulder Basin predominantly through the Las Vegas Wash. Perchlorate is not a parameter in the effluent but enters the Las Vegas Wash through a series of groundwater seeps. In addition, there are 40 to 60 perchlorate measurements available per year in the Las Vegas Wash, which enables meaningful statistical analysis. On the other hand, most other conservative substances computed in the model have significant contributions from both the Narrows and the effluent, making a direct estimate of confidence level difficult.

The errors of the model output are identified by determining the differences between the field and model averages. These errors are then combined over the four calendar years using the conservative "Root Mean Square" (RMS) method (Lorden 2004). Specifically, the RMS error is obtained by averaging the squares of the errors and taking the square root of the result. The percent RMS errors generally range from 10.4 percent to 13.5 percent. Based upon these results, a reasonable value to use to estimate model confidence limits for the annual average perchlorate value is 13 percent.

Confidence levels for the model estimates of conservative substances other than perchlorate (eg. effluent tracer, chloride, bromide) are also assumed to be 13 percent. A similar analysis for chlorophyll *a* indicated confidence levels of 35 percent (Lorden 2004). This difference in confidence levels is attributed to the fact that the predictions for conservative substances are more accurate than those for chlorophyll. This is a result of the uncertainty in model input parameters such as algae growth rates and their dependence on other factors such as water temperature, phosphorus concentrations, and solar radiation.

Other non-conservative parameters in Lake Mead such as phosphorus and nitrogen are expected to have confidence levels somewhere between 13 percent and 35 percent. This is a result of the belief that confidence levels for such substances are expected to be lower than those for chlorophyll, but higher than those for conservative substances. Due to lack of reliable field data, especially for phosphorus, the confidence levels for such parameters are simply estimated at 25 percent.

The estimated model confidence limits for all modeled parameters are shown in Table D.2-1. It should be noted that the percentage model confidence limits for each parameter are relative to the change in concentration above the background level.

## D.2.2 Lake Mead Model Input Data

Water quality data was obtained from the CLV, CCWRD, COH, SNWA, Reclamation, USGS, Basic Management Inc. (BMI), and NDEP for the Lake Mead Model. Data collected included flow rates and water quality data for the effluent, Las Vegas Wash inflow, SNWA intakes, BMI intake, Hoover Dam discharges, and Boulder Basin data. Meteorological and water quality data for Boulder Basin and upstream areas of Lake Mead were also collected. Unless otherwise specified for the wastewater effluent data, all temperature, pH, DO, and FC data were measured using instantaneous (field) or grab samples.

Table D.2-1 Estimated Model Confidence Levels for Parameters.

| Parameter | Estimated *Percentage*[1] Model Confidence Levels (percent) |
|---|---|
| Temperature (°C [°F]) | 13 |
| Perchlorate (µg/L) | 13 |
| Effluent Tracer (%) | 13 |
| Conductivity (µS/cm) | 13 |
| Total Dissolved Solids (mg/L) | 13 |
| Dissolved Oxygen (mg/L) | 25 |
| Chlorophyll (µg/L) | 35 |
| Total Phosphorus (mg/L) | 25 |
| Total Nitrogen (mg/L) | 25 |
| Total Ammonia Nitrogen (mg/L) | 25 |
| Un-ionized Ammonia (mg/L) | 25 |
| Bromide (mg/L) | 13 |
| Sulfate (mg/L) | 13 |
| Chloride (mg/L) | 13 |

Note:
[1] Relative to the difference between model estimate and background level.

The ELCOM/CAEDYM alternative runs were modeled using "base" conditions from 2002 (Table D.2-2). Year 2002 was selected as the baseline year for the following reasons:

- Prior to year 2000, a limited amount of water quality data is available for Lake Mead;
- A significant amount of data is available for years 2000, 2001, and 2002;
- Year 2001 was an atypical year concerning algal growth in Lake Mead, so it was eliminated from consideration;
- Year 2002 data is representative of typical conditions in Lake Mead including algal growth years; and
- Year 2002 Lake elevation was lower, which is expected to be typical in the future.

The modeling report provides data analysis and modeling of the Lake from 1999 to 2004, not just the baseline year (2002). However, extending the baseline conditions back to 1999 would result in higher baseline values for phosphorus loads through Hoover Dam. This is a direct result of the large algae bloom in 2001 and the fact that before 2002, the dischargers had not yet initiated year-round phosphorus removal (see Table 1 of Attachment 2). For constituents other than phosphorus, using several years for baseline data rather than the single year of 2002 did not produce any significant differences in the conclusions (Black & Veatch 2005b).

Meteorological data, Colorado River inflow volumes, water quality, tracer concentrations, Hoover Dam release volumes, and initial water surface elevations were used to define the meteorological and hydrologic conditions. Actual flow rates for the baseflow and stormwater components of the Las Vegas Wash were also used for each simulation year. The Narrows inflow rates for the alternative runs were adjusted slightly to maintain the same water levels as obtained in 2002. This was needed due to the

Table D.2-2 Baseline Modeled Water Quality Conditions in Boulder Basin
(1,178 ft [359 m] Lake level for Year 2002 effluent flows of 150 mgd [231 cfs] and TP = 292 lbs/day).[1]

| Parameter | Inner Bay (LVB1.85M) [2] | Inner Bay (LVB2.7) | Boulder Basin (CR346.4) | Boulder Beach | Hoover Dam Discharge [3] | SNWA Intake [4] |
|---|---|---|---|---|---|---|
| Temperature (°C[°F]) | 20.3 [68.5] | 20.3 [68.5] | 19.6 [67.3] | 19.3 [66.7] | 13.2 [55.8] | 13.0 [55.4] |
| Perchlorate (µg/L) | 45.2 | 46.7 | 12.9 | 13.9 | 6.6 | 5.8 |
| Conductivity (µS/cm) | 1,085 | 1,094 | 947 | 952 | 901 | 896 |
| Total Dissolved Solids (mg/L) [5] | 687 | 693 | 599 | 603 | 570 | 567 |
| Dissolved Oxygen (mg/L) | 8.7 | 8.7 | 8.3 | 8.3 | 7.7 | 7.5 |
| Chlorophyll Growing Season Average (µg/L) [6] | 12.4 | 12.4 | 2.0 | 2.1 | ≤ 0.01 | ≤ 0.01 |
| Chlorophyll Annual 95th Percentile (µg/L) [6] | 23.0 | 23.0 | 3.8 | 4.1 | 0.2 | 0.1 |
| Secchi Depth (m) | 3.2 | 3.2 | 8.5 | 8.8 | ND [7] | ND [7] |
| Total Phosphorus (mg/L) | 0.018 | 0.018 | 0.005 | 0.005 | 0.005 | 0.004 |
| Soluble Phosphorus (mg/L) | 0.009 | 0.009 | 0.003 | 0.003 | 0.004 | 0.004 |
| Total Nitrogen (mg/L) | 1.61 | 1.68 | 0.42 | 0.44 | 0.34 | 0.36 |
| Total Inorganic Nitrogen (mg/L) [8] | 1.57 | 1.64 | 0.40 | 0.43 | 0.32 | 0.33 |
| Total Ammonia Nitrogen (mg/L) | 0.012 | 0.013 | 0.010 | 0.011 | 0.014 | 0.019 |
| Un-ionized Ammonia (mg/L) [9] | 0.0008 | 0.0008 | 0.0002 | 0.0004 | 0.0002 | 0.0003 |
| Bromide (mg/L) | 0.106 | 0.107 | 0.086 | 0.087 | 0.080 | 0.080 |
| Sulfate (mg/L) | 295 | 297 | 257 | 259 | 243 | 242 |
| Chloride (mg/L) | 107 | 108 | 85 | 85 | 79 | 78 |
| Fecal Coliform (MPN/dL) [10] | 1.0 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| pH | 8.1 | 8.1 | 8.0 | 8.0 | 7.7 | 7.7 |

Notes: See following page.

Table D.2-2 Notes:

[1] Unless otherwise specified, sampling depth is surface to 1 m (3.3 ft) except at SNWA and Hoover Dam, which were sampled at the intake depths. All data is the annual average, except for chlorophyll, which includes the growing season average (April 1 to September 30) and the annual 95th percentile, and Secchi depth, which includes the growing season average.

[2] M = Mobile. LVB1.85M is mobile and located at a depth of 16 to 18 m (52 to 59 ft) near the confluence of Las Vegas Wash and Lake Mead. All other locations are stationary (See Figure 4.1-1). The position of LVB1.85M for the initial lake level of 1178 ft is the same as LVB2.7 for the entire growing season, but moves away from the Las Vegas Wash later in the year as the lake level drops. Therefore the chlorophyll concentrations (which are averaged over the growing season) are the same at LVB1.85M and LVB2.7, while other parameters (averaged over the entire year) are slightly different.

[3] Hoover Dam discharge data is from upper and lower intakes combined.

[4] SNWA data is for intake located at 1,000 ft.

[5] Total Dissolved Solids (TDS) are not simulated. It is computed from the correlation, TDS (mg/L) = 0.633 Conductivity (µS/cm).

[6] Sampling depth for chlorophyll was averaged over the top 5 m (16 ft), except at SNWA and Hoover Dam, which were sampled at the intake depths.

[7] ND = No Data. No Secchi depth data exists for Hoover Dam Discharge and SNWA Intake because Secchi depth is a property of lake surface.

[8] Total Inorganic Nitrogen is not simulated. It is computed as Nitrate + Total Ammonia Nitrogen. Nitrite is not simulated.

[9] Un-ionized ammonia is averaged over the entire depth.

[10] Most Probable Number per 100mL (1 deciliter).

*Source: Black & Veatch 2004d.*

projected increase in both the effluent discharge and SNWA withdrawals. Lake Mead limnological information was obtained from the University of Nevada, Las Vegas (UNLV) (1980 and 2002) and from Dr. Jim LaBounty (LaBounty and Horn 1997). Wastewater treatment process and effluent phosphorus information was obtained from the *SCOP Process Assessment* (Black & Veatch 2004b).

The input data for the alternatives characterized the Las Vegas Wash flows and water quality at the point of discharge to Boulder Basin (i.e., the composite flow), where the flow includes baseflow, possibly stormwater, and effluent. The water quality and tracer concentrations for the Las Vegas Wash in the alternative runs were computed based on a flow-weighted average of the baseflow, stormwater, and effluent components that are expected to comprise the Las Vegas Wash in 2030 and 2050. It was assumed that future baseflow and stormwater flow quality could be accurately defined using 2002 data.

## D.3 Lake Mohave Model

The primary goal of the Lake Mohave modeling effort was to test the sensitivity of changing nutrient input to Lake Mohave on 1) the in-lake (Lake Mohave) water quality and 2) the nutrient discharged downstream of Davis Dam. CE-QUAL-W2, a time varying, longitudinal-vertical hydrodynamic and water quality model maintained by the Waterways Experiment Station of the U.S. Army Corps of Engineers (USACE), was chosen for application to Lake Mohave. The information presented in this section is based on *Lake Mohave Water Quality Model Project Report: Validation* prepared by J.E. Edinger Associates, Inc (2003). Figure D.3-1 provides a general view of Lake Mohave.

It is important to note that the nutrient loading through Hoover Dam is dependent on several factors. These factors include, but are not limited to the quality of the effluent being discharged into Boulder Basin, and water quality from sources upstream of Boulder Basin such as water from the Overton Arm, water released from Lake Powell, and water from the tributaries of the Colorado River. In addition, the nutrient loading that goes through Hoover Dam is dependent upon how Reclamation operates Hoover Dam. For modeling purposes, it was assumed that Reclamation would not modify the operation of

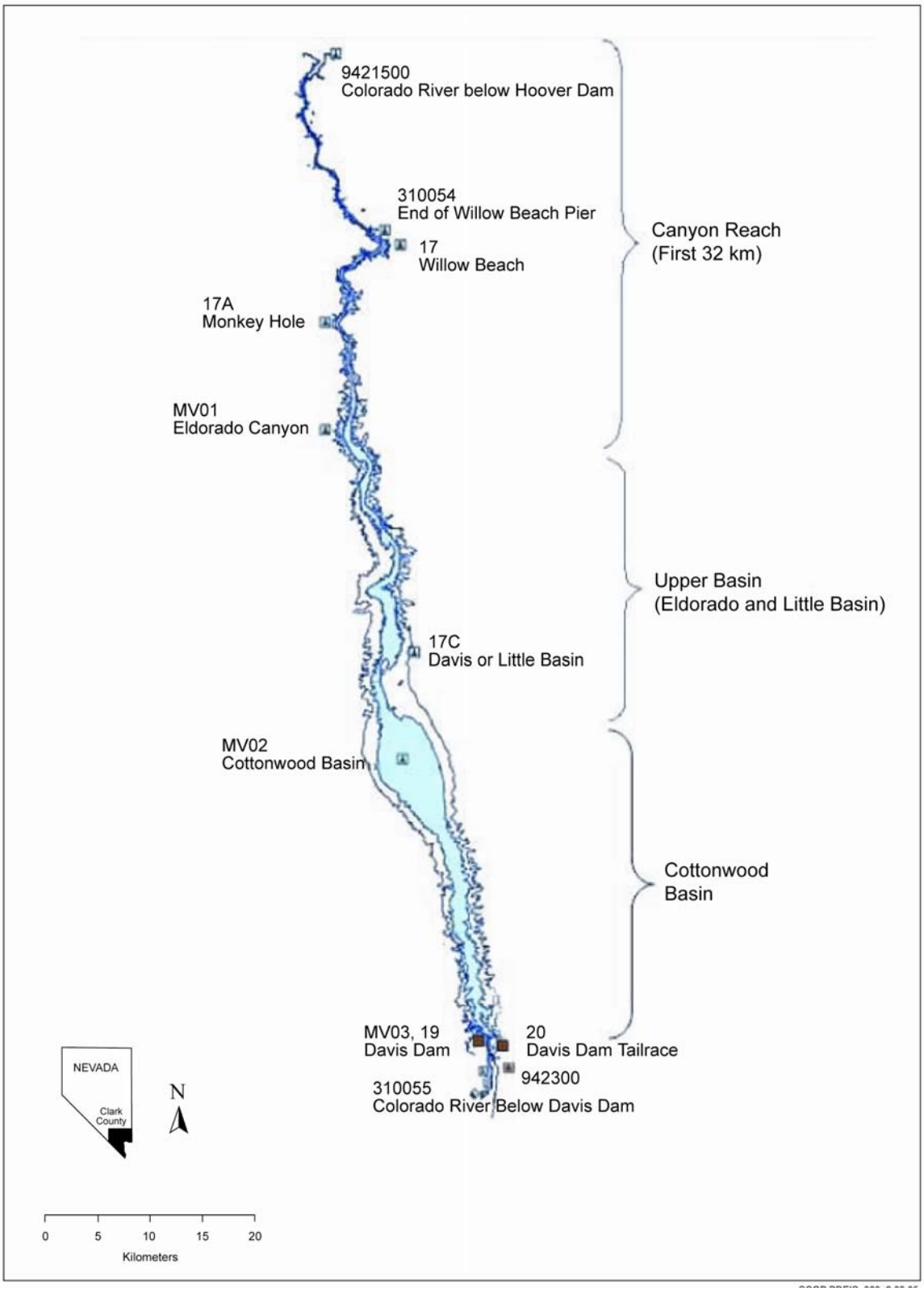



Figure D.3-1 General View of Lake Mohave.

Hoover Dam. A description of the Hoover Dam operations that were taken into consideration during the water quality modeling efforts is provided in the Lake Mead Water Quality Modeling Report (Black & Veatch 2005b), which is available upon request. However, Reclamation's operation of Hoover Dam is beyond the control and scope of this EIS.

## D.3.1 Model Selection, Set-up, and Calibration

### D.3.1.1 Model Selection

The Lake Mohave Model used CE-QUAL-W2, which is a longitudinal-vertical hydrodynamic and transport model built for long-term, time varying water quality simulations of lakes, reservoirs, and estuaries. CE-QUAL-W2 can accurately reproduce vertical and longitudinal water quality gradients when complete boundary condition data are available. CE-QUAL-W2 has been under development for the USACE since 1974 and has had extensive review and testing.

Lake Mohave's dominant gradients are in the longitudinal and vertical directions, which is readily obvious by noting Lake Mohave's long and narrow outline (Figure D.3-1) or by considering Lake Mohave's basic dimensions: length of 67 miles (mi) (108 kilometers [km]) , width of 4 mi (6 km), and maximum depth of 131 ft (40 m). Furthermore, the problem of phosphorus addition to Lake Mohave is one of simulating annual cycles. Both the longitudinal-vertical spatial domain and the long-term modeling needs fit well with CE-QUAL-W2's capabilities.

### D.3.1.2 Model Set-up

Input data for the Lake Mohave Model had two main sources: Data included in reports prepared by UNLV and data downloaded from the USGS and STORET web sites. Researchers at UNLV designed, implemented, and interpreted the results of comprehensive field programs that measured physical, chemical, and biological variables for the periods 1977-1978 and 1981-1982. In addition, nutrient budget analyses were based on data downloaded from USGS and STORET web sites.

The Lake Mohave System characteristics most applicable to the Lake Mohave modeling effort are:

- The seasonally uniform, cold inflow from Lake Mead near-bottom releases (approximately 12ºC [54ºF] year round) transits the Canyon Reach (Figure D.3-1) with very little warming and enters the Upper Basins (Figure D.3-1) as an underflow through the spring, summer, and fall seasons. The location at which this inflow plunges varies with the density difference, flow rate, and water surface elevation. There is evidence that the inflow enters the Upper Basins as a surface flow in the winter due to insignificant density differences.
- Surface warming is important in the Upper Basins and especially in the Cottonwood Basin.
- Strong stratification develops in the Cottonwood Basin during the summer. Extension of the epilimnion all the way to Davis Dam is somewhat limited by upwelling in the vicinity of Davis Dam caused by the coldwater underflow. This underflow is larger than the inflow from Lake Mead due to entrainment of epilimnetic water at the plunge point. The upwelling can be strong enough to cause reverse currents on the surface.
- In contrast to the temperature differences between the Lake Mead outflow and the waters of Lake Mohave, there are no measurable differences in conductivity and TDS.

No seasonal pattern was apparent in the water quality characteristics of the inflow below Hoover Dam in the years for which seasonal data were available. Nitrate and dissolved phosphorus concentration averaged about 0.4 milligrams per liter (mg/L) and 0.015 mg/L, respectively, while the ammonia concentration was usually less than 0.020 mg/L.

Water quality characteristics within Lake Mohave are strongly influenced by Lake Mohave's uniformly colder year-round inflow that becomes an underflow through most of the lake during the stratified period. This limits the availability of nutrients during the summer in the Cottonwood Basin, except for upwelling of entrained surface water near Davis Dam.

The concentration of nitrate varies seasonally in relation to thermal stratification, declining at the surface in the summer due to phytoplankton uptake, and rising due to mixing with river water upstream and upwelling of inflow at the downstream end. A horizontal nitrate gradient, ranging from 0.3 or 0.4 mg/L at Monkey Hole to less than 0.2 mg/L at Davis Dam, was sustained because of a net conversion of nitrate to organic nitrogen.

Dissolved phosphorus undergoes a similar seasonal change. Strong vertical or horizontal gradients were not discerned for phosphorus. Depletion of dissolved phosphorus by phytoplankton in the epilimnion was not as prominent as nitrate depletion. This feature is likely due to a lower stoichiometric requirement and faster turnover rate of phosphorus compared to nitrogen.

Dissolved oxygen concentration was reduced in the hypolimnion of Lake Mohave during thermal stratification (June-October). Typically, the DO would go as low as 4 mg/L during summer. The pH in the hypolimnion decreased consistent with biological respiration and mineralization of organic material. However, oxygen concentrations remained relatively high. There was a general decrease in oxygen concentration in the hypolimnion at the downstream stations. A metalimnetic oxygen minimum usually did not develop in Lake Mohave.

A key assumption in the Lake Mohave Model is that there are no sources of nutrients other than the inflow from Hoover Dam. There appear to be no point sources on Lake Mohave other than a fish hatchery at Willow Beach. Precipitation in the region is small.

Though the comparison should be conducted for input and output loads (the product of flow and concentration), the input and output concentrations are used for simplicity, because over the long-term, flows will balance out in the inflow and outflow records. Another reason for comparing concentrations is that computation of the loads as a product of flow and concentration requires interpolating the sporadic concentration measurements to the frequency of flow measurements, which is daily. There is no unique way to interpolate. Thus, computing the loads introduces additional assumptions in the analyses. Therefore, it is instructive to examine the time series of the concentration data prior to computing loads from these data.

Assuming there are no other sources of nutrients to Lake Mohave, the implications are that historically Lake Mohave has not served as a significant sink of total phosphorus delivered to it through Hoover Dam. Unless changes in lake "metabolism" due to additional phosphorus load alter this input-output relationship, the additional load from the wastewater effluent is likely to be passed relatively unchanged to the downstream reservoir.

In the analyses, nutrient loads were computed as a product of daily concentration estimates and daily flows.

The years 1977-1978 and 1981-1982 were selected for model calibration because large amounts of in-lake water quality data are available from the intensive studies by UNLV. All supporting inflow, outflow, and water surface elevation data were also available from various agency websites.

The two simulation periods were used for calibration of the model as follows. The temperature calibration was first carried out for the 1981-1982 period. The calibration was confirmed further by using the same coefficients in 1977-1978 simulations and comparing the model results to the detailed temperature profile data available for these two years. Water quality calibrations were similarly started with 1981-1982. The additional confirmation step for the water quality calibration, where the same kinetic coefficients would be applied to another set of years and then the calibration checked, was not done for this report.

Meteorological data sets for the two study periods were developed from hourly National Weather Service observations of air temperature, dew point temperature, wind speed and direction, and cloud cover at Las Vegas, NV.

Flow data were available as daily releases from Lake Mead for 1977-1978 and 1981-1982. Temperatures of the inflow to Lake Mohave from Lake Mead were developed from observations.

Inflow water quality constituent files were developed only for 1981-1982. Long-term data were examined for any seasonality to help determine the best interpolation approach for refining the model upstream boundary. No consistent seasonal pattern could be discerned in the TP data, except for a slight suggestion that December through January values may be slightly higher than those during the rest of the year.

Development of concentration input files for CE-QUAL-W2 also requires assumptions about how the measurements are related to the model representations of the water quality constituents. The following two guidelines, sometimes in conflict with one another, were used to develop the boundary concentration files.

- Total Phosphorus and TN estimates should be accurate as these reflect the nutrient budgets that are crucial to mass balance accuracy.
- The partitioning of nutrients and organic carbon should reflect the lability of these components at short and long time scales. Constant stoichiometry of organic matter and algae in the model is a constraint to achieving the best representation.

### D.3.1.3 Model Calibration

Calibration was conducted in three phases: water balance, temperature calibration, and water quality calibration. Each phase depended on the successful completion of the prior phase.

Water balance is the process of using observation of lake elevations to account for missing flows or inaccuracies. It is a necessary first step because it affects all other calibration efforts. Temperature calibration was conducted using time-series observations rather than synoptic measurements (i.e., vertical profiles at a particular time). This approach is consistent with the goal of modeling the seasonal behavior of the Lake Mohave system and also allows gross properties (e.g., seasonal temperature changes) to be examined prior to examining vertical profiles from the temperature and water quality observations.

Water quality calibration is a more involved exercise than temperature calibration because of fewer and less precise field data, a preponderance of non-linear and interaction terms in the underlying equations,

and there are more constituents and parameters to consider. The water quality calibration isolated the key calibration features indicated by the field data in the aggregate, and then the model was calibrated to capture these key features. Key calibration target features were isolated from a review of the field data and prior reports. In no particular order of importance, these were:

- Approximately similar TP in Lake Mohave inflow and outflow,
- Approximate TN loss of 10 percent during passage through Lake Mohave,
- Significant increase in Total Kjeldahl Nitrogen in the outflow at Davis Dam,
- Significant (30 percent) decrease in $NO_3$ in the outflow at Davis Dam,
- Surface depletion of $NO_3$ to near detection limits,
- Nitrogen limitation may sometimes occur during the summer,
- High vertical gradient at the surface for primary production,
- DO vertical gradient not so high at the surface,
- No anoxia anywhere in any season,
- Slow longitudinal decline of DO towards the Davis Dam, down to about 4 mg/L,
- Primary production in the range of 500 to 3000 $mgC/m^2/day$,
- Secchi disk depth is highly variable, but in the range of 1 to 12 m (3 to 39 ft), and
- Chlorophyll *a* concentration ranges seasonally from 1 to 6 micrograms per liter (µg/L).

Given the relevance of nutrient retention for the problem being studied, model-based nutrient budget calculations formed a significant part of the calibration effort. Analyses of nutrient retention from long-term monitoring data, subject to the assumption of no phosphorus load besides Hoover Dam outflow, suggest a certain amount of "average" retention that may vary from year to year and is dependent on assumptions regarding outliers and below-detection values in the field data. For the calibration, the nutrient load corresponding to the distributed inflow was computed by estimating a reasonable runoff flow rate and reasonable runoff concentration separately.

## D.3.2 Results

The Lake Mead Model simulated nutrient loads through the Hoover Dam for various scenarios of effluent discharge locations in Lake Mead. These nutrient loads were used as input to the Lake Mohave model.

Two scenarios were run in which the nutrient load estimated at Hoover Dam was increased by 25 percent and 100 percent. The same proportional increase was applied to all the nutrient species. These hypothetical and illustrative scenarios do not relate to any specific effluent or loading scenarios. Since all nutrient species were changed proportionally, it can be tempting to think of the two scenarios as indicative of loads under different hydrologic years, but it may be noted that higher flows will likely change the system retention. Increase in loading due to a higher flow is a very different perturbation to a system compared to an increase in loading due to a higher inflow concentration.

The year 2000 was selected for running scenarios as a result of discussions within the SCOP Water Quality Modeling Subcommittee. Table D.3-1 shows the fate of the nutrient under loads estimated from field data for year 2000.

Tables D.3-2 and D.3-3 show the fate of the total and the additional nutrient loading through Hoover Dam under the two scenarios (25 percent increase in nutrient loading and 100 percent increase in nutrient loading).

The effects of scenarios on the in-lake water quality are summarized in Table D.3-4. A 25 percent increase in loads led to an in-lake water quality change that appeared minor compared to measurement and modeling uncertainty for these metrics. A 100 percent load increase led to more significant effects. Two-year average clarity was reduced by 25 percent. Primary productivity and average algal population density were both increased 40 percent with a doubling of nitrogen and phosphorus loads.

Table D.3-1 Daily Average Nutrient Budgets for the Calibrated Model for 2000.

| | Hoover Dam Release | Non-Hoover Load Assumed | Davis Dam Release | Percent Retention in Lake Mohave |
|---|---|---|---|---|
| TP (lbs/day) | 471 | 115 | 524 | 10.4 % |
| TN (lbs/day) | 50,824 | 7 | 42,916 | 15.6 % |

Table D.3-2 Fate of a 25 percent Increased Load at Hoover Dam for 2000.

| | Additional In | Additional Out | Percent Retention of Additional Load | Percent Retention of Total Load |
|---|---|---|---|---|
| TP (lbs/day) | 119 | 88 | 26.2% | 13.0 % |
| TN (lbs/day) | 13,518 | 9,663 | 28.5% | 18.3 % |

Table D.3-3 Fate of a 100 percent Increased Load at Hoover Dam for 2000.

| | Additional In | Additional Out | Percent Retention of Additional Load | Percent Retention of Total Load |
|---|---|---|---|---|
| TP (lbs/day) | 471 | 352 | 25.5% | 17.1 % |
| TN (lbs/day) | 52,095 | 36,967 | 29.0% | 22.4 % |

Table D.3-4 Model Predictions of In-lake Water Quality Metrics.

| Metric | 2000 Load Estimated from Field Data | Scenario 1 125 percent 2000 Load | Scenario 2 200 percent 2000 Load |
|---|---|---|---|
| Minimum Secchi Depth (ft) | 16.0 | 16.0 | 14.7 |
| Average Secchi Depth (ft) | 25.1 | 23.0 | 19.1 |
| Areal Primary Production ($mgC/m^2/day$) | 296.0 | 343.0 | 449.0 |
| Maximum Chlorophyll *a* (µg/L) | 4.4 | 5.3 | 7.5 |
| Average Chlorophyll *a* (µg/L) | 2.7 | 3.1 | 3.9 |

The model results showed a net reduction of the additional phosphorus and nitrogen during passage through Lake Mohave. In the two scenarios examined that scaled up the phosphorus and nitrogen load through Hoover Dam, this reduction was about 25 percent for TP and 30 percent for TN. The additional phosphorus and nitrogen assumed in the scenarios was retained by a larger percentage than baseline load. If there are phosphorus sources other than Hoover Dam outflow, the overall nutrient retention will be higher.

Effects of the hypothetical load increases on the water quality of Lake Mohave were quantified into five metrics (Table D.3-4). The results showed significant effects in all chosen metrics with a 100 percent increase in nutrient loads, but the effects were much less with a 25 percent increase.

# Appendix D

Attachment 1 – Destratification of Lake Mead

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# Memorandum

Date: 3/28/2006

Re: Incomplete Destratification of Lake Mead

Project No: S014004.1

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## Introduction

The purpose of this memorandum is to clarify results of the Lake Mead modeling with respect to the fact that Lake Mead may not completely destratify every winter. Results are presented from refined ELCOM simulations that indicate the original modeling conclusions do *not* change as a result of an incomplete destratification. In particular, the modeling indicates that there is *no* accumulation of effluent when it is discharged into the hypolimnion through a diffuser at Boulder Islands (BI) in the years when the lake does not destratify in the winter. As discussed below, this is mainly a result of the effluent being significantly warmer and thus less dense than the ambient reservoir water.

## ELCOM Refinement

Previous ELCOM/CAEDYM simulations were performed for the years 1999 through 2003 (Lake Mead ELCOM/CAEDYM Modeling, November 17, 2005 [Modeling Report]). Of those years, Lake Mead did not completely destratify in 2000 and 2003 (LaBounty & Burns, 2005). This is apparent in Figure 4.7 of the Modeling Report, where measured and simulated temperature profiles are shown. On 2/15/00 and 2/11/03 the measured data indicate the presence of weak thermoclines. The original ELCOM simulation for these years *does* predict incomplete destratification and the existence of the 2000 and 2003 winter thermoclines. However, the locations of the predicted weak thermoclines are, respectively, approximately 200 ft and 100 ft deeper than measured.

The 2003 ELCOM simulation has subsequently been refined to better capture the depth of the weak winter thermocline. This was achieved by reducing the bulk wind mixing and stress coefficients and slightly adjusting the vertical distribution of The Narrows inflow from late 2002 through early 2003. **Figure 1** plots temperature profiles from the refined simulation together with measured data from November 2002 through June 2003. The agreement between the new modeling results and the measured temperature profiles is good. In particular, the modeling results capture well the weak thermoclines in January, February, and March.

**BI Alternative Simulations**

Three new simulations of the BI diffuser operation using the ECP (ELCOM/CAEDYM/PLUMES) code with the modified boundary conditions (as described above) were carried out to represent operations from the beginning of 2002 through the spring of 2003. The initial (on 1/1/2002) water surface elevations (WSEL) considered were 1,178 ft, 1,100 ft, and 1,000 ft.

**Figure 2** plots the concentration of effluent tracer along a cross-section from the Las Vegas Wash (LVW) through the diffuser to Hoover Dam on a typical winter day (February 1) in 2003 for the simulation with an initial WSEL of 1,178 ft. Contours of perchlorate (entering from the LVW) and temperature are also shown. It is clear that the effluent rises *above* the diffuser, which is at an elevation of 880 ft, approximately 220 ft above the lowest point in Boulder Basin. The effluent does not sink, which is a result of the effluent temperature being warmer than the ambient lake temperature (even though the effluent has a slightly higher salinity than the ambient water, the effluent is positively buoyant due to the temperature difference). The vast majority of effluent tracer is located above the elevation of the lower Hoover Dam outlets, indicating that a build up of effluent constituents deep in the hypolimnion will not occur.

**Figure 3** plots contours of effluent tracer as a function of elevation and time for the first three months of 2003 at Hoover Dam (1,178 ft WSEL). At all times the effluent is mixed and diluted, and remains mostly between 900 ft and 1,000 ft elevations, approximately 240 to 340 ft above the lowest point of the reservoir. The bottom of the hypolimnion is not impacted.

**Figures 4** and **5** are similar to **Figures 2** and **3**, respectively, except that the initial WSEL is 1,100 ft. The results are much the same as when the initial WSEL is 1,178 ft, although there is more mixing of the effluent into the epilimnion as a result of the shallower insertion depth. Again, the base of the hypolimnion is not significantly impacted by the effluent. In fact, **Figure 5** shows the predicted concentrations of effluent tracer at the base of the hypolimnion near Hoover Dam *decrease* with time when the lake remains weakly stratified in the winter.

**Figures 6** and **7** are similar to **Figures 4** and **5**, respectively, except that the initial WSEL is 1,000 ft. The effluent is now usually mixed completely throughout the epilimnion. The base of the hypolimnion is not significantly impacted by the effluent, and the concentrations of effluent tracer at the base of the hypolimnion near Hoover Dam *decrease* with time when the lake remains weakly stratified in the winter.

At all three lake levels considered, the modeling indicates that there is *no* accumulation of effluent when it is discharged into the hypolimnion through a diffuser at BI in years when the lake does not destratify in the winter. This is mainly a result of the discharged effluent being significantly warmer and thus less dense than the ambient reservoir water. Thus, in winter, the effluent rises well

above the diffuser, located at elevation 880 ft (approximately 220 ft above the lowest point in the reservoir), and is diluted with ambient lake water. The majority of the effluent remains above the elevation of the diffuser.

**References**

"Lake Mead ELCOM/CAEDYM Modeling" [Modeling Report], *Flow Science Incorporated*, November 17, 2005.

LaBounty, J.F. and N.M. Burns, 2005. "Characterization of Boulder Basin, Lake Mead, Nevada-Arizona, USA – Based on Analysis of 34 Limnological Parameters". *Lake and Reserv. Manage.* 21(3):277-307.

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Comparison of Measured and Simulated Temperature Profiles at Station CR346.4
(November 2002 - June 2003)

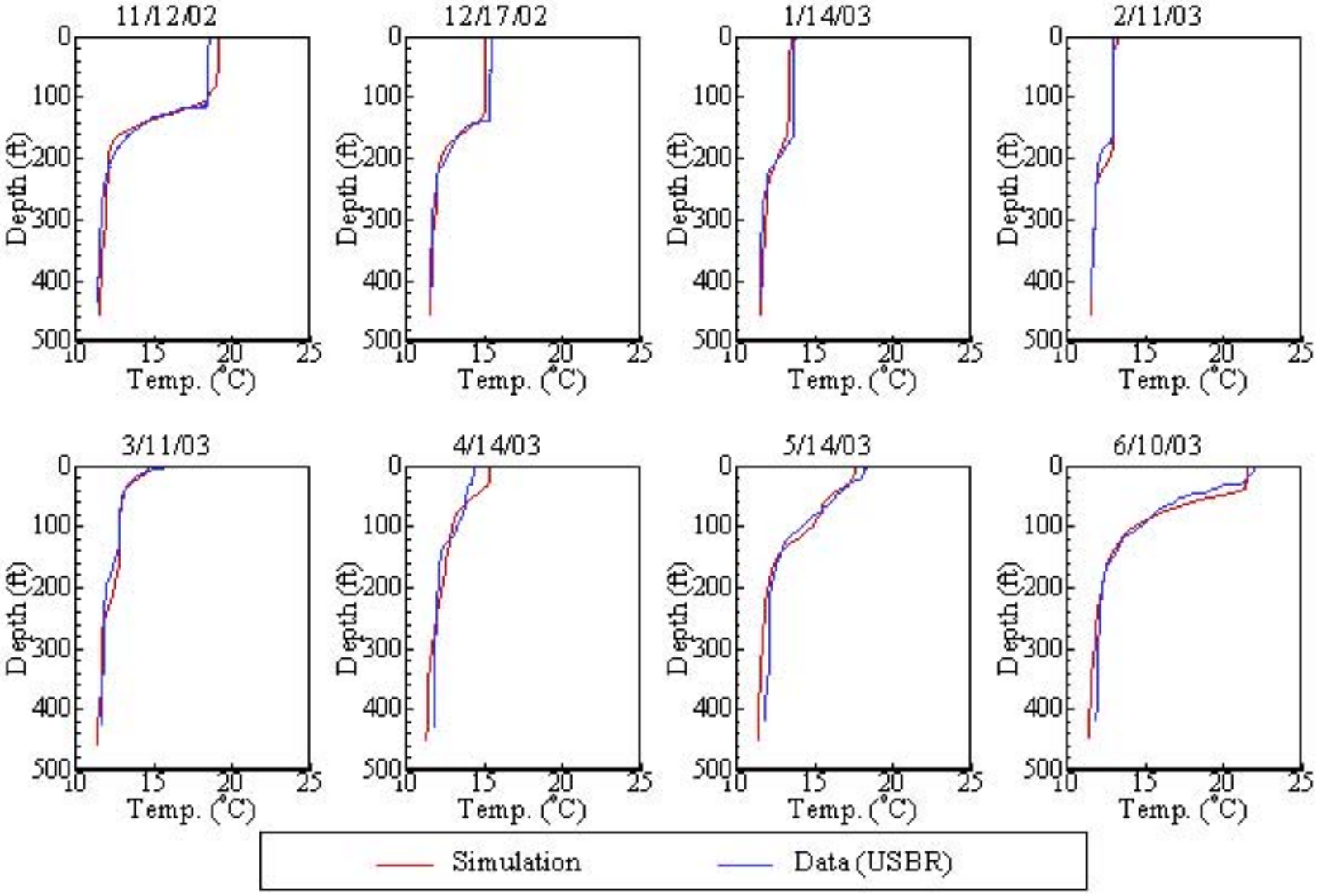



Figure 1

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# Boulder Islands Diffuser, Initial WSEL = 1,178 ft

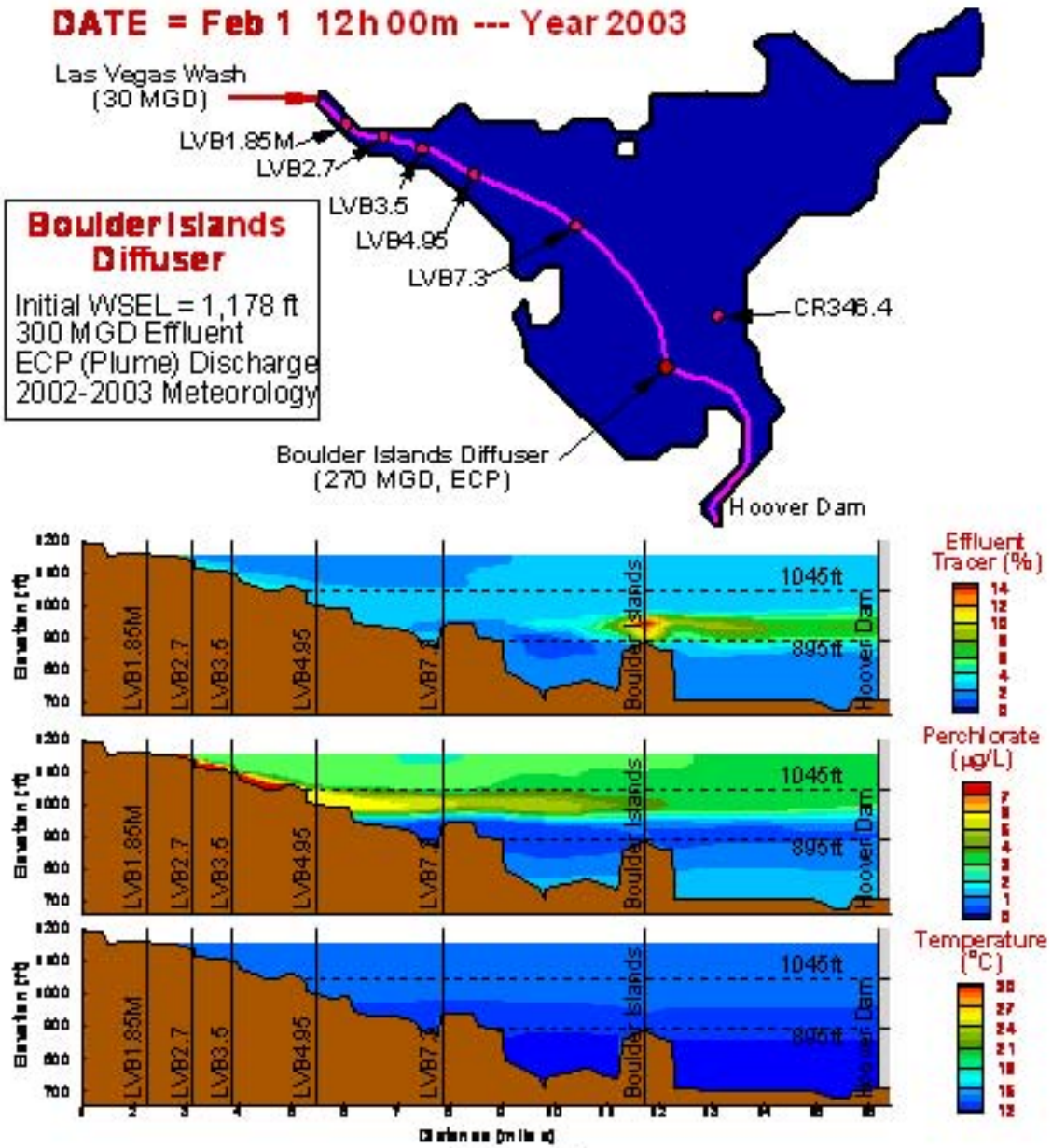



Figure 2

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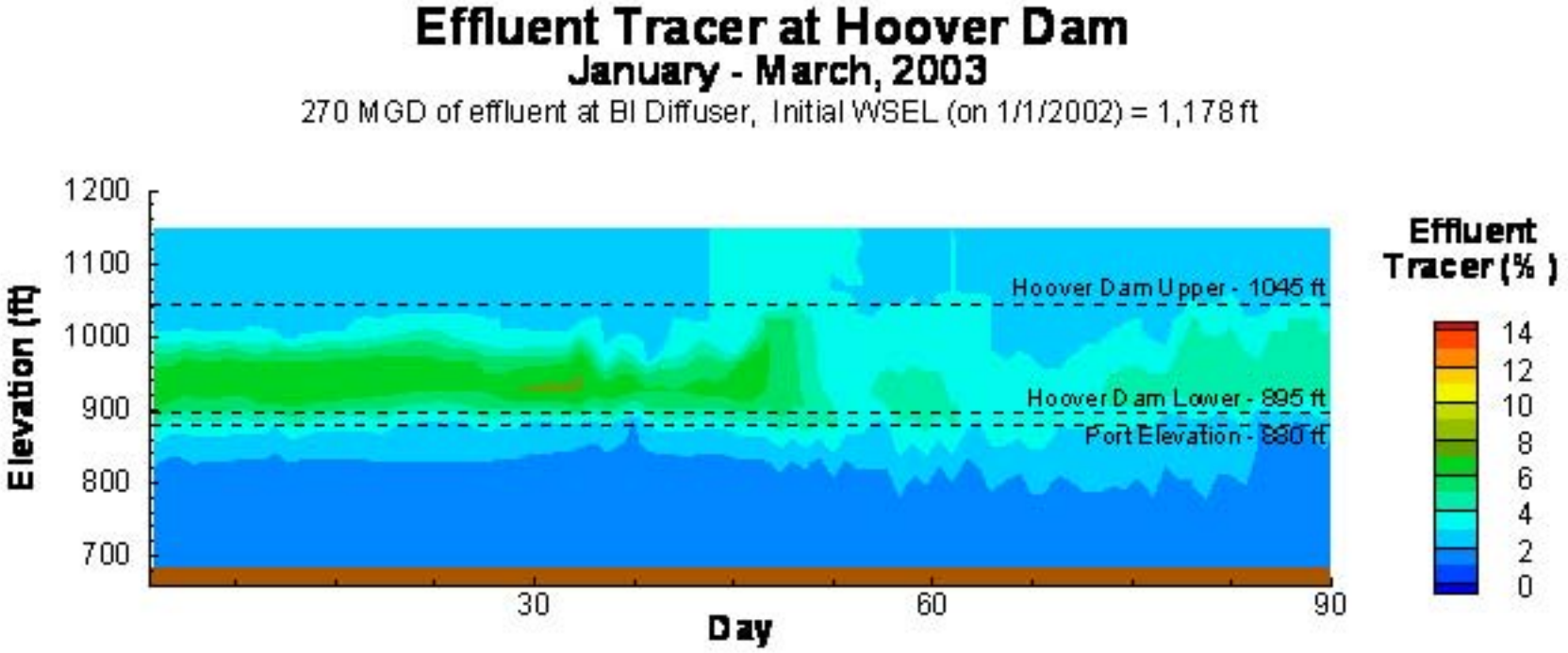



Figure 3

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# Boulder Islands Diffuser, Initial WSEL = 1,100 ft

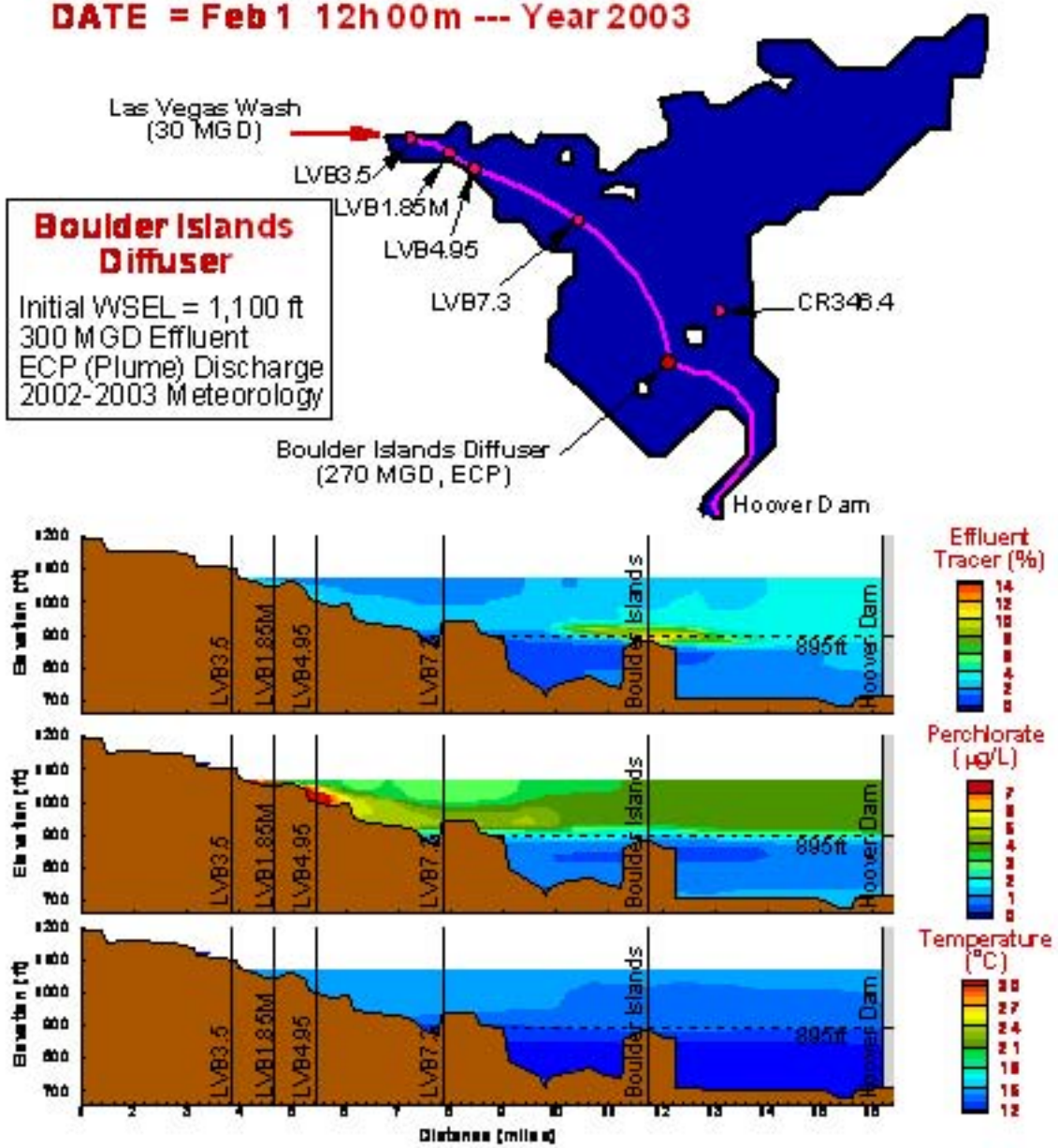



Figure 4

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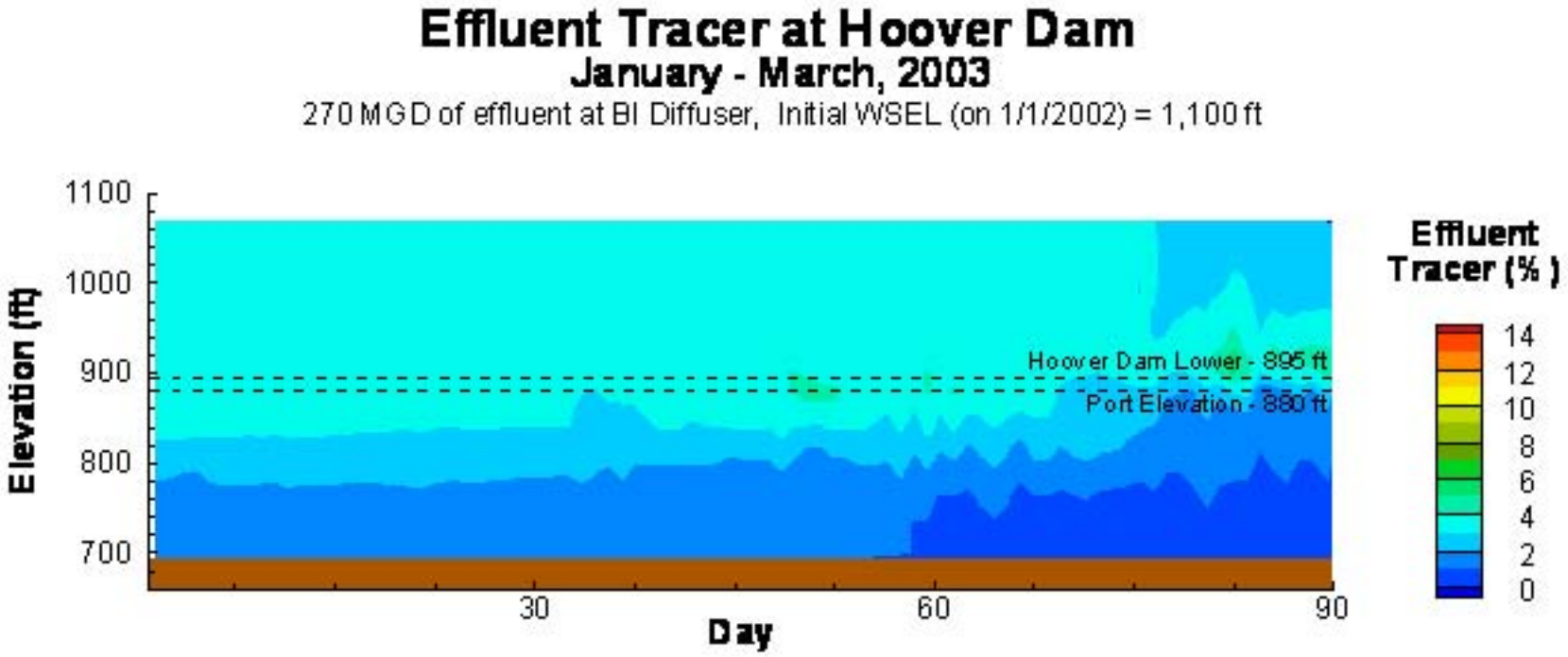



Figure 5

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# Boulder Islands Diffuser, Initial WSEL = 1,000 ft

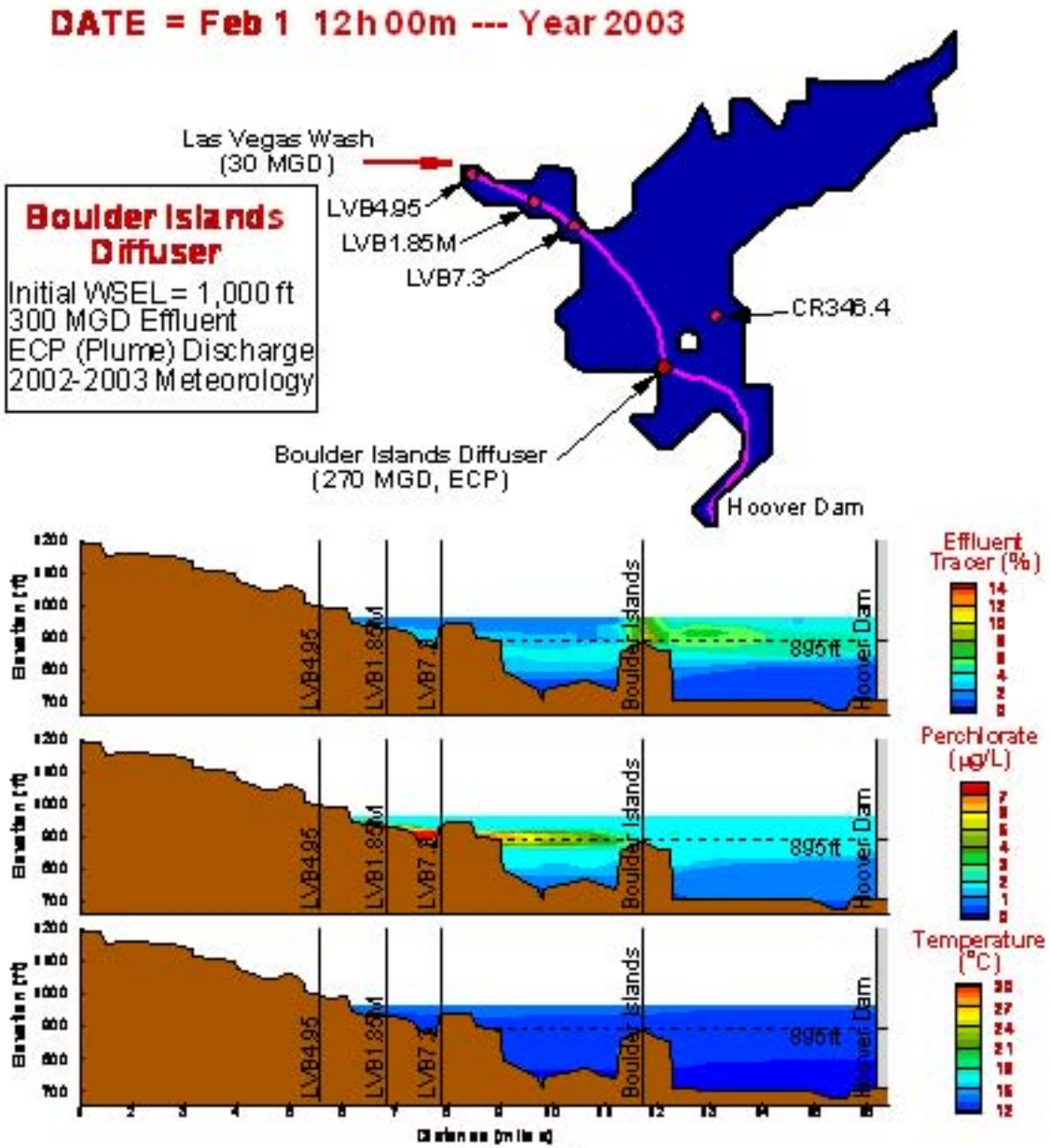



Figure 6

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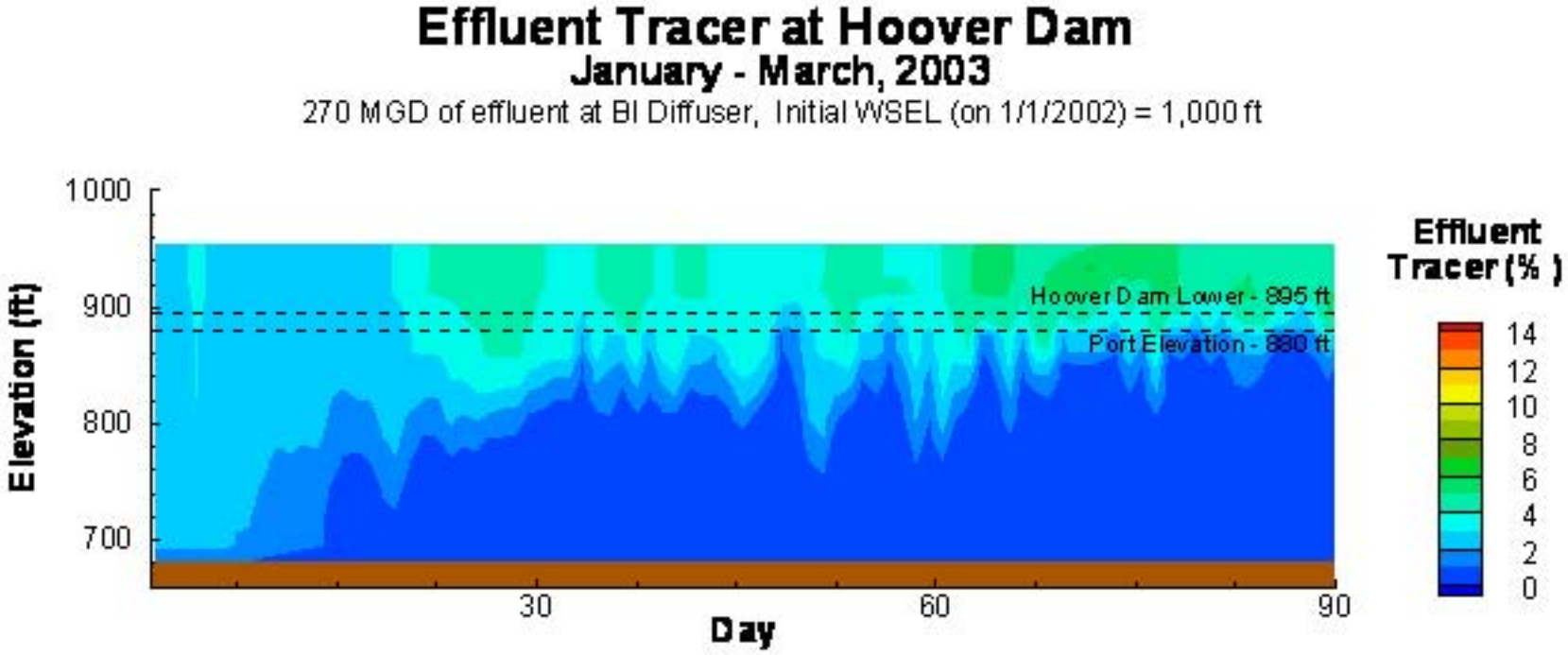



Figure 7

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Figure 8

# Appendix D

Attachment 2 – TP Through Hoover Dam

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# Memorandum

Date: 3/28/2006

Re: Phosphorus Load through Hoover Dam

Project No: S014004.1

---

## Introduction

The purpose of this memorandum is to clarify and elaborate on results of the Lake Mead modeling with respect to predicted phosphorus loads through Hoover Dam. Much of the information presented here is also available in the Modeling Report ("Lake Mead ELCOM/CAEDYM Modeling", November 2005) that was prepared in relation to the Environmental Impact Statement (EIS).

## Model and Data Validation

The Boulder Basin ELCOM/CAEDYM model is able to accurately model the Total Phosphorus (TP) concentrations passing through Hoover Dam, as illustrated by **Figure 1** (a similar figure appears as Figure 4.43 in the Modeling Report). **Figure 1** compares the measured and simulated TP concentrations over a four year period from 2000 to 2003, the period chosen for modeling as included in the Modeling Report. The agreement between the simulation and the measured United States Geological Survey (USGS) data is good, indicating the veracity of the model.

Other phosphorus data near Hoover Dam exist for the period after the modeling was completed (years 2004 and 2005) and are plotted in **Figure 2**. For this time period the data from all sources, other than the USGS, appear to have significant variability and indicate possibly higher TP concentrations than the 2000-2003 USGS data that were used to verify the model. However, these other data sets do not include the 2000 to 2003 modeling period and as such were not able to be directly used in the development of the model. Additionally, these other data sets have discrepancies and limitations as discussed below:

- All but two of the data points from the Southern Nevada Water Authority (SNWA) data set are below the detection limit, which is typically 10 µg/L. The second of the two data points that are above the detection limit, indicates a TP concentration of 30 µg/L on 9/21/05, but the same data set indicates an ortho-phosphorus concentration of 38 µg/L. Clearly there are inaccuracies in the measurements, since, by definition, TP must be greater than or equal to ortho-phosphorus.

- The United States Bureau of Reclamation (USBR) data were not measured at the dam outlets or downstream of the dam. The data were obtained from profile measurements at Station CR342.5, located approximately half a mile upstream of the dam in Black Canyon. The data are obtained from depths of approximately 70 m and 29 m, which are respectively chosen to approximately match the depths of the lower and upper Hoover Dam outlets. However, the TP concentrations measured half a mile upstream of the dam at the approximate depth of the outlets do not necessarily represent the flow passing through the dam. For example, when the lake is not stratified (as commonly occurs in the winter) water from *all depths* upstream, not just water at the depths of the outlets, will pass through the dam. When the lake is stratified, the withdrawal flow field will depend upon the strength of the stratification and the withdrawal flow rate (see, for example, the text "*Mixing in Inland and Coastal Waters*"). The approximation of water remaining confined to a relatively thin withdrawal layer only holds for strongly stratified reservoirs and low withdrawal flow rates. In addition, the empirical formulae used to estimate the vertical thickness of the withdrawal envelope are only valid in the steady-state, which may not be achieved given the high degree of daily variation in the dam flow rate. The situation is further complicated by the temporal flow reversals that can occur with depth in Black Canyon. Thus it can be concluded that much of the time the data measured half a mile upstream of Hoover Dam at the elevation of the outlets does not necessarily represent the quality of the water passing through the dam.

- Prior to September 2005, the USBR samples were not routinely collected at the 29 m depth (the approximate depth of the upper outlets), so that data collected before then would be biased toward values deeper in the hypolimnion.

- On certain instances in 2004 two USBR samples were collected. One of the samples was sent to the Denver Environmental Chemistry Lab (DECL) for separate analysis. The data points of the DECL laboratory results are plotted in **Figure 2** (pink points) and show clear discrepancies with the analysis results from the routine lab (blue points in **Figure 2**). Further comparisons indicate that the average of the absolute differences between the two laboratories is 7 µg/L (based upon the nine dates of dual lab analysis). In particular, on 3/16/04, the routine analysis indicates a TP concentration of 35 µg/L, while the DECL analysis indicates a concentration of only 4 µg/L. Such large discrepancies indicate one or more of the following with respect to the USBR measurements:
    - at least one, if not both, of the laboratory results is not accurate,
    - the samples are subject to contamination,
    - the samples are sensitive to the influence of discrete particulate matter, sometimes resulting in high, and not repeatable, apparent TP concentrations. Conversely, the USGS and SNWA data (from downstream of the dam) may have such particulate matter churned up and mixed by the turbines, and as such any samples may be more representative of the true average concentrations.

Additionally, it has been indicated that, due to some instrument problems in 2004 at the routinely used Boulder City Laboratory, the DECL results are likely to be more reliable than the routine laboratory results (Chris Holdren – personal communication, January 12, 2006). Therefore more confidence can be placed on the DECL data (which are comparable to the USGS data), than the routine data (which are generally higher in concentration).

Considering the discrepancies and limitations of the SNWA and USBR data, the TP concentrations at Hoover Dam were deemed to be best represented by the USGS data, which are at least consistent for the period 2000 through 2005.

In addition to the issues discussed above, and as documented in Section 2.5.3.7 of the Modeling Report, the wide variability of measured in-reservoir TP concentrations represented by the SNWA, USBR, and City of Las Vegas (COLV) data sets, is in part due to the detection limits of the various laboratory analyses being high relative to the low TP concentrations in Lake Mead. As a result of the uncertainty in TP concentrations, frozen samples collected in Boulder Basin between 2000 and 2002 (originally collected and analyzed by COLV) were re-analyzed using the more accurate Inductively Coupled Plasma -Mass Spectrometry (ICP-MS) technique. **Figure 3** (same figure appears as Figure 4.42 in the Modeling Report) plots these measured TP concentrations at Station CR346.4 (additional ICP-MS analysis was *not* conducted on samples collected at the Hoover Dam). Also plotted are the original measurements by COLV and other measurements by USBR and SNWA. Again, the data from different agencies shows wide variation. However, the agreement between the original COLV data and the re-analyzed ICP-MS data is reasonable (see also Figure 2.42 of the Modeling Report). Notably, the ICP-MS data have less variability than the other data sets and do not indicate the exceedingly high values that occur in other data sets. The prediction of the ELCOM/CAEDYM model is also plotted in **Figure 3**, and indicates reasonable agreement with the ICP-MS measurements (which appear to be the most accurate), particularly in the hypolimnion.

In addition to the ICP-MS analysis of the previously collected frozen samples, a special sampling of TP in Boulder Basin was undertaken in December 2002 and January 2003. Special care was taken during this sampling to avoid contamination. These samples were also analyzed using ICP-MS. As further discussed in Section 2.5.3.7 of the Modeling Report, TP concentrations from the special sampling are significantly lower than those obtained from other analyses. The differences are believed to be caused by contamination of the routinely collected data, which can have a major impact at the very low phosphorus levels. The data from the special sampling effort are believed to be more accurate since special precautions were taken during both the sampling and analysis to avoid any potential contamination. Thus, it is likely that the TP concentrations in Boulder Basin and through Hoover Dam are in fact lower than indicated by the routinely collected data. In particular, the TP concentrations in the hypolimnion at Hoover Dam range from 2.0 to 2.5 µg/L as measured by the special sampling, as compared to the 2000-2003 average of the USGS Hoover Dam data of 5.0 µg/L.

Since the special sampling only consisted of measurements on two days (one in December 2002 and one in January 2003) it is not appropriate to use these results for a four year (2000 through 2003) model calibration. Thus, the model was developed to match the most accurate data sets that were available over most or all of the four-year period; namely the ICP-MS data at Station CR346.4, and the USGS data at Hoover Dam. The agreement of the model with the most accurate TP measurements available over the four-year model period, both within Boulder Basin and at Hoover Dam, further validates the modeling.

**Model Predictions for BI Alternative and Comparison to Historical Levels**

As discussed in Section 2.2.2.6 of the final EIS, the phosphorus loading from the combined effluent discharges through the BI diffuser and into the Las Vegas Wash is not expected to exceed 334 lbs/day during ordinary conditions. The ELCOM/CAEDYM model predictions of flow weighted annual average TP concentrations through Hoover Dam for effluent TP loadings of 334 lbs/day are presented in **Table 1**. Modeling results for the BI Alternative (as well as the No Action [LVW] and LVB Alternatives) at initial water surface elevations (WSEL) of 1,178 ft and 1,000 ft are presented together with modeling results for the baseline year (2002), together with an extended baseline consisting of the average for years 1999 through 2003. It should be noted that the modeling results for the BI and LVB Alternatives are interpolated from simulations at 275 and 467 lbs/day. **Table 1** indicates that the BI Alternative results in predicted phosphorus levels through Hoover Dam that are similar to those that occurred over the extended baseline period of 1999 through 2003. While the levels for the BI Alternative are marginally higher than the single baseline year of 2002, the small difference of 1 µg/L is of the same order as the modeling errors.

**Table 1. Lake Mead Modeling Results for Flow-Weighted Annual Average Total Phosphorus Concentrations through Hoover Dam**

| | Extended Baseline (average of 1999-2003) | Initial WSEL = 1,178 ft | | | | Initial WSEL = 1,000 ft | | |
|---|---|---|---|---|---|---|---|---|
| | | Baseline (2002, 150 mgd, 292 lbs/day) | Effluent flow of 300 mgd, effluent TP = 334 lbs/day | | | | | |
| | | | No Action | Boulder Islands* | Las Vegas Bay* | No Action | Boulder Islands* | Las Vegas Bay* |
| Total Phosphorus (mg/L) | 0.006 | 0.005 | 0.005 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 |

* Results for the Boulder Islands and Las Vegas Bay Alternatives are interpolated from simulations at effluent TP loadings of 275 and 467 lbs/day.

**Figure 4** plots the modeled results for the Alternatives together with modeling results for the years 1999 through 2003. Again, it is clear that the BI Alternative is predicted to result in TP loads through Hoover Dam that are comparable to recent historical values. In particular, at a WSEL of 1,178 ft (which is comparable to recent historical years) the TP loads through the dam are predicted to

be less than three of the five modeled recent historical years, while at a WSEL of 1,000 ft (that is much lower than recent historical years) the load is predicted to be less than that experienced in year 2000.

**Figure 5** plots the annual average TP concentration for water passing through Hoover Dam from USGS data extending back to 1974. It is apparent that the TP concentration through the Hoover Dam has historically been far higher than in recent years, apparently without negative consequences downstream. Clearly, the predicted TP concentrations through Hoover Dam for the BI Alternative are lower than historical levels over an extended period of time.

**Variability of Measurements and Not-to-Exceed Water Quality Standards**

As discussed previously, the TP measurements in Lake Mead and downstream of Hoover Dam have significant variability due to possible sample contamination, presence of discrete particulate phosphorus, and relatively high detection limits. Such data variability implies it may be unrealistic to attempt to maintain at all times a TP concentration at a not-to-exceed level of 10 µg/L for water leaving Hoover Dam.

To illustrate this, the USGS data, which shows the *least* variability of the Hoover Dam data plotted in **Figure 2**, is further analyzed. **Figure 6** plots the USGS data at Hoover Dam dating back to 1974. It is clear that the level of 10 µg/L was routinely exceeded prior to 1994, which is when the dischargers began to meet the waste load allocations limiting them to 334 lbs/day during the algal growing season (April through September). Even since 1994, there have been numerous exceedances of the 10 µg/L level. In fact, seven of the 68 measurements taken between 1994 and 2005 have been greater than 10 µg/L. This corresponds to exceedances for approximately 10 percent of the samples.

Since the large algal bloom of 2001 the dischargers have been removing more phosphorus during October through March. While the USGS data plotted in **Figure 6** do not indicate any exceedances of the 10 µg/L level since that time, statistical analysis of the data indicates exceedances would almost certainly occur during an extended period of time if the reservoir is continued to be operated as it has been since 2001. Assuming the USGS data TP concentrations at Hoover Dam between 2002 and 2005 to be log-normally distributed, then it is computed that there is a one percent probability that any single measurement will exceed 10 µg/L. While one percent is relatively small, over an extended period of time and many measurements the probability for exceedance becomes significant. For example, if it is assumed that TP measurements are made at the dam monthly then there are 12 measurements per year. The probability of at least one of these measurements exceeding 10 µg/L is then 11 percent ( $1-[1-0.01]^{12} = 0.11$ ). Over 10 and 20 years, the probability increases to 70 and 91 percent, respectively.

It should be emphasized that the significant probability of exceeding 10 µg/L is a result of the variability of the measurement process (including sample contamination, presence of discrete particulate phosphorus, and high detection limits), rather than the real representative concentration

necessarily being greater than 10 µg/L. Additionally, the USGS data are the *least* variable of the Hoover Dam data plotted in **Figure 2**, and the probabilities of exceedance would be significantly higher if other data sets were used in the statistical analysis. Indeed, **Figure 2** indicates that both the SNWA and USBR data (which have significant discrepancies and limitations as discussed previously) exceed the 10 µg/L level on occasion in 2004 and 2005, even though the real representative concentration of TP in water through Hoover Dam (i.e., the USGS data) indicate that it is likely to be less than 10 µg/L.

Given the large variability in the measurement processes leading to a significant probability of exceedance of the 10 µg/L level, it is unrealistic to impose such a not-to-exceed criterion on future operations.

Additionally, it is the average TP concentration that is most relevant to downstream users concerned about algal blooms, since temporary and isolated peak TP concentrations will be mixed and diluted before reaching the photic zone of Lake Mohave. The seasonally uniform, cold inflow from the Lake Mead hypolimnetic Hoover Dam releases (approximately 12 °C year round) transits the Canyon Reach of the river with very little warming and enters the upper basins of Lake Mohave as an underflow through the spring, summer, and fall seasons (when algae growth in Lake Mohave may be of concern). This underflow becomes larger than the inflow from Lake Mead due to entrainment of epilimnetic water at the plunge point ("Lake Mohave Water Quality Model Project Report: Model Validation", October 27, 2003). This entrainment directly dilutes any parcels of water that may have higher than average phosphorus concentrations. In addition, the average residence time of Cottonwood Basin (the largest and furthest downstream portion of Lake Mohave) is 64 days ("Lake Mohave Water Quality Model Project Report: Model Validation", October 27, 2003). The time for the underflow to upwell and reach the surface in Lake Mohave would be smaller than, but of the same order as, the residence time. It would therefore take many days or weeks for any parcels of water with higher than average phosphorus concentrations to surface and reach the photic zone after entering Lake Mohave as an underflow. By this time, the higher phosphorus concentration will have been well mixed and diluted with ambient water and water entrained from the epilimnion. Thus, with respect to algal growth in Lake Mohave, the relevant phosphorus concentration leaving Hoover Dam is one that has been averaged over many days or weeks, rather than any instantaneous or maximum values.

**Downstream Phosphorus Concentrations**

The TP passing through Hoover Dam makes up only part of the TP concentrations downstream. **Figure 7** plots the TP concentrations through Hoover Dam (USGS data) together with Metropolitan Water District (MWD) data at inlets and outlets of Lakes Havasu and Mathews (downstream of Lake Mead), for the period 2000 through 2005. A similar plot with reduced range of vertical scale to enable more clarity is shown in **Figure 8**. The figures show that the TP concentrations in the downstream lakes are substantially higher than those that pass through Hoover Dam. This indicates that there are sources of phosphorus downstream of the dam that may be more significant than the phosphorus that passes through the dam. This is particularly evident in that none

of the large TP concentration peaks evident in the downstream lakes (particularly Lake Mathews) correlate with the TP concentration through Hoover Dam, which is devoid of large peaks.

Since there are more significant sources of phosphorus downstream of Hoover Dam, any modest changes to TP concentrations through the dam are likely to result in only very minor *relative* changes to the TP concentrations further downstream.

**References**

"Lake Mead ELCOM/CAEDYM Modeling" [Modeling Report], *Flow Science Incorporated*, November 17, 2005.

"Lake Mohave Water Quality Model Project Report: Model Validation", *J. E. Edinger Associates, Inc*., October 27, 2003.

"*Mixing in Inland and Coastal Waters*", H. B. Fischer, E. J. List, R. C. Y. Koh, J. Imberger, N. H. Brooks, *Academic Press*, 1979; Section 6.6.

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# Data vs. Simulation for 2000-2003 at Hoover Dam Outlets

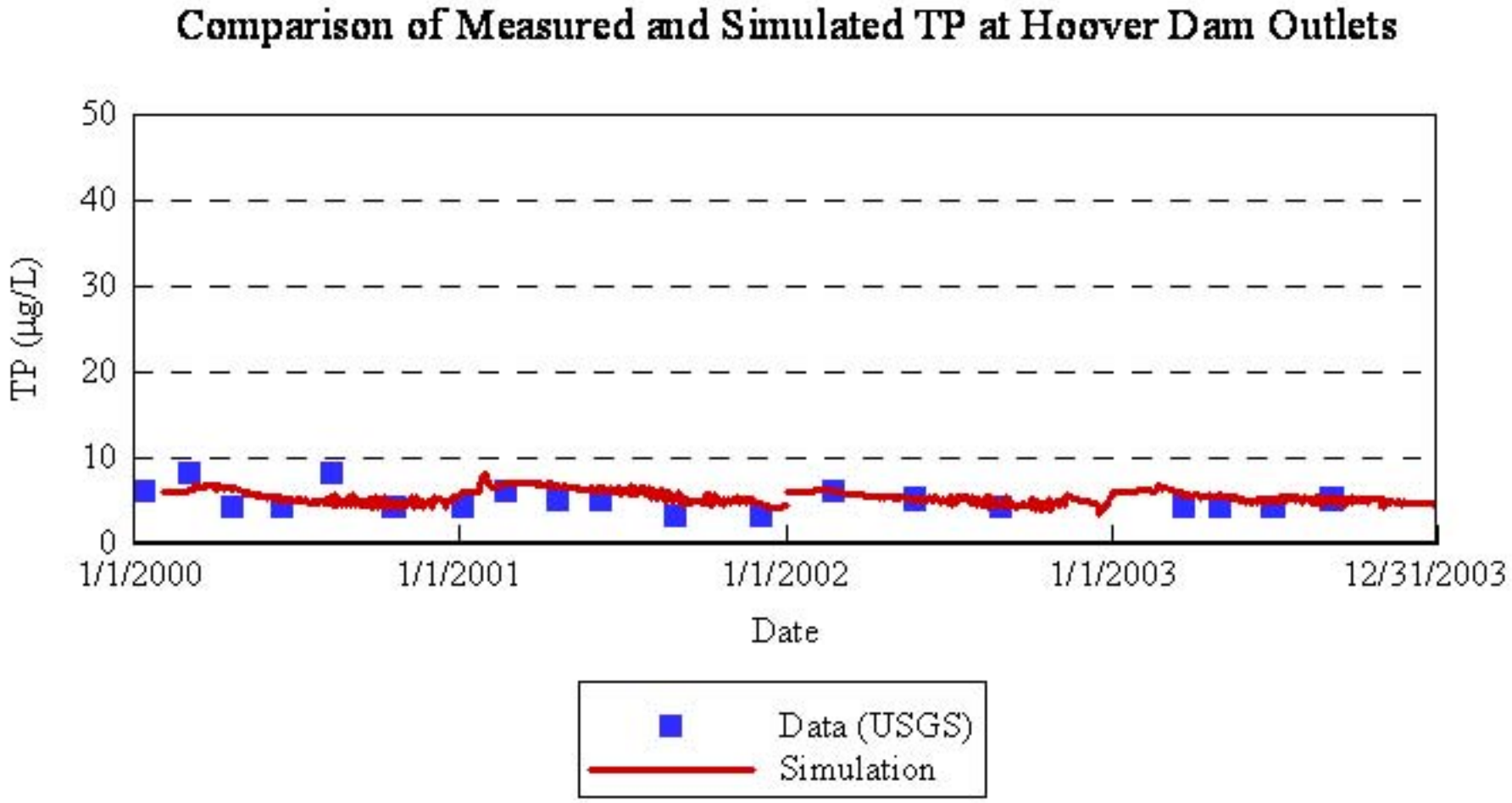
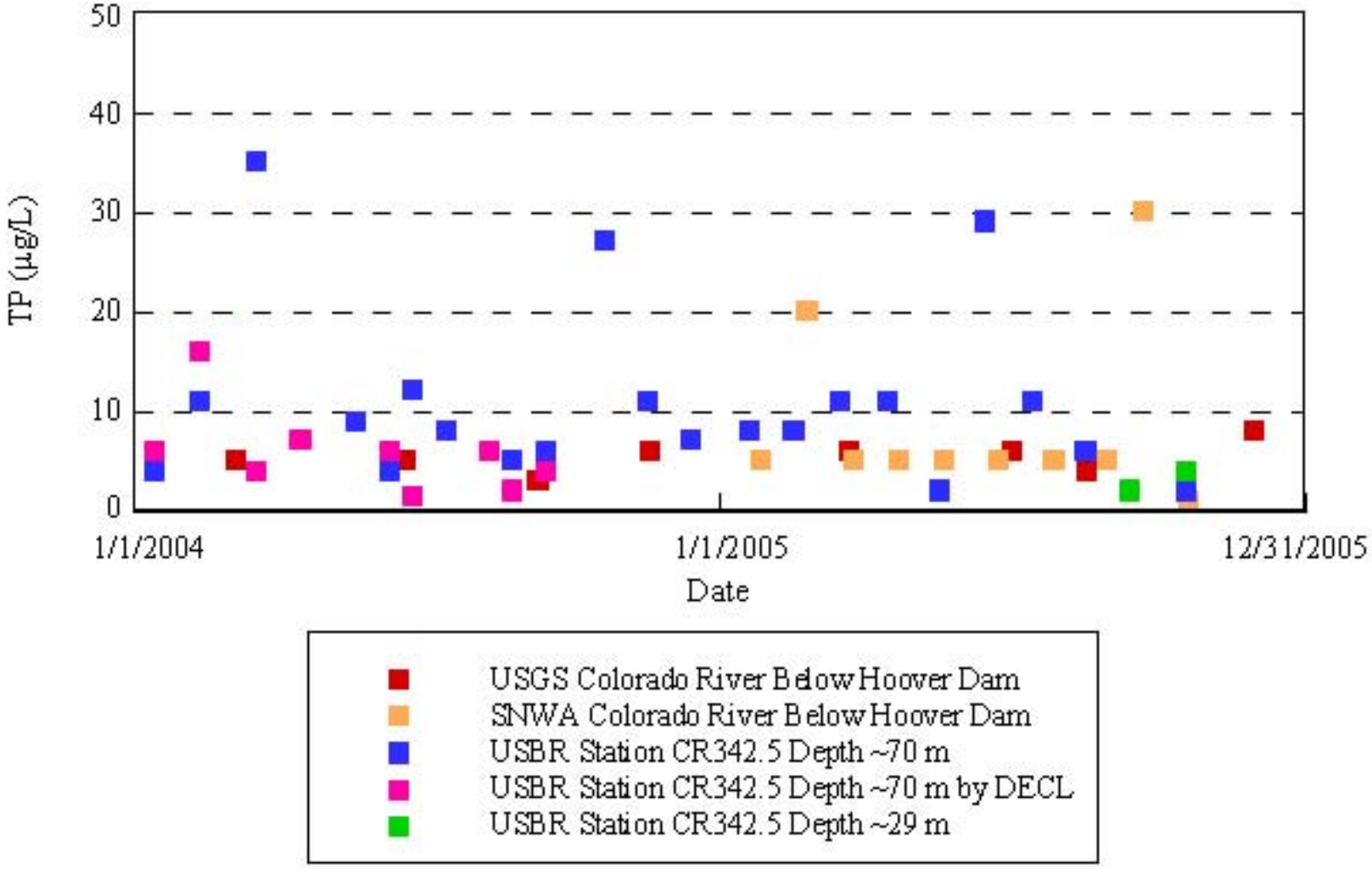



Figure 1

FLOW SCIENCE

# Measured Total Phosphorus at Hoover Dam




Note: Data reported as "not detected" and/or "less than" measured values were assumed to be equal to half of the detection limit.

Figure 2

FLOW SCIENCE

# Data vs. Simulation for 2000-2003 at Station CR 346.4

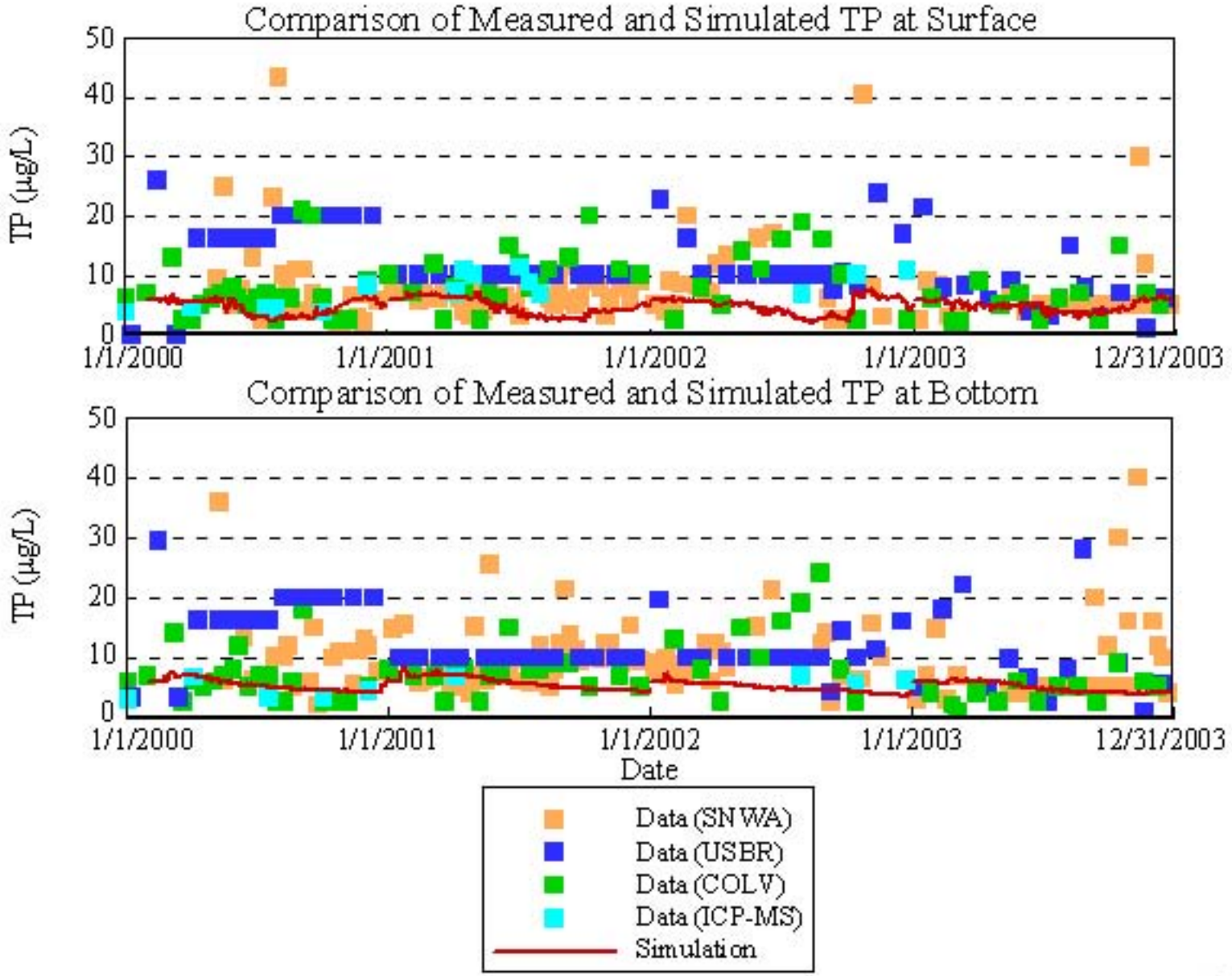



Figure 3

FLOW SCIENCE

# Total Phosphorus through Hoover Dam

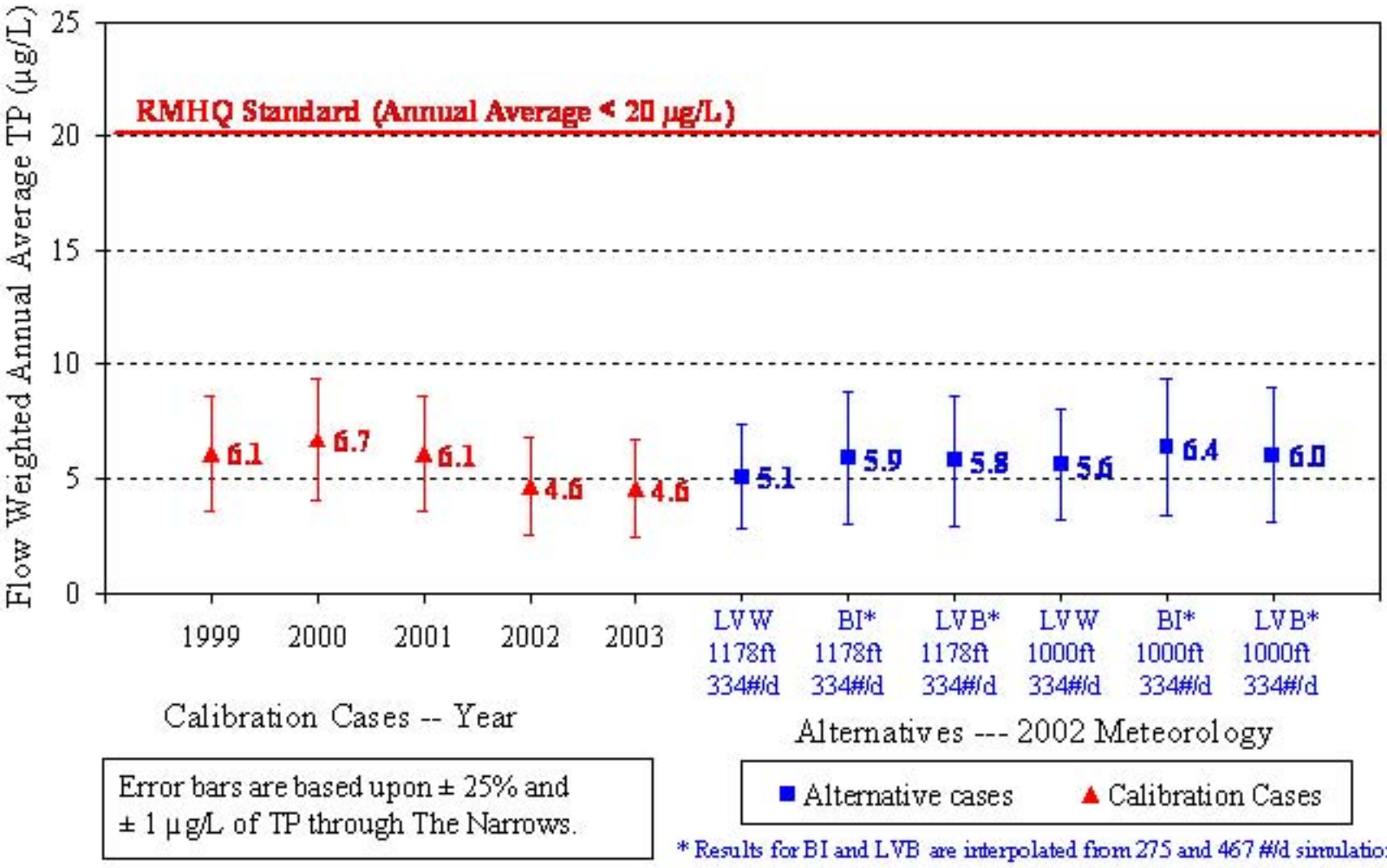



Figure 4

FLOW SCIENCE

# Annual Average Total Phosphorus Concentration at Hoover Dam (USGS Data)

Data points below the detection limit of 10 µg/L (prior to year 1999)
are assumed to be equal to half of the detection limit.

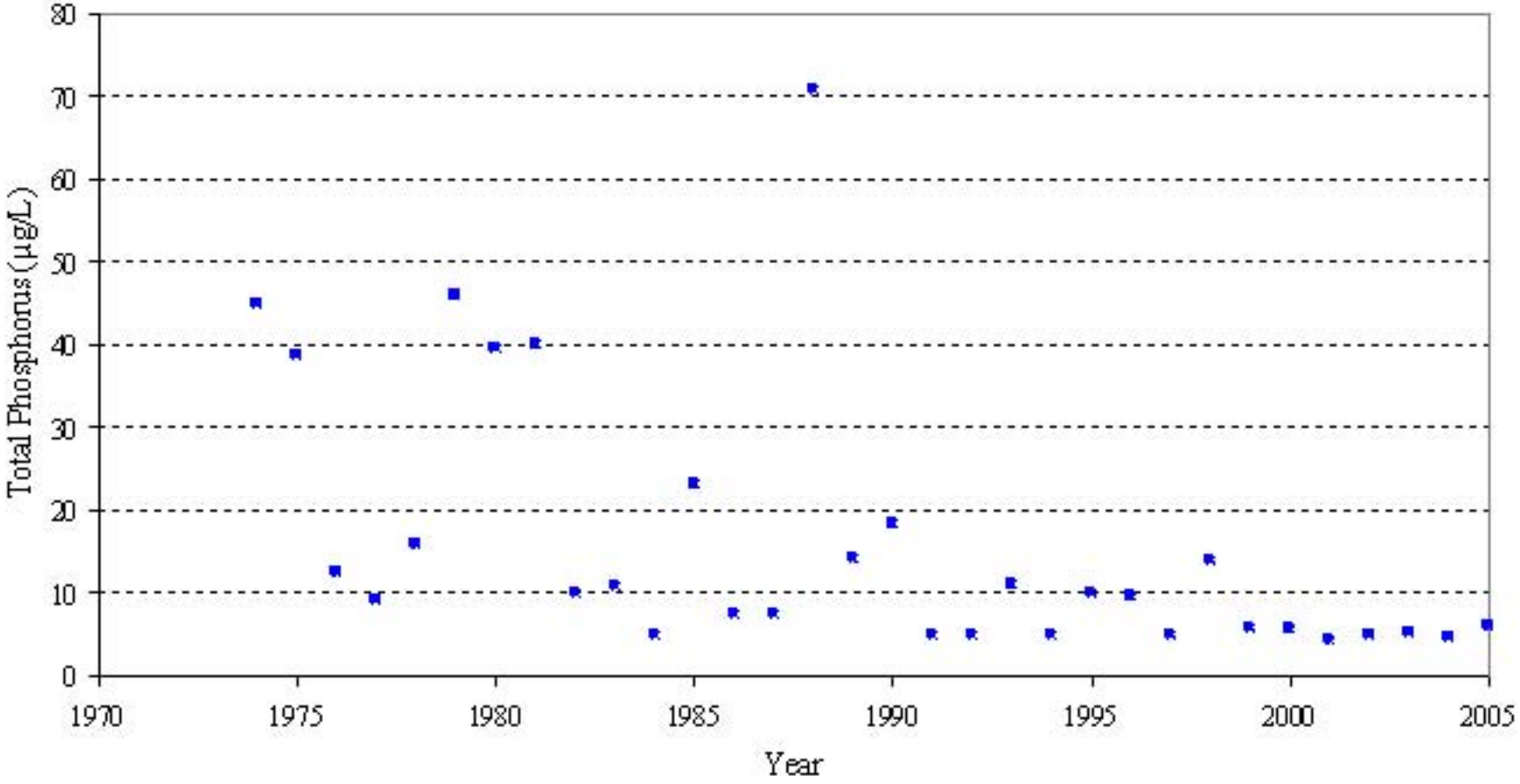



Figure 5

FLOW SCIENCE

# Total Phosphorus at Hoover Dam (USGS Data)

Data points below the detection limit of 10 µg/L (prior to year 1999) are assumed to be equal to half of the detection limit.

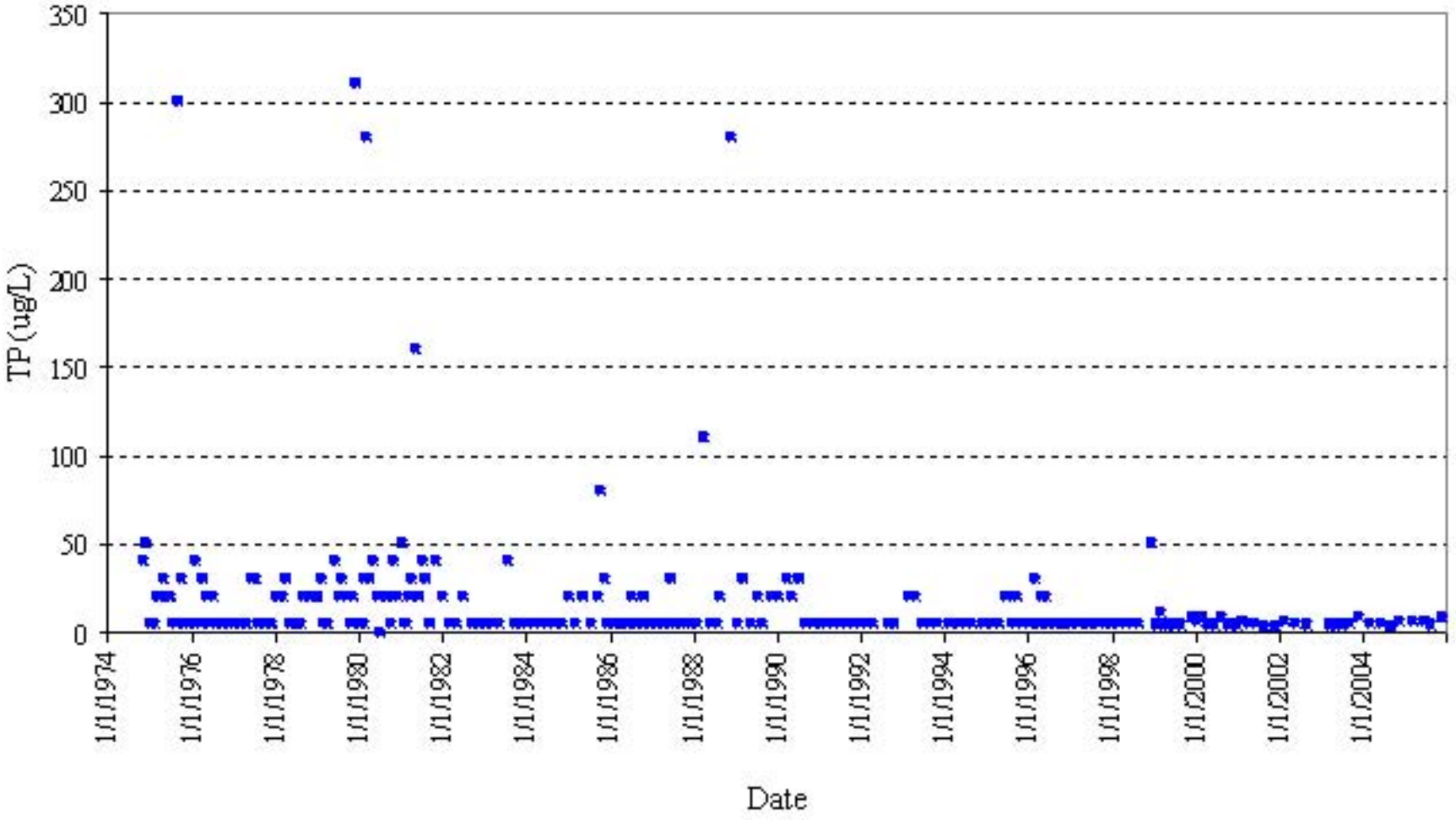



Figure 6

FLOW SCIENCE

# Total Phosphorus Concentrations

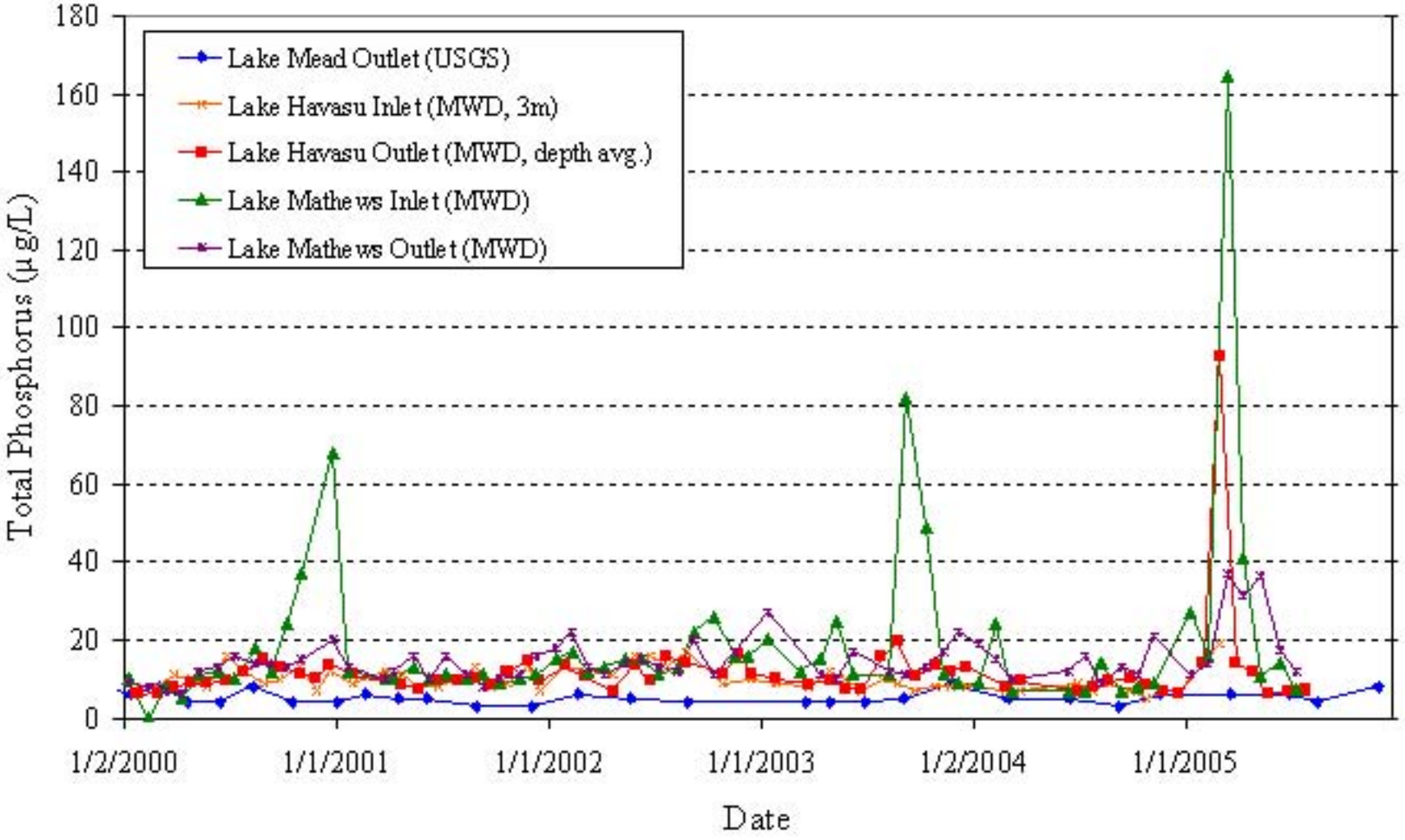



Figure 7

FLOW SCIENCE

# Total Phosphorus Concentrations

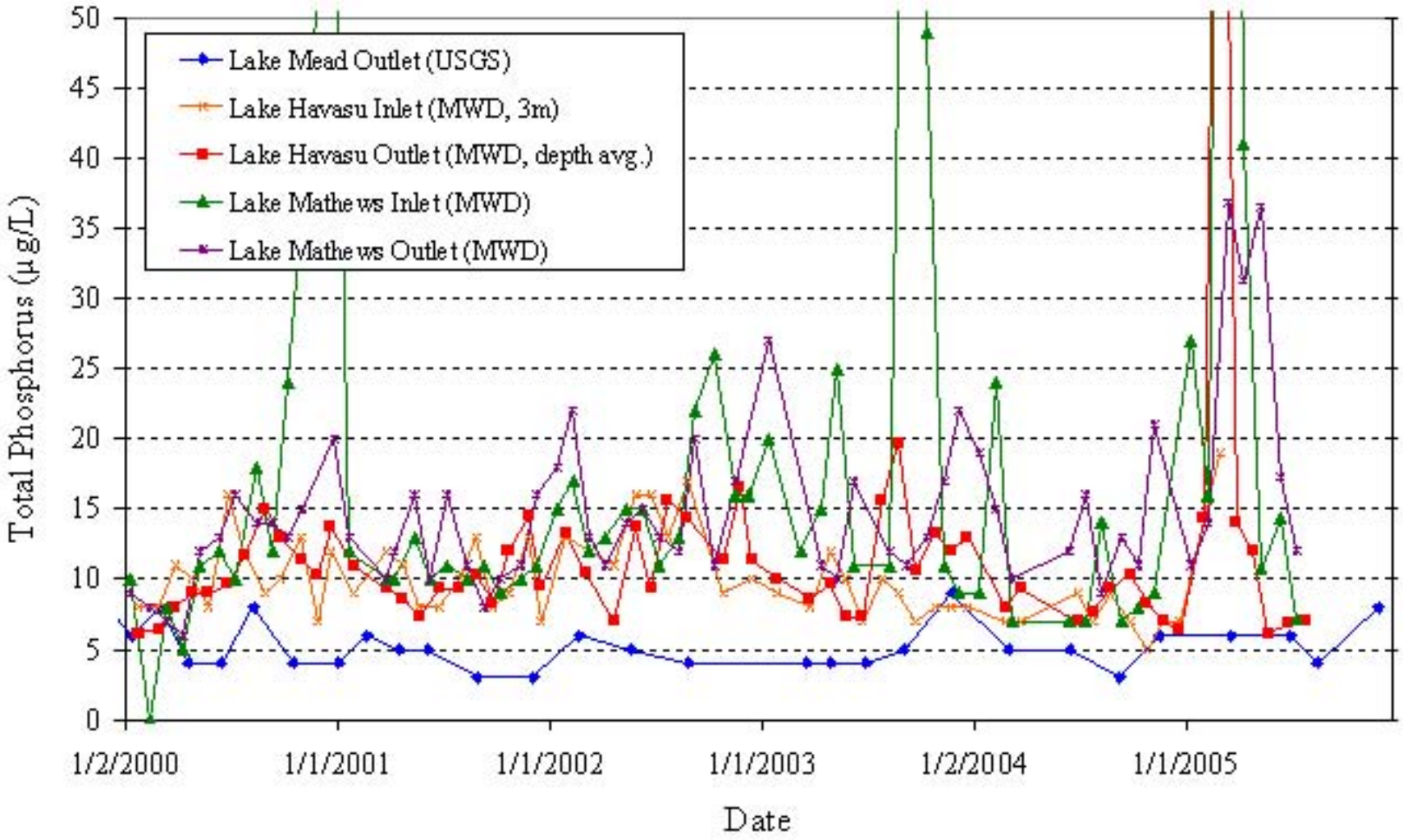



Figure 8

FLOW SCIENCE

# Appendix E

Biological Resources

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# E.0 Biological Resources

This appendix provides additional information regarding select topics discussed in Section 3.2 and 4.2, Biological Resources, of this Environmental Impact Statement (EIS). A description of baseline biological resources is required to adequately describe environmental impacts of the alternatives. This appendix is used to analyze the potential impacts to biological resources, and provides the information necessary for preparation of the biological assessment.

The major focus of this appendix is to provide wildlife and vegetation data (especially tabular data) that is too extensive to include in the main body of the EIS.

## E.1 Methodology

The methodology used to develop the biological resources baseline in the study area included agency coordination, literature review, and field investigations. The biology, habitat, range, and location of recorded occurrences of special status species in the project study area was compiled from information derived from:

- Review of existing scientific literature, technical reports, and data from surveys previously performed in or adjacent to the study area; and
- Coordination with the National Park Service (NPS), U.S. Bureau of Reclamation (Reclamation), U.S. Fish and Wildlife Service (USFWS) (USFWS 2003), and Nevada Natural Heritage Program (NNHP) (NNHP 2002).

Copies of the USFWS and NNHP coordination letters are included in Attachment 1 of this appendix.

Reconnaissance-level field investigations were conducted in spring 2003, 2004, and 2005 to:

- Assess current ecological conditions in the study area,
- Determine the presence of potentially suitable habitat for special status species on site, and
- Define portions of the study area requiring species-specific (focused) field surveys.

The study area is located within the habitat for the Mojave desert tortoise (*Gopherus agassizii*), a federally listed as threatened species. Surveys for tortoise and tortoise sign (i.e., carcasses, skeletal parts, egg shells, scat, burrows, pallets, tracks, courtship rings, and drinking depressions) were performed in the study area in April and May 2003; March, April, and May 2004; and March 2005. The surveys were conducted using parallel pedestrian transects spaced 30 ft apart in accordance with the published USFWS protocol (1992). Additionally, the zones of influence adjacent to Reach 2 and the EI Terminus were surveyed to determine the presence of desert tortoise. The zones of influence were surveyed using a modification of the 1992 USFWS protocol that included surveying two triangular-strip transects and one 40-acre (16-hectares) validation plot (Figure 3.2-1 of EIS). Linear transects spaced 30 ft (9 m) apart were used to survey a 400 square ft (37 $m^2$) parcel at the South River Mountains Tunnel No. 3 (SRMT3)-East

working shaft and a 60-ft (18-m) wide by 3,500-ft (1,067-m) long corridor along each side of the access road to the SRMT3-East working shaft.

Botanical surveys were conducted concurrently with desert tortoise surveys. Timing of the botanical surveys corresponded to the standard flowering periods, between late May and early June, of the special status plant species that have potential to occur in the study area, which include the Las Vegas Bearpoppy (*Arctomecon californica*) and the rosy two-toned beardtongue (*Penstemon bicolor* ssp. *roseus*). Surveys were conducted in areas that support potential habitat such as in ephemeral washes or along roadsides for the rosy two-toned beardtongue, and in gypsiferous soils for the Las Vegas Bearpoppy. Surveys focused on assessing habitat for sensitive species and estimating cacti and yucca population densities in the study area. A comprehensive list of plant species observed in the study area during field investigations is provided in Section E.3.

Wildlife species observed in the study area during field investigations were recorded and are provided in Section E.4. Focused surveys for avian, mammalian, and aquatic species were not conducted as part of this project.

The presence of wetlands and riparian communities has been documented in the Las Vegas Wash and, by definition those communities are dependent on the availability of water. The analysis used to determine the impacts from the Systems Conveyance and Operations Program (SCOP) to wetlands and riparian communities used a water balance relationship estimated for the Las Vegas Wash as a means of estimating the implications associated with a future reduction in effluent flows.

Available data was used to develop an annual water balance equation for 12-miles (19 kilometers [km]) of the Las Vegas Wash. Inflows and outflows to the hydrologic regime for the Las Vegas Wash were determined for historical conditions. Future effluent flow scenarios were examined to determine the potential effects associated with changes in effluent inflows. Due to a lack of available data, historical conditions were estimated for the years 1994 and 2000. An estimate of future conditions was developed for the years 2010 and 2020.

This analysis used data from the following sources:

- *The Las Vegas Wash Comprehensive Adaptive Management Plan* (Las Vegas Wash Coordination Committee [LVWCC] 2000),
- Final Program Environmental Impact Statement for the Clark County Wetlands Park (Reclamation and Clark County Department of Parks and Recreation 1998),
- U.S. Geological Survey (USGS) Streamflow Data,
- National Weather Service pan evaporation data, and
- Southern Nevada Water Authority (SNWA) Drought Plan (SNWA 2004).

Total inflow ($Q_{in}$) to the Las Vegas Wash was estimated by determining annual effluent inflow, urban and groundwater inflow, and storm runoff. Effluent quantities were derived from available historical data on effluent releases and future estimates for releases documented in the SCOP EIS. Urban and groundwater inflows and storm runoff were derived from estimates provided in the existing publications mentioned previously. Future scenarios utilized urban runoff estimates that

include reductions based on future water conservation measures that are being incorporated by SNWA. Proportional relationships between these factors evidenced by historical flows were used to estimate future flow components.

Total outflow ($Q_{out}$) from the system includes instream flows at the downstream end of the Las Vegas Wash, evaporation, infiltration, and evapotranspiration (ET) by vegetation communities in the Las Vegas Wash system. Historical surface outflows were determined from stream gauge data. Evaporation was estimated by determining an approximate surface area for the low-flow channel of the Las Vegas Wash, using average width assumptions, and calculating the total annual evaporation from the Las Vegas Wash based upon National Weather Service pan evaporation data for the locality. Estimated outflow from ET was estimated using vegetation coverage data provided in the Final Program EIS for the Wetlands Park, and estimates for future vegetation coverage in the Las Vegas Wash. To estimate infiltration loss, the water balance equation was used in years 1994 and 2000 to determine infiltration after the other factors in the equation were determined or estimated. These infiltration rates were assumed to be valid estimates for the future conditions in Years 2010 and 2020.

A review of historical data coupled with estimates of key inflow/outflow factors provides perspective for the water balance that has existed in the Las Vegas Wash during the past 10 years. Table E.1-1 shows the approximate water balance factors of the Las Vegas Wash for 1994 and 2000. As indicated by this table, effluent constitutes the primary source of water into the Las Vegas Wash system. It should be noted that urban runoff/groundwater inflow is based upon an estimate provided in the *Final Program Environmental Impact Statement of the Clark County Wetlands Park* (Reclamation and Clark County Parks and Recreation 1998), while storm water runoff is highly variable from year to year. Under the 2 years shown, there is ample water available within the system to support the existing riparian vegetation communities. However, the composition and diversity of those communities may change. A significant quantity of water flows out of the Las Vegas Wash and into Lake Mead as surface flow.

Table E.1-1 Historical Water Balance (1994 and 2000).

| **Water Balance Factors** | **1994** | | **2000** | |
|---|---|---|---|---|
| | **Quantity (mgd)** | **Percentage of Total** | **Quantity (mgd)** | **Percentage of Total** |
| Effluent | 129.4 | 84% | 153.4 | 83% |
| Urban Runoff/ Groundwater Inflow | 22.3 | 14% | 22.0 | 12% |
| Storm Runoff | 2.6 | 2% | 9.2 | 5% |
| **Total $Q_{in}$** | **154.3** | **100%** | **184.6** | **100%** |
| Surface Flow | 117.6 | 76% | 143.5 | 78% |
| Infiltration | 21.7 | 14% | 25.1 | 14% |
| Evaporation | 6.5 | 4% | 6.5 | 3% |
| Evapotranspiration | 8.5 | 6% | 9.5 | 5% |
| **Total $Q_{out}$** | **154.3** | **100%** | **184.6** | **100%** |

## E.2 Regulatory Framework

The federal, state, and local regulatory framework established for management and protection of special status species are summarized in this section.

The *Endangered Species Act of 1973*, as amended (ESA) (16 U.S.C. Section 1531 *et seq*.), directs federal agencies to conserve threatened and endangered species and their habitats. Federal agencies are required to ensure actions they fund, authorize, or carry out are not likely to jeopardize the continued existence and recovery of a species that is listed or proposed for listing as threatened or endangered, or modify or destroy critical habitat. If an agency determines that a proposed action is likely to adversely affect a federally listed species, it must formally consult with the USFWS pursuant to Section 7 of the ESA.

Under the *Migratory Bird Treaty Act of 1918* (MBTA) (16 U.S.C. 703-711), as amended, all migratory bird species identified in the 50 Code of Federal Regulations (CFR) 10.13 are protected by international treaty. The MBTA prohibits hunting, taking, possessing, selling, purchasing, shipping, transporting, or possessing any migratory bird, part, nest, or egg, unless permitted by regulations. Compliance with the MBTA is enforced by the USFWS.

The *Bald and Golden Eagle Protection Act of 1940* (16 U.S.C. 668a-d), as amended, prohibits the take, transport, sale, barter, trade, import and export, and possession of eagles, eagle parts, nests, and eggs without a permit. Compliance with the *Bald and Golden Eagle Protection Act* is enforced by the USFWS.

The Nevada Division of Wildlife (NDOW) and the Nevada Division of Forestry (NDF) have established a list of endangered and threatened species that are declining in all or portions of their natural range within the state of Nevada. The NDOW and NDF perform administrative and regulatory actions involving the protection and management of special status wildlife and plants species, pursuant to the following Nevada Revised Statutes:

- Nevada Revised Statutes (NRS) Chapters 501 – 503. Involves the protection and management of special status wildlife, game species, and fur-bearing mammals.
- NRS Chapter 527. Involves the protection and management of timbered lands, special status plant species, and commercial harvesting of Nevada state protected cacti and yucca species (families Cactaceae and Agavaceae) and Christmas (conifer) trees.

These statutes prohibit the unlawful take of a special status wildlife species, or the take (i.e., to cut, destroy, mutilate, remove, or possess) of any Nevada state protected cactus, yucca, conifer tree, or other special status plant species, or part of such, without a permit from NDOW or NDF, or written permission from the legal land owner, occupant, manager, or duly authorized agent.

The *Multiple Species Habitat Conservation Plan* (MSHCP) for Clark County, Nevada, was prepared by Clark County; the Cities of Las Vegas, North Las Vegas, Boulder City, Mesquite, and Henderson; and the Nevada Department of Transportation, in cooperation with several federal, state, and local regulatory entities. The MSHCP was prepared to allow continued development within Clark County in exchange for conservation programs to benefit the federally listed as threatened Mojave desert tortoise and 78 other species that are currently unlisted but that

may become listed in the near future without implementation of conservation measures. The MSHCP supports the USFWS issuance of a permit or permits allowing incidental take (i.e., to harm, harass, or kill) of species covered by the MSHCP, that would result from otherwise lawful activities on non-federal properties within the County.

The MSHCP and resultant incidental take permit includes implementation measures designed to reduce the likelihood of additional species in the County from becoming federally listed, and to maximize prospects for long-term protection of habitats and the species that live in those areas within Clark County (Clark County 2000a). The NPS, a signatory to the MSHCP, shares with the other cooperating agencies the responsibility for long-term protection and management of the MSHCP-covered species and their habitats. Therefore, the NPS must analyze potential impacts to MSHCP-covered species that may result from any project they implement or approve.

Section 404 of the *Clean Water Act* regulates the placement of fill into waters of the United States (U.S.). Waters of the U.S. include lakes, rivers, streams and their tributaries, and wetlands. Wetlands are defined for regulatory purposes as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances support a prevalence of vegetation typically adapted for saturated soil conditions (33 CFR 328.3, 40 CFR 230.3).

Other waters of the U.S. in the study area include intermittent drainages with defined beds and banks that are tributaries to navigable waters, such as lakes, rivers, streams, and other surface features (e.g., the Las Vegas Wash, Lake Mead, the Colorado River). These other waters of the U.S. are discussed in Section 3.1.1 of the EIS. A wetland delineation report was not conducted as part of this EIS. Potential wetlands that occur along portions of the Las Vegas Wash within the Wetlands Park boundary were identified and mapped in 2000 (SWCA 2000b).

Once a Record of Decision is issued for the project, a full inventory of waters of the U.S. would be developed in accordance with the U.S. Army Corps of Engineers (USACE) guidelines for final permit and construction documents. Results of this inventory would be included in a jurisdictional determination report. This report would be submitted to the USACE for certification and would serve as a baseline for determining impacts to waters of the U.S. The delineation report would also be part of the application package for the Section 404 permit needed to authorize regulated activities within waters of the U.S. Permit and construction documents would include tables that specify the type, length, and width of temporary and permanent impacts to jurisdictional waters of the U.S. All waters of the U.S. that would be affected by the project would be identified on construction and permit document maps. Permits would be obtained from the USACE for all discharges of fill material into waters of the U.S. before proceeding with construction activities.

## E.3 Vegetation

The vegetation community descriptions used in this section are based on Holland's (1986) *Preliminary Descriptions of Terrestrial Natural Communities of California*. Although this vegetation classification was developed to describe vegetation communities in California, it includes detailed descriptions applicable throughout the Mojave Desert ecoregion. Four plant

communities, Mojave creosote bush scrub, desert saltbush scrub, Mojave wash scrub, and desert riparian scrub were identified within the study area, along with ruderal vegetation, which comprises previously disturbed lands. Characteristics of these communities are described in this section. Table E.3-1 provides a summary of the vegetation species observed during field surveys. Mojave creosote bush scrub is the most common vegetation community found in the Mojave Desert below 4,200 ft above msl (Holland 1986, Rowlands et al. 1982, Vasek and Barbour 1977). Mojave creosote bush scrub occurs throughout the study area in well-drained soils, often on bajadas and low hills, and is characterized by widely spaced shrubs 2 to 8 ft (1 to 2 m) tall. Creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) are the dominant shrubs in this community and a variety of annual grasses and forbs comprise the herbaceous understory.

Mojave wash scrub occurs in the Mojave Desert below 5,000 ft (1,524 m) above msl, along ephemeral drainages (washes) that are subject to seasonal flooding. These washes are frequently composed of species from adjacent vegetation communities, however in some cases, the slightly higher moisture availability allows for higher plant density and greater species diversity than the adjacent areas. Common species associated with this community include catclaw acacia (*Acacia greggii*), cheesebush (*Hymenoclea salsola*), and occasionally mesquite (*Prosopis* sp.).

Desert saltbush scrub occurs on bajadas and small localized depressions, in relatively low abundance along the EI segment of the study area. It thrives in poorly drained, fine-textured (silts and clays), halophytic soils and gypsiferous soils, and is predominantly comprised of several species of *Atriplex*.

Ruderal vegetation are weedy and commonly introduced plants growing where the vegetational cover has been disturbed. Ruderal is not a vegetation community described by Holland. Lands in the study area that have been physically altered by prior and ongoing surface disturbance are barren or support ruderal vegetation composed primarily of invasive, non-native annual grasses and forbs, such as Russian thistle (*Salsola tragus*) and red brome (*Bromus madritensis*). Activities such as mechanical land clearing, maintenance of paved and unpaved roads and trails, off-highway vehicle (OHV) use, gravel mining operations, and unauthorized trash disposal, have removed or damaged native vegetation and soils in a large portion of the project vicinity, and subsequently, ruderal vegetation has colonized these areas.

Table E.3-1 Study Area Vegetation Types.

| Scientific Name | Common Name | EI Pipeline | South Lateral Pipeline and/or COH Forcemain | EI Terminus | LCS (all alternatives) |
|---|---|---|---|---|---|
| *Ephedra californica* | Desert tea | x | | x | |
| *Ephedra nevadensis* | Nevada Ephedra | x | | x | |
| *Ephedra torreyana* | Mormon tea | x | | x | |

Table E.3-1 Study Area Vegetation Types (continued).

| Scientific Name | Common Name | EI Pipeline | South Lateral Pipeline and/or COH Forcemain | EI Terminus | LCS (all alternatives) |
|---|---|---|---|---|---|
| *Tidestromia oblongifolia* | Honey-sweet | x | | x | |
| *Acamptopappus sphaerocephalus* | Goldenhead | x | | x | x |
| *Ambrosia dumosa* | White bursage | x | x | x | x |
| *Anisocoma acaulis* | Scale-bud | x | | | |
| *Atrichoceris platyphylla* | Gravel ghost | x | | | x |
| *Baileya multiradiata var. multiradiata* | Desert marigold | x | | | |
| *Bebbia juncea* | Sweetbush | x | x | x | x |
| *Calycoseris wrightii* | White tack-stem | x | | | |
| *Chaenactis fremontii* | Desert pincushion | | | | x |
| *Chaenactis stevioides* | Esteve pincushion | x | | x | x |
| *Chaenactis xantiana* | Mojave pincushion | x | | x | x |
| *Cirsium sp.* | Thistle | x | | | |
| *Encelia farinose* | Brittlebush | | | | x |
| *Encelia frutescens* | Bush encelia | x | | | |
| *Enceliopsis argophylla* | Silverleaf sunray | x | | x | |
| *Eriophyllum wallacei* | Woolly eriophyllum | x | | x | |
| *Geraea canescens* | Desert sunflower | | | x | |
| *Gutierrezia sarothrae* | Sticky snakeweed | x | | x | x |
| *Hymenoclea salsola* | Cheesebush | x | | x | x |
| *Malacothrix glabrata* | Desert dandelion | x | x | | x |
| *Mamillaria sp.* | Fishook cactus | | | | x |
| *Monoptilon bellidiforme* | Daisy desert star | | | | x |
| *Monoptilon bellioides* | Mojave desert star | x | | | x |
| *Psathyrotes ramosissima* | Turtleback | x | x | | |
| *Rafinesquia neomexicana* | Desert chicory | x | | | |

Table E.3-1 Study Area Vegetation Types (continued).

| Scientific Name | Common Name | EI Pipeline | South Lateral Pipeline and/or COH Forcemain | EI Terminus | LCS (all alternatives) |
|---|---|---|---|---|---|
| *Senecio flaccidus* | Ragwort | x | | | |
| *Stephanomeria pauciflora var. pauciflora* | Desert milk-aster | x | | | x |
| *Stylocline micropoides* | Desert nest straw | x | | x | |
| *Xylorhiza tortifolia* | Mojave aster | x | | x | x |
| *Amsinckia tessellate* | Rough fiddleneck | x | | x | x |
| *Cryptantha angustifolia* | Popcorn flower | x | x | | x |
| *Cryptantha circumscissa* | Western forget-me-not | x | | | |
| *Cryptantha dumetorum* | Greene's cryptantha | | | | x |
| *Cryptantha micrantha* | Purple-rooted forget-me-not | | | | x |
| *Cryptantha nevadensis* | Nevada forget-me-not | x | | x | x |
| *Cryptantha pterocarya* | Wing-nut forget-me-not | x | x | x | x |
| *Heliotropium curassavicum* | Heliotrope | x | | | |
| *Pectocarya heterocarpa* | Unequal combseed | x | | | |
| *Pectocarya platycarpa* | Flattened combseed | x | | | |
| *Arabis perennans* | Common rock cress | | | | x |
| *Brassica tournefortii* [1] | Mustard | | | | x |
| *Descurainia pinnata* | Tansy mustard | x | | | |
| *Dithyrea californica* | Spectacle-pod | x | | x | x |
| *Lepidium fremontii* | Desert alyssum | x | | x | x |
| *Lepidium montanum* | Western peppergrass | x | | x | x |
| *Lesquerella tenella* | Bead pod | x | | x | x |
| *Sisymbrium irio* | London rocket | x | x | x | x |
| *Echinocactus polycephalus var. polycephalus* | Cottontop cactus | x | | | |
| *Ferocactus cylindraceus* | Barrel cactus | | | x | |

Table E.3-1 Study Area Vegetation Types (continued).

| Scientific Name | Common Name | EI Pipeline | South Lateral Pipeline and/or COH Forcemain | EI Terminus | LCS (all alternatives) |
|---|---|---|---|---|---|
| *Opuntia basilaris var. basilaris* | Beavertail cactus | x | | | |
| *Opuntia echinocarpa* | Silver cholla | x | | x | |
| *Opuntia ramosissima* | Pencil cholla | x | | x | |
| *Atriplex canescens* | Fourwing saltbush | x | x | x | |
| *Atriplex confertifolia* | Shadscale | x | x | x | |
| *Atriplex hymenelytra* | Desert holly | | | x | |
| *Atriplex lentiformis* | Big saltbush | x | | x | |
| *Atriplex polycarpa* | Desert saltbush | x | | | |
| *Salsola tragus* [1] | Russian thistle | x | x | x | |
| *Suaeda moquinii* | Seepbush | x | | | |
| *Cuscuta sp.* | Dodder | | | | x |
| *Chamaesyce albomarginata* | Rattlesnake weed | x | | x | |
| *Chamaesyce polycarpa* | Smallseed sandmat | x | | | x |
| *Acacia greggii* | Catclaw acacia | x | x | x | x |
| *Astragalus lentiginosus var. fremontii* | Freckled milkvetch | | | | x |
| *Dalea mollissima* | Silky dalea | | | | x |
| *Lupinus arizonicus* | Arizona lupine | | | | x |
| *Prosopis glandulosa var. torreyana* | Honey mesquite | x | | | x |
| *Psorothamnus fremontii* | Indigo bush | x | | x | |
| *Senna armata* | Desert senna | x | x | | |
| *Erodium cicutarium* [1] | Red-stemmed filaree | x | | x | x |
| *Erodium texanum* | Desert heron's bill | x | | x | x |
| *Nama demissum* | Purple mat | x | | x | |
| *Nama hispidium* | Hairy nama | x | | x | |
| *Phacelia crenulata* | Notch-leaved phacelia | x | | x | x |
| *Phacelia pulchella var. gooddingii* | Gooddings phacelia | x | | | |
| *Phacelia sp.* | Scorpion weed | x | | x | x |

Table E.3-1 Study Area Vegetation Types (continued).

| Scientific Name | Common Name | EI Pipeline | South Lateral Pipeline and/or COH Forcemain | EI Terminus | LCS (all alternatives) |
|---|---|---|---|---|---|
| *Krameria grayi* | White rhatany | x | | x | x |
| *Salazaria mexicana* | Paperbag bush | x | | | |
| *Salvia columbariae* | Chia | | | | x |
| *Mentzelia involucrate* | White bract stickleaf | x | | x | x |
| *Mentzelia sp.* | Blazing star | x | | x | x |
| *Petalonyx parryi* | Parry's sandpaper plant | x | | x | |
| *Eremalche rotundifolia* | Desert five-spot | | | x | |
| *Sphaeralcea ambigua var. ambigua* | Apricot mallow | x | x | x | x |
| *Allionia incarnate* | Trailing four o'clock | x | | x | x |
| *Camissonia boothii* | Woody bottle-washer | x | | | |
| *Camissonia brevipes* | Yellow cups | x | | x | x |
| *Gaura coccinea* | Wild honeysuckle | x | | | |
| *Oenothera deltoids* | Devil's lantern | x | | | |
| *Oenothera sp.* | Evening primrose | x | | x | |
| *Arctomecon californica* [2] | Las Vegas bearpoppy | x | | | |
| *Eschscholtzia glyptosperma* | Mojave goldpoppy | x | | | x |
| *Eschscholtzia minutiflora* | Little goldpoppy | x | | | x |
| *Plantago ovata* | Desert plantain | x | | x | x |
| *Plantago patagonica* | Woolly plantain | x | | | |
| *Gilia latifolia* | Broadleaved gilia | x | | x | x |
| *Gilia sp.* | Gilia | x | | x | x |
| *Langloisia setosissima* | Bristly langloisia | x | | x | |
| *Chorizanthe brevicornu var. brevicornu* | Brittle spineflower | x | | x | x |
| *Chorizanthe corrugate* | Wrinkled spineflower | x | | x | x |

Table E.3-1 Study Area Vegetation Types (continued).

| Scientific Name | Common Name | EI Pipeline | South Lateral Pipeline and/or COH Forcemain | EI Terminus | LCS (all alternatives) |
|---|---|---|---|---|---|
| *Eriogonum deflexum* | Flat-topped buckwheat | x | x | x | x |
| *Eriogonum inflatum* | Desert trumpet | x | x | x | x |
| *Eriogonum pusillum* | Yellow turban | x | | x | x |
| *Eriogonum thomasii* | Thomas' buckwheat | x | | x | x |
| *Eriogonum trichopes var. trichopes* | Little trumpet | x | x | x | x |
| *Populus fremontii* | Cottonwood | | | | x |
| *Antirrhinum filipes* | Twining snapdragon | | | | x |
| *Mimulus bigelovii* | Desert monkey flower | x | | | |
| *Lycium andersonii* | Desert tomato | x | | | |
| *Nicotiana obtusifolia* | Desert tobacco | | | | x |
| *Tamarix ramosissima* [1] | Tamarisk | x | x | | |
| *Phoradendron californicum* | Desert mistletoe | x | | | |
| *Larrea tridentate* | Creosote bush | x | x | x | x |
| *Allium sp.* | Onion | x | | | |
| *Achnatherum speciosum* | Desert needlegrass | x | | x | x |
| *Aristida purpurea* | Purple three-awn | x | | x | x |
| *Bromus madritensis ssp. Rubens*[1] | Red brome | x | x | x | x |
| *Bromus spp.* | Brome grass | | | | |
| *Erioneuron pulchellum* | Fluff grass | x | x | x | x |
| *Pleuraphis rigida* | Big galleta | x | | x | x |
| *Schismus barbatus* [1] | Mediterranean schismus | x | | x | |
| *Vulpia octoflora* | Sixweeks fescue | x | x | | |

Notes:

[1] Indicates a non-native (introduced) species.

[2] Las Vegas bearpoppy were observed adjacent to, but not within, the EI pipeline study corridor.

Desert riparian scrub located within the floodplain of the Las Vegas Wash is a monoculture comprised predominantly of tamarisk (*Tamarix ramosissima*), an aggressively invasive exotic species that commonly occurs along floodplains, riverbanks, stream courses, salt flats, marshes, and irrigation ditches in arid regions of the southwestern U.S. (Mozingo 1987). The term riparian describes a unique physical environment and associated plant vegetation that occurs along banks of freshwater bodies, watercourses, and surface-emergent aquifers and adjacent areas. The groundwater in these areas provides soil moisture sufficiently in excess of that available through local precipitation, and is capable of supporting vegetation requiring moderate amounts of water (Warner and Hendrix 1984). The extent of groundwater influence defines the riparian-corridor width and the plant assemblages that grow there.

Plant communities within the Wetlands Park were surveyed and mapped in May 2004 (SWCA 2004). This map is included as Figure E.3-1. The SNWA also provided a map of their revegetation sites, which is included as Figure E.3-2.

## E.3.1 Special Status Plant Species

No federally listed or candidate plant species are known to occur within the proposed study area. Five species of concern were reported to potentially occur in or near the study area as shown in Table E.3-2, based on information obtained through the literature search and agency coordination. All five species are federal species of concern; four are protected by the state of Nevada as imperiled due to rarity, salvage restriction, or other factors. Surveys were conducted in areas that supported potential habitat for sensitive plant species, such as in ephemeral washes or along roadsides for the rosy two-toned beardtongue, and in gypsiferous soils for the Las Vegas Bearpoppy.

Results of the field surveys conducted in spring 2003, 2004, and 2005 determined that two of the five plant species of concern have potential to occur in the study area, the Las Vegas bearpoppy and the rosy twotone beardtongue. The threecorner milkvetch (*Astragalus geyeri* var. *triquetrus*) and sticky buckwheat (*Eriogonum viscidulum*) have been previously recorded as occurring in Clark County but habitat for these species does not occur within the study area. The last recorded observation of the Las Vegas catseye (*Cryptantha insolita*) was in 1942, at an undefined location in the Las Vegas Valley, and it is now presumed extinct (Mozingo and Williams 1980, NNHP 2003). However, to confirm presence or absence of the species in the study area, all plants of the same genus as the Las Vegas catseye (i.e. *Cryptantha)* found during the botanical surveys, were identified to the species level. No Las Vegas catseye were found in the study area.

Additionally, brief descriptions of the threecorner milkvetch, sticky buckwheat, and Las Vegas catseye are provided below; however, based on the reasons previously stated, they will not be discussed in further detail.

Las Vegas bearpoppy and rosy twotone beardtongue are described in Section 3.2 of the EIS. Therefore, they will not be discussed in this appendix.

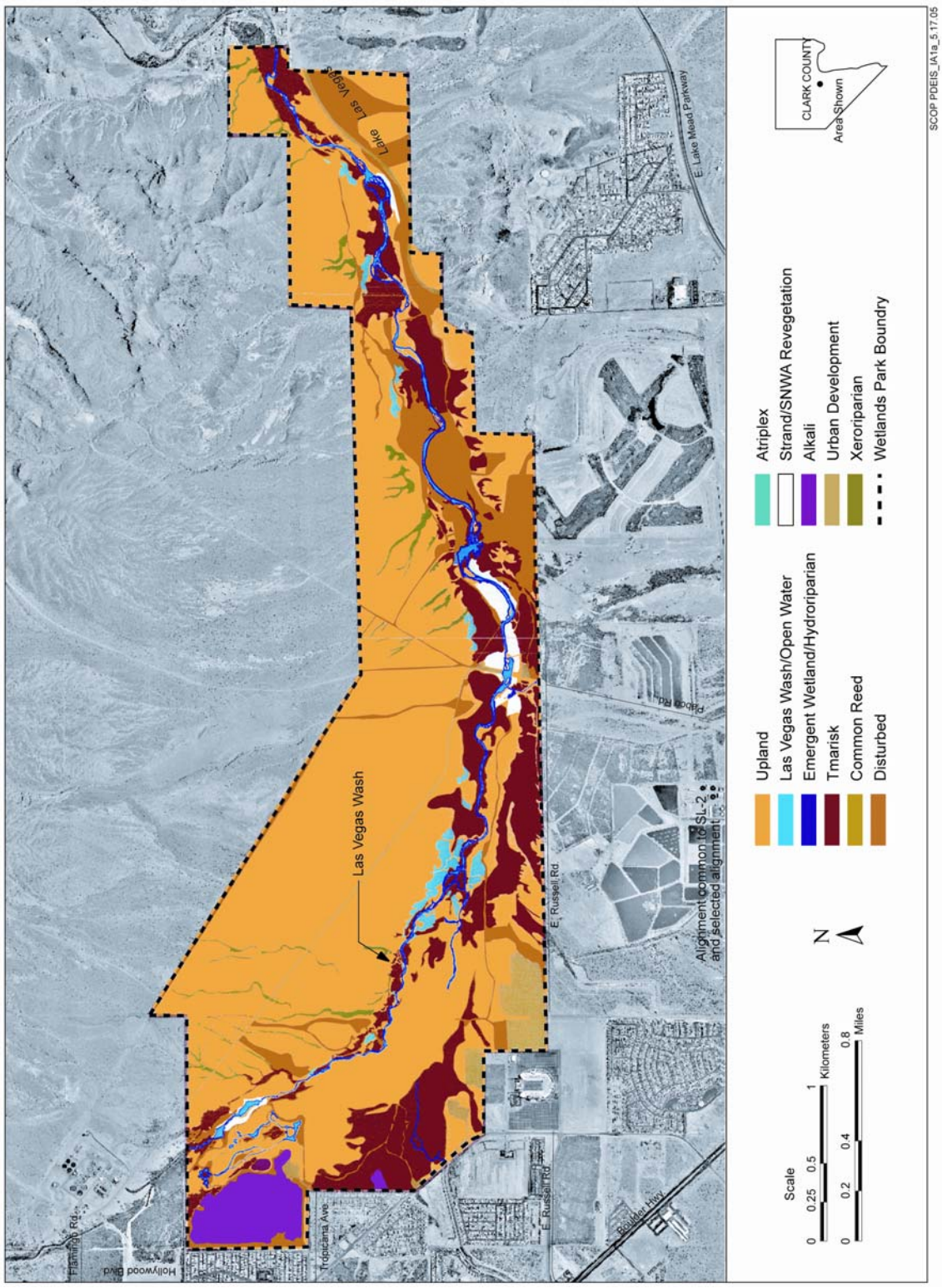



Figure E.3-1 Vegetation Communities.

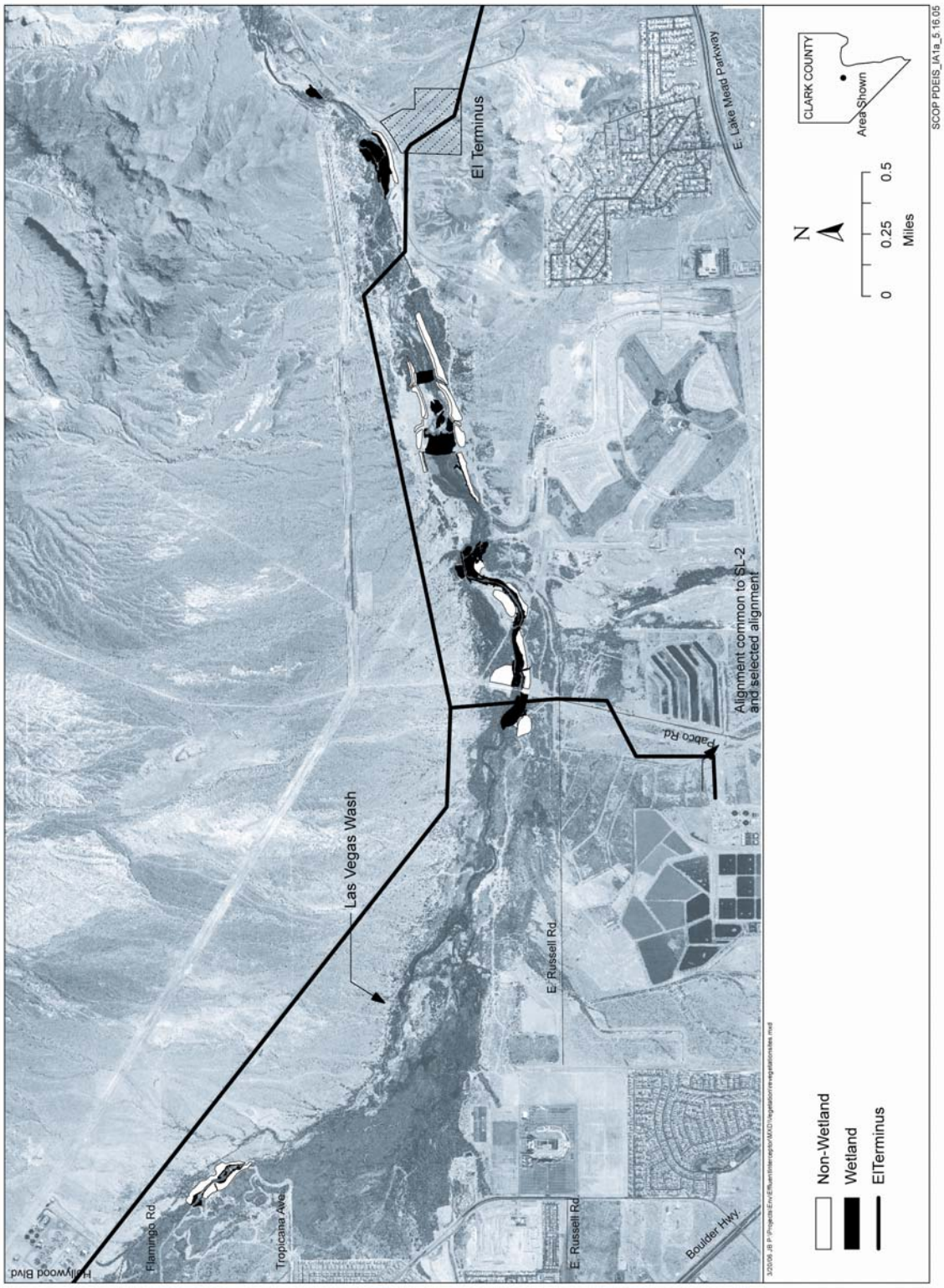



Figure E.3-2 Revegetation Sites.

Table E.3-2 Special Status Species Evaluated for Potential Occurrence in the Study Area.

| Species | | Protection Status | | Suitable Habitat |
|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Federal [1]** | **State of Nevada [2]** | |
| **Plants** | | | | |
| *Arctomecon californica* | Las Vegas bearpoppy | SOC | Yes | Yes |
| *Astragalus geyeri var. triquetrus* | Threecorner milkvetch | SOC | Yes | No |
| *Eriogonum viscidulum* | Sticky buckwheat | SOC | Yes | No |
| *Penstemon bicolor ssp. Roseus* | Rosy twotone beardtongue | SOC | - | Yes |
| *Cryptantha insolita* | Las Vegas catseye | SOC | - | - |
| **Reptiles** | | | | |
| *Gopherus agassizii* | Desert tortoise (Mojave Desert population) | LT | Yes | Yes |
| *Heloderma suspectum cinctum* | Banded Gila monster | SOC | Yes | Yes |
| *Sauromalus obesus* | Chuckwalla | SOC | - | Yes |
| **Amphibians** | | | | |
| *Rana onca* | Relict leopard frog | C | Yes | Yes |
| *Bufo microscaphus* | Southwestern toad | SOC, N | No | Yes |
| **Birds** | | | | |
| *Athene cunicularia hypugea* | Western burrowing owl | SOC | Yes | Yes |
| *Chlidonias niger* | Black tern | SOC | - | Yes |
| *Coccyzus americanus occidentalis* | Western yellow-billed cuckoo | C | Yes | Yes |
| *Empidonax traillii extimus* | Southwestern willow flycatcher | LE | Yes | Yes |
| *Falco peregrinus anatum* | American peregrine falcon | SOC | Yes | Yes |
| *Guiraca caerulea* | Blue grosbeak | SOC | - | Yes |
| *Phainopepla nitens* | Phainopepla | SOC | Yes | Yes |
| *Piranga rubra* | Summer tanager | SOC | - | Yes |
| *Plegadis chihi* | White-faced ibis | SOC | Yes | Yes |
| *Pyrocephalus rubinus* | Vermilion flycatcher | SOC | - | Yes |
| *Rallus longirostris yumanensis* | Yuma clapper rail | LE | Yes | Yes |
| *Sterna antillarum* | Least tern | LE(PS) | Yes | - |
| *Vermivora luciae* | Lucy's warbler | SOC | - | Yes |
| *Vireo bellii arizonae* | Arizona Bell's vireo | SOC | - | Yes |

Table E.3-2 Special Status Species Evaluated for Potential Occurrence in the Study Area (continued).

| Species | | Protection Status | | Suitable Habitat |
|---|---|---|---|---|
| **Scientific Name** | **Common Name** | **Federal [1]** | **State of Nevada [2]** | |
| **Mammals** | | | | |
| *Corynorhinus townsendii pallescens* | Pale Townsend's big-eared bat | SOC(PS) | - | Yes |
| *Euderma maculatum* | Spotted bat | SOC | Yes | Yes |
| *Eumops perotis californicus* | Greater western mastiff bat | SOC | - | Yes |
| *Idionycteris phyllotis* | Allen's big-eared bat | SOC | - | Yes |
| *Macrotus californicus* | California leaf-nosed bat | SOC | - | Yes |
| *Myotis ciliolabrum* | Small-footed myotis | SOC | - | Yes |
| *Myotis thysanodes* | Fringed myotis | SOC | - | Yes |
| *Myotis velifer* | Cave myotis | SOC | - | Yes |
| *Myotis volans* | Long-legged myotis | SOC | - | Yes |
| *Myotis yumanensis* | Yuma myotis | SOC | - | Yes |
| *Nyctinomops macrotis* | Big free-tailed bat | SOC | - | Yes |
| *Ovis Canadensis nelsoni* | Desert bighorn sheep | - | Yes | Yes |
| **Fish** | | | | |
| *Xyrauchen texanus* | Razorback sucker | LE | Yes | Yes |
| *Gila elegans* | Bonytail chub | LE | Yes | Yes |
| *Catostomus latipinnis* | Flannelmouth sucker | SOC | No | No |
| *Gila robusta* | Roundtail chub | SOC | No | No |

Notes:

[1] Federal (USFWS) Status for listing under the ESA.

[2] State of Nevada special status species protected under Nevada Revised Statutes (NRS) 527, 501.

LT Listed Threatened.

LE Listed Endangered.

C Candidate for listing.

N Nevada BLM Special Status Species-Sensitive.

PS Partial Status (a subspecies or part of a taxon's range has listed or candidate status but not in Nevada).

SOC Species of Concern.

*Source: NNHP 2002, and USFWS 2003.*

Threecorner milkvetch is a federal species of concern and a Nevada state-protected species restricted to fine-grained, non-caliche soil habitats in flats, dunes, washes, gullies, and on valley floors in the Mojave Desert between 1,500 to 2,500 ft (457 to 762 m) elevation (Niles et al. 1995). Habitat for this plant occurs in southern Nevada on the Muddy Creek geologic formation. Suitable habitat for the milkvetch is not present in the study area.

Sticky buckwheat is a federal species of concern and a Nevada state-protected species. It has similar known distribution and habitat requirements as the threecorner milkvetch described above, as it is restricted to fine-grained soil (sand dunes or deep sand) habitats on the Muddy

Creek geologic formation and has an elevational range of approximately 1,000 to 2,500 ft (305 to 762 m) above msl. Unlike the threecorner milkvetch, however, it is generally associated with caliche-rich sand and sand containing weathered calcareous rock (Niles et al. 1995). Suitable habitat for the sticky buckwheat is not present in the study area.

Las Vegas catseye, also known as unusual catseye, is a federal species of concern and a Nevada state-protected species known only from the Las Vegas Valley and adjacent lower slopes of the Spring Mountains, in Clark County, Nevada. Habitat for this plant includes barren flats, knolls, and rocky slopes. It grows in saline, clay soils with gypsum outcrops at elevations between 1,000 and 2,000 ft (305 and 610 m). The last recorded observation of the species was in 1942 and it is now presumed extinct (Mozingo and Williams 1980, NNHP 2003).

## E.3.2 Noxious Weeds

Executive Order 13112, signed in February 1999, directs all federal agencies to prevent, monitor, and control the introduction of invasive, non-native species, including noxious plant species, or "noxious weeds." The phrase "noxious weed" is a legal term applied to any plant designated by a federal, state, or county government to be injurious to public health, agriculture, recreation, wildlife, or any public or private property (Sheley et al. 1999).

Chapter 555 of the NRS, entitled *Control of Insects, Pests, and Noxious Weeds*, defines a noxious weed as "any species of plant which is, or is likely to be, detrimental or destructive and difficult to control or eradicate." Nevada Revised Statute Chapter 555 includes the laws by which noxious weeds and other pests are designated and regulated by the Nevada Department of Agriculture.

The Nevada Department of Agriculture maintains a list of noxious plants of economic and ecological concern to the State. A list of potential noxious weeds known or with potential to occur in the study area is presented in Table E.3-3.

Two state-regulated noxious weeds, tamarisk and tall whitetop (*Lepidium latifolium*), are known to occur in the study area along the Las Vegas Wash. Tamarisk is a strong phreatophyte and is prolific at reproduction. Few if any plants are able to grow under a tamarisk canopy due to the high concentration of salt that builds up in the soil from its accumulated leaf litter and the excretion of salt from glands on the leaves (University of Nevada, Reno 1996). These characteristics predispose tamarisk to be an aggressive competitor and often supplant native vegetation in disturbed riparian corridors.

Similarly, tall whitetop infests riparian and wetland areas, forms dense monotypic stands, creates highly saline soils, and competes with native plants for resources. Current and ongoing efforts by Clark County and the LVWCC are underway to eradicate these invasive species from the Las Vegas Wash (LVWCC 2003b).

Table E.3-3 Noxious Weeds Known or with Potential to Occur in Clark County, Nevada.

| Scientific Name | Common Name |
|---|---|
| *Acroptilon repens* | Russian knapweed |
| *Centaurea masculosa* | Spotted knapweed |
| *Lepidium latifolium* | Tall whitetop |
| *Tribulus terrestris* | Puncturevine |
| *Tamarix ramosissima* | Tamarisk |
| *Sorghum halepense* | Johnsongrass |
| *Centaurea solstiltialis* | Yellow star thistle |
| *Sonchus arvensis* | Sow thistle |
| *Carduus nutans* | Musk thistle |
| *Onopordum acanthium* | Scotch thistle |
| *Linaria dalmatica* | Dalmatian toadflax |
| *Cardaria draba* | Hoary cress |
| *Solanum elaeagnifolium* | White horse-nettle |
| *Alhagi camelorum* | Camelthorn |
| *Lythrum salicaria* | Purple loosestrife |

*Source: Rafferty, D. 2000; O'Brien 2000; Deuser 2000.*

## E.4 Wildlife

Wildlife species discussed in this section commonly occur in the Mojave Desert and have adapted to desert scrub habitats with little cover and xeric conditions. Focused surveys for birds, mammalian, all reptiles and aquatic species were not conducted as part of this project. However, all wildlife species observed in the study area or identified by indirect evidence such as tracks, burrows, carcasses, or scat during field investigations were recorded and are provided in Table E.4-1.

### E.4.1 Federally Listed as Threatened or Endangered

Five federally listed wildlife species were evaluated for potential occurrence in the study area. The southwestern willow flycatcher (*Empidonax traillii extimus*), Yuma clapper rail (*Rallus longirostris yumanensis*), and least tern (*Sterna antillarum*) are federally listed as endangered; however, the least tern has federal protection status in a portion of its range that does not include Nevada. The bald eagle (*Haliaeetus leucocephalus*) and Mojave desert tortoise (*Gopherus agassizii*) are federally listed as threatened. The desert tortoise, southwestern willow flycatcher, Yuma clapper rail, bald eagle, and least tern are described in Section 3.2 of the EIS, and are not described further in this appendix.

Table E.4-1 Wildlife Species Observed During Field Surveys.

| Scientific Name | Common Name |
|---|---|
| **Reptilia** | **Reptiles** |
| *Callisaurus draconoides* | Zebra-tailed lizard |
| *Cnemidophorus tigris* | Western whiptail |
| *Dipsosaurus dorsalis* | Desert iguana |
| *Gopherus agassizii* | Desert tortoise |
| *Masticophis flagellum piceus* | Red coachwhip |
| *Uta stansburiana* | Side-blotched lizard |
| **Aves** | **Birds** |
| *Amphispiza bilineata* | Black-throated sparrow |
| *Ardea herodias* | Great blue heron |
| *Athene cunicularia hypugea* | Western burrowing owl |
| *Auriparus flaviceps* | Verdin |
| *Buteo jamaicensis* | Red-tailed hawk |
| *Callipepla gambelii* | Gambel's quail |
| *Campylorhynchus brunneicapillus* | Cactus wren |
| *Carpodacus mexicanus* | House finch |
| *Cathartes aura* | Turkey vulture |
| *Chordeiles acutipennis* | Lesser nighthawk |
| *Corvus corax* | Common raven |
| *Falco sparverius* | American kestrel |
| *Lanius ludovicianus* | Loggerhead shrike |
| *Molothrus ater* | Brown-headed cowbird |
| *Pandion haliaetus* | Osprey |
| *Polioptia melanura* | Black-tailed gnatcatcher |
| *Quiscalus mexicanus* | Great-tailed grackle |
| *Vermivora luciae* | Lucy's warbler |
| *Zenaida macroura* | Mourning dove |
| **Mammalia** | **Mammals** |
| *Ammospermophilus leucurus* | White-tail antelope ground squirrel |
| *Canis latrans* | Coyote |
| *Dipodomys spp.* | Kangaroo rat |
| *Lepus californicus* | Black-tailed jackrabbit |
| *Neotoma lepida* | Desert woodrat |
| *Ovis canadensis nelsoni* | Desert bighorn sheep |
| *Perognathus spp.* | Pocket mouse |
| *Sylvilagus audubonii* | Desert cottontail |
| *Vulpes macrotis arsipus* | Desert kit fox |

## E.4.2 Federal Candidate Species and Species of Concern, Nevada State-protected Species, and Clark County MSHCP-covered Species

There is one species, the western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), which is a candidate for federal listing, and 24 federally listed species of concern that are known to occur in the project area. Twenty three of these species are also protected by the State of Nevada due to rarity or other factors.

Two reptile species of concern, the banded Gila monster (*Heloderma suspectum cinctum*) and the chuckwalla (*Sauromalus obesus*), have the potential to occur in the proposed project area. However, none of these species were identified during field surveys, and protocol followed did not concentrate on reptiles other than the desert tortoise.

Banded Gila monster, a federal species of concern and a Nevada-state protected species, is distributed from southwestern Utah and southern Nevada south to southern Sonora, Mexico, and from the Colorado River east to extreme southwestern New Mexico. This large venomous reptile is commonly found on lower slopes of rocky canyons and arroyos with permanent or intermittent streams, but is also associated with desert flats supporting scrubs and succulents. The Gila monster digs burrows or finds shelter under rocks or in existing reptile and mammal burrows (Stebbins 1985). The banded Gila monster is a known inhabitant of the study area (U.S. Bureau of Land Management [BLM] 2000), but none were observed during field surveys.

Chuckwalla is a federal species of concern found throughout the deserts of the southwestern U.S. and northern Mexico. Chuckwallas inhabit rock outcrops where cover is available between boulders or in rock crevices. It is typically found on slopes and open flats below 6,100 ft above msl (Stebbins 1985). Typical habitat includes rocky hillsides and talus slopes, boulder piles, lava beds, or other clusters of rock, usually in association with desert scrub habitat including Mojave desert scrub, blackbrush, salt desert scrub, and mesquite/catclaw. It requires shady, well-drained soils for nests. The chuckwalla is a widespread species, but is regionally limited by its requirement for rock outcrops. Potential chuckwalla habitat occurs in the study area near the EI Terminus and SRMT3-East working shaft, but none were observed during field surveys.

Western yellow-billed cuckoo, a candidate for federal protection is described in Section 3.2 of the EIS, and will not be discussed further in this appendix.

The following avian species of concern are known to occur in the proposed study area based on results from previous studies and existing habitat conditions.

Western burrowing owl *(Athene cunicularia hypugea*) is a federal species of concern and a Nevada-state protected species. It is a year-round resident in open, dry, grassland, Mojave Desert scrub, sagebrush/perennial grassland, and open shrub stages of pinyon-juniper and mixed conifer habitats. The burrowing owl is distributed throughout Clark County in the Mojave Desert and in lower elevations of the Great Basin. This species commonly nests in abandoned kit fox, badger, or tortoise burrows, generally from mid-March to mid-August, and spends much time on the ground or on low perches such as fence posts or dirt mounds. The presence of an existing nest burrow appears to be a critical requirement for habitat use. The majority of potentially suitable

habitat in the study area is highly degraded. Burrowing owl sign was observed along the proposed Boulder Islands South Outfall Pipeline alignment and there is potential for the species to occur throughout the rest of the study area.

Black tern (*Chlidonias niger*), a federal species of concern, breeds in the northern U.S. through central Canada and winters in South America. Summer range for nonbreeders is from South America northward as far as the Gulf coast of the U.S. During migration, the black tern frequents freshwater and saltwater, and occurs along the coast and along marshes, rivers, lakes, and nearby cultivated fields. Preferred summer habitats are inland marshes and sloughs with fairly dense cattail or other marsh vegetation and pockets of open water. Special habitat requirements for this species are aquatic habitats with extensive stands of emergent vegetation and large areas of open water. The Red Rock Audubon Society (2002) reports the black tern to be an uncommon migrant to the Las Vegas Wash.

American peregrine falcon (*Falco peregrinus anatum*) was removed from the federal list of endangered and threatened species in August 1999 based on available data that indicated the subspecies has recovered. It is currently a federal species of concern and a Nevada state protected species. The American peregrine falcon occurs in a wide range of habitats from desert mountains to seacoasts with the presence of tall cliffs being a limiting factor of habitat suitability. Cliffs provide the peregrine falcon with both nesting and perching sites and an unobstructed view of the surrounding area. Where cliffs are lacking, manmade structures such as buildings and bridges are occasionally used as substitutes. A nearby source of water that supports an adequate prey base of small- to medium-sized birds is another common feature of peregrine falcon habitat that influences their distribution and abundance. The peregrine falcon is a year-round resident species in southern Nevada. It breeds in the Lake Mead area. One known nesting location occurs in the project vicinity near Promontory Point in the Lake Mead area (NPS 2002). The species has also been occasionally observed at the Las Vegas Wash (LVWCC 2002).

Blue grosbeak (*Guiraca caerulea*), a federal species of concern, is associated with desert riparian and grassland habitats and also agricultural and urban areas. They are primarily found in riparian habitat, in vegetation comprised of willow, cottonwood, arrowweed, and tamarisk along watercourses or oases, and forage in adjacent openings, grasslands, and croplands. Potential habitat for this species is found along the Colorado River system, including the Virgin and Muddy Rivers and the Las Vegas Wash.

Western least bittern (*Ixobrychus elixis hesperis*) is a federal species of concern and a Nevada state protected species that migrates from southern California to Mexico for winter. This secretive bird is usually found in densely vegetated emergent wetlands near sources of fresh water and in desert riparian zones in southern California and in the Lower Colorado River Valley in western Arizona. The western least bittern is also reported to be a rare migrant to the Las Vegas Wash (Red Rock Audubon Society 2002).

Summer tanager (*Piranga rubra*), a federal species of concern, is a neotropical migrant that breeds throughout most of the southeastern and southwestern U.S., including New Mexico, Arizona, southern Nevada, and southeast California. In the southwestern U.S., summer tanagers occur primarily in cottonwood-willow forests along rivers and streams and are attracted to stands of tamarisk along the Colorado River. Summer tanagers forage mainly for insects in the tops of

tall riparian trees. Their association with tall riparian tree habitats suggests that canopy height may be a more important factor than species composition in selection of foraging and nesting habitats. The summer tanager is a summer visitant of riparian areas in Clark County. Suitable habitat for this species is present along the Las Vegas Wash.

White-faced ibis (*Plegadis chihi*), a federal species of concern, historically nested throughout the U.S. down to the Gulf Coast and Mexico. Breeding colonies are now isolated, with the greatest abundance of breeding birds occurring in Utah, Texas, and Louisiana. The white-faced ibis is a common migrant in southern Nevada. It forages and nests in colonies near the ground or over water in extensive, undisturbed perennial marshes with dense stands of bulrush. Suitable habitat for this species is present along the Las Vegas Wash.

Vermilion flycatcher (*Pyrocephalus rubinus*), a federal species of concern, is found in the arid southwest, occurring almost exclusively near water. The species favors wooded groves of cottonwood, willow, oak, and mesquite, bordering rivers, especially near open, brushy, grassy, or agricultural fields. It also occurs in widely spaced junipers and oaks, and in dry washes on plains. The vermilion flycatcher nests in willow, sycamore, mesquite, cottonwood, oak, palo verde, hackberry, and other trees and bushes. The nests are built on a small, horizontal forked branch usually 8 to 20 ft (2 to 6 m), but sometimes 40 to 50 ft (12 to 15 m), above the ground, and usually near a stream or other water source. They feed on insects such as bees, grasshoppers, and small beetles. Potentially suitable habitat for this species is present along the Las Vegas Wash. The Vermilion flycatcher is a rare winter visitor to southern Nevada.

Lucy's warbler (*Vermivora luciae*), a federal species of concern, breeds from southeastern California, southern Nevada, and Utah to southern Arizona, northern Mexico, and extreme western Texas. It winters in western Mexico. It is found in southwestern deserts, generally in large mesquite bosques, especially along main watercourses. They also occur in mountain foothills in streamside cottonwoods and willows. The warbler requires cavities for nesting, such as natural cavities in trees (usually mesquite), where the entrance is in a sheltered spot, and in abandoned woodpecker holes or Verdin nests. This species occasionally nests in holes in banks, in yuccas, willows, sycamores, or elderberries. They forage for insects at middle heights in mesquite, but seldom in treetops or near the ground. Lucy's warbler is a common summer visitor to the Las Vegas Wash.

Arizona Bell's vireo (*Vireo bellii arizonae*), a federal species of concern, is distributed throughout the river systems of the desert southwest. It is a summer resident along the Colorado, Virgin, and Muddy rivers, and isolated springs in southern Nevada. It is an insectivorous, neotropical migrant that breeds during the summer in riparian scrub habitats. This species requires low, dense riparian areas along water or intermittent streams. At low elevations, it is largely associated with early successional cottonwood-willow. At higher elevations (above 1,400 ft [427 m]), the Bell's vireo uses tamarisk and honey mesquite, as well as cottonwood-willow habitats. Potentially suitable habitat may occur along the Las Vegas Wash.

Desert bighorn sheep (*Ovis canadensis nelsoni*) is a Nevada state protected species. A population of desert bighorn sheep occurs in the study area in the River Mountains Range. This sheep population, referred to as the River Mountains herd, is valued by the NPS, NDOW, and the Arizona Game and Fish Department because it provides recreational wildlife viewing and

supplements, through a translocation program, sheep population numbers in other regions of the southwestern U.S.

The River Mountains herd has been studied extensively since the 1940s to obtain information on diet, hydration requirements, seasonal movement, reproduction, and sensitivity to human disturbance. The boundaries of sheep habitat, lambing areas, major movement corridors, and location of permanent, man-made wildlife watering facilities in the study area are depicted on Figure 3.2-2 of the EIS. Prior to the 1940s, sheep presence in the River Mountains was occasional, however, construction and continued maintenance of the man-made watering facilities has allowed a residential sheep population to grow to about 200 to 250 individuals (NPS 2003c). Water availability is a major limiting factor for size and distribution of bighorn herds in the desert (Monson and Sumner 1981, Welles and Welles 1961). Surface water utilization by bighorn sheep is dependent on several factors including environmental heat load and complementary water available through food resources such as annuals, grasses, and shrubs.

Desert bighorn sheep require steep, rugged areas for lambing and escape terrain (Ferrier and Bradley 1970, Douglas and Kingsley 1981). Traditional lambing areas, such as those found in the River Mountains, are utilized by bighorn sheep because of key features including isolation, shelter, and expansive, unobstructed views. Approximately 23,000 acres (9,308 hectares) of high quality sheep habitat occur in the River Mountains; however, the habitat is surrounded by some form of land development or human presence.

Desert bighorn rutting season may occur almost any time of year; however the peak period of the rut generally occurs from mid-July through mid-October. Lambing in the southwest can occur during any month, but the majority of lambs are born in late winter and early spring (Monson and Sumner 1981). Bighorn sheep tend to spend the hottest part of the day relatively inactive, bedding down in the shade or in a cave. Nighttime foraging during the hottest period of the year has been observed in the past and may be a behavior to conserve water. Desert bighorn ewes typically have a daily movement radius of up to 1 mile (2 km), depending upon the availability of surface water.

*Bat Species*. Several bat species of federal concern have been recorded in the Las Vegas Valley and at Lake Mead, including the Pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), spotted bat (*Euderma maculatum*), greater western mastiff bat (*Eumops perotis californicus*), Allen's big-eared bat (*Idionycteris phyllotis*), California leaf-nosed bat (*Macrotus californicus*), small-footed myotis (*Myotis ciliolabrum*), fringed myotis (*Myotis thysanodes*), cave myotis (*Myotis velifer*), long-legged myotis (*Myotis volans*), Yuma myotis (*Myotis yumanensis*), and big free-tailed bat (*Nyctinomops macrotis*) (Burt and Grossheider 1976, Davis 1978, NatureServe 2003, Philpott 1997, Sherwin 1998). These bats typically utilize cliffs, caves, mines, and trees as nesting and roosting sites, and are frequently observed near open water foraging for insects.

## E.5 Aquatic Resources

This section includes a brief history of Lake Mead, a summary of the riverine/reservoir environment, and baseline information about the aquatic fauna and their habitat that may be impacted by the proposed project.

The creation of Lake Mead altered and changed the physical, chemical, and biological composition of the lower Colorado River. The habitat was transformed into deep water systems favorable for the establishment of recreationally important species. Many native fish have been extirpated from Lake Mead and are now designated endangered as a result of these changes.

The completion of Hoover Dam in 1935 formed Lake Mead and drastically altered the fish species occurring in this reach of the Colorado River Basin. Free-flowing lotic (riverine) habitats were inundated and converted to sprawling lentic (reservoir) habitats. Some of the endemic fish species impacted by the construction of Hoover Dam include bonytail chub (*Gila elegans*), roundtail chub (*Gila robusta*), Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), flannelmouth sucker (*Catostomus latipinnis*), and woundfin (*Plagopterus argentissimus*). While endemic fish once thrived in the swift, widely fluctuating, and sediment loaded waters of the lower Colorado River riverine system, other introduced species became well established in the newly created reservoir system of Lake Mead.

From 1935 to 1942, warm-water species such as largemouth bass *(Micropterus salmoides)*, black crappie *(Pomoxis nigromaculatus)*, and bluegill *(Lepomis macrohirus)* were stocked into Lake Mead by the USFWS (Allan and Roden 1978). These species flourished as the reservoir continued to expand, creating a prime warm-water fishery. However, the condition of sport fish suffered in the absence of adequate prey. To help improve the condition of these species, threadfin shad (*Dorosoma petenense)* were successfully introduced in 1954 through a tri-state agreement of the Fish and Game Departments of Arizona, Nevada, and California (Allan and Roden 1978). With native fish stocks at historically low levels, the native fish cannot compete with the high populations of introduced fish species. Although these non-native fish have adapted to the reservoir habitat, their population levels are prone to cyclic highs and lows depending on conditions in the reservoir.

The base productivity for Lake Mead remains low, with nutrient deficiencies primarily resulting from the presence of the Glen Canyon Dam (Reclamation 2000). Threadfin shad remain the number one prey species for game fish in the lake. This presence of threadfin shad has sustained a large population of striped bass *(Morone saxatilis)* that is dominating the upper portion of the Lake Mead food chain. Other sport fish species, such as the large mouth bass populations, have declined significantly because of competition with the striped bass, low prey base, and low-water levels.

The quality of the sport fishery in Lake Mead is generally dependant on forage fish (primarily threadfin shad) production (NDOW 2004). The NDOW (2004) conducts forage fish surveys throughout Lake Mead and determined Las Vegas Bay has the highest density of forage fish, upwards of five times that of the Overton Arm. This high production of forage fish supports what NDOW terms a 'world-class' fishery on Lake Mead, particularly in the Las Vegas Bay area. Boulder Basin, which includes Las Vegas Bay, sustained over 71 percent of the total fishing

pressure expended on Lake Mead during 2004 (NDOW 2004). Lake Mead is the largest recreational fishery in Nevada, representing over 425,000 angler use days and an economic gain of $95 million to Clark County annually (NDOW 2004).

The factors that drive threadfin shad production and the quality of the sport fishery in Las Vegas Bay include nutrient inputs from effluent discharge into the Las Vegas Bay via the Las Vegas Wash, nutrient inputs from terrestrial vegetation inundation, and storm and ground water inputs. These nutrients, including phosphorus, nitrogen, nitrate, and ammonia, provide for phytoplankton production (measured as chlorophyll *a*). Phytoplankton is then consumed by zooplankton and the threadfin shad consume both. The condition of sport fish populations fluctuate with shad abundance, therefore, the quality sport fishery that is now established in Lake Mead is likely dependant upon the nutrient input from Las Vegas Wash.

The endemic fish such as the razorback sucker initially flourished in the expanding water habitat behind Hoover Dam (Reclamation 2000). The initial success of these species was related to spawning success behind the new dam and was attributed to the warmer water temperatures in the reservoir shoreline habitat and the inundated vegetation in the littoral zone. The submerged vegetation created a protective habitat and a sustainable food base for the razorback larvae. As the reservoir matured, the endemic species were not able to take advantage of the new forage base and were out competed by the introduced species. Native fish populations declined and the non-native fish populations increased dramatically. As recruitment of young razorbacks declined, fewer mature adults were available for spawning. After years of poor spawning success, the population of razorback suckers and other native fish contained primarily older adults.

With fewer adults available for spawning, the non-native fish out-produced the native species. With so many new species introduced to the lower Colorado River, the sheer numbers of these fish literally created large populations with high levels of immature fish. These non-native species also utilized the native fish as a prey base and this furthered the impacts to the populations of endemic fish.

Many other native fish have been eliminated or are endangered as a result of the changes of their habitat and with the introductions of exotic species. With native fish populations at historically low levels, they cannot compete with the high populations of introduced fish species.

Aquatic wildlife occupy suitable aquatic habitat throughout the proposed project area. These areas include the Las Vegas Wash and Lake Mead. Amphibian and fish species are known to occur in the vicinity of the proposed project.

Amphibians known to occur in the Las Vegas Wash and within the Lake Mead National Recreation Area include the southwestern toad (*Bufo microscaphus*), red-spotted toad (*Bufo punctatus*), pacific treefrog (*Pseudacris regilla*), North American spadefoot frogs (*Scaphiopus* spp.), and the candidate species the relict leopard frog (*Rana onca*). The bullfrog (*Rana catesbeiana*) and Woodhouse's toad (*Bufo woodhousii*), are the most common amphibians found within the Las Vegas Wash (LVWCC 2002).

Several fish species inhabit Lake Mead and Lake Mohave, including game, non-game, and endemic fish species (Table E.5-1). Native fish species are known to occur in Lake Mead. Of these, the bonytail chub is presumed extirpated and the roundtail chub and flannelmouth sucker

are considered incidental occurrences. There are 12 non-native fish species known to occur in Lake Mead (Table E.5-1). Non-game species known to occur in both lakes are the common carp (*Cyprinus carpio*), fathead minnow (*Pimephales promelas*), red shiner (*Cyprinella lutrensis*), and threadfin shad. Game fish species inhabiting the lakes include bluegill, green sunfish (*Lepomis cyanellus*), channel catfish (*Ictalurus punctatus*), crappie, largemouth bass, striped bass, and rainbow trout (*Onchorhynchus mykiss*).

Five non-native fish species are known to occur in the Las Vegas Wash, including black bullhead catfish (*Ameiurus melas*), common carp, green sunfish, mosquitofish (*Gambusia afinnis*), and red shiner. Other aquatic species known to occur in the Las Vegas Wash include the red swamp crayfish (*Procambrus clarkii*) and spiny softshell turtle (*Apalone spinifera*) (LVWCC 2002).

The current management trend in the reservoir is to continue management of game fish to provide fishing opportunities in Lake Mead. However, preservation of the endangered and native razorback sucker population in Lake Mead is a top priority of the USFWS. Lake Mead does provide good habitat for this species and other native species. Six special status aquatic species were identified to potentially occur in the study area based on information obtained through a literature search and agency consultation. The scientific and common names, federal and state protection status, and indication of presence or absence of suitable habitat for special status aquatic species in the study area are provided in Table 3.2-1 of the EIS, and Table E.3-2 of this appendix. Additionally, some of these special status species are addressed in the Clark County MSHCP. Of the fish species, only the razorback sucker is identified as occurring in Lake Mead, and Lake Mead is designated by the USFWS as critical habitat.

## E.5.1 Federally Listed as Threatened or Endangered

See Section 3.2.3.1 of the EIS for a description of the razorback sucker.

Bonytail chub, a large minnow, is endemic to the Colorado River Basin, historically occurring in warm, swift, turbid mainstream waters, tributaries, and backwaters. The bonytail has not been positively identified in Lake Mead since the 1950s, but a population exists in Lake Mohave and Lake Havasu with individuals being captured through year 2002 (Minckley and Thorson 2002). Lake Mohave is designated as a critical habitat for the species.

The bonytail chub was once abundant throughout the lower Colorado River. Damming, non-native fish introductions, and other changes in the lower Colorado River environment reduced their population. In response to this population decline, the USFWS formerly listed the bonytail chub as endangered on May 23, 1980. A revised recovery plan was approved for the bonytail on September 4, 1990 (USFWS 1990) and on March 21, 1994, a final rule for critical habitat was approved.

The bonytail chub prefers pools and eddies with low to moderate velocity currents. Historic records indicate the bonytail chub utilized backwater habitat during periods of flooding during the spring and early summer for spawning, which takes place in May (USFWS 2002).

Table E.5-1 Native and Non-native Fish Species Occurring in Lake Mead.

| Scientific Name | Common Name | Native or Non-native to Lake Mead |
|---|---|---|
| *Gila elegans* | Bonytail chub | Native (extirpated) |
| *Gila robusta robusta* | Roundtail chub | Native (incidental) |
| *Catostomus latipinnis* | Flannelmouth sucker | Native (incidental) |
| *Xyrauchen texanus* | Razorback Sucker | Native |
| *Cyprinella lutrensis* | Red Shiner | Non-native |
| *Cyprinus carpio* | Carp | Non-native |
| *Dorsoma petenense* | Threadfin Shad | Non-native |
| *Ictalurus punctatus* | Channel Catfish | Non-native |
| *Lepomis cyanellus* | Green Sunfish | Non-native |
| *Lepomis macrochirus* | Bluegill Sunfish | Non-native |
| *Micropterus salmoides* | Largemouth Bass | Non-native |
| *Morone Saxatilis* | Striped Bass | Non-native |
| *Oncorhynchus mykiss* | Rainbow Trout | Non-native |
| *Pimephales promelas* | Fathead minnow | Non-native |
| *Pomoxis nigromaculatus* | Black Crappie | Non-native |
| *Tilapia aureau* | Tilapia | Non-native |

Due to low and diminishing populations in the Colorado River, habitat needs of the bonytail chubs are not well documented (Minckley and Deacon 1991). Few young fish are available for study in their native habitat, although it is expected they would utilize backwater and slough habitat for protection and forage because these areas would hold the largest populations of aquatic invertebrates, a preferred food source of young chubs.

Adult bonytail chubs can live to be approximately 50 years old. Wild fish are extremely rare, and the bonytail has been extirpated from much of its historic range. Adult females can produce between 1,000 to over 10,000 eggs. This type of prolific egg production could result in rapid gains in population if given optimum habitat conditions. However, due to changes in habitat and the introduction of non-native fish species, the ability of the bonytail chub to maintain viable populations has been greatly diminished. In the current reservoir habitat, ideal conditions for the bonytail chub include water temperature ranging from 60 degree Fahrenheit (°F) (16 degrees Celsius [°C]) to 70°F (21 °C), dissolved oxygen ranging from 4.4 to 12.5 mg/L, and a pH ranging from 7.5 to 8.5 (Benke and Bensen 1983).

## E.5.2 Federal Candidate Species and Species of Concern, Nevada-State-protected Species, and Clark County MSHCP-Covered Species

One candidate species for federal listing as threatened and endangered, and three species of concern are known to occur in the study area as shown in Table 3.2-1 of the EIS. See Section 3.2.3.1 of the EIS for a description of the relict leopard frog, a candidate species for federal listing as threatened or endangered.

The species of concern that have the potential to occur in the study area include the flannelmouth sucker, roundtail chub, and southwestern toad.

Flannelmouth sucker is being considered as a candidate for federal listing as threatened or endangered. It occurs only in the Colorado River basin, and inhabits a variety of river habitats including riffles, runs, eddies, and backwaters. Occurrences of the flannelmouth sucker within the reservoir system of Lake Mead are uncommon or rare.

Roundtail chub is being reviewed for listing as a federally threatened or endangered species. The species is restricted to the Colorado River basin and parts of northwestern Mexico. It is found in warm streams and larger rivers, usually in habitats with slow-flowing water adjacent to areas of faster water. The roundtail chub does not prefer reservoir habitat. Therefore, it is unlikely that it is present in the proposed project area.

Southwestern toad is a federal species of concern. This toad inhabits arroyos, streams bordered by willow and cottonwoods, washes, and adjacent uplands. It can also be found along irrigation ditches, reservoirs and in flooded fields. Populations in the project area have not been identified and recorded, but the southwestern toad has the potential to occur adjacent to the Las Vegas Wash and the shorelines of Lake Mead.

# Appendix E

Attachment 1 – Letters

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# United States Department of the Interior

FISH AND WILDLIFE SERVICE
NEVADA FISH AND WILDLIFE OFFICE
1340 FINANCIAL BOULEVARD, SUITE 234
RENO, NEVADA 89502

February 12, 2003
File No. 1-5-03-SP-467

Mr. Douglas Karafa
Program Manager
Clean Water Coalition
Clark County Sanitation District
5857 East Flamingo Road
Las Vegas, Nevada 89111

Subject: Species List for the Proposed Systems Conveyance and Operations Program in Clark County, Nevada

This responds to your letter dated January 16, 2003, requesting information on threatened and endangered species, and species of concern that *may* occur in the subject project area. The Clean Water Coalition (comprised of the City of Las Vegas, City of Henderson and Clark County Water Reclamation District) proposes to implement the Systems Conveyance Operations Program. The proposed project would include an effluent interceptor pipeline, and one or a combination of alternatives to discharge highly treated effluent into the Lower Colorado River System.

We have enclosed a list of threatened and endangered species that *may* be present within the vicinity of, or be affected by, the proposed project (Enclosure A). This list fulfills the requirement of the Fish and Wildlife Service (Service) to provide information on listed species pursuant to section 7(c) of the Endangered Species Act of 1973, as amended (Act), for projects that are authorized, funded, or carried out by a Federal agency. Please reference the species list file number 1-5-03-SP-467 in all subsequent correspondence concerning this proposed project.

Enclosure A also lists the species of concern to the Nevada Fish and Wildlife Office that *may* occur in the proposed project area. We have used information from State and Federal agencies and private sources to assess the conservation needs and status of these species. Further biological research and field study are needed to resolve the conservation status of these taxa. One potential benefit of considering these species during project planning, is that by exploring alternatives early in the planning process, it may be possible to provide long-term conservation benefits for these species and avoid future conflicts that could otherwise develop. We also recommend that you contact the Nevada Natural Heritage Program (1550 East College Parkway, Suite 145, Carson City, Nevada 89710, 775-687-4245) and the appropriate regional office of the Nevada Division of Wildlife, as well as other local, State, and Federal agencies for distribution

Mr. Douglas Karafa

File No. 1-5-03-SP-467

data and information on conservation needs on these and other species of concern that may occur in your proposed project area. Potential impacts to species of concern should be considered during the environmental documentation process.

Enclosure B provides a discussion of the responsibilities Federal agencies have under section 7(c) of the Act and the conditions under which a biological assessment must be prepared by the lead Federal agency or its designated non-Federal representative. Given that some of the proposed activities and infrastructure would be located on lands managed by the National Park Service and Bureau of Reclamation, one or both (as a joint effort) of these Federal agencies should initiate consultation pursuant to 50 CFR § 402.14. Informal consultation may be utilized prior to a written request for formal consultation to exchange information and resolve conflicts with respect to a listed species. If a biological assessment is required, and it is not initiated within 90 days of your receipt of this letter, you should informally verify the accuracy of this list with our office. If, through informal consultation or development of a biological assessment, or both, you determine that the proposed action is not likely to adversely affect the listed species, and the Service concurs in writing, then the consultation process is terminated and formal consultation is not required.

If you have any questions regarding this correspondence, please contact Amy LaVoie in our Southern Nevada Field Office at 702-515-5230.

Sincerely,

Cynthia T. Martinez

for Robert D. Williams
Field Supervisor

Enclosures

cc:
Arizona Ecological Services Field Office, Fish and Wildlife Service, Phoenix, Arizona
(Attn: Lesley Fitzpatrick)

# ENCLOSURE A

## Listed Species and Species of Concern That *May* Occur Within the Proposed Systems Conveyance and Operations Program Clark County, Nevada

**File Number: 1-5-03-SP-467**
**February 12, 2002**

### Listed Species

| | |
|---|---|
| **Reptile** | |
| Desert tortoise (T) | *Gopherus agassizii* |
| Relict leopard frog (C) | *Rana onca* |
| **Fish** | |
| Bonytail chub (E) ◆ | *Gila elegans* |
| Razorback sucker (E) ◆ | *Xyrauchen texanus* |
| **Birds** | |
| Yellow-billed cuckoo (C) | *Coccyzus americanus* |
| Southwestern willow flycatcher (E) | *Empidonax traillii extimus* |
| Bald eagle (T) | *Haliaeetus leucocephalus* |
| Yuma clapper rail (E) | *Rallus longirostrus yumanensis* |

T = Threatened E = Endangered C = Candidate ◆ = Designated Critical Habitat

### Species of Concern

| | |
|---|---|
| **Mammals** | |
| Pale Townsend's big-eared bat | *Corynorhinus townsendii pallescens* |
| Spotted bat | *Euderma maculatum* |
| Greater western mastiff-bat | *Eumops perotis californicus* |
| Allen's big-eared bat | *Idionycteris phyllotis* |
| California leaf-nosed bat | *Macrotus californicus* |
| Small-footed myotis | *Myotis ciliolabrum* |
| Fringed myotis | *Myotis thysanodes* |
| Cave myotis | *Myotis velifer* |
| Long-legged myotis | *Myotis volans* |
| Yuma myotis | *Myotis yumanensis* |
| Big free-tailed bat | *Nyctinomops macrotis* |

# ENCLOSURE A (continued)

**File Number: 1-5-03-SP-467**
**February 12, 2002**

**Species of Concern (continued)**

| | |
|---|---|
| **Birds** | |
| Western burrowing owl | *Athene cunicularia hypugea* |
| Black tern | *Chlidonias niger* |
| Peregrine falcon | *Falco peregrinus* |
| Blue grosbeak | *Guiraca caerulea* |
| Least bittern | *Ixobrychus exilis hesperis* |
| Phainopepla | *Phainopepla nitens* |
| Summer tanager | *Piranga rubra* |
| White faced ibis | *Plegadis chihi* |
| Vermilion flycatcher | *Pyrocephalus rubinus* |
| Lucy's warbler | *Vermivora luciae* |
| Arizona Bell's vireo | *Vireo bellii arizonae* |
| **Reptiles** | |
| Banded Gila monster | *Heloderma suspectum cinctum* |
| Chuckwalla | *Sauromalus ater* |
| **Fish** | |
| Flannelmouth sucker | *Catostomus latipinnis* |
| Roundtail chub | *Gila robusta* |
| **Plants** | |
| Las Vegas bearpoppy | *Arctomecon californica* |
| Threecorner milkvetch | *Astragalus geyeri* var. *triquetrus* |
| Las Vegas catseye* | *Cryptantha insolita* |
| Sticky buckwheat | *Eriogonum viscidulum* |
| Rosy twotone beardtongue | *Penstemon bicolor* ssp. *roseus* |

* Taxa presumed extinct

## ENCLOSURE B

FEDERAL AGENCIES' RESPONSIBILITIES UNDER SECTIONS 7 (a) and (c)
OF THE ENDANGERED SPECIES ACT

SECTION 7 (a); Consultation/Conference

Requires:

1) Federal agencies to utilize their authorities to carry out programs to conserve **endangered and threatened species**;

2) Consultation with the Fish and Wildlife Service (Service) when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the Federal agency after determining the action may affect a listed species or critical habitat;

3) Conference with the Service when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat.

SECTION 7 (c): Biological Assessment - Major Construction Activity 1/

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for major construction activities. The BA analyzes the effects of the action on listed and proposed species. The process begins with a Federal agency requesting from the Service a list of proposed and listed threatened and endangered species. The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the list, the accuracy of the species list should be informally verified with the Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may proceed; however, no construction may begin.

We recommend the following for inclusion in the BA:

1. An onsite inspection of the area affected by the proposal which may include a detailed survey of the area to determine if the species or suitable habitat are present.

2. A review of literature and scientific data to determine species distribution, habitat needs, and other biological requirements.

3. Interviews with experts, including those within the Service, State conservation departments, universities, and others who may have data not yet published in scientific literature.

4. An analysis of the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat.

5. An analysis of alternative actions considered.

6. Documentation of study results, including a discussion of study methods used, any problems encountered, and other relevant information.

7. Conclusion as to whether or not a listed or proposed species will be affected.

Upon completion, the BA should be forwarded to our office with a request for consultation, if required.

---

1/ A construction project (or other major undertaking having similar physical impacts) is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332 (2) C).

# Nevada Natural Heritage Program

## Department of Conservation and Natural Resources

1550 East College Parkway, Suite 145 * Carson City, Nevada 89706-7921
voice: (775) 687-4245 fax: (775) 687-1288 web: www.state.nv.us/nvnhp/


9

13 February 2002

Bobby Tuttle
PBS & J
901 North Green Valley Parkway
Henderson, NV 89704

RE: Data request received 19 February 2002

Dear Mr. Tuttle:

We are pleased to provide the information you requested on endangered, threatened, candidate, and/or sensitive plant and animal taxa recorded within or near the Effluent Interceptor project area. We searched our database and maps for the following: a three mile buffer zone utilizing the jpeg map provided in:

| | | |
|---|---|---|
| Township 21S | Range 62E | Section all |
| Township 21S | Range 63E | Section all |

The enclosed printout lists the taxa recorded within the given area. Please be aware that habitat may also be available for: the chuckwalla, *Sauromalus obesus*, a Nevada Bureau of Land Management (BLM) Sensitive Species; the unusual catseye, *Cryptantha insolita*, a Nevada BLM Special Status Species; the spotted bat, *Euderma maculatum*, a Nevada BLM Special Status Species; and the greater western mastiff bat, *Eumops perotis californicus*, a Nevada BLM Sensitive Species. We do not have complete data on various raptors that may also occur in the area; for more information contact Ralph Phenix, Nevada Division of Wildlife at (775) 688-1565. Please note that all cacti, yuccas, and Christmas trees are protected by Nevada state law (NRS 527.060-.120), including taxa not tracked by this office.

Please note that our data are dependent on the research and observations of many individuals and organizations, and in most cases are not the result of comprehensive or site-specific field surveys. Natural Heritage reports should never be regarded as final statements on the taxa or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments.

Thank you for checking with our program. Please contact us for additional information or further assistance.

Sincerely,

Eric S. Miskow
Biologist III/Data Manager

# Sensitive Taxa Recorded nea[illegible]he Effluent Interceptor project area

Compiled by Nevada Natural Heritage Program for PBS&J

19 February 2002

| Scientific name | Common name | Usfws | Blm | Usfs | State | Grank | Townrange | Section | Lat | Long | Prec | Last observed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Plants** | | | | | | | | | | | | |
| *Arctomecon californica* | Las Vegas bearpoppy | <C2 | S | | CE | G3 | 021S063E | 08;09 | 36.133889 | 114.956944 | S | 1993-02-12 |
| *Arctomecon californica* | Las Vegas bearpoppy | <C2 | S | | CE | G3 | 021S062E | 11-14;24;25 | 36.113056 | 115.003889 | S | 1993-06-14 |
| | | | | | | | 021S063E | 05-08;18;19 | | | | |
| *Arctomecon californica* | Las Vegas bearpoppy | <C2 | S | | CE | G3 | 021S063E | 17 | 36.121389 | 114.970000 | S | 1993-06-14 |
| *Arctomecon californica* | Las Vegas bearpoppy | <C2 | S | | CE | G3 | 021S063E | 08;17 | 36.129444 | 114.961944 | S | 1993-02-12 |
| *Penstemon bicolor* ssp. *roseus* | rosy twotone beardtongue | <C2 | | S | | G3T3Q | 021S063E | 14 | 36.122778 | 114.905000 | S | 1980-04-04 |
| **Amphibian** | | | | | | | | | | | | |
| *Bufo microscaphus* | southwestern toad | | N | | | G3G4 | 021S062E | 08 | 36.136111 | 115.077778 | S | 1998-PRE |
| **Reptiles** | | | | | | | | | | | | |
| *Gopherus agassizii* | desert tortoise (Mojave Desert pop.) | LTNL | S | T | YES | G4 | 022S063E | 03 | 36.067500 | 114.935556 | S | 1998-04-29 |
| *Gopherus agassizii* | desert tortoise (Mojave Desert pop.) | LTNL | S | T | YES | G4 | 021S063E | 09 | 36.132500 | 114.941111 | S | 1987-PRE |
| *Gopherus agassizii* | desert tortoise (Mojave Desert pop.) | LTNL | S | T | YES | G4 | 021S063E | 19 | 36.110556 | 114.989167 | S | 1987-PRE |
| *Heloderma suspectum cinctum* | banded Gila monster | <C2NL | S | | YES | G4T4 | 020S062E | | | | G | 1991-06 |
| **Mammals** | | | | | | | | | | | | |
| *Corynorhinus townsendii* | Townsend's big-eared bat | (PS) | N | S,I,L | | G4 | 021S062E | | | | M | 1929-05-31 |
| *Macrotus californicus* | California leaf-nosed bat | <C2 | N | C | | G4 | 021S062E | | | | S | 1946-PRE |
| *Nyctinomops macrotis* | big free-tailed bat | <C2 | N | | | G5 | 022S062E | 13 | 36.041111 | 114.995833 | S | 1964-10-13 |
| **Birds** | | | | | | | | | | | | |
| *Rallus longirostris yumanensis* | Yuma Clapper Rail | LE | | | YES | G5T? | 021S062E | | | | M | 1959-09-19 |
| *Sterna antillarum* | Least Tern | (PS:LE) | S | | YES | G4 | 021S062E | 22 | 36.113333 | 115.029722 | M | 1986-07-06 |

U. S. Fish and Wildlife Service (Usfws) Categories for Listing under the Endangered Species Act:

- LE — Listed Endangered - in danger of extinction in all or a significant portion of its range
- LT — Listed Threatened - likely to be classified as Endangered in the foreseeable future if present trends continue
- <C2 — Former Category 2 Candidate, now species of concern
- NL — Not Listed (no status) in a portion of the species' range
- PS — Partial Status, Protected in a portion of entire species' range

Bureau of Land Management (Blm) Species Classification:

- S — Nevada Special Status Species - USFWS listed, proposed or candidate for listing, or protected by Nevada state law
- N — Nevada Special Status Species - designated Sensitive by State Office

United States Forest Service (Usfs) Species Classification:

- S — Region 4 (Humboldt-Toiyabe NF) sensitive species
- I — Region 5 (Inyo NF) sensitive species
- L — Region 5 (Lake Tahoe Basin Management Unit) sensitive species
- C — Region 5 sensitive species, not yet known from Inyo NF or LTBMU
- T — Region 4 and/or Region 5 Threatened species

Nevada State Protected (State) Species Classification:

Fauna:

- YES — Species protected under NRS 501.

Flora:

- CE — Critically endangered - species whose survival requires assistance because of overexploitation, disease or other factors, or because their habitat is threatened with destruction, drastic modification or severe curtailment (NRS 527.260-.300)

Precision (Prec) of Mapped Occurrence:

Precision, or radius of uncertainty around latitude/longitude coordinates:

- S — Seconds: within a three-second radius
- M — Minutes: within a one-minute radius, approximately 2 km or 1.5 miles
- G — General: within about 8 km or 5 miles, or to map quadrangle or place name

Nevada Natural Heritage Program Global (**Grank**) and State (**Srank**) Ranks for Threats and/or Vulnerability:

- G — Global rank indicator, based on worldwide distribution at the species level
- T — Global trinomial rank indicator, based on worldwide distribution at the infraspecific level
- S — State rank indicator, based on distribution within Nevada at the lowest taxonomic level
  - 1 — Critically imperiled and especially vulnerable to extinction or extirpation due to extreme rarity, imminent threats, or other factors
  - 2 — Imperiled due to rarity or other demonstrable factors
  - 3 — Vulnerable to decline because rare and local throughout its range, or with very restricted range
  - 4 — Long-term concern, though now apparently secure; usually rare in parts of its range, especially at its periphery
  - 5 — Demonstrably secure, widespread, and abundant
    - A — Accidental within Nevada
    - B — Breeding status within Nevada (excludes resident taxa)
    - H — Historical; could be rediscovered
    - N — Non-breeding status within Nevada (excludes resident taxa)
    - Q — Taxonomic status uncertain
    - U — Unrankable
    - Z — Enduring occurrences cannot be defined (usually given to migrant or accidental birds)
    - ? — Assigned rank uncertain

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# Appendix F

Noise Assessment

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# Effluent Interceptor Construction Noise Assessment

## Systems Conveyance and Operations Program

## Clark County, Nevada

## Clean Water Coalition

*B&V Project 069427.0160*

*July 17, 2003*

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# Executive Summary

The Systems Conveyance and Operations Program (SCOP) includes the construction and operation of the Effluent Interceptor (EI) pipeline and the South Lateral Pipeline to be located on private, City of Las Vegas, City of Henderson, Bureau of Land Management (BLM), United States Bureau of Reclamation (USBR), and Clark County land in Nevada. The proposed route currently consists of undeveloped land, land near future developments, the Las Vegas Flood Control Wash, and a wetlands park. The surrounding areas include residential, recreational, and utility uses.

Based on the available information, Clark County, the City of Las Vegas, and the City of Henderson all have noise regulations included in their respective development code (County) or municipal code (City). As such, the construction noise emissions have been evaluated based on these regulations, as applicable.

In order to evaluate the potential noise impacts on the nearest noise sensitive receptors, the noise emissions associated with the construction of the proposed facility have been estimated. If the construction equipment is fitted with typical noise reduction equipment (e.g., mufflers) and is operated in typical fashion, then no significant noise impacts are anticipated to occur to the currently existing nearby residential areas from construction activities.

Some impacts may occur to the planned future residential developments during construction of Reach 1 of the EI and the South Lateral Pipeline. Impacts to the planned residential developments resulting from the construction of Reach 2 and Reach 3 of the EI are expected to be minimal.

# 1.0 Introduction

The proposed route for the SCOP EI is located in Clark County, Nevada. The EI and the South Lateral Pipeline will convey treated effluent from the City of Las Vegas Water Pollution Control Facility (WPCF), the Clark County Water Reclamation District (CCWRD), and the City of Henderson Water Reclamation Facility (WRF) to the EI Terminus. Currently, these three sources discharge effluent into the upper Las Vegas Wash (Wash). The EI will bypass the upper Wash and discharge the combined WPCF and CCWRD effluent at the EI Terminus, a point further downstream, approximately one mile upstream of Lake Las Vegas. The South Lateral Pipeline will bypass the upper Wash and convey WRF effluent to the EI Terminus.

The EI pipeline is divided into three sections, Reaches 1, 2, and 3. The first stretch of the EI, Reach 1, is further divided into two stretches. The first stretch of Reach 1 is approximately 7,200 feet long and will be constructed using cut-and-cover installation. The second stretch of Reach 1 is approximately 420 feet long will be constructed utilizing tunneling methods. Reach 2 is approximately 19,000 feet long and will be constructed using the cut-and-cover method. Reach 3 is approximately 6,500 feet long and will be constructed using tunneling methods. The South Lateral Pipeline is a separate pipeline that connects the City of Henderson WRF to the same terminus that serves the EI. The South Lateral Pipeline will convey effluent from the WRF to the EI Terminus and is approximately 17,500 feet long.

## 2.0 Acoustical Terminology

Noise is often considered unwanted sound. However, human response to sound is complex and is influenced by a variety of acoustic and non-acoustic factors. Acoustic factors generally include the sound's amplitude, duration, frequency content, and fluctuations. Non-acoustic factors typically include the listener's ability to become accustomed to the sound, the listener's attitude towards the noise and the noise source, the listener's view of the necessity of the noise, and the predictability of the noise. As such, response to noise is highly individualized.

Sound energy is physically characterized by amplitude and frequency. Sound amplitude is measured in decibels (dB) as the logarithmic ratio of a sound pressure to a reference sound pressure (20 microPa). The reference sound pressure corresponds to the typical threshold of human hearing. A 3 dB change in a continuous broadband noise is generally considered "just barely perceptible" to the average listener. Similarly, a 5 dB change is generally considered "clearly noticeable" and a 10 dB change is generally considered a doubling (or halving) of the apparent loudness.

Frequency is measured in hertz (Hz), which is the number of cycles per second. The typical human ear can hear frequencies ranging from approximately 20 Hz to 20,000 Hz. Typically, the human ear is most sensitive to sounds in the middle frequencies (1,000 to 8,000 Hz) and is less sensitive to sounds in the low and high frequencies. As such, the A-weighting scale was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighting scale emphasizes sounds in the middle frequencies and de-emphasizes sounds in the low and high frequencies. Any sound level to which the A-weighting scale has been applied is expressed in A-weighted decibels, dBA. For reference, the A-weighted sound pressure level and subjective loudness associated with some common noise sources are listed in Table 2-1.

Frequency is typically divided into nine octave bands ranging from 31 Hz to 8,000 Hz for the purpose of analyzing noise. An octave represents a bandwidth covering a frequency interval with the higher frequency limit being twice the lower frequency limit. For example, the 31 Hz band represents sound energy ranging in frequency from 22 Hz to 44 Hz, where 31 Hz is considered the mean frequency of the band. Similarly, the 8,000 Hz band represents sound energy ranging in frequency from 5,600 Hz to 11,200 Hz, where 8,000 Hz is the mean frequency of the band (*Noise Control for Buildings and Manufacturing Plants).*

**Table 2-1**

Typical Sound Pressure Levels Associated with Common Noise Sources.

| Sound Pressure Level (dBA) | Subjective Evaluation | Environment | |
|---|---|---|---|
| | | Outdoor | Indoor |
| 140 | Deafening | Jet aircraft at 75 ft | |
| 130 | Threshold of pain | Jet aircraft during takeoff at a distance of 300 ft | |
| 120 | Threshold of feeling | Elevated Train | Hard rock band |
| 110 | | Jet flyover at 1000 ft | Inside propeller plane |
| 100 | Very Loud | Power mower, motorcycle at 25 ft, auto horn at 10 ft, crowd noise at football game | |
| 90 | | Propeller plane flyover at 1000 ft, noisy urban street | Full symphony or band, food blender, noisy factory |
| 80 | Moderately Loud | Diesel truck (40 mph) at 50 ft | Inside auto at high speed, garbage disposal, dishwasher |
| 70 | Loud | B-757 cabin during flight | Close conversation, vacuum cleaner, electric typewriter |
| 60 | Moderate | Air-conditioner condenser at 15 ft, near highway traffic | General office |
| 50 | Quiet | | Private office |
| 40 | | Farm field with light breeze, birdcalls | Soft stereo music in residence |
| 30 | Very quiet | Quiet residential neighborhood | Bedroom, average residence (without t.v. and stereo) |
| 20 | | Rustling leaves | Quiet theater, whisper |
| 10 | Just audible | | Human breathing |
| 0 | Threshold of hearing | | |

*Source: Adapted from Architectural Acoustics, M. David Egan, 1988 and Architectural Graphic Standards, Ramsey and Sleeper, 1994.*

Noise in the environment is constantly fluctuating, such as when a car drives by, a dog barks, or a plane passes overhead. Therefore, noise metrics have been developed to quantify fluctuating environmental noise levels. These metrics include the exceedance sound levels. The exceedance sound level, $L_x$, is the sound level exceeded "x" percent of the sampling period and is referred to as a statistical sound level. The most common $L_x$ values are $L_{90}$, $L_{50}$, and $L_{10}$. $L_{90}$ is the sound level exceeded 90 percent of the sampling period. $L_{90}$ represents the sound level without the influence of loud, transient noise sources and is therefore often referred to as the *residual* or *background* sound level. $L_{50}$

is the sound level exceeded 50 percent of the sampling period or the median sound level. $L_{10}$ is the sound level exceeded 10 percent of the sampling period. $L_{10}$ represents the occasional louder noises and is often referred to as the *intrusive* sound level. The variation between the $L_{90}$, $L_{50}$, and $L_{10}$ sound levels can provide an indication of the variability of the acoustical environment. If the acoustical environment is perfectly steady, all values are identical. A large variation between the values indicates the environment experiences highly fluctuating sound levels. For instance, measurements near a roadway with frequent passing vehicles may cause a large variation in the statistical sound levels.

In addition to the statistical sound levels described above, another parameter, $L_{eq}$, is used to represent the equivalent sound pressure level over a specified time period. $L_{eq}$ is the sound level of a steady-state sound that has the same (equivalent) total energy as the time-varying sound of interest, taken over a specified time period and covering a specified set of conditions. Thus, $L_{eq}$ is a single-value level that expresses the time-averaged total energy of a widely varying or fluctuating sound level (*Noise Control for Buildings and Manufacturing Plants)*.

As previously discussed, the $L_{90}$ environmental sound level typically represents the background sound level. Typical background sound levels in various types of communities are outlined in Table 2-2.

**Table 2-2**

Typical Daytime Residual (Background) Sound Pressure Levels in Various Types of Communities.

| Type of Community | Range | Average |
|---|---|---|
| Very Quiet Rural Areas | 31 to 35 dBA | 33 dBA |
| Quiet Suburban Residential | 36 to 40 dBA | 38 dBA |
| Normal Suburban Residential | 41 to 45 dBA | 43 dBA |
| Urban Residential | 46 to 50 dBA | 48 dBA |
| Noisy Urban Residential | 51 to 55 dBA | 53 dBA |
| Very Noisy Urban Residential | 56 to 60 dBA | 58 dBA |

*Source: Adapted from U.S. Environmental Protection Agency, Community Noise, December, 1971.*

# 3.0 Applicable Noise Regulations

Construction of SCOP will take place in the cities of Las Vegas and Henderson in Clark County, NV. As such, the project is subject to local regulations regarding construction noise emissions.

## 3.1 City of Las Vegas

The City of Las Vegas noise regulation falls under Title 9, Health and Safety, of the municipal code. The noise code is subjective in nature. As such, no noise level limits (measured on a decibel scale) are presented. Rather, the noise code prohibits "noise disturbances," defined as "any sound which is unreasonably loud, disturbing or unnecessary or which endangers or injures the health of humans or annoys or disturbs a reasonable person of normal sensitivities." Furthermore, prohibited noises are defined as "any noise disturbance within the corporate boundaries of the City." Since perception of noise is highly individualized, interpretation and enforcement of the Las Vegas noise code is subjective and lacks measurable criteria.

## 3.2 City of Henderson

The City of Henderson noise regulation falls under Title 8, Public Peace and Safety, of the municipal code. Similar to the Las Vegas code, the City of Henderson code contains subjective language prohibiting "noise disturbances." The City of Henderson defines a noise disturbance as "any sound which endangers or injures the safety or health of humans or animals, or annoys or disturbs a reasonable person of normal sensitivities, or endangers or injures personal or real property."

In addition to the prohibition on noise disturbances, the City of Henderson noise code includes octave band sound level limits. The octave band limits are based on obsolete octave bands per Z24.10-1953 which are no longer used but can be converted to the new octave band scale per ANSI S1.11. Both the old limits and the new, converted limits are presented in Table 3-1. The octave band limits are operational performance standards and therefore should not apply to construction activity. They are provided here for informational purposes.

The converted limits equate to an overall sound pressure level of 54 dBA. This overall level is provided for informational purposes only and is not included as part of the City of Henderson noise code.

**Table 3-1**
Maximum Allowable Sound Pressure Level

| Old Octave Band Range, Hz | Old SPL, dB | Octave Center Frequency, Hz | New Converted SPL, dB |
|---|---|---|---|
| Below 75 | 72 | 63 | 70.8 |
| 75-150 | 67 | 125 | 65.1 |
| 151-300 | 59 | 250 | 57.3 |
| 301-600 | 52 | 500 | 50.6 |
| 601-1200 | 46 | 1000 | 44.6 |
| 1201-2400 | 40 | 2000 | 38.6 |
| 2401-4800 | 34 | 4000 | 33.5 |
| Above 4800 | 32 | 8000 | 31.5 |

In addition, the City of Henderson noise code includes correction factors for uneven or discontinuous noises. The correction factors are presented in Table 3-2 below.

**Table 3-2**
Correction to Uneven/Discontinuous Noise

| Noise Source/Timing | Correction, dB |
|---|---|
| Daytime operation only. | +5 |
| Noise source operates less than twenty percent of any one-hour period. | +5 |
| Noise source operates less than five percent of any one-hour period. | +10 |
| Noise of impulsive character such as hammering. | -5 |
| Noise of periodic character such as humming or screeching. | -5 |

## 3.3 Clark County

Clark County has a noise regulation included in Title 30 of the Unified Development Code. However, the requirements of the County noise code do not apply to construction or demolition activities when conducted during daytime hours. As such, the project will not be subject to the County noise regulations if construction activities are limited to daytime hours. Although not specifically defined in the County code, daytime hours are typically defined as the hours between 7:00 a.m. and 10:00 p.m.

If construction activities take place outside of daytime hours then the following octave band limits presented in Table 3-3 shall apply. The octave band limits presented below equate to an overall sound pressure level of 48 dBA. Again, this overall level is provided for informational purposes and is not included as part of the Clark County noise code.

**Table 3-3**

Maximum Permitted Sound Levels

| Octave Band Center Frequency, Hz | Within Residential Districts, dB | | Within Business and Industrial Districts, dB | |
|---|---|---|---|---|
| | Daytime | Nighttime | Daytime | Nighttime |
| 31.5 | 72 | 65 | 76 | 65 |
| 63 | 65 | 58 | 69 | 62 |
| 125 | 58 | 50 | 62 | 54 |
| 250 | 53 | 44 | 58 | 49 |
| 500 | 50 | 40 | 55 | 45 |
| 1000 | 47 | 37 | 52 | 42 |
| 2000 | 43 | 33 | 49 | 38 |
| 4000 | 40 | 30 | 46 | 35 |
| 8000 | 37 | 27 | 43 | 32 |

In the event that impulsive noise emissions related to construction activities are emitted, the sound level limits in Table 3-4 will also apply. Note that these limits do not include A-weighting, as described in Section 2.0 of this report.

**Table 3-4**

Impulsive Noise – Maximum Permitted Sound Levels

| Within Residential Districts, dB | | Within Business and Industrial Districts, dB | |
|---|---|---|---|
| Daytime | Nighttime | Daytime | Nighttime |
| 56 | 46 | 65 | 61 |

## 3.4 U.S. Environmental Protection Agency

The Environmental Protection Agency (USEPA) has identified yearly day-night average sound levels, $L_{dn}$, sufficient to protect public health and welfare from the effects of environmental noise [*EPA Pub. No. 550/9-77, April 1977*]. According to the USEPA, yearly levels are sufficient to protect public health and welfare if they do not exceed an $L_{dn}$ of 55 dBA outdoors in sensitive areas such as residences, schools, and hospitals. The day-night sound level, $L_{dn}$, is the 24-hour average sound level with a 10 dB penalty applied to the nighttime sound levels (10:00 p.m. to 7:00 a.m.) to account for increased sensitivity to noise during nighttime hours. As such, this equates to a constant sound level of 55 dBA during daytime hours and 45 dBA during nighttime hours.

It should be noted that the USEPA has also established an indoor guideline of $L_{dn}$ 45 dBA for residences, schools, hospitals, and churches. The sound attenuation provided by a typical residential home (outdoor-to-indoor noise reduction) is approximately 15 dB with the windows open and 25 dB with the windows closed [*EPA Pub. No. 550/9-74-004, March 1974*]. As such, the USEPA outdoor guideline of $L_{dn}$ 55 dBA would result in corresponding indoor levels below the USEPA indoor guideline.

The USEPA emphasizes that since the protective sound levels were derived without concern for technical or economic feasibility, and contain a margin of safety to ensure their protective value, they must not be viewed as standards, criteria, regulations, or goals. Rather, they should be viewed as levels below which there is no reason to suspect that the general population will be at risk from any of the identified effects of noise. Additionally, the USEPA has no authority to regulate ambient noise levels.

# 4.0 Construction Noise Emissions

The following sections discuss the methodology for estimating the construction activity noise emissions associated with the EI and South Lateral Pipeline construction and the evaluation of the noise levels.

## 4.1 Construction Activities

Major construction phases will consist of site preparation, pipeline installation (either cut-and-cover or tunneling), building structures, and site cleanup. Noise emissions will vary with each phase of construction depending on the construction activity and the associated equipment.

Site preparation will require the use of internal combustion engine powered earth moving equipment. This equipment will include backhoes, scrapers, dump trucks, graders, and front end loaders. Noise emissions during this construction phase will be dominated by the engine noise. Site preparation activities will occur at various locations along the pipeline route.

The pipeline installation will involve trenchers, tunnel boring machines, mobile cranes, earth moving equipment, equipment and materials delivery, welders, air compressors, and a variety of other equipment. A list of specific equipment pieces that will be used is provided in Appendix A.

Construction activities will be scheduled during daytime and evening periods (7:00 a.m. to 10:00 p.m.) to the fullest extent possible. Some activities may require extended hours of operation due to scheduling constraints or to avoid times of increased traffic. Any nighttime construction will be limited to low noise activities to the fullest extent possible.

Site clean-up will generally result in minimal noise emissions. It is anticipated that clean-up will include hauling activities to remove materials off site, collection activities, and final surface restoration.

## 4.2 Construction Equipment Noise Emissions

The variable nature of construction noise is best represented by an average noise level. The average noise levels account for the type and quantity of equipment, the typical usage of each piece of equipment, and the typical noise levels of the equipment used

during each phase of construction. The type of equipment, equipment usage, and equipment noise emissions for typical construction is listed in Appendix A. Furthermore, the information provided in Appendix A is separated for each construction technique (i.e., cut-and-cover and tunneling). Estimates of the construction equipment usage and noise levels are based on information provided in *EPA Document PB-250 430 - Noise Emission Standards for Construction Equipment (EPA 1975)*, *Power Plant Construction Noise Guide*, *Electric Power Plant Environmental Noise Guide*, and available project-specific equipment information provided by the design team.

## 4.3 Impacts from Construction Noise

The variable nature of construction activity makes it difficult to predict construction noise emissions. While the average noise level is one representation of construction activities, certain activities will produce temporary elevations in the noise level.

As discussed, the EI can be divided into four sections, Reach 1, Reach 2, Reach 3, and the South Lateral Pipeline. The first stretch, Reach 1, is further divided into two stretches. The first stretch of Reach 1 is approximately 7,200 feet long and will be installed using cut-and-cover installation. The second stretch of Reach 1, approximately 420 feet long, will utilize tunneling methods for installation. Reach 2 is approximately 19,000 feet long and will be installed using the cut-and-cover method. Reach 3 is approximately 6,500 feet long and will be installed using the tunneling method. The South Lateral Pipeline is approximately 17,500 feet long and will be installed using the cut-and-cover method.

Currently, the nearest residences are located approximately 4,000 feet southwest of the transition point between Reach 1 and Reach 2, as shown on Figure 4-1. In addition to the direct pipe installation activity, a construction staging area is planned near the beginning of Reach 2 on the south side of the construction easement. However, it is anticipated that staging area related noise will be less significant than pipe installation construction.

Future development plans in the project area include residences to be located adjacent to tunnel shafts in Reach 1 and a 1,390-foot portion of the cut-and-cover construction of Reach 1. Also, residences are planned to be located adjacent to approximately 3,400 feet of South Lateral Pipeline cut-and-cover construction. These planned developments are shown on Figure 4-1 as Locations 4 and 5, respectively. It is anticipated that these new residences will be built before construction of the EI and the South Lateral Pipeline is complete. Furthermore, since these residential developments are located so close to the

project it is anticipated that these areas have the greatest potential to be impacted by construction-related noise.

Noise emissions attributable to construction activities are highly variable, depending on the location and operating load of the construction equipment. Based on information provided specific to the EI and on the guidelines provided in the EPA document referenced above, it is anticipated that sound levels from construction activities will be less than 45 dBA at the nearest *current* residences, identified as Location 1 on Figure 4-1. Since the receptors at Location 1 are closest to the construction zone, it is anticipated that the construction sound levels at Locations 2 and 3 will be less than the construction sound levels at Location 1. Appendix A of this report details the calculations and assumptions used to estimate the construction noise emissions. Sound level totals provided in Appendix A are based on a distance of 50 feet. Sound levels will decrease as distance from the contruction site increases.

Based on the EPA guidelines listed in Table 2-2 of this report, 45 dBA is consistent with "*normal suburban residential*" areas. As such, the construction noise emissions are not expected to be significantly disruptive to the currently existing community (i.e., Locations 1, 2, and 3).

Since the EI and the South Lateral Pipeline routes run adjacent to planned residential developments, it is anticipated that these areas will experience the greatest impacts from construction noise. Residences closest to the construction activities could experience sound levels that exceed 75 dBA. Based on Table 2-2, 75 dBA significantly exceeds even "*very noisy urban residential*" communities. For comparison, 75 dBA is typically associated with industrial areas. Due to the variable nature of construction-related noise, though, maximum sound levels should not persist at all times and will fluctuate with the passing of heavy trucks, machinery and intermittent use of the construction equipment.

In addition, due to the variation in human response to noise, it is possible that the highly fluctuating nature of the noise will also negatively impact the nearest residents. As such, two potential impacts could result. The first is the "loudness" of the noise and the second is the "nature" of the noise.

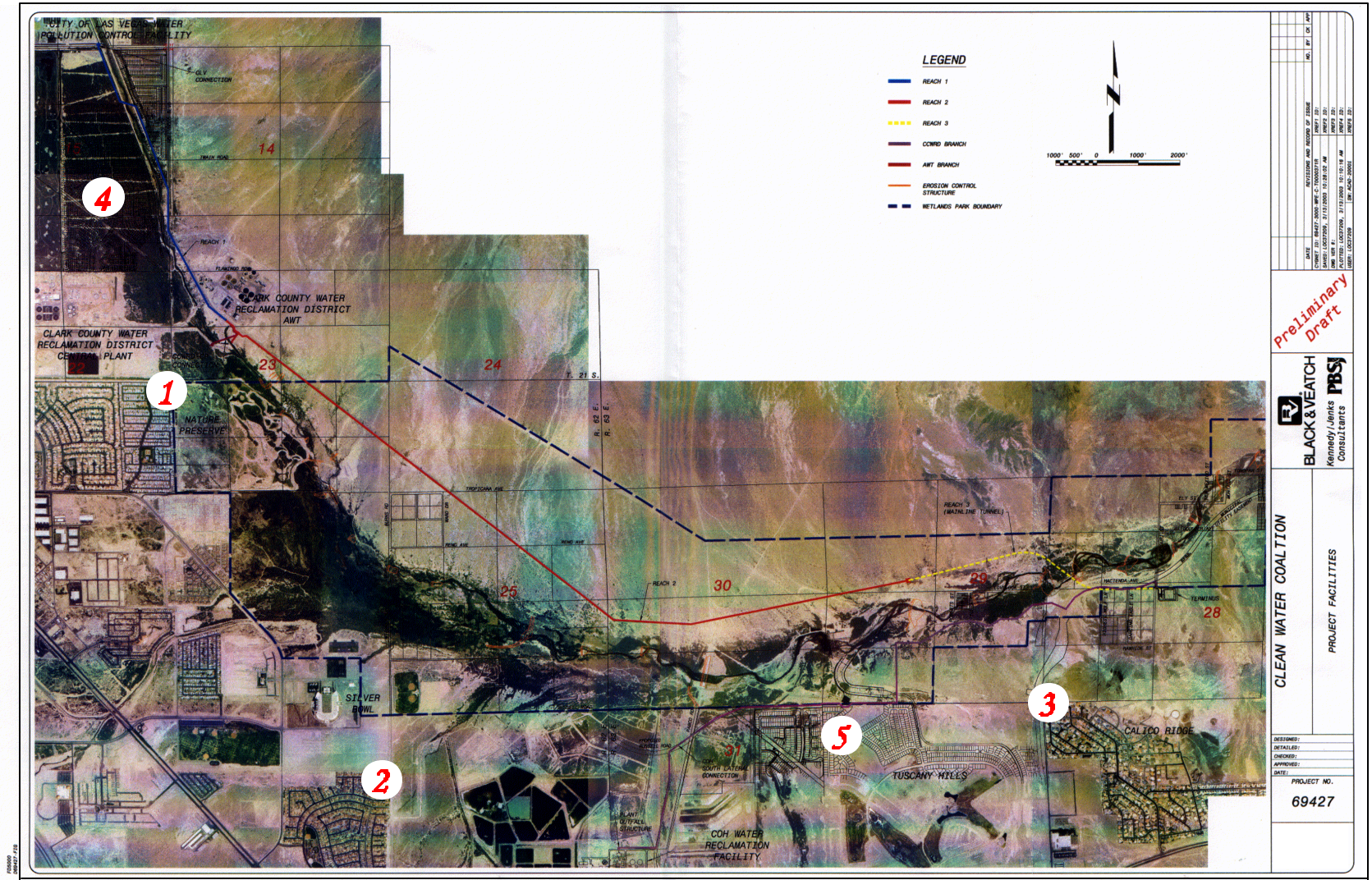



FIGURE 4-1
RECEPTOR LOCATIONS

# 5.0 Conclusions

The EI and South Lateral Pipeline routes are located in the Cities of Las Vegas and Henderson in Clark County, Nevada. Based on the information provided, there are local noise regulations that apply to the project.

Construction noise is highly variable in nature. As such, construction noise is best represented by an average noise level. The average noise level accounts for the type and quantity of equipment being used, the typical usage of each piece of equipment, and typical operating noise levels of each piece of equipment. Based on construction noise guidelines, the noise emissions associated with construction of the SCOP have been estimated and evaluated against applicable regulations as well as community noise parameters.

It is anticpated that construction noise emissions will be less than 45 dBA at the nearest *current* residences, identified as Location 1 in Figure 4-1. Additionally, construction noise emissions at Locations 2 and 3 are expected to be less than levels at Location 1. Forty-five dBA is consistent with "normal suburban residential" areas. As a result, impacts from construction-related noise are not expected to be significant to these three locations.

However, it is anticipated that construction noise emissions could exceed 75 dBA at two planned residential developments, identified as Locations 4 and 5 in Figure 4-1. Seventy-five dBA significantly exceeds typical sound levels associated with community environments. Efforts should be made to minimize, as much as possible, noise-related impacts to these two residential areas. Efforts could include speed limits for delivery trucks, limiting certain construction activities to specific times of the day, and limiting the simultaneous use of the noisiest equipment pieces as much as possible.

# 6.0 References

1. *Noise Control for Buildings and Manufacturing Plants,* Hoover & Keith Inc., Fifteenth Printing, 2001.

2. *Power Plant Construction Noise Guide,* Bolt Beranek and Newman, Inc., May 1977.

3. Beis, D.A. and C.H. Hansen, *Engineering Noise Control.* London: Unwin, 1988.

4. *Noise Emission Standards for Construction Equipment,* Environmental Protection Agency, Document PB-250 430, December 1975.

5. *Community Noise,* Environmental Protection Agency, Document PB 207 124, December 1971.

6. *Toward a National Strategy for Noise Control,* Environmental Protection Agency, Document 550/9-77, April 1977.

7. *Information on Levles of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety,* Environmental Protection Agency, Document 550/9-74-004 (PB-239 429), March 1974.

8. Egan, M. David, *Architectural Acoustics,* McGraw-Hill Publishing Company, New York, 1988.

9. *Electric Power Plant Environmental Noise Guide, 2nd Edition,* Prepared by Bolt Beranek and Newman, Inc. for Edison Electric Institute, Rev. 1984.

# Appendix A

# Construction Noise Emissions Calculation

## Systems Conveyance and Operations Program
### Construction Noise Emissions Estimate

| Construction Type | Equipment | Lp @ 15m (dBA) | Quantity[1] | Usage[2] | Usage Factor Correction[2] | Acoustic Max Factor[3] | Leq @ 15 m (dBA) | Usage Factor Correction | Legend |
|---|---|---|---|---|---|---|---|---|---|
| Cut-and-Cover | Hydraulic Backhoe | 85 | 1 | 0.75 | -1 | 4 | 80.0 | 89-100 | 0 |
| | Grader | 85 | 1 | 0.50 | -3 | 6 | 76.0 | 71-88 | -1 |
| | Front End Loader | 84 | 1 | 0.75 | -1 | 5 | 78.0 | 56-70 | -2 |
| | Crane | 83 | 1 | 0.75 | -1 | 8 | 74.0 | 45-55 | -3 |
| | Hydraulic Drilling Rig | 87 | 1 | 0.75 | -1 | 5 | 81.0 | 36-44 | -4 |
| | Welder | 73 | 1 | 0.10 | -10 | 5 | 58.0 | 28-35 | -5 |
| | Air Compressor | 74 | 1 | 0.10 | -10 | 7 | 57.0 | 23-27 | -6 |
| | Portable Generator | 73 | 1 | 0.10 | -10 | 5 | 58.0 | 18-22 | -7 |
| | Concrete Vibrator | 76 | 1 | 0.40 | -4 | 5 | 67.0 | 15-17 | -8 |
| | Diesel Generator | 78 | 1 | 0.50 | -3 | 5 | 70.0 | 12-14 | -9 |
| | Dozer | 87 | 1 | 0.75 | -1 | 5 | 81.0 | 9-11 | -10 |
| | Compactor | 80 | 1 | 0.50 | -3 | 5 | 72.0 | 5-8 | -12 |
| | Truck, Large | 88 | 1 | 0.85 | -1 | 8 | 79.0 | 3.2-4.9 | -14 |
| | Water Truck | 88 | 1 | 0.85 | -1 | 8 | 79.0 | 2.0-3.1 | -16 |
| | Torque Wrench | 85 | 1 | 0.10 | -10 | 5 | 70.0 | 1.3-1.9 | -18 |
| | Concrete Delivery Truck | 88 | 1 | 0.25 | -6 | 8 | 74.0 | 0.8-1.2 | -20 |
| | Concrete Pump | 82 | 1 | 0.25 | -6 | 5 | 71.0 | | |
| | Concrete Saw | 78 | 1 | 0.10 | -10 | 5 | 63.0 | | |
| | Grinder | 80 | 1 | 0.10 | -10 | 5 | 65.0 | | |
| | | | | | | **Total[4]** | **88.6** | **@ 50 ft** | |

## Systems Conveyance and Operations Program
### Construction Noise Emissions Estimate

**City of Las Vegas WWTF (Reach 1)**

| Construction Type | Equipment | Lp @ 15m (dBA) | Quantity[1] | Usage[2] | Usage Factor Correction[2] | Acoustic Max Factor[3] | Leq @ 15 m (dBA) | Usage Factor Legend | |
|---|---|---|---|---|---|---|---|---|---|
| Tunneling -- Excavation | Delivery Truck | 88 | 1 | 0.40 | 4 | 8 | 76.0 | 89-100 | 0 |
| | Diesel Generator | 78 | 1 | 0.75 | 1 | 5 | 72.0 | 71-88 | -1 |
| | Crane | 83 | 1 | 0.40 | 4 | 8 | 71.0 | 56-70 | -2 |
| | Front End Loader | 84 | 1 | 0.40 | 4 | 5 | 75.0 | 45-55 | -3 |
| | Dump Truck | 88 | 2 | 0.26 | 6 | 8 | 77.0 | 36-44 | -4 |
| | Water Truck | 88 | 1 | 0.26 | 6 | 8 | 74.0 | 28-35 | -5 |
| | Pneumatic Wrench | 85 | 3 | 0.80 | 1 | 5 | 83.8 | 23-27 | -6 |
| | Air Compressor | 74 | 1 | 1.00 | 0 | 7 | 67.0 | 18-22 | -7 |
| | Welder | 73 | 1 | 0.80 | 1 | 5 | 67.0 | 15-17 | -8 |
| | Grinder | 80 | 1 | 0.80 | 1 | 5 | 74.0 | 12-14 | -9 |
| | Vent Fan (20 hp) | 65 | 1 | 1.00 | 0 | 0 | 65.0 | 9-11 | -10 |
| | | | | | | | | 5-8 | -12 |
| | | | | | | | | 3.2-4.9 | -14 |
| | | | | | | | | 2.0-3.1 | -16 |
| | | | | | | | | 1.3-1.9 | -18 |
| | | | | | | | | 0.8-1.2 | -20 |
| | | | | | | **Total[4]** | **86.5** | **@ 50 ft** | |

| Construction Type | Equipment | Lp @ 15m (dBA) | Quantity[1] | Usage[2] | Usage Factor Correction[1] | Acoustic Max Factor[3] | Leq @ 15 m (dBA) | |
|---|---|---|---|---|---|---|---|---|
| Tunneling -- Shaft Excavation | Drill (pneumatic spade) | 85 | 4 | 0.80 | 1 | 5 | 87.0 | |
| | Delivery Truck | 88 | 1 | 0.26 | 6 | 8 | 86.0 | |
| | Diesel Generator | 78 | 1 | 0.75 | 1 | 5 | 74.0 | |
| | Crane | 83 | 1 | 0.40 | 4 | 8 | 79.0 | |
| | Front End Loader | 84 | 1 | 0.40 | 4 | 5 | 83.0 | |
| | Dump Truck | 88 | 2 | 0.26 | 6 | 8 | 89.0 | |
| | Water Truck | 88 | 1 | 0.26 | 6 | 8 | 86.0 | |
| | Pneumatic Wrench | 85 | 3 | 0.80 | 1 | 5 | 85.8 | |
| | Concrete Delivery Truck | 88 | 2 | 0.40 | 4 | 8 | 87.0 | |
| | Grout Pump | 82 | 1 | 0.50 | 3 | 5 | 80.0 | |
| | Air Compressor | 74 | 1 | 1.00 | 0 | 7 | 67.0 | |
| | Welder | 73 | 1 | 0.80 | 1 | 5 | 69.0 | |
| | Grinder | 80 | 1 | 0.80 | 1 | 5 | 76.0 | |
| | Vent Fan (20 hp) | 60 | 1 | 1.00 | 0 | 5 | 55.0 | |
| | | | | | | **Total[4]** | **95.4** | **@ 50 ft** |

| Construction Type | Equipment | Lp @ 15m (dBA) | Quantity[1] | Usage[2] | Usage Factor Correction[1] | Acoustic Max Factor[3] | Leq @ 15 m (dBA) | |
|---|---|---|---|---|---|---|---|---|
| Pipe Placement & Grouting | Concrete Vibrator | 76 | 1 | 0.10 | 10 | 8 | 58.0 | |
| | Delivery Truck | 88 | 3 | 0.26 | 6 | 8 | 78.8 | |
| | Diesel Generator | 78 | 1 | 0.75 | 1 | 5 | 72.0 | |
| | Crane | 83 | 1 | 0.40 | 4 | 8 | 71.0 | |
| | Water Truck | 88 | 1 | 0.26 | 6 | 8 | 74.0 | |
| | Pneumatic Wrench | 85 | 3 | 0.80 | 1 | 5 | 83.8 | |
| | Concrete Delivery Truck | 88 | 2 | 0.40 | 4 | 8 | 79.0 | |
| | Grout Pump | 82 | 1 | 0.50 | 3 | 5 | 74.0 | |
| | Air Compressor | 81 | 1 | 1.00 | 0 | 7 | 74.0 | |
| | Welder | 73 | 1 | 0.80 | 1 | 5 | 67.0 | |
| | Grinder | 80 | 1 | 0.80 | 1 | 5 | 74.0 | |
| | Vent Fan (20 hp) | 60 | 1 | 1.00 | 0 | 5 | 55.0 | |
| | | | | | | **Total[4]** | **87.2** | **@ 50 ft** |

## Systems Conveyance and Operations Program
### Construction Noise Emissions Estimate

**Clark County Sanitation District (Reach 2)**

| Construction Type | Equipment | Lp @ 15m (dBA) | Quantity[1] | Usage[2] | Usage Factor Correction[2] | Acoustic Max Factor[3] | Leq @ 15 m (dBA) | Usage Factor Correction | Legend |
|---|---|---|---|---|---|---|---|---|---|
| Tunneling -- Excavation | Delivery Truck | 88 | 1 | 0.40 | 4 | 8 | 76.0 | 89-100 | 0 |
| | Diesel Generator | 78 | 1 | 0.75 | 1 | *5* | 72.0 | 71-88 | -1 |
| | Crane | 83 | 1 | 0.40 | 4 | 8 | 71.0 | 56-70 | -2 |
| | Front End Loader | 84 | 1 | 0.40 | 4 | 5 | 75.0 | 45-55 | -3 |
| | Dump Truck | 88 | 2 | 0.26 | 6 | 8 | 77.0 | 36-44 | -4 |
| | Water Truck | 88 | 1 | 0.26 | 6 | 8 | 74.0 | 28-35 | -5 |
| | Pneumatic Wrench | 85 | 3 | 0.80 | 1 | *5* | 83.8 | 23-27 | -6 |
| | Air Compressor | 74 | 1 | 1.00 | 0 | 7 | 67.0 | 18-22 | -7 |
| | Welder | 73 | 1 | 0.80 | 1 | *5* | 67.0 | 15-17 | -8 |
| | Grinder | 80 | 1 | 0.80 | 1 | *5* | 74.0 | 12-14 | -9 |
| | Vent Fan (20 hp) | 65 | 1 | 1.00 | 0 | *0* | 65.0 | 9-11 | -10 |
| | | | | | | | | 5-8 | -12 |
| | | | | | | | | 3.2-4.9 | -14 |
| | | | | | | | | 2.0-3.1 | -16 |
| | | | | | | | | 1.3-1.9 | -18 |
| | | | | | | | | 0.8-1.2 | -20 |
| | | | | | | **Total[4]** | **86.5** | **@ 50 ft** | |

| Construction Type | Equipment | Lp @ 15m (dBA) | Quantity[1] | Usage[2] | Usage Factor Correction[1] | Acoustic Max Factor[3] | Leq @ 15 m (dBA) |
|---|---|---|---|---|---|---|---|
| Tunneling -- Shaft Excavation | Hoe Ram (50 hp) | 85 | 1 | 0.40 | 4 | 4 | 85.0 |
| | Drill (pneumatic spade) | 85 | 4 | 0.80 | 1 | *5* | 87.0 |
| | Delivery Truck | 88 | 1 | 0.26 | 6 | 8 | 86.0 |
| | Diesel Generator | 78 | 1 | 0.75 | 1 | *5* | 74.0 |
| | Crane | 83 | 1 | 0.40 | 4 | 8 | 79.0 |
| | Front End Loader | 84 | 1 | 0.40 | 4 | 5 | 83.0 |
| | Foundation Drill | 85 | 1 | 0.80 | 1 | *5* | 81.0 |
| | Dump Truck | 88 | 2 | 0.26 | 6 | 8 | 89.0 |
| | Water Truck | 88 | 1 | 0.26 | 6 | 8 | 86.0 |
| | Pneumatic Wrench | 85 | 3 | 0.80 | 1 | *5* | 85.8 |
| | Concrete Delivery Truck | 88 | 2 | 0.40 | 4 | 8 | 87.0 |
| | Grout Pump | 82 | 1 | 0.50 | 3 | *5* | 80.0 |
| | Air Compressor | 74 | 1 | 1.00 | 0 | 7 | 67.0 |
| | Welder | 73 | 1 | 0.80 | 1 | *5* | 69.0 |
| | Grinder | 80 | 1 | 0.80 | 1 | *5* | 76.0 |
| | Vent Fan (20 hp) | 60 | 1 | 1.00 | 0 | *5* | 55.0 |
| | | | | | | **Total[4]** | **95.9** **@ 50 ft** |

| Construction Type | Equipment | Lp @ 15m (dBA) | Quantity[1] | Usage[2] | Usage Factor Correction[1] | Acoustic Max Factor[3] | Leq @ 15 m (dBA) |
|---|---|---|---|---|---|---|---|
| Pipe Placement & Grouting | Concrete Vibrator | 76 | 1 | 0.10 | 10 | *8* | 58.0 |
| | Delivery Truck | 88 | 3 | 0.26 | 6 | 8 | 78.8 |
| | Diesel Generator | 78 | 1 | 0.75 | 1 | *5* | 72.0 |
| | Crane | 83 | 1 | 0.40 | 4 | 8 | 71.0 |
| | Water Truck | 88 | 1 | 0.26 | 6 | 8 | 74.0 |
| | Concrete Delivery Truck | 88 | 2 | 0.40 | 4 | 8 | 79.0 |
| | Grout Pump | 82 | 1 | 0.50 | 3 | *5* | 74.0 |
| | Air Compressor | 81 | 1 | 1.00 | 0 | 7 | 74.0 |
| | Vent Fan (20 hp) | 60 | 1 | 1.00 | 0 | *5* | 55.0 |
| | | | | | | **Total[4]** | **84.1** **@ 50 ft** |

## Systems Conveyance and Operations Program
### Construction Noise Emissions Estimate

**Main Tunnel Working Shaft (Reach 3)**

| Construction Type | Equipment | Lp @ 15m (dBA) | Quantity[1] | Usage[2] | Usage Factor Correction[2] | Acoustic Max Factor[3] | Leq @ 15 m (dBA) | Usage Factor Legend | |
|---|---|---|---|---|---|---|---|---|---|
| Tunneling -- Excavation | Boom Truck | 88 | 1 | 0.40 | 4 | 8 | 76.0 | 89-100 | 0 |
| | Delivery Truck | 88 | 2 | 0.40 | 4 | 8 | 79.0 | 71-88 | -1 |
| | Diesel Generator | 78 | 1 | 0.75 | 1 | *5* | 72.0 | 56-70 | -2 |
| | Crane | 83 | 1 | 0.40 | 4 | 8 | 71.0 | 45-55 | -3 |
| | Front End Loader | 84 | 1 | 0.40 | 4 | 5 | 75.0 | 36-44 | -4 |
| | Dump Truck | 88 | 2 | 0.26 | 6 | 8 | 77.0 | 28-35 | -5 |
| | Water Truck | 88 | 2 | 0.26 | 6 | 8 | 77.0 | 23-27 | -6 |
| | Pneumatic Wrench | 85 | 3 | 0.80 | 1 | *5* | 83.8 | 18-22 | -7 |
| | Dozer | 87 | 1 | 0.40 | 4 | 5 | 78.0 | 15-17 | -8 |
| | Air Compressor | 74 | 1 | 1.00 | 0 | 7 | 67.0 | 12-14 | -9 |
| | Welder | 73 | 1 | 0.80 | 1 | *5* | 67.0 | 9-11 | -10 |
| | Grinder | 80 | 1 | 0.80 | 1 | *5* | 74.0 | 5-8 | -12 |
| | Vent Fan (50 hp) | 65 | 1 | 1.00 | 0 | *0* | 65.0 | 3.2-4.9 | -14 |
| | | | | | | | | 2.0-3.1 | -16 |
| | | | | | | | | 1.3-1.9 | -18 |
| | | | | | | | | 0.8-1.2 | -20 |
| | | | | | | **Total[4]** | **87.9** | **@ 50 ft** | |

| Construction Type | Equipment | Lp @ 15m (dBA) | Quantity[1] | Usage[2] | Usage Factor Correction[1] | Acoustic Max Factor[3] | Leq @ 15 m (dBA) |
|---|---|---|---|---|---|---|---|
| Tunneling -- Shaft Excavation | Sinking Drills | 85 | 4 | 0.40 | 4 | 4 | 91.0 |
| | Delivery Truck | 88 | 1 | 0.26 | 6 | 8 | 86.0 |
| | Diesel Generator | 78 | 1 | 0.75 | 1 | *5* | 74.0 |
| | Crane | 83 | 1 | 0.40 | 4 | 8 | 79.0 |
| | Front End Loader | 84 | 1 | 0.40 | 4 | 5 | 83.0 |
| | Dump Truck | 88 | 2 | 0.26 | 6 | 8 | 89.0 |
| | Water Truck | 88 | 1 | 0.26 | 6 | 8 | 86.0 |
| | Pneumatic Wrench | 85 | 3 | 0.80 | 1 | *5* | 85.8 |
| | Concrete Delivery Truck | 88 | 2 | 0.40 | 4 | 8 | 87.0 |
| | Grout Pump | 82 | 1 | 0.50 | 3 | *5* | 80.0 |
| | Air Compressor | 74 | 4 | 1.00 | 0 | 7 | 73.0 |
| | Welder | 73 | 1 | 0.80 | 1 | *5* | 69.0 |
| | Grinder | 80 | 1 | 0.80 | 1 | *5* | 76.0 |
| | Vent Fan (20 hp) | 60 | 1 | 1.00 | 0 | *5* | 55.0 |
| | | | | | | **Total[4]** | **96.2** |

## Systems Conveyance and Operations Program
### Construction Noise Emissions Estimate

**Main Tunnel Retrieval Shaft (Reach 3)**

| Construction Type | Equipment | Lp @ 15m (dBA) | Quantity[1] | Usage[2] | Usage Factor Correction[1] | Acoustic Max Factor[3] | Leq @ 15 m (dBA) | |
|---|---|---|---|---|---|---|---|---|
| Tunneling -- Shaft Excavation | Hoe Ram (50 hp) | 85 | 1 | 0.40 | 4 | 4 | 85.0 | |
| | Drill (pneumatic spade) | 85 | 4 | 0.80 | 1 | *5* | 87.0 | |
| | Delivery Truck | 88 | 1 | 0.26 | 6 | 8 | 86.0 | |
| | Diesel Generator | 78 | 1 | 0.75 | 1 | *5* | 74.0 | |
| | Crane | 83 | 1 | 0.40 | 4 | 8 | 79.0 | |
| | Front End Loader | 84 | 1 | 0.40 | 4 | 5 | 83.0 | |
| | Foundation Drill | 85 | 1 | 0.80 | 1 | *5* | 81.0 | |
| | Dump Truck | 88 | 2 | 0.26 | 6 | 8 | 89.0 | |
| | Water Truck | 88 | 1 | 0.26 | 6 | 8 | 86.0 | |
| | Pneumatic Wrench | 85 | 3 | 0.80 | 1 | *5* | 85.8 | |
| | Concrete Delivery Truck | 88 | 2 | 0.40 | 4 | 8 | 87.0 | |
| | Grout Pump | 82 | 1 | 0.50 | 3 | *5* | 80.0 | |
| | Air Compressor | 74 | 1 | 1.00 | 0 | 7 | 67.0 | |
| | Welder | 73 | 1 | 0.80 | 1 | *5* | 69.0 | |
| | Grinder | 80 | 1 | 0.80 | 1 | *5* | 76.0 | |
| | Vent Fan (20 hp) | 60 | 1 | 1.00 | 0 | *5* | 55.0 | |
| | | | | | | **Total[4]** | **95.9** | **@ 50 ft** |

| Construction Type | Equipment | Lp @ 15m (dBA) | Quantity[1] | Usage[2] | Usage Factor Correction[1] | Acoustic Max Factor[3] | Leq @ 15 m (dBA) | |
|---|---|---|---|---|---|---|---|---|
| Pipe Placement & Grouting | Concrete Vibrator | 76 | 1 | 0.10 | 10 | *8* | 58.0 | |
| | Delivery Truck | 88 | 1 | 0.26 | 6 | 8 | 74.0 | |
| | Diesel Generator | 78 | 1 | 0.75 | 1 | *5* | 72.0 | |
| | Boom Truck | 88 | 1 | 0.40 | 4 | 8 | 76.0 | |
| | Water Truck | 88 | 1 | 0.26 | 6 | 8 | 74.0 | |
| | Concrete Delivery Truck | 88 | 2 | 0.40 | 4 | 8 | 79.0 | |
| | Grout Pump | 82 | 1 | 0.50 | 3 | *5* | 74.0 | |
| | Air Compressor | 81 | 1 | 1.00 | 0 | 7 | 74.0 | |
| | Vent Fan (20 hp) | 60 | 1 | 1.00 | 0 | *5* | 55.0 | |
| | | | | | | **Total[4]** | **83.7** | **@ 50 ft** |

NOTES:

1. Based on information provided by the project design team.
2. Based on Table 4.5-1, Summary of Construction Equipment Types, Sound Levels and Usage Factors, Electric Power Plant Environmental Noise Guide, 2nd Edition; Edison Electric Institute; Prepared by Bolt, Beranek and Newman Inc., 1984.
3. With the exception of italicized values, the AMF reductions are based on Table B.5, Measured and Suggested Acoustic Max Factor for Construction Equipment and Plant Noise Sources, Power Plant Construction Noise Guide; Bolt, Beranek and Newman Inc., 1977. Italicized values are based on in-house data and previous experience.
4. Assumes simultaneous operation of all equipment from similar distances. The overall sound level may decrease when certain equipment pieces are not in use.

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# Appendix G

Air Quality

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# G.0 Air Quality

Impacts to air quality would result from construction activities. Operation of the Effluent Interceptor (EI) and Lake Conveyance System (LCS) would not result in impacts to air quality.

Construction of the EI and LCS would require the following actions or activities:

- Installation of erosion controls, clearing and staging area preparation;
- Excavation and placement of pipeline;
- Backfilling, compaction and grading of disturbed soils over installed pipeline;
- Construction and installation of manways;
- Grading and paving of "chat" trails;
- Shaft excavation;
- Tunnel excavation;
- Tunnel lining and grouting;
- Shaft lining and backfill;
- Dredging of sediments from Lake Mead;
- Fusing of the High-density Polyethylene (HDPE) pipe;
- Construction of ancillary facilities and structures; and
- Ongoing final grading and re-vegetation of disturbed soils as projects are completed.

In order to assess potential impacts to air resources from construction activities, the magnitude of the air pollutants emitted during the different construction segments were estimated. This included an estimation of fugitive dust emissions from soil disturbances and criteria pollutants emissions from construction equipment exhaust.

## G.1 Fugitive Dust Emissions

Fugitive dust is produced from soil disturbances, materials handling, transfer and storage, and vehicle traffic at the construction sites. Fugitive dust emissions from soil disturbances and movement of construction equipment are estimated using the amount of soil to be disturbed and emission factors based on Section 13.2.3 of AP-42 (U.S. Environmental Protection Agency [EPA] 1995a). For this analysis, fugitive dust emissions are those emissions that would be generated from construction activities during a one-month period. This time period was selected because Clark County regulations for active construction sites require stabilization of disturbed soils within one month.

The majority of particles generated from the mechanical disturbance of soil are coarse particles, typically ranging from 10 to 1,000 microns (μm) in aerodynamic diameter. Ground-level emissions of mechanically generated particles are likely to be removed close to the source due to gravitational settling and impaction on nearby obstacles (Countess et al. 2001). A study

(Chow et al. 1999) found that up to one-half the mass of dust generated from construction activities does not attain an elevation above 6.6 feet (ft) (2 meter [m]).

A particle would be removed from the ambient air by gravitational settling if the time it takes the particle to settle to the ground is less than the time it takes the volume of air containing the particle to leave the site. The time it takes for a particle to settle to the ground due to gravity is called the gravitational settling time. The gravitational settling time can be estimated from the terminal velocity of the particle and the elevation at which the particle is released. The time for the volume of air that contains the particle to leave the site can be determined from the wind speed and the distance to the boundary of the property.

At a temperature of 80 degree Fahrenheit (ºF) (27 degree Celsius [ºC]), a soil particle with an aerodynamic diameter of 10 µm has a terminal velocity of 0.0116 feet per second (0.004 m/second). When this particle is released at a height of 6.6 ft (2 m), it takes 564 seconds for the particle to reach the ground. During this same amount of time, using the average daytime wind speed for the Las Vegas area (3.85 mile per hour [mph] [6196 m/hour]), if the particle encounters no obstacles, it would travel approximately 3,185 ft (971 m) horizontally in the direction the wind blows. A particle with an aerodynamic diameter of 15 µm would reach the ground in about 251 seconds.

Because gravitational settling and obstacles would be present to reduce the travel of coarse-sized particles (>10 µm) from the site, impacts to air resources would focus on fugitive dusts with an aerodynamic diameter less than 10 µm. These particles are more likely to become entrained in the ambient air.

Fugitive dust emissions are estimated for dust generated by construction activities that is classified as particulate matter less than 10 µm in diameter ($PM_{10}$). Fugitive dust emissions have been estimated for the case where no controls are used to reduce formation of dust and for the case where construction activities are conducted in compliance with Clark County air quality regulations. To estimate uncontrolled $PM_{10}$ emissions from earth disturbances, an emission factor of 0.42 tons $PM_{10}$ per acre per month is used. This value comes from the $PM_{10}$ State Implementation Plan for Clark County (Clark County 2001). Fugitive dust emissions for each segment of the EI and the LCS alternatives are provided in Table G.1-1.

## G.2 Construction Equipment Exhaust Emission Factors

To estimate exhaust emissions from construction equipment, the emission standards (40 CFR 89.112) promulgated for non-road equipment diesel engines were used for most criteria pollutants. Sulfur dioxide ($SO_2$) emissions from non-road diesel engines are not regulated as an emission standard, rather the sulfur content of diesel fuel is regulated.

Sulfur dioxide emissions are directly proportional to the sulfur content of the fuel. A maximum fuel sulfur content of 500 parts per million (ppm)[1] by weight and brake-specific fuel consumption of 0.325 lb-fuel per horsepower (hp) -hour was used to estimate $SO_2$. The brake-specific fuel consumption is the amount of fuel consumed by the engine to produce the rated hp for a period of one hour.

[1] Current regulatory standard for diesel fuel.

Table G.1-1 Fugitive Dust ($PM_{10}$) Emissions from Construction Activities.

| Source | Construction Disturbance [1] ($ft^2$) | Uncontrolled $PM_{10}$ Emissions [2] (tons) | Uncontrolled $PM_{10}$ Emissions [3] (tons/year) | $PM_{10}$ Emissions after Controls [4] (tons) | $PM_{10}$ Emissions after Controls [3] (tons/year) |
|---|---|---|---|---|---|
| **EI-Alignment A 28 mos.)[5]** | | | | | |
| Reach 1 | 1,245,625 | 12.0 | ----- | 6.0 | ----- |
| Reach 2 | 1,290,000 | 12.4 | ----- | 6.2 | ----- |
| Reach 3 | 161,172 | 1.6 | ----- | 0.8 | ----- |
| COH Forcemain | 434,625 | 4.2 | ----- | 2.1 | ----- |
| AWT Pipeline | 6,050 | 0.1 | ----- | 0.0 | ----- |
| CCWRD Conn. | 10,425 | 0.1 | ----- | 0.1 | ----- |
| EI Terminus | 1,021 | 0.0 | ----- | 0.0 | ----- |
| **Total** | | **30.4** | **13.0** | **15.2** | **6.5** |
| **EI-Alignment B (28 mos.)** | | | | | |
| Reach 1 | 1,245,625 | 12.0 | ----- | 6.0 | ----- |
| Reach 2 | 1,314,565 | 12.7 | ----- | 6.3 | ----- |
| Reach 3 | 161,172 | 1.6 | ----- | 0.8 | ----- |
| South lateral | 737,645 | 7.1 | ----- | 3.6 | ----- |
| AWT Pipeline | 6,050 | 0.1 | ----- | 0.0 | ----- |
| CCWRD Conn. | 10,425 | 0.1 | ----- | 0.1 | ----- |
| EI Terminus | 377,500 | 3.6 | ----- | 1.8 | ----- |
| **Total** | | **37.2** | **15.9** | **18.6** | **8.0** |
| **Boulder Islands North LCS** | | | | | |
| NRMT3-West Tunnel (35 mos.) | 450,000 | 4.3 | 1.5 | 2.2 | 0.7 |
| NRMT3-East Tunnel (67 mos.) | 450,000 | 4.3 | 0. 8 | 2.2 | 0.4 |
| BINDP (15 mos.) | 363,000 | 3.5 | 1.8 | 3.5 | 1.8 |
| HPRS | 43,560 | 0.4 | 0.2 | 0.4 | 0.2 |
| **Total** | | **12.5** | **3.5** | **8.3** | **3.1** |
| **Boulder Islands South LCS** | | | | | |
| SRMT3-West Tunnel (35 mos.) | 450,000 | 4.3 | 1.5 | 2.2 | 0.7 |
| SRMT3-East Tunnel (67 mos.) | 450,000 | 4.3 | 0.8 | 2.2 | 0.4 |
| BISOP (8 mos.) | 440,000 | 4.2 | 4.2 | 2.1 | 2.1 |
| BISDP (15 mos.) | 126,500.0 | 1.2 | 0.6 | 1.2 | 0.6 |
| **Total** | | **14.0** | **7.1** | **7.7** | **3.8** |

Table G.1-1 Fugitive Dust ($PM_{10}$) Emissions from Construction Activities (continued).

| Source | Construction Disturbance [1] ($ft^2$) | Uncontrolled $PM_{10}$ Emissions [2] (tons) | Uncontrolled $PM_{10}$ Emissions [3] (tons/year) | $PM_{10}$ Emissions after Controls [4] (tons) | $PM_{10}$ Emissions after Controls [3] (tons/year) |
|---|---|---|---|---|---|
| **Las Vegas Bay LCS** | | | | | |
| LVBT1 (39 mos.) | 450,000 | 4.3 | 1.3 | 2.2 | 0.7 |
| LVBT2 (64 mos.) | 456,000 | 4.4 | 0.8 | 2.2 | 0.4 |
| Las Vegas Bay Diffuser (6 mos.) | 360,000 | 3.5 | 3.5 | 1.7 | 1.7 |
| **Total** | | **12.2** | **5.6** | **6.1** | **2.8** |

Notes:

[1] Soil disturbed is from cut-and-cover construction, staging areas, chat trail construction and tunnel retrieval and working shafts.

[2] Fugitive dust emissions reported only for dust with an aerodynamic diameter less than or equal to ≤ 10 µm. Uncontrolled $PM_{10}$ emissions from earth disturbances were calculated using an emission factor of 0.42 tons $PM_{10}$ per acre (i.e. 3,148,917.5 $ft^2$ ÷ 4,3560 [$ft^2$ per acre] = 72.3 acres x 0.42 [tons per acre] = 30.36 tons). The value of 0.42 tons $PM_{10}$ per acre comes from the $PM_{10}$ State Implementation Plan (SIP) for Clark County (Clark County 2001).

[3] Emissions per year were calculated by dividing total emissions (tons) by number of construction months and then multiplying by 12 months. (i.e. 30.36 tons ÷ 28 months = 1.08428 tons per month x 12 months = 13.01 tons per year)

[4] Controls include those required in the Clark County SIP for construction activities (Clark County 2001). Controlled $PM_{10}$ emissions were calculated using an emission factor of 0.21 tons $PM_{10}$ per acre.

[5] The number of months (mos.) for construction is indicated in parenthesis.

$SO_2$ emission factor =
(500 lb-S/1000000 lb-fuel) x (0.325 lb-fuel/hp-hr) x (1 mole-S/32 lb-S) x
(1 mole-$SO_2$/1 mole-S) x (64 lb-$SO_2$/1 mole-$SO_2$) x 453.6 grams/lb
$SO_2$ emission factor = 0.147 grams/hp-hr

Emission factors for other criteria pollutants are listed in Table G.2-1. The emission factors are given in grams of pollutant per hp-hour.

## G.3 On-road Diesel Vehicle Emission Factors

Emissions of nitrogen dioxide ($NO_x$) and $PM_{10}$ from on-road vehicles such as haul trucks and water trucks that are present at the construction sites were estimated using 2004 calendar year emission standards codified in 40 CFR Part 86. The $SO_2$ emission factor was calculated in the same manner as non-road engines, but a sulfur content of 15 ppm in fuel was used. This is because the sulfur content of diesel fuel used in on-road engines cannot exceed 15 ppm after 2006.

Table G.2-1 Construction Equipment Emission Factors.

| Rated Power (hp) | Model Year Standard | $NO_x$ + VOC (g/hr) | CO (g/hr) | $PM_{10}$ (g/hr) |
|---|---|---|---|---|
| 100 < size ≤ 175 | 2003 | 4.9 | 3.7 | 0.22 |
| 175 < size ≤ 300 | 2003 | 4.9 | 2.6 | 0.15 |
| 300 < size ≤ 600 | 2001 | 4.8 | 2.6 | 0.15 |
| 600 < size ≤ 750 | 2002 | 4.8 | 2.6 | 0.15 |
| 100 < size ≤ 175 | 2007 | 3.0 | 3.7 | 0.22 |
| 175 < size ≤ 300 | 2006 | 3.0 | 2.6 | 0.15 |
| 300 < size ≤ 600 | 2006 | 3.0 | 2.6 | 0.15 |
| 600 < size ≤ 750 | 2006 | 3.0 | 2.6 | 0.15 |

Engine emissions testing data[2] was used to determine an average emission factor for carbon monoxide (CO) emissions from on-road engines. This same data was used to determine an average brake-specific hp for estimating the $SO_2$ emission factor. Emission factors for on-road engines are listed in Table G.3-1.

Table G.3-1 On-road Diesel Emission Factors.

| Pollutant | Emission Factor (g/hp-hr) |
|---|---|
| $PM_{10}$ | 0.1000 |
| $NO_x$ + VOC | 2.5000 |
| CO | 0.3450 |
| $SO_2$ | 0.0050 |

## G.4 Construction Equipment for Cut-and-Cover Activities

The equipment listed in Table G.4-1 was assumed to be part of daily operations at each construction site for cut-and-cover construction associated with installation of the pipeline. The hourly exhaust pollutant emissions provided in the table assume that the equipment is operating continuously during the hour.

## G.5 Construction Equipment for Tunneling

The equipment listed in Table G.5-1 would be used in different phases of tunnel construction. The maximum daily number of each type of equipment is presented in the table. Hourly emissions from construction equipment, assuming continuous operation is also presented.

[2] Information provided by Mack Trucks Inc. to the Maryland Department of the Environment, March 2004. Data for model year 2004 engines whose size ranges from 350 to 460 hp.

Table G.4-1 Cut-and-Cover Construction Equipment and Hourly Pollutant Emissions.

| Equipment | Size (hp) | Number Per Day | CO (g/hr) | $SO_2$ (g/hr) | $NO_x$ +VOC (g/hr) | $PM_{10}$ (g/hr) |
|---|---|---|---|---|---|---|
| Backhoe/Front-end Loader | 115 | 1 | 425.5 | 16.9 | 563.5 | 25.3 |
| D-6 Dozer | 175 | 1 | 455.0 | 25.7 | 857.5 | 38.5 |
| Compactor | 250 | 1 | 650.0 | 36.8 | 1,225.0 | 37.5 |
| Grader | 175 | 1 | 455.0 | 25.7 | 857.5 | 38.5 |
| 65-ton Crane | 250 | 1 | 650.0 | 36.8 | 1,225.0 | 37.5 |
| Haul Trucks | 350 | 54 | 845.6 | 12.3 | 6,125.0 | 245.0 |
| Water Truck | 350 | 1 | 120.8 | 1.8 | 875.0 | 35.0 |

Table G.5-1 Tunneling Construction Equipment and Hourly Pollutant Emissions.

| Equipment | Size (hp) | Number Per Day | CO (g/hr) | $SO_2$ (g/hr) | $NO_x$ + VOC (g/hr) | $PM_{10}$ (g/hr) |
|---|---|---|---|---|---|---|
| Bulldozer | 175 | 1 | 425.5 | 16.9 | 563.5 | 25.3 |
| Grader | 175 | 1 | 425.5 | 16.9 | 563.5 | 25.3 |
| 65-ton Crane | 250 | 1 | 650.0 | 36.8 | 1,225.0 | 37.5 |
| Delivery/Haul Trucks | 350 | 70 | 1,087.0 | 15.8 | 7,875.0 | 315.0 |
| Water Truck | 350 | 1 | 120.8 | 1.8 | 875.0 | 35.0 |
| Tunnel Boring Machine | -- | -- | -- | -- | -- | -- |

## G.6 Construction Equipment for Fabrication of Sub-aqueous Diffuser Sections

The diffuser sections for the LCS would require dredging of sediments from Lake Mead, fusing HDPE pipeline, laying the pipeline in Lake Mead, and covering the pipeline so it remains in place. Barges would be used to hold equipment used for the dredging and pipe installation. A clamshell dredge mounted on a crane would be used to remove sediments from Lake Mead. Another crane would be used to load the dredged material into haul trucks for disposal. A small tugboat or workboat would be available as needed to move the barges. Equipment and hourly emissions of criteria pollutants are given in Table G.6-1.

## G.7 Estimation of Emissions

Although a variety of construction equipment is needed for construction of the EI and LCS alternatives, not all construction activities occur simultaneously. To determine impacts to air resources, the first step was to determine what 12-month sequence of construction activities

Table G.6-1 Diffuser Construction Equipment and Hourly Pollutant Emissions.

| Equipment | Size (hp) | Number (per day) | CO Emissions (g/hr) | $SO_2$ Emissions (g/hr) | $NO_x$ + VOC Emissions (g/hr) | $PM_{10}$ Emissions (g/hr) |
|---|---|---|---|---|---|---|
| 65-ton Crane | 250 | 1 | 650.0 | 36.8 | 1,225.0 | 37.5 |
| 75-ton Crane | 350 | 1 | 910.0 | 51.5 | 1,680.0 | 52.5 |
| Backhoe/Front-end Loader | 175 | 1 | 425.5 | 16.9 | 563.5 | 25.3 |
| Grader | 195 | 1 | 507.0 | 28.7 | 955.5 | 29.3 |
| Haul Trucks | 350 | 30 | 483.2 | 7.0 | 3,500.0 | 140.0 |

resulted in the maximum number of construction equipment used on the site. This was determined from the proposed construction schedule and sequencing of construction activities. The *RSMeans Heavy Construction Cost Data* manual (Reed Construction Data 2003) was used to determine the type and size equipment used for the various construction activities, as well as the daily construction progress. The daily construction progress estimate was used for the determination of the number of material delivery trucks and haul trucks needed to support the construction activities.

In addition, for all construction activities, a maximum of three diesel support vehicles and three gasoline-fueled support vehicles are assumed to operate continuously throughout the day. Based on these estimates, the worst-case 12-month construction period emissions were determined, assuming an 8-hour day, 6 days per week. These estimates are provided in Tables G.7-1 through G.7-5 for EI-Alignment A, EI-Alignment B, Boulder Island North LCS, Boulder Islands South LCS, and Las Vegas Bay LCS.

Table G.7-1 EI- Alignment A Maximum Daily Construction Equipment Exhaust Pollutant Emissions.

| Equipment | Maximum On Site (per hour) | CO Emissions (g/hr) | $NO_x$ + VOC Emissions (g/hr) | $PM_{10}$ Emissions (g/hr) | $SO_2$ Emissions (g/hr) |
|---|---|---|---|---|---|
| 65-ton Crane | 3 | 1,950 | 3,675 | 112.5 | 110.4 |
| Front-end loader | 3 | 1,277 | 1,691 | 75.9 | 50.7 |
| Grader | 3 | 1,365 | 2,573 | 115.5 | 77.1 |
| Dozers | 3 | 1,365 | 2,573 | 115.5 | 86.1 |
| Water Trucks | 2 | 242 | 1,750 | 70 | 3.5 |
| Haul Trucks for excavated materials | 4 | 483 | 3,500 | 140 | 7 |
| Haul Trucks for fill material | 2 | 242 | 1,750 | 70 | 3.5 |
| Pipe delivery trucks | 1 | 121 | 875 | 35 | 1.8 |
| Support vehicles – diesel | 3 | 362 | 2,625 | 105 | 10.5 |

Table G.7-1 EI- Alignment A Maximum Daily Construction Equipment Exhaust Pollutant Emissions (continued).

| Equipment | Maximum On Site (per hour) | CO Emissions (g/hr) | $NO_x$ + VOC Emissions (g/hr) | $PM_{10}$ Emissions (g/hr) | $SO_2$ Emissions (g/hr) |
|---|---|---|---|---|---|
| Support vehicles – gasoline | 3 | 375 | 45 | 9 | 5.3 |
| Total Hourly Emissions (g/hr) | -- | **7,781.1** | **21,056.0** | **848.4** | **355.8** |
| Total Daily Emissions (lb/day) | -- | **137.3** | **371.4** | **15.0** | **6.3** |
| 12-month emissions (tons) | -- | **21.4** | **57.9** | **2.3** | **1.0** |

Table G.7-2 EI-Alignment B Maximum Daily Construction Equipment Exhaust Pollutant Emissions.

| Equipment | Maximum On Site (per hour) | CO Emissions (g/hr) | $NO_x$ + VOC Emissions (g/hr) | $PM_{10}$ Emissions (g/hr) | $SO_2$ Emissions (g/hr) |
|---|---|---|---|---|---|
| 65-ton Crane | 4 | 2,600.00 | 4,900.00 | 150.00 | 147.20 |
| Front-end Loader | 4 | 1,702.00 | 2,254.00 | 101.20 | 67.60 |
| Grader | 4 | 1,820.00 | 3,430.00 | 154.00 | 102.80 |
| Dozers | 4 | 1,820.00 | 3,430.00 | 154.00 | 114.80 |
| Water Trucks | 3 | 362.40 | 2,625.00 | 105.00 | 5.30 |
| Haul Trucks for Excavated materials | 5 | 604.00 | 4,375.00 | 175.00 | 8.80 |
| Haul Trucks for Fill Material | 2 | 241.60 | 1,750.00 | 70.00 | 3.50 |
| Pipe Delivery Trucks | 1 | 120.80 | 875.00 | 35.00 | 1.80 |
| Support Vehicles – Diesel | 3 | 362.40 | 2,625.00 | 105.00 | 10.50 |
| Support Vehicles – Gasoline | 3 | 375.00 | 45.00 | 9.00 | 5.30 |
| Total Hourly Emissions (g/hr) | -- | **10,008.20** | **26,309.00** | **1,058.20** | **467.40** |
| Total Daily Emissions (lb/day) | -- | **176.51** | **464.00** | **18.66** | **8.24** |
| 12-month Emissions (tons) | -- | **27.54** | **72.38** | **2.91** | **1.29** |

Table G.7-3 Boulder Islands North LCS - Maximum Daily Construction Equipment Exhaust Pollutant Emissions.

| Equipment | Maximum On Site (per hour) | CO Emissions (g/hr) | $NO_x$ + VOC Emissions (g/hr) | $PM_{10}$ Emissions (g/hr) | $SO_2$ Emissions (g/hr) |
|---|---|---|---|---|---|
| **Projected Use for 12-month Period** | | | | | |
| Cranes | 5 | 3,250 | 6,125 | 188 | 184 |
| Pipe delivery trucks | 5 | 604 | 4,375 | 175 | 9 |
| Grout/Lining Trucks | 12 | 1,450 | 10,500 | 420 | 21 |

Table G.7-3 Boulder Islands North LCS - Maximum Daily Construction Equipment Exhaust Pollutant Emissions (continued).

| Equipment | Maximum On Site (per hour) | CO Emissions (g/hr) | $NO_x$ + VOC Emissions (g/hr) | $PM_{10}$ Emissions (g/hr) | $SO_2$ Emissions (g/hr) |
|---|---|---|---|---|---|
| Support trucks - diesel | 3 | 362 | 2,625 | 105 | 11 |
| Support trucks - gasoline | 3 | 375 | 45 | 9 | 5 |
| **Projected Use for 6-month Period** | | | | | |
| Cranes at 65 tons | 2 | 1,300 | 2,450 | 75 | 74 |
| Cranes at 75 tons | 1 | 910 | 1,680 | 53 | 52 |
| Pipe delivery trucks | 5 | 604 | 4,375 | 175 | 9 |
| Bulldozer | 2 | 910 | 1,715 | 77 | 57 |
| Scraper or Grader | 1 | 455 | 858 | 39 | 29 |
| Water truck | 1 | 121 | 875 | 35 | 2 |
| Haul trucks | 7 | 846 | 6,125 | 245 | 12 |
| Support trucks – diesel | 2 | 242 | 1,750 | 70 | 7 |
| Support trucks – gasoline | 2 | 250 | 30 | 6 | 4 |
| Tug boat | 1 | -- | -- | -- | -- |
| **Maximum Hourly Emissions (g/hr)** | -- | **11,678** | **43,527.5** | **1,671** | **474** |
| **Maximum Daily Emissions (lb/day)** | -- | **206.0** | **767.8** | **29.5** | **8.4** |
| **Rolling 12-month emissions (tons)** | -- | **32.1** | **119.8** | **4.6** | **1.3** |

Table G.7-4 Boulder Islands South LCS - Maximum Daily Construction Equipment Exhaust Pollutant Emissions.

| Equipment | Maximum On Site (per hour) | CO Emissions (g/hr) | $NO_x$ + VOC Emissions (g/hr) | $PM_{10}$ Emissions (g/hr) | $SO_2$ Emissions (g/hr) |
|---|---|---|---|---|---|
| **Projected Use for 12-month Period** | | | | | |
| Cranes | 6 | 3,900 | 7,350 | 225 | 221 |
| Pipe delivery trucks | 6 | 725 | 5,250 | 210 | 11 |
| Grout/Lining trucks | 14 | 1,691 | 12,250 | 490 | 25 |
| Support trucks – diesel | 3 | 362 | 2,625 | 105 | 11 |
| Support trucks - gasoline | 3 | 375 | 45 | 9 | 5 |
| **Projected Use for 6-month Period** | | | | | |
| Cranes at 65 tons | 2 | 1,300 | 2,450 | 75 | 74 |
| Cranes at 75 tons | 1 | 910 | 1,680 | 53 | 52 |
| Pipe delivery trucks | 6 | 725 | 5,250 | 210 | 11 |
| Bulldozer | 2 | 910 | 1,715 | 77 | 57 |

Table G.7-4 Boulder Islands South LCS - Maximum Daily Construction Equipment Exhaust Pollutant Emissions (continued).

| Equipment | Maximum On Site (per hour) | CO Emissions (g/hr) | $NO_x$ + VOC Emissions (g/hr) | $PM_{10}$ Emissions (g/hr) | $SO_2$ Emissions (g/hr) |
|---|---|---|---|---|---|
| Scraper or grader | 1 | 455 | 858 | 39 | 29 |
| Water truck | 1 | 121 | 875 | 35 | 2 |
| Haul trucks | 8 | 966 | 7,000 | 280 | 14 |
| Support trucks – diesel | 2 | 242 | 1,750 | 70 | 7 |
| Support trucks – gasoline | 2 | 250 | 30 | 6 | 4 |
| Tug boat | 1 | -- | -- | -- | -- |
| **Maximum Hourly Emissions (g/hr)** | | **12,932** | **49,127.5** | **1,883** | **519.5** |
| **Maximum Daily Emissions (lb/day)** | | **228.1** | **866.6** | **33.2** | **9.2** |
| **Rolling 12-month emissions (tons)** | | **35.6** | **135.2** | **5.2** | **1.4** |

Table G.7-5 Las Vegas Bay LCS - Maximum Daily Construction Equipment Pollutant Emissions.

| Equipment | Maximum Oon Site (per hour) | CO Emissions (g/hr) | $NO_x$ + VOC Emissions (g/hr) | $PM_{10}$ Emissions (g/hr) | $SO_2$ Emissions (g/hr) |
|---|---|---|---|---|---|
| **Projected Use for 12-month Period** | | | | | |
| Cranes | 5 | 3,250 | 6,125 | 188 | 184 |
| Pipe delivery trucks | 5 | 604 | 4,375 | 175 | 9 |
| Grout/Lining Trucks | 12 | 1,450 | 10,500 | 420 | 21 |
| Support trucks - diesel | 3 | 362 | 2,625 | 105 | 11 |
| Support trucks - gasoline | 3 | 375 | 45 | 9 | 5 |
| **Projected Use for 6-month Period** | | | | | |
| Cranes at 65 tons | 2 | 1,300 | 2,450 | 75 | 74 |
| Cranes at 75 tons | 1 | 910 | 1,680 | 53 | 52 |
| Pipe delivery trucks | 5 | 604 | 4,375 | 175 | 9 |
| Bulldozer | 2 | 910 | 1,715 | 77 | 57 |
| Haul trucks | 4 | 483 | 3,500 | 140 | 7 |
| Tug boat | 1 | -- | -- | -- | -- |
| **Maximum Hourly Emissions (g/hr)** | -- | **10,248** | **37,390** | **1,416** | **427.6** |
| **Maximum Daily Emissions (lb/day)** | -- | **180.8** | **659.6** | **25.0** | **7.6** |
| **Rolling 12-month emissions (tons)** | -- | **28.2** | **102.9** | **3.9** | **1.2** |

The information in Tables G.7-1 through G.7-5 was combined with Table G.1-1 to determine the worst-case, 12-month emission rates. Also determined are the combined emissions, should construction of the EI and LCS segments occur concurrently. The maximum, worst-case emissions are then compared to major source threshold levels for the air shed in which the construction would occur.

Major source threshold levels serve to define regulatory obligations and are threshold levels below which no adverse impact to air quality is expected. Air emissions from new stationary sources whose potential emissions are below threshold levels are presumed not to cause or contribute to an exceedance of the ambient air quality standards. Maximum, worst-case emissions are provided in Table G.7-6 along with major source threshold values for the Las Vegas Valley and Black Mountain airsheds (Figure 3.7-1).

Potential emissions of CO, PM10, and SO2 are below their respective threshold level for any individual or combined construction activities, no matter where the construction would occur. Therefore, emissions of these pollutants from construction activities are not likely to cause or contribute to an exceedance of the ambient air quality standards.

Emissions of nitrogen oxides, however, are above the nonattainment area major source threshold and the attainment area major source threshold for construction for all scenarios. An area is classified as "attainment" for a pollutant if the concentration of the pollutant measured at official monitoring stations is equal to or below the National Ambient Air Quality Standards (NAAQS) set for that pollutant.

Projects located on federal lands in nonattainment areas are subject to the conformity regulations if the potential pollutant emissions from both direct and indirect sources are above threshold levels. If the projected annual emissions from the proposed project exceed the major source threshold, a conformity determination is required. A conformity determination is completed by the federal agency that is sponsoring the project.

Pollutants subject to the conformity requirements include CO, $PM_{10}$, $NO_x$, and VOCs for projects located in the Las Vegas Valley airshed. The emissions from the EI segment for these pollutants are below the major source conformity levels; the emissions from the combined construction of the EI and LCS are above the conformity levels.

## G.8 Estimation of Impacts

To determine if construction emissions of $NO_x$ could cause an exceedance of the short-term NAAQS, a simple screen model (EPA SCREEN3 1995b) was executed to determine the maximum 1-hour concentration of each pollutant emitted from each source. Screening models incorporate assumptions that are overly conservative in order to provide assurance that the maximum concentration of the pollutant would not be under estimated. Assumptions used to execute the model include:

- Exhaust emissions from construction equipment and other mobile sources are modeled as point sources;
- Construction activities occur during daylight hours only;

Table G.7-6 Worst-case 12-Month Potential Emissions from Construction Activities.

| Construction Segment | CO Emissions (ton/yr) | $NO_x$ +VOC Emissions (ton/yr) | $PM_{10}$ Emissions (ton/yr) | $SO_2$ Emissions (ton/yr) |
|---|---|---|---|---|
| EI-Alignment A | 21.4 | 57.9 | 2.3 | 1.0 |
| EI-Alignment B | 27.5 | 72.4 | 2.9 | 1.3 |
| Boulder Island North LCS | 32.1 | 119.8 | 4.6 | 1.3 |
| Boulder Island South LCS | 35.6 | 135.2 | 5.2 | 1.4 |
| Las Vegas Bay LCS | 28.2 | 102.9 | 3.9 | 1.2 |
| EI-Alignment A & Boulder Island North LCS | 53.6 | 177.7 | 6.9 | 2.3 |
| EI-Alignment B & Boulder Island South LCS | 63.1 | 207.6 | 8.1 | 2.7 |
| EI-Alignment B and Las Vegas Bay LCS | 55.7 | 175.3 | 6.8 | 2.5 |
| Major Source Threshold Las Vegas Valley Airshed | 70 | 50 | 70 | 100 |
| Major Source Threshold Black Mountain Airshed | 100 | 100 | 100 | 100 |
| Major Source Threshold Conformity Determinations | 70 | 100 | 70 | 100 |

- All construction equipment is active at the same time, maximizing worst-case hourly emissions;
- Exhaust diameter of 0.3 ft (0.1 m);
- Exhaust gas temperature of 450 K (350º F);
- Exhaust flow rate estimated from fuel usage and air/fuel ratio of 27:8; and
- No building downwash.

Assumptions inherent to the model include:

- Steady-state emissions of the pollutant;
- Gaussian dispersion of the pollutants; and
- No deposition or reactive gases.

The model was executed in order to obtain the hourly concentration of various pollutants at the edge of the construction rights-of-way (ROWs), at the edges of staging areas, and at distances of approximately 500 ft (152 m), 1,000 (305 m), and 2,000 ft (610 m) from the construction sites. These values are provided in Table G.8-1.

Once the 1-hour maximum concentrations were determined for each pollutant, these values were converted into either a 3-hour, 8-hour, 24-hour, or annual averaging value in order to compare the impact of the project plus the existing background concentration to their respective NAAQS. Data is not presented for $PM_{10}$, because values at monitoring stations already exceed the NAAQS.

Data are provided in Table G.8-2 for the maximum concentration that occurs at the edge of the ROW or staging area.

Predicted concentrations of CO and $SO_2$ plus background concentrations are well below the primary standards. This was expected, because the annual mass emission of these compounds was below the major source threshold. Emissions that are below major source threshold levels are presumed not to cause or contribute to a violation of the NAAQS. Since $PM_{10}$ emissions are well below major source threshold levels, these emissions are assumed not to cause or contribute to existing violations.

Predicted emissions of $NO_x$ + volatile organic carbons (VOC), however are above the ambient air quality standard for $NO_2$. The estimate of an annual concentration based on the 1-hour maximum is overly conservative as it is based on continuous emissions occurring every hour of the day, 365 days per year. Further, nitrogen oxides emitted from construction equipment are reactive gases, which are likely to undergo chemical reactions as they disperse in the atmosphere. The SCREEN3 model used for this initial impact assessment does not account for removal of components due to atmospheric reactions.

Only about 4 percent of the $NO_x$ + VOC emissions are attributed to VOC. The largest contributor to emissions is from delivery/haul truck traffic. Hourly emissions are based on calendar year 2004 diesel engine standards.

Table G.8-3 provides concentrations plus background levels at a distance of 2,000 ft (610 m) from the source.

New diesel engine emission standards have been promulgated for calendar year 2007 models. These standards result in a significant decrease in $NO_x$ and $PM_{10}$ emissions. Table G.8-4 shows the predicted concentrations from the SCREEN Model for $PM_{10}$ and $NO_x$, assuming that the diesel engines meet 2007 standards.

Because of the large distance separating the EI and LCS segments, the SCREEN3 Model cannot be used to estimate the combined impacts of concurrent construction of the EI and LCS. Pollutant concentrations are proportional to the distance from the source. As a result it is unlikely that concurrent construction would cause or contribute to an exceedance of the NAAQS.

Table G.8-1 Short-term Modeled Pollutant Concentrations (micrograms per cubic meter [µg/$m^3$]).

| Construction Segment | Pollutant | Concentration at edge of ROW or staging area[1] | Concentration at 500 ft | Concentration at 1,000 ft | Concentration at 2,000 ft |
|---|---|---|---|---|---|
| EI-Alignment A | CO | 420.0 (115) | 381.5 | 201.8 | 129.6 |
| | $SO_2$ | 19.9 (115) | 18.5 | 9.2 | 6.2 |
| | $NO_x$ + VOC | 1,052.4 (115) | 906.8 | 501.8 | 319.1 |
| | $PM_{10}$ | 43.3 (115) | 37.2 | 20.2 | 13.0 |
| EI-Alignment B | CO | 547.0 (115) | 496.7 | 261.3 | 168.2 |
| | $SO_2$ | 26.2 (115) | 24.4 | 12.1 | 8.2 |
| | $NO_x$ + VOC | 1,344.3 (115) | 1,151.5 | 631.7 | 403.5 |
| | $PM_{10}$ | 55.3 (115) | 47.3 | 25.3 | 16.4 |
| Boulder Islands North LCS | CO | 627.4 (295) | 547.1 | 369.7 | 204.5 |
| | $SO_2$ | 22.2 (295) | 19.7 | 13.3 | 7.2 |
| | $NO_x$ + VOC | 2,776.3 (295) | 2,381.7 | 1,567.1 | 900.9 |
| | $PM_{10}$ | 110.0 (295) | 94.1 | 61.8 | 35.5 |
| Boulder Islands South LCS | CO | 646.0 (295) | 562.9 | 380.0 | 210.5 |
| | $SO_2$ | 22.4 (295) | 19.9 | 13.5 | 7.3 |
| | $NO_x$ + VOC | 2,911.0 (295) | 2,495.9 | 1,641.3 | 944.4 |
| | $PM_{10}$ | 115.3 (295) | 98.7 | 64.8 | 37.2 |
| Las Vegas Bay LCS | CO | 622.5 (295) | 554.7 | 376.7 | 219.4 |
| | $SO_2$ | 23.4 (295) | 21.4 | 14.8 | 8.6 |
| | $NO_x$ + VOC | 2,367.3 (295) | 2,057.2 | 1,368.0 | 799.6 |
| | $PM_{10}$ | 90.1 (295) | 77.9 | 51.6 | 30.2 |

Note:
[1] Shortest distance to ROW or staging area was used (distance in parenthesis)

Table G.8-2 Modeled Maximum Impacts from Construction Equipment Exhausts (Year 2004 Diesel Engines at Edge of ROW).

| Construction Segment | Pollutant & Averaging Time | Maximum Construction Impacts [1] | Background Concentration | Total Impact | Primary Standard |
|---|---|---|---|---|---|
| EI-Alignment A | 1-hour CO | 0.4 | 7.2 | 7.6 | 35.0 |
| | 8-hour CO | 0.3 | 3.0 | 3.259 | 9.0 |
| | 3-hour SO2 | 0.02 | 0.052 | 0.05 | .50 |
| | 24-hour SO2 | 0.00 | 0.01 | 0.01 | .14 |
| | Annual NOx + VOC | 0.040 | 0.027 | 0.067 | 0.053 |
| EI-Alignment B | 1-hour CO | 0.5 | 7.2 | 7.7 | 35.0 |
| | 8-hour CO | 0.3 | 3.0 | 3.3 | 9.0 |
| | 3-hour $SO_2$ | 0.01 | 0.05[2] | 0.05 | .50 |
| | 24-hour $SO_2$ | 0.00 | 0.01 | 0.01 | .14 |
| | Annual $NO_x$ + VOC | 0.057 | 0.027 | 0.084 | 0.053 |
| Boulder Islands North LCS | 1-hour CO | 0.4 | 7.2 | 7.6 | 35.0 |
| | 8-hour CO | 0.3 | 3.0 | 3.3 | 9.0 |
| | 3-hour $SO_2$ | 0.01 | 0.05 | 0.05 | 0.50 |
| | 24-hour $SO_2$ | 0.00 | 0.01 | 0.01 | 0.14 |
| | Annual $NO_x$ + VOC | 0.100 | 0.027 | 0.127 | 0.053 |
| Boulder Islands South LCS | 1-hour CO | 0.4 | 7.2 | 7.6 | 35.0 |
| | 8-hour CO | 0.3 | 3.0 | 3.3 | 9.0 |
| | 3-hour $SO_2$ | 0.01 | 0.05 | 0.05 | 0.50 |
| | 24-hour $SO_2$ | 0.00 | 0.01 | 0.01 | 0.14 |
| | Annual $NO_x$ + VOC | 0.100 | 0.027 | 0.127 | 0.053 |
| Las Vegas Bay LCS | 1-hour CO | 0.4 | 7.2 | 7.6 | 35.0 |
| | 8-hour CO | 0.3 | 3.0 | 3.3 | 9.0 |
| | 3-hour $SO_2$ | 0.01 | 0.05 | 0.05 | 0.50 |
| | 24-hour $SO_2$ | 0.00 | 0.01 | 0.01 | 0.14 |
| | Annual $NO_x$ + VOC | 0.100 | 0.027 | 0.127 | 0.053 |

Notes:

[1] Values converted to ppm in order to compare to air quality standards.

[2] No monitored value reported. Estimate derived from 24-hour value.

Table G.8-3 Modeled Impacts from Construction Equipment Exhausts
(Year 2004 Diesel Engines at 2,000 ft [610 m]).

| Construction Segment | Pollutant & Averaging Time | Maximum Construction Impacts [1] | Background Concentration | Total Impact | Primary Standard |
|---|---|---|---|---|---|
| EI-Alignment A | 1-hour CO | 0.1 | 7.2 | 7.3 | 35.0 |
| | 8-hour CO | 0.1 | 3.0 | 3.1 | 9.0 |
| | 3-hour SO2 | 0.00 | 0.052 | 0.05 | .50 |
| | 24-hour SO2 | 0.00 | 0.016 | 0.01 | .14 |
| | Annual NOx + VOC | 0.010 | 0.027 | 0.037 | 0.053 |
| EI-Alignment B | 1-hour CO | 0.1 | 7.2 | 7.3 | 35.0 |
| | 8-hour CO | 0.1 | 3.0 | 3.1 | 9.0 |
| | 3-hour SO2 | 0.00 | 0.052 | 0.048 | .50 |
| | 24-hour SO2 | 0.001 | 0.016 | 0.007 | .14 |
| | Annual NOx + VOC | 0.020 | 0.027 | 0.047 | 0.053 |
| Boulder Islands North LCS | 1-hour CO | 0.1 | 7.2 | 7.3 | 35.0 |
| | 8-hour CO | 0.1 | 3.0 | 3.1 | 9.0 |
| | 3-hour SO2 | 0.00 | 0.052 | 0.05 | .50 |
| | 24-hour SO2 | 0.00 | 0.02 | 0.01 | .14 |
| | Annual NOx + VOC | 0.030 | 0.027 | 0.057 | 0.053 |
| Boulder Islands South LCS | 1-hour CO | 0.1 | 7.2 | 7.3 | 35.0 |
| | 8-hour CO | 0.1 | 3.0 | 3.1 | 9.0 |
| | 3-hour SO2 | 0.00 | 0.052 | 0.05 | .50 |
| | 24-hour SO2 | 0.00 | 0.02 | 0.01 | .14 |
| | Annual NOx + VOC | 0.030 | 0.027 | 0.057 | 0.053 |
| Las Vegas Bay LCS | 1-hour CO | 0.1 | 7.2 | 7.3 | 35.0 |
| | 8-hour CO | 0.1 | 3.0 | 3.1 | 9.0 |
| | 3-hour SO2 | 0.00 | 0.052 | 0.05 | .50 |
| | 24-hour SO2 | 0.00 | 0.02 | 0.01 | .14 |
| | Annual NOx + VOC | 0.030 | 0.027 | 0.057 | 0.053 |

Notes:
[1] Values converted to ppm in order to compare to air quality standards.
[2] No monitored value reported. Estimate derived from 24-hour value.

Table G.8-4 Modeled Impacts from Construction Equipment Exhausts (year 2007 Engines at 2,000 ft [610 m]).

| Construction Segment | Pollutant & Averaging Time | Construction Impacts | Background Concentration | Total Impact | Primary Standard |
|---|---|---|---|---|---|
| EI-Alignment A | Annual $NO_x$ + VOC (ppm) | 0.009 | 0.027 | 0.036 | 0.053 |
| | 24-hr $PM_{10}$ ($\mu g/m^3$) | 3 | -- | -- | 150 |
| EI-Alignment B | Annual $NO_x$ + VOC (ppm) | 0.011 | 0.027 | 0.038 | 0.053 |
| | 24-hr $PM_{10}$ ($\mu g/m^3$) | 4 | -- | -- | 150 |
| Boulder Islands North LCS | Annual $NO_x$ + VOC (ppm) | 0.012 | 0.027 | 0.039 | 0.053 |
| | 24-hr $PM_{10}$ ($\mu g/m^3$) | 3 | -- | -- | 150 |
| Boulder Islands South LCS | Annual $NO_x$ + VOC (ppm) | 0.011 | 0.027 | 0.038 | 0.053 |
| | 24-hr $PM_{10}$ ($\mu g/m^3$) | 3 | -- | -- | 150 |
| Las Vegas Bay LCS | Annual $NO_x$ + VOC (ppm) | 0.011 | 0.027 | 0.038 | 0.053 |
| | 24-hr $PM_{10}$ ($\mu g/m^3$) | 3 | -- | -- | 150 |

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# Appendix H

Visual Resources

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# H.0 Visual Resources

The visual resources evaluation for this project is being conducted in accordance with the objectives and methods described in the BLM *Visual Resource Management (VRM) Guidelines* (BLM 1986a) and the BLM *Manual Handbook - Visual Resource Contrast Rating* (BLM 1986b). The objective of the VRM Guidelines is to manage public lands in a manner that would protect the quality of the scenic or visual values of those lands.

The BLM VRM guidelines were used for visual resource assessment because Reclamation and the NPS do not have any formalized guidance procedures for assessing visual resources. The visual resource inventory process provides Reclamation and NPS managers with a means for determining visual values. The baseline inventory consists of the evaluation of the following three items:

1) Scenic quality evaluation: The scenic quality of an area is determined by completing a visual resource inventory process based on seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. During the VRM evaluation process, each of these factors is ranked on a comparative basis with similar features within the physiographic province. The areas being evaluated are subdivided into scenic quality rating units for rating purposes. Rating areas are delineated on a basis of like physiographic, visual, and manmade modification characteristics.

   Scenic quality evaluations were conducted from selected key observation points (KOP) along the proposed SCOP alignment. The scenic quality was then rated based on BLM VRM guidelines, using BLM Scenic Quality Field Inventory – Bureau Form 8400-5. Once the KOPs were identified, each rating unit was ranked depending on the type of user, the amount of use, public interest, adjacent land uses, special areas, and consideration of other factors. In accordance with BLM guidelines, a ranking number between 1 and 5 was then assigned to each key factor, totaled, and assigned a classification letter. The scenic quality was classified as follows:

- Class A: High scenic quality (totals of 19 or more),
- Class B: Medium scenic quality (totals between 12 and 18),
- Class C: Low scenic quality (totals lower than 11).

2) Sensitivity level analysis: Sensitivity levels are a measure of public concern for scenic quality. Visual sensitivity is dependent upon user (or viewer) attitudes, the amount of use, and the types of activities in which people are engaged when viewing an object. Overall, higher degrees of visual sensitivity are correlated with areas where people live and with people who are engaged in recreational outdoor pursuits or participate in scenic or pleasure driving. Conversely, areas of industrial or commercial use are considered to have low to moderate visual sensitivity because the activities conducted in these areas are not significantly affected by the quality of the environment. As with the scenic quality evaluation, the VRM sensitivity-level analysis requires delineation of rating units. However, for sensitivity levels, the delineation should be based on those factors that drive the sensitivity.

Adjacent land uses may have an effect on the visual sensitivity of the project area, so they are measured as well. Lands that are currently being developed for residential communities are not considered sensitive. This is based on the rationale that at the time of the analysis of existing conditions, the area is essentially a construction site.

Special areas are another element of the sensitivity analysis. This element of the analysis takes into account the management objectives of designated areas such as Wilderness Areas, Natural Areas, Wild and Scenic Areas, and Areas of Critical Environmental Concern (ACECs). The portions of the proposed SCOP alignment that enter the Wetlands Park would be considered very sensitive.

Sensitivity level analysis was conducted from the selected KOPs and then rated based on the BLM VRM guidelines using BLM Sensitivity Level Rating Sheet 8400-6. Each rating unit was ranked according to the visual sensitivity areas listed above.

3) Delineation of distance zones. Landscapes are subdivided into three distance zones based on relative visibility from travel routes or observation points. The three zones are foreground-middleground (F/M), background, and seldom seen. The foreground-middleground zone includes areas seen from highways, rivers, or other viewing locations that are less than 3 to 5 miles away. The background zone includes areas that are visible beyond the foreground-middleground zone but are less than 15 miles away. Other areas are in the seldom-seen zone.

## H.1 Methodology

Views that can be seen from travel routes or observation points were identified along each alternative of the proposed SCOP project. The KOPs consisted of foreground, middleground, and background observations in relation to the surrounding landscapes. The majority of the proposed SCOP pipeline would be at or below grade and would not be visible from a seldom-seen zone. Therefore, KOPs were not identified for this distance zone.

Based on the above three factors, federally administered lands are placed into one of four visual resource inventory classes. The relative value of the visual resource is indicated by one of four classes. Classes I and II are the most valued, Class III represents a moderate value, and Class IV is of least value. The following VRM objectives are established for each of the classes:

- Class I: The objective of Class I is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention. This class includes primitive (wilderness) areas, some natural areas, wild sections of national wild and scenic rivers, and other congressionally and administratively designated areas where decisions have been made to preserve a natural landscape.
- Class II: The objective of Class II is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the causal observer. Any changes must repeat the basic

element of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

- Class III: The objective of Class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape can be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. As in Class II, changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- Class IV: The objective of Class IV is to provide management activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

A total of twelve KOPs were established throughout the study area (Figure 3.10-1). These KOPs were selected based on three factors: (1) the major, potentially sensitive, viewer groups that may be affected by the action under study; (2) the types of planned improvements that would have varied visual impact consequences; and (3) the orientation of the viewers toward the project areas. The following subsections describe the existing conditions at these KOPs, and evaluate the scenic quality, viewer sensitivity, and distance zones in the area of the proposed pipeline alignment. These sections describe the existing resources using the BLM VRM terminology.

For the purposes of the visual analysis, the site of the proposed KOPs is defined as the separate areas to potentially be affected by construction of the SCOP and the ancillary improvements and facilities. The KOPs are described in terms of their location, access roads, landscape, visual/color variety, and panoramic visual quality. For descriptive purposes, the proposed EI alignment is separated into six segments. These segments are described in detail in Section 2.2.1:

- Reach 1
- Reach 2
- Reach 3
- COH Forcemain
- South Lateral Pipeline
- EI Terminus Site

Each of the segments has a unique location, shape, and function. Most of Reach 2 and 3 have been previously assigned a VRM classification of Class III by the BLM (BLM 1998). Accordingly, only the north end of Reach 2 and the south end of Reach 3 were evaluated. Private land and land managed by Reclamation and NPS in the project area have not previously been assigned a VRM classification by the BLM.

The visual characteristics in the vicinity of the proposed EI alignment are different than those in the vicinity of the LCS. Therefore, the existing visual resources for the EI and the LCS are discussed below in separate subsections.

## H.2 Effluent Interceptor and Ancillary Facilities Setting

An analysis of the scenic quality, sensitivity level, and distance zone delineations were completed for each segment of the EI alignment that has not been previously assigned a VRM classification by the BLM. The analysis is described in the following section and is followed by a detailed description of the existing visual conditions. Finally, a Visual Resource Classification has been assigned to each of these segments.

### H.2.1 Scenic Quality Summary

The scenic quality rating range within the EI and Terminus is from 3 to 10. This places all segments of the study area in category C, low scenic quality (Table H.2-1).

### H.2.2 Sensitivity Levels

Sensitivity is measured by the level of public concern for scenic quality. The Wetlands Park and Rainbow Garden/Lava Butte Roads have a medium sensitivity. However, generally the sensitivity level in the areas of the EI and ancillary facilities is low. Table H.2-2 provides a summary of the existing types of users, the amount of use, and the level of concern of users concerning the visual quality of the project area. Determination of sensitivity level was assigned based on an overall average sensitivity level among these three criteria.

### H.2.3 Delineation of Distance Zones

The locations of the KOPs are shown in Figure 3.10-1. As explained previously, the three major distance zones are foreground, middleground, and background.

The viewing areas in Reaches 1, 2, 3, COH Forcemain, and the South Lateral Pipeline are mostly within the F/M distance zones from travel routes or observation points. Background zones would include mountain areas to the north and east of the EI alignment. Public roads or parks that would provide recreational viewing areas toward the proposed project are located in areas defined by the BLM as background zones (3 to 5 miles), and the only thing discernible from this zone would be forms or outlines of the project activities during construction. Therefore, background visual analysis has not been considered in the overall analysis of the existing visual conditions. The majority of the Reaches would be at or below ground level and therefore the seldom-seen zone has not been considered in the overall analysis of the existing visual conditions.

Table H.2-1 Effluent Interceptor and Ancillary Facilities Scenic Quality Summary.

| Key Factors | Reach 1 | Reach 2 areas not Classified by BLM | Reach 3 areas not Classified by BLM VRM as Class III | COH Forcemain | South Lateral Pipeline | EI Terminus |
|---|---|---|---|---|---|---|
| Landform | Low, alluvial fan, though not dominant or exceptional | Low, alluvial fan, though not dominant or exceptional | Slight rise in elevation though not dominant or exceptional | Slight rise in elevation, rolling hills, washes | Slight rise in elevation, rolling hills, washes | Low foothills with few interesting landscape features |
| **Rank** | **3** | **3** | **3** | **3** | **3** | **1** |
| Vegetation | Area mostly cleared of vegetation. Tamarisk in background | Some variety in vegetation, but does not exhibit interesting forms, textures, or patterns. Riparian vegetation to the south along the Las Vegas Wash | Some variety in vegetation, but does not exhibit interesting forms, textures, or patterns | Area of cut and cover mostly cleared. Tunnel area shows some variety, but does not exhibit interesting forms, textures or patterns | Riparian vegetation at confluence of C-1 Channel and Las Vegas Wash | Some variety in vegetation, but the area is mostly cleared. Riparian vegetation to the north along the Las Vegas Wash |
| **Rank** | **1** | **3** | **1** | **1** | **3** | **1** |
| Water | Running water visible for all areas of this Reach | Generally not visible from this reach | Not visible from this reach | Generally visible at wash area only | Generally not visible from this reach | Not visible from this site |
| **Rank** | **3** | **0** | **0** | **1** | **0** | **0** |
| Color | Fore-and middle-ground void of color variations | Subtle color variations with limited contrast | Subtle color variations with limited contrast | Subtle color variations with limited contrast | Variation and contrast in color provided by green strip of washes | Subtle color variations with limited contrast |
| **Rank** | **1** | **3** | **3** | **3** | **3** | **1** |

Table H.2-1 Effluent Interceptor and Ancillary Facilities Scenic Quality Summary (continued).

| Key Factors | Reach 1 | Reach 2 areas not Classified by BLM | Reach 3 areas not Classified by BLM VRM as Class III | COH Forcemain | South Lateral Pipeline | EI Terminus |
|---|---|---|---|---|---|---|
| Adjacent Scenery | Moderately enhances the overall visual quality due to the connection to a relatively undisturbed panoramic landscape | Dominated by previously disturbed areas broken by the crossing of many dirt roads | Dominated by previously disturbed areas broken by the crossing of many dirt roads. Panoramic views broken by power lines and water towers | Dominated by previously disturbed areas and industrial and construction activities. | Dominated to the south, east and west by development. Adjacent to the north is the Las Vegas Wash which enhances the overall visual quality due to the level of vegetation | Foreground views broken by the crossing of many dirt roads. Middleground scenery enhances the overall visual quality due to the connection to a relatively undisturbed panoramic landscape. |
| **Rank** | **3** | **0** | **0** | **0** | **3** | **3** |
| Scarcity | Features are very common to the region | Features are very common to the region | Features are very common to the region | Features are very common to the region | Features are very common to the region | Middleground mountain view somewhat less common to the overall area. |
| **Rank** | **1** | **1** | **1** | **1** | **1** | **3** |
| Cultural Modification | Extreme and change the scenic quality to urban residential | Moderate due to dominance of dirt roads | Moderate due to dominance of dirt roads | To the east and west are extreme. Along area of tunnel portion moderate due to dominance of dirt roads. | To the south, east and west are extreme and change the scenic quality to urban residential | Extreme due to dominance of dirt roads and earth moving activities. |
| **Rank** | **-4** | **-4** | **-4** | **-4** | **-4** | **-4** |
| **Total Rank** | **8** | **6** | **4** | **5** | **9** | **5** |

Table H.2-2 Effluent Interceptor and Ancillary Facilities User Summary for Sensitivity Level.

| KOP/Reach | Type of User | Amount of Use | Level of Concern | Sensitivity Level |
|---|---|---|---|---|
| KOP #1 Las Vegas Wash/CLV facility/Reach 1 | Construction Workers | Low based on the relatively small number of workers. | Concern is low based low public response to activities. | Low |
| KOP #2 Wetlands Park/Reach 2 | Recreation/hiker | Moderate because Wetlands Park is not fully developed. | High based on public interest to maintain visual quality within the Wetlands Park. | Medium |
| KOP #3 Rainbow Garden/Lava Butte Roads/ Reach 3 | Mainly recreation, some workers | Limited to mostly weekend recreation. | Interest medium to low based on type of recreation use (off-road vehicles). | Medium |
| KOP #4/Terminus Site | Worker, some recreation | High based on construction activities adjacent to site. | Low based on approved construction sites. | Low |
| KOP #5/South Lateral – Las Vegas Wash and C-1 Channel | Worker, some recreation | Medium based on number of workers. | Low adjacent land is graded for future development. | Low |
| KOP#7/Telephone Line Road/Reach 2 | Workers, some recreation | Low use for maintenance, recreation limited to weekend. | Low based on use and surrounding disturbance. | Low |

## H.2.4 Visual Resource Class Rating

Based on the analysis of the scenic quality, sensitivity level, and distance zones, all of the EI segments and ancillary facilities' settings that have not been previously classified by BLM were designated as Class IV (Table H.2-3). This classification was determined based on the analysis procedure outlined by the BLM of the scenic quality, sensitivity level, and distance zones.

Table H.2-3 Effluent Interceptor and Ancillary Facilities Visual Inventory Classes.

| KOP/Reach | Scenic Quality | Sensitivity Level | Distance Zones | Class |
|---|---|---|---|---|
| #1/Reach | C | L | F/M | IV |
| #2*/Reach 2 | B | M | F/M | III |
| #3/Reach 3 | C | M | F/M | IV |
| #4/Terminus | C | L | F/M | IV |
| #5/South Lateral | C | L | F/M | IV |
| #7/Reach 2 | C | L | F/M | IV |

Note:

* KOP #2 is in the area designated as Class III by BLM.

## H.3 Lake Conveyance System

The NPS is Congressionally directed to not allow park resources and values to be impaired, but it is allowed to use management discretion to allow impacts to park resources when necessary. There are three proposed LCS alignments with two proposed discharge locations. One discharge location is in the vicinity of the Boulder Islands. The second discharge location is in the Las Vegas Bay. Each of the alternatives has a unique location, shape, and function. The visual quality of the three alternatives is described in general terms below.

For the purposes of the visual analysis, the site of the proposed alternatives is defined as the separate areas to potentially be affected by construction and operation of the LCS and the ancillary facilities (Figure 3.10-1). The KOPs within the LMNRA have been identified as:

- Lake Mead Parkway at the location where the LCS would pass under the road,
- Lakeshore Drive where the NRMT3-East working shaft would be located,
- Lakeshore Drive (two KOPs) at the locations where the Boulder Islands South and the Las Vegas Bay alternatives of the LCS would pass under the road,
- Boulder Beach from the beach near the public campground area,
- Las Vegas Bay from the public scenic overlook area.

An analysis of the scenic quality was completed for each identified KOP. The analysis is described in the following sections and is followed by a detailed description of the existing visual conditions. These KOPs are described in terms of their location, landscape, visual/color variety, and panoramic visual quality. Next, sensitivity level, and distance zones delineation were completed for each KOP. Finally, a Visual Resource Classification was assigned to each of these KOPs.

### H.3.1 Scenic Quality Summary

Generally, except for the area along Lake Mead Parkway, the scenic quality of the LCS received a scoring of 19 or more, which places the KOPs in category A, high scenic quality (Table H.3-1).

### H.3.2 Sensitivity Levels

There is a high degree of sensitivity in the vicinity of the three proposed alternatives with the exception of the Lake Mead Parkway thoroughfare. Table H.3-2 provides a summary of the existing types of users, the amount of use, and level of interest in the visual quality of the project area.

Table H.3-1 Lake Conveyance System - Scenic Quality Summary
Scenic Quality Rating Areas and Evaluation.

| Key Factors | Lake Mead Parkway at Three Kids Mine | Lakeshore Drive at NRMT3-East Site | Lakeshore Drive | Boulder Beach | Las Vegas Bay |
|---|---|---|---|---|---|
| Landform | Slight rise in elevation, rolling hills, washes | Sloping arroyo toward Lake Mead | Meandering road through slight rise/dips in elevation | Mix of color, texture and line between water and mountains | Rolling hills with lake view with a mix of color texture and line between water and mountains |
| **Rank** | **1** | **1** | **3** | **5** | **5** |
| Vegetation | Bush scrub in foreground, barren in background | Brush scrub and invasives – relatively lush at time of site visit | Bush scrub in foreground, barren in background | Bush scrub and invasives | Low to no vegetation |
| **Rank** | **1** | **3** | **1** | **1** | **1** |
| Water | Not visible from this site | Visible from the road- dominant to view of the area | Visible from parts of the drive | Water is dominant to view of the area | Water is dominant to view of the area |
| **Rank** | **0** | **5** | **5** | **5** | **5** |
| Color | Green to brown with limited contrast | Green with contract provided by gray of ground and blue-gray of water | Gray-green with contrast provided by blue-gray of water | High variation and contrast provided by gray-green of surrounding rock. Focal point is blue-gray of water | High variation and contrast provided by gray of surrounding rock and blue-gray of water |
| **Rank** | **1** | **3** | **3** | **3** | **5** |
| Adjacent scenery | Dominated by previously disturbed areas broken by the crossing of many dirt roads, panoramic views broken by power lines | Dominated by washes and desert areas | Dominated by washes and desert areas typical of Mojave Desert scrub | Dominated by wash, desert area, campgrounds and roads | Dominated by washes and desert areas typical of Mojave Desert Scrub |
| **Rank** | **0** | **3** | **3** | **3** | **3** |
| Scarcity | Features are very common to the region | Views of lakes are uncommon in the Mojave Desert Region | Views of lakes are uncommon in the Mojave Desert Region | Views of lakes are uncommon in the Mojave Desert Region | Views of lakes are uncommon in the Mojave Desert Region |
| **Rank** | **1** | **5** | **5** | **5** | **5** |
| Cultural modification | Moderate due to dominance of dirt roads, adjacent mining operations and construction | Moderate due to roads and nearby AMSWTP | Little to no cultural modification except for road | Moderate due to adjacent campground, roads and visitor facilities | Moderate due to adjacent roads and visitor facilities |
| **Rank** | **-4** | **0** | **0** | **0** | **0** |
| **Total Rank** | **0** | **20** | **20** | **22** | **21** |

Table H.3-2 Lake Conveyance System User Summary for Sensitivity Level.

| KOP/Area | Type of User | Amount of Use | Level of Concern | Sensitivity Level |
|---|---|---|---|---|
| #6/Lake Mead Drive at Three Kids Mine | Recreational user and commuter | High-greater thank 45,000 visits/year | Low, based on surrounding activities of mining and construction | Low |
| #8/Boulder Beach | Recreational user | High-greater than 10,000 visitor days/year | High, based on user of the beach, recreationist with desire to maintain visual quality | High |
| #9, 10/Lakeshore Drive | Recreational user/sight-seeing | High-greater than 45,000 visits/year | High, based on user of the road recreationist with desire to maintain visual quality | High |
| #11/Las Vegas Bay | Recreational user/sight-seeing | High-greater than 10,000 visitor days/year | High, based on user of the overlook at the bay to maintain visual quality | High |
| #12/Lakeshore Drive at NRMT3-East | Recreational user/sight seeing | High-greater than 10,000 visitor days/year | High based on user of the highway to maintain visual quality | High |

## H.3.3 Delineation of Distance Zones

Views from the designated KOPs are within the F/M distance zones from travel routes or observation points. The majority of the LCS is underground and would not be seen from any of the designated KOPs. Portions of the proposed project that would be above ground include facilities at the EI Terminus and access portals that could possibly be seen from the KOP on Lake Mead Parkway.

Background zones would include mountain areas to the north and east of the LCS alignment. Public roads that would provide viewing areas toward the proposed project are in the areas defined by the BLM as background zones, and the only thing discernible from this zone would be forms or outlines of the project activities during construction. Therefore, background visual analysis has not been considered in the overall analysis of the existing visual conditions. All of the LCS pipeline and most of the ancillary facilities would be at or below ground level and therefore the seldom-seen zone has not been considered in the overall analysis of the existing visual conditions.

## H.3.4 Visual Resource Class

Based on the analysis of the scenic quality, sensitivity level, and distance zones, the LCS area, except for KOP #6-Lake Mead Parkway, was designated as Class II (Table H.3-3). This classification was determined based on the analysis procedure outlined by the BLM of the scenic quality, sensitivity level, and distance zones.

Table H.3-3. Lake Conveyance System Visual Inventory Classes.

| KOP/Area | Scenic Quality | Sensitivity Level | Distance Zones | Class |
|---|---|---|---|---|
| #6/Lake Mead Drive at Three Kids Mine | C | L | F/M | IV |
| #8/Boulder Beach | A | H | F/M | II |
| #9/Lakeshore Drive | A | H | F/M | II |
| #10/Lakeshore Drive | A | H | F/M | II |
| #11/Las Vegas Bay | A | H | F/M | II |

## H.4 Impact Analysis Methodology

The BLM VRM System consists of two stages, inventory and analysis. The inventory stage involves identifying the visual resources of an area and assigning them to inventory classes using BLM's visual resource inventory process. As discussed in Section H.1, the BLM developed the VRM classes for areas within the Wetlands Park during preparation of the BLM Resource Management Plan (BLM 1998). A visual inventory for all other sections of the proposed project was conducted and is described in detail in Section H.1.

The degree to which an activity affects the visual quality of a landscape depends on the visual contrast created between a project and the existing landscape. The contrast can be measured by comparing the project features with the major features in the existing landscape. The basic design elements of form, line, color, and texture are used to make this comparison and to describe the visual contrast created by the project. This assessment process provides a means for determining visual impacts and for identifying measures to mitigate these impacts (BLM 1986b).

Public lands have a variety of visual values. These different values warrant varying levels of management. Because it is neither desirable nor practical to provide the same level of management for all visual resources, it is necessary to systematically identify and evaluate these values to determine the appropriate level of management.

Because the proposed project would cross several different types of visual areas, with each having a different visual value, a series of KOPs along the proposed project area were designated (Figures 3.10-1). A KOP is one or a series of points on a travel route or at a use area or a potential use area, where the view of an activity would be most revealing (Section H.1).

The character of the existing visual environment within the site vicinity was documented in the field and by thorough analyses of area maps. Viewer groups within the view-shed limit were identified (Table H.2-2). Viewer responses to visual changes from the alternatives were inferred from a variety of factors including:

- Viewer exposure,
- Types of viewers,
- Number of viewers,

- Duration of view, and
- Viewer activities.

Viewer exposure includes distance and viewing angle. The distance that a man-made structure can be seen on a clear day is generally 1 mile. The viewer type, and associated viewer sensitivity, is distinguished among viewers in residential, recreation/open space, and tourist commercial areas, with the first two having relatively high sensitivity and the last having lower sensitivity. Activities can either encourage a viewer to observe the surrounding area more closely (scenic driving) or discourage close observation (commuting in heavy traffic). All of these viewer elements were considered when evaluating the alternatives.

The existing conditions and visual contrast rating was completed in Section H.1. To compare existing VRM designations with potential impacts, one BLM Form 8400-4, Visual Contrast Rating Worksheet was completed for each KOP associated with each proposed action alternative (Attachment A). The worksheet provides the tool for determining if the potential impacts from the proposed alternatives are compatible with BLM VRM classifications. Worksheets for the no-action alternative were not generated because under this alternative, the proposed SCOP project would not be constructed and the existing VRM classification and management designation would not experience potential impacts.

Photos were taken at each KOP for the purpose of developing visual simulations. Copies of the photos are included in Attachment B. These photos were taken at the KOP locations shown in Figure 3.10-1 of the EIS. Simulations are extremely important to portray the relative scale and extent of a project. However, based on the results from the Visual Contract Rating Worksheets for each KOP, visual simulations of possible change to the viewshed were developed for only KOP 4 of the EI (Figure 4.10-1). This was based on the rationale that change in visual resources from KOPs in association with activities with the proposed SCOP operation would be insignificant, because the proposed pipeline and facilities would be underground. The visual simulation of KOP 4 includes the Terminus Facility.

Visual simulations were not developed for temporary disturbances to the viewshed from construction activities. This is based on the rationale that construction would be temporary, and following construction, disturbed areas would be re-vegetated. The shafts and PRS located on LMNRA land would be at grade and not observable to the casual viewer. Also, access to working shafts would be along existing roads, which would represent no change to the existing viewshed. Because of these reasons, changes in form, line color and texture are not expected. Visual simulation of possible change at Boulder Island/Las Vegas Bay was not developed, because there would not be any visible structures at the site.

# Appendix H

Attachment A – Worksheets

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Reach 1 - KOP #1 - used for Table 3.10.1

Form 8400–1
(September 1985)

**UNITED STATES**
**DEPARTMENT OF THE INTERIOR**
**BUREAU OF LAND MANAGEMENT**

**SCENIC QUALITY FIELD INVENTORY**

Date 03-22-04
District SCOP
Resource Area KOP-1
Scenic quality rating unit

1. Evaluators *(name)*
Lynn Bowdidge - Kelly Shook

2. LANDSCAPE CHARACTER *(Feature)*

| | a. LANDFORM/WATER | b. VEGETATION | c. STRUCTURE *(General)* |
|---|---|---|---|
| FORM | gradual wash running it | tamarisk along wash/bank | modified |
| LINE | flat w/ some hills. Frenchman in background | back | |
| COLOR | brown/grey - sparse veg | / | |
| TEXTURE | dirt - disturbed | / | |

3. Narrative
Area highly disturbed w/ const activities from Desert Inn master plan - i wood side thanes - & flood control facility being built -

4. SCORE *(Circle Appropriate Level)**

| | HIGH | MEDIUM | LOW | EXPLANATION OR RATIONALE |
|---|---|---|---|---|
| a. Landform | 5 | (3) | 1 | |
| b. Vegetation | 5 | 3 | (1) | little - |
| c. Water | 5 | (3) | 0 | sunny water indistinct |
| d. Color | 5 | 3 | (1) | Color disturbed - |
| e. Adjacent Scenery | 5 | (3) | 0 | Because of Mtn View |
| f. Scarcity | 5+ | 3 | (1) | not unusual - |
| g. Cultural Modification | 2 | 0 | (-4) | |
| TOTALS | 0 + 9 | | 1 | 10 |

SCENIC QUALITY CLASSIFICATION

- ☐ A 19 or more
- ☒ B – 12–18
- ☑ C – 11 or less

*(Instructions on reverse)*

Very modified -

Sensitivity Level - L

Reach 2 - kop #2 - nature Preserve
not on table 10.1.
BLM class III

Form 5400–1
(September 1985)

**UNITED STATES**
**DEPARTMENT OF THE INTERIOR**
**BUREAU OF LAND MANAGEMENT**

**SCENIC QUALITY FIELD INVENTORY**

Date 03-22-04
District KOP
Resource Area
Scenic quality rating ---

1. Evaluators *(name-1*

Kelly Shook Lynn Baisley

**2. LANDSCAPE CHARACTER (Feature)**

| | a. LANDFORM/WATER | b. VEGETATION | c. STRUCTURE (General) |
|---|---|---|---|
| FORM | land form - low, reeds in possible wetlands | thick - dominant in foreground | flat w/ reeds dominant |
| LINE | flat - fore-middle mtn back ground | dominant canopy flat @ left | vertical veg - draw line yarrow |
| COLOR | brown/grey - no little visible H2O - stand water | brown - straw - early spring - tamarisk | vertical - tamarisk - juniper - tamarisk |
| TEXTURE | very broken see photo - border - veg = | reed/tamarisk - dominant | |

3. Narrative

low - land area - not vista view.
view toward telephone Rd limited -

**4. SCORE (Circle Appropriate Level)***

| | HIGH | MEDIUM | LOW | EXPLANATION OR RATIONALE |
|---|---|---|---|---|
| a. Landform | 5 | (3) | 1 | |
| b. Vegetation | 5 | (3) | 1 | 4 - wash structure |
| c. Water | 5 | (3) | 0 | - by wash |
| d. Color | 5 | 3 | (1) | monochromatic |
| e. Adjacent Scenery | 5 | 3 | (0) | 4 |
| f. Scarcity | 5+ | 3 | (1) | |
| g. Cultural Modification | (2) | 0 | | |
| TOTALS | | | 13. | |

**SCENIC QUALITY CLASSIFICATION**

- ☐ A 19 or more
- ☑ B – 12–18
- ☐ C – 11 or less

*(Instructions on reverse)*

Sensitivity Level H

Reach 2 - Kop #3 Chat Trail site from Rainbow Gardens Rd
Table 3-10.1

Form 8400–1
(September 1985)

**UNITED STATES**
**DEPARTMENT OF THE INTERIOR**
**BUREAU OF LAND MANAGEMENT**

**SCENIC QUALITY FIELD INVENTORY**

Date 3/22/04
District
Resource Area
Scenic quality rating unit

1. Evaluators (name) LYNN BOWDIDGE, KELLY SHOOK

**2. LANDSCAPE CHARACTER (Feature)**

| | a. LANDFORM/WATER | b. VEGETATION | c. STRUCTURE (General) |
|---|---|---|---|
| FORM | Gentle slope; < 4% rise toward North ii Rolling "low hills" due to dry wash (Bajadas ↗) crossings; no water visible. | Desert Bush scrub, disturbed 30% ground cover canopy | Disturbed |
| LINE | Gentle slope w/ ~~Bttk~~ Mtns in distant view; LV wash in middle ground; desert scrub in foreground | " | Linear facility under construction (Hollywood Rd?). |
| COLOR | Grey, brown, grn in foregrnd; green-grey in mid-grnd; brown-green in ~~for~~ background | " | |
| TEXTURE | Coarse, gravelly | " | Gentle slope |

3. Narrative

Highly disturbed area to immed. adj. North (possible road under construction); existing unpaved trails, highly utilized by OHV; ~~and dist~~ undisturbed desert scrub; Telephone line is visible, however, T-line road is not.

**4. SCORE (Circle Appropriate Level)***

| | HIGH | MEDIUM | LOW | EXPLANATION OR RATIONALE |
|---|---|---|---|---|
| a. Landform | 5 | (3) | 1 | good variety & land/not pristine |
| b. Vegetation | 5 | (3) | 1 | typical Desert Scrub |
| c. Water | 5 | 3 | (0) | not visible |
| d. Color | 5 | (3) | 1 | 2 = taken in spring - sm green |
| e. Adjacent Scenery | 5? | 3 | (0) | E disturbance |
| f. Scarcity | 5+ | 3 | (1) | |
| g. Cultural Modification | 2 | 0 | -4 | by dirt road / remnant of road? |
| TOTALS | 9 + .2 | | | |

**SCENIC QUALITY CLASSIFICATION**

- ☐ A 19 or more
- ☐ B – 12–18
- ☑ C – 11 or less

(Instructions on reverse)

Sensitivity Level M

Reach 3 - KOP #4 - Terminus site

Form 8400–1
(September 1985)

**UNITED STATES**
**DEPARTMENT OF THE INTERIOR**
**BUREAU OF LAND MANAGEMENT**

**SCENIC QUALITY FIELD INVENTORY**

Date 03-22-04
District KOP
Resource Area
Scenic quality rating unit

1. Evaluators *(name)*

2. LANDSCAPE CHARACTER *(Feature)*

| | a. LANDFORM/WATER | b. VEGETATION | c. STRUCTURE *(General)* |
|---|---|---|---|
| FORM | hills - washes. no water | disturbed<br>Mostly barren | disturbed |
| LINE | broken hills - channel<br>wash - no visible H2O | " | |
| COLOR | brown - dirt - sparse<br>veg | " | |
| TEXTURE | disturbed w/ large boulders<br>criss-cross roads | | |

3. Narrative

4. SCORE *(Circle Appropriate Level)**

| | HIGH | MEDIUM | LOW | EXPLANATION OR RATIONALE |
|---|---|---|---|---|
| a. Landform | 5 | 3 | (1) | Dev on foreground |
| b. Vegetation | 5 | 3 | (1) | disturbed area |
| c. Water | 5 | 3 | (0) | |
| d. Color | 5 | 3 | (1) | |
| e. Adjacent Scenery | 5 | (3) | 0 | mtn views |
| f. Scarcity | 5+ | 3 | (1) | |
| g. Cultural Modification | 2 | 0 | (-4) | |
| TOTALS | 3 x | | 8 3 | |

SCENIC QUALITY CLASSIFICATION

- ☐ A 19 or more
- ☐ B – 12–18
- ☑ C – 11 or less

*(Instructions on reverse)*

sensitivity level L

South Lateral KOP #5 - Calico Ridge/Tuscany Hills

Form 8400–1
(September 1985)

**UNITED STATES**
**DEPARTMENT OF THE INTERIOR**
**BUREAU OF LAND MANAGEMENT**

**SCENIC QUALITY FIELD INVENTORY**

Date 03-22-04
District Soesp
Resource Area
Scenic quality rating unit

1. Evaluators *(name-1*

**2. LANDSCAPE CHARACTER (*Feature*)**

| | a. LANDFORM/WATER | b. VEGETATION | c. STRUCTURE (*General*) |
|---|---|---|---|
| FORM | rolling hills - wash - * | tamarisk in C-1 | rolling - |
| | ** water in C-1 channel - surface runoff - from stand pt to boundary C-1 - 50ft | Desert scrub 30-40% cover | |
| LINE | broken w/ hills - wash - x with hills - ~~Desert~~ - West steady line | " | |
| COLOR | brown-green - H20 - green-blue - hills - Calico | " | Back - middle hills of Calico color - development |
| TEXTURE | grainy | - low desert | |

3. Narrative

area to south under const for housing -
C-1 west area ~~de~~ disturbed @ const site -
s.p. rap in place
(9 sediment control structures) in site.

**4. SCORE (*Circle Appropriate Level*)***

| | HIGH | MEDIUM | LOW | EXPLANATION OR RATIONALE |
|---|---|---|---|---|
| a. Landform | 5 | (3) | 1 | viewing Calico hills |
| b. Vegetation | 5 | (3) | 1 | |
| c. Water | 5 | 3 | (0) | diversion/control structures - |
| d. Color | 5 | (3) | 1 | Variety in hills - |
| e. Adjacent Scenery | 5 | (3) | 0 | |
| f. Scarcity | 5+ | 3 | (1) | |
| g. Cultural Modification | 2 | 0 | (-2) | |
| TOTALS | | 12 - 3 | | 9 |

**SCENIC QUALITY CLASSIFICATION**

- ☐ A 19 or more
- ☒ B – 12–18
- ☑ C – 11 or less

*(Instructions on reverse)*

sensitivity level L

KOP 6 - Boulder Islands Alt
Lake Mead Dr. @ 3 Kids Mine

Form 8400–1
(September 1985)

**UNITED STATES**
**DEPARTMENT OF THE INTERIOR**
**BUREAU OF LAND MANAGEMENT**

**SCENIC QUALITY FIELD INVENTORY**

Date 3/22/04
District SCOP
Resource Area
Scenic quality rating unit

1. Evaluators (name): LYNN BOWDIDGE, KELLY STOOK

2. LANDSCAPE CHARACTER (Feature)

| | a. LANDFORM/WATER | b. VEGETATION in foreground | c. STRUCTURE (General) |
|---|---|---|---|
| FORM | hills – dry washes; no water | 60% bush scrub; barren in background | Mountainous background; T-lines break line in middle ground |
| LINE | Very gentle slope toward North then Mountainous in background; homes/residential community in foreground to the immed. West of photo point. | " | " |
| COLOR | Green to brown (foreground to background) | Green – grey | |
| TEXTURE | Smooth to rough (fore- to background) | Smooth; bush scrub height ≥ 2.5 ft | T-lines break texture of smooth slope |

3. Narrative

4. SCORE (Circle Appropriate Level)*

| | HIGH | MEDIUM | LOW | EXPLANATION OR RATIONALE |
|---|---|---|---|---|
| a. Landform | 5 | 3 | (1) | T-lines; construction; disturbance |
| b. Vegetation | 5 | 3 | (1) | |
| c. Water | 5 | 3 | (0) | |
| d. Color | 5 | 3 | (1) | T-lines; " ; " |
| e. Adjacent Scenery | 5 | 3 | (0) | |
| f. Scarcity | 5+ | 3 | (1) | |
| g. Cultural Modification | 2 | 0 | -2 | |
| TOTALS | | | (7) | |

SCENIC QUALITY CLASSIFICATION

- ☐ A 19 or more
- ☐ B – 12–18
- ☑ C – 11 or less

(Instructions on reverse)

sensitivity level L

new kop #7
@ CCW.RD.

Form 9400–1
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

**SCENIC QUALITY FIELD INVENTORY**

Date 3-26-04
District SCOP
Resource Area CCWRD
Scenic quality rating unit

1. Evaluators (name)
Lynn Bowdidge

2. LANDSCAPE CHARACTER (Feature)

| | a. LANDFORM/WATER | b. VEGETATION | c. STRUCTURE (General) |
|---|---|---|---|
| FORM | flat w/mtn Backdrop if not visible | Heavy line of tamarisk & back related Veg | except for treatment plant & power lines no major break in line |
| LINE | fallows Veg strip phone line & road | steady line of green | " |
| COLOR | brown/gray | green gray | - |
| TEXTURE | smooth | steady line of Veg canopy | |

3. Narrative

Area is highly disturbed @ road & treatment plant w/ dirt roads criss crossy. Telephone line

4. SCORE (Circle Appropriate Level)*

| | HIGH | MEDIUM | LOW | EXPLANATION OR RATIONALE |
|---|---|---|---|---|
| a. Landform | 5 | (3) | 1 | good backround View of |
| b. Vegetation | 5 | (3) | 1 | wash |
| c. Water | 5 | (3) | 0 | Wash |
| d. Color | 5 | (3) | 1 | wash |
| e. Adjacent Scenery | 5 | 3 | (0) | |
| f. Scarcity | 5+ | 3 | (1) | |
| g. Cultural Modification | (2) | 0 | -4 | ~~fence~~ wt treatment plant - power lines |
| TOTALS | 2 + | 12 | -3 | = 11 |

SCENIC QUALITY CLASSIFICATION

- ☐ A 19 or more
- ☐ B – 12–18
- ☑ C – 11 or less

(Instructions on reverse)

KOP-8 - Boulder Islands Alt. - Boulder Beach

Form 8400–1
(September 1985)

**UNITED STATES**
**DEPARTMENT OF THE INTERIOR**
**BUREAU OF LAND MANAGEMENT**

**SCENIC QUALITY FIELD INVENTORY**

Date 03-24-04
District SCOP
Resource Area Boulder Pole - Boulder Beach
Scenic quality rating unit

1. Evaluators (name-1)
Ryan Bowdidge Kelly Shoole Jeff Beller

2. LANDSCAPE CHARACTER (Feature)

| | a. LANDFORM/WATER | b. VEGETATION | c. STRUCTURE (General) |
|---|---|---|---|
| FORM | land - mtns. | Russian Thistle | flat - w/ setting mtns |
| | ii lake flat - | | |
| LINE | steady line background mtn broken by lake - yes focal point | " | " |
| COLOR | dominant blue - w/ line of brown/gray mtns | - | blending colors - lake provides dominant |
| TEXTURE | rough landform. | " | mtns - rugged - rocky |
| | smooth H2O | | Beach gravelly water smooth |

3. Narrative
looking southward Boulder Islands - description of area

mtns to water

4. SCORE (Circle Appropriate Level)*

| | HIGH | MEDIUM | LOW | EXPLANATION OR RATIONALE |
|---|---|---|---|---|
| a. Landform | (5) | 3 | 1 | - mix of color/texture ✓ |
| b. Vegetation | 5 | 3 | (1) | Indistinct |
| c. Water | (5) | 3 | 0 | |
| d. Color | 5 | (3) | 1 | focal point to color and rock east of Boulder Is |
| e. Adjacent Scenery | 5 | (3) | 0 | |
| f. Scarcity | (5+) | 3 | 1 | water independent |
| g. Cultural Modification | 2 | (0) | | Built up recreation |
| TOTALS | 15 + 6 + 1 = Camparea - 22 | | | |

SCENIC QUALITY CLASSIFICATION
- [x] A 19 or more
- [ ] B – 12–18
- [ ] C – 11 or less

(Instructions on reverse)
Not distinct w/in 5 miles

Sensitivity Level is H

KOP 9 & 10 - Las Vegas Bay Alt
Lakeshore Dr - 1.5 miles from KOP 9 by road

Form 8400–1
(September 1985)

**UNITED STATES**
**DEPARTMENT OF THE INTERIOR**
**BUREAU OF LAND MANAGEMENT**

# SCENIC QUALITY FIELD INVENTORY

Date: March 24, 2004
District: SCUP - Lakeshore Dr
Resource Area:
Scenic quality rating unit:

1. Evaluators (name): Lynn Brodigh Kelly Shrock - Jeff Getler

## 2. LANDSCAPE CHARACTER (Feature)

| | a. LANDFORM/WATER | b. VEGETATION | c. STRUCTURE (General) |
|---|---|---|---|
| FORM | Meandering road - Through slight rise/dips in elevation. Water through some of the area | sparce | Surrounding structure rolling hills - little variation |
| LINE | Steady line with little abrupt changes | Gray-green w/ little variation - Sparce | |
| COLOR | Gray-green - up lake to east | | |
| TEXTURE | Smooth w/ flat background - Rock formations | | |

3. Narrative

## 4. SCORE (Circle Appropriate Level)*

| | HIGH | MEDIUM | LOW | EXPLANATION OR RATIONALE |
|---|---|---|---|---|
| a. Landform | 5 | (3) | 1 | Based on ~~scenic~~ uniqueness |
| b. Vegetation | 5 | 3 | (1) | Very low use |
| c. Water | (5) | 3 | 0 | Water seen from views |
| d. Color | 5 | (3) | 1 | Break in color as lake |
| e. Adjacent Scenery | 5 | (3) | 0 | Not unique |
| f. Scarcity | (5+) | 3 | 1 | Based on lake view |
| g. Cultural Modification | 2 | (0) | | little mod. except roads |
| TOTALS | 10 + 9 + 1 | | 20 | |

**SCENIC QUALITY CLASSIFICATION**

- ☐ A 19 or more
- ☐ B – 12–18
- ☐ C – 11 or less

(Instructions on reverse)

Sensitivity high.

KOP 11 - Las Vegas Bay alt - Las Vegas Bay

Form 8400–1
(September 1985)

**UNITED STATES**
**DEPARTMENT OF THE INTERIOR**
**BUREAU OF LAND MANAGEMENT**

**SCENIC QUALITY FIELD INVENTORY**

Date 03-24-04
District SCOP
Resource Area Las Vegas Bay
Scenic quality rating unit Scenic overlook

1. Evaluators (name): Lynn Burdick Kelly Shade Jeff Reller

2. LANDSCAPE CHARACTER (Feature)

| | a. LANDFORM/WATER | b. VEGETATION | c. STRUCTURE (General) |
|---|---|---|---|
| FORM | rolling hills - lake view | Mojave desert scrub - ushcat | rolling hills - fore mountains back |
| LINE | steady broken by water | — | |
| COLOR | brown to grey | gray/green | lows of lake & visable line |
| TEXTURE | smooth to rocky | low canopy | |

3. Narrative

Area vista views - Panoramic beauty - Bad view from lookout is toward the exit portal -

4. SCORE (Circle Appropriate Level)*

| | HIGH | MEDIUM | LOW | EXPLANATION OR RATIONALE |
|---|---|---|---|---|
| a. Landform | (5) | 3 | 1 | good quality |
| b. Vegetation | 5 | 3 | (1) | not unusual |
| c. Water | (5) | 3 | 0 | lake view |
| d. Color | (5) | 3 | 1 | lake is the only not scenery |
| e. Adjacent Scenery | 5 | 3 | (0) | |
| f. Scarcity | (5+) | 3 | 1 | view of lake & desert |
| g. Cultural Modification | 2 | (0) | 1 | road/structures on skyline |
| TOTALS | 20 | +0 | | 20 |

SCENIC QUALITY CLASSIFICATION

- [x] A 19 or more
- [ ] B – 12–18
- [ ] C – 11 or less

(Instructions on reverse)

Sensitivity Level is H

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(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

# VISUAL CONTRAST RATING WORKSHEET

Date 4-16-04
District
Resource Area Kop-1
Activity (program) SCOP

## SECTION A. PROJECT INFORMATION

1. Project Name SCOP.
2. Key Observation Point #1 @ DR. & Wash.
3. VRM Class IV
4. Location
Township
Range
Section
5. Location Sketch Used KOP-1-JPS- looking NW West towards CHV treatment plan

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | See form 8400.1 for existing conditions | | |
| LINE | | | |
| COLOR | | | |
| TEXTURE | | | |

## SECTION C. PROPOSED ACTIVITY DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | Land same/ Form of H2O would be less flow | Cleared -/disturbed. | Visible @ eye level for- no new structures @ this KOP. |
| LINE | Stream Channel remain the same. | " | " |
| COLOR | no change. | " | " |
| TEXTURE | No change | " | " |

## SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

1. DEGREE OF CONTRAST

| ELEMENTS | FEATURES: LAND/WATER BODY (1) | | | | VEGETATION (2) | | | | STRUCTURES (3) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None |
| Form | | ✓ | | | | | ✓ | | | ✓ | | |
| Line | | ✓ | | | | | ✓ | | | ✓ | | |
| Color | | ✓ | | | | | ✓ | | | ✓ | | |
| Texture | | ✓ | | | | | ✓ | | | ✓ | | |

2. Does project design meet visual resource management objectives? ☑ Yes ☐ No (Explain on reverse side) VRM class IV

3. Additional mitigating measures recommended ☐ Yes ☑ No (Explain on reverse side)

Evaluator's Names — Date

Lynn Berwick — 4-16-04

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**VISUAL CONTRAST RATING WORKSHEET**

Date 4-16-04
District
Resource Area KOP 2.
Activity (program) SCOP

## SECTION A. PROJECT INFORMATION

1. Project Name SCOP
2. Key Observation Point #2 L.V. Wash
3. VRM Class III
4. Location
Township
Range
Section
5. Location Sketch Nature trail @ Duck Creek @ L.V. Wetlands Park photos KOP 2.1 ; 2.2.

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | | See form 8400-1 | |
| LINE | | for existing conditions | |
| COLOR | | | |
| TEXTURE | | | |

## SECTION C. PROPOSED ACTIVITY DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | no change - because project will not be visible from the | | |
| LINE | Public Viewing area | | |
| COLOR | | | |
| TEXTURE | | | |

## SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

1. DEGREE OF CONTRAST

| ELEMENTS | FEATURES: LAND/WATER BODY (1) Strong | Moderate | Weak | None | VEGETATION (2) Strong | Moderate | Weak | None | STRUCTURES (3) Strong | Moderate | Weak | None |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Form | | | | | | | | | | | | |
| Line | | | | | | | | | | | | |
| Color | | | | | | | | | | | | |
| Texture | | | | | | | | | | | | |

2. Does project design meet visual resource management objectives? ☑ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☑ No (Explain on reverse side)
no change in viewshed

Evaluator's Names — Date

Lynn Bowdidge 4-16-04

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**VISUAL CONTRAST RATING WORKSHEET**

Date 4-16-04
District
Resource Area KOP3
Activity (program) SCOP

## SECTION A. PROJECT INFORMATION

1. Project Name SCOP.
2. Key Observation Point #3. Chat trail View
3. VRM Class IV
4. Location
   Township
   Range
   Section
5. Location Sketch from Rainbow Gardens Rd. toward Wetlands Park -

   KOP photos 3.1, 3.2, 3.3

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | | See form 8400-1 for existing conditions - | |
| LINE | | | |
| COLOR | | | |
| TEXTURE | | | |

## SECTION C. PROPOSED ACTIVITY DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | no visible water land form would not change - veg - no chg. | | no proposed structures |
| LINE | chat trail would not be visible from this point - | w/be covered by veg - | |
| COLOR | no chge! | | |
| TEXTURE | " | | |

## SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

1. DEGREE OF CONTRAST

| ELEMENTS | FEATURES: LAND/WATER BODY (1) Strong | Moderate | Weak | None | VEGETATION (2) Strong | Moderate | Weak | None | STRUCTURES (3) Strong | Moderate | Weak | None |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Form | | | | | | | | | | | | |
| Line | | | | | | | | | | | | |
| Color | | | | | | | | | | | | |
| Texture | | | | | | | | | | | | |

2. Does project design meet visual resource management objectives? ☐ Yes ☒ No (Explain on reverse side) VRM II

3. Additional mitigating measures recommended ☐ Yes ☑ No (Explain on reverse side)

Evaluator's Names — Date

Lynn Bowdidge 4-16-04

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# VISUAL CONTRAST RATING WORKSHEET

Date 4-16-04
District
Resource Area Terminus Area
Activity (program) SOP

## SECTION A. PROJECT INFORMATION

1. Project Name SOP
2. Key Observation Point KOP
3. VRM Class IV

4. Location
Township
Range
Section

5. Location Sketch
EI - terminus site

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | | See form 8400-1 | |
| LINE | | for existing conditions | |
| COLOR | | | |
| TEXTURE | | | |

## SECTION C. PROPOSED ACTIVITY DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | no change | previously cleared of vegetation | minimal change - low lying structure |
| LINE | break of line where building/wall | | Building forms horizontal/ vertical line - Does not affect Background view |
| COLOR | blends with surrounding area | | blends with surroundig |
| TEXTURE | change from broken/ dirt to smooth of stucco | | |

## SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

1. DEGREE OF CONTRAST

| | FEATURES | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LAND/WATER BODY (1) | | | | VEGETATION (2) | | | | STRUCTURES (3) | | | |
| | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None |
| Form | | | | ✓ | | | ✓ | | | ✓ | | |
| Line | | | | ✓ | | | ✓ | | | ✓ | | |
| Color | | | ✓ | | | | ✓ | | | | ✓ | |
| Texture | | | ✓ | | | | ✓ | | | | ✓ | |

2. Does project design meet visual resource management objectives? ☑ Yes ☐ No (Explain on reverse side) √ RM IV

3. Additional mitigating measures recommended ☐ Yes ☑ No (Explain on reverse side)

Evaluator's Names: Lynn Bowdidge
Date: 4-16-04

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**VISUAL CONTRAST RATING WORKSHEET**

Date 4-16-04
District
Resource Area C-1 channel
Activity (program) SCOP

## SECTION A. PROJECT INFORMATION

1. Project Name SCOP
2. Key Observation Point #5
3. VRM Class IV
4. Location
   Township
   Range
   Section
5. Location Sketch Las Vegas Wash / C-1 Channel

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | | See form 8400-1 | |
| LINE | | for existing conditions | |
| COLOR | | | |
| TEXTURE | | | |

## SECTION C. PROPOSED ACTIVITY DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | channel lined - bridge does not affect the channel | spurce | adds elevation to lined channel |
| LINE | no change | " | curved bridge adds vertical interest to channel path |
| COLOR | no change | " | blends w/ channel |
| TEXTURE | no change | " | no change |

## SECTION D. CONTRAST RATING ☐ SHORT TERM ☑ LONG TERM

1. DEGREE OF CONTRAST

| ELEMENTS | FEATURES: LAND/WATER BODY (1) Strong | Moderate | Weak | None | VEGETATION (2) Strong | Moderate | Weak | None | STRUCTURES (3) Strong | Moderate | Weak | None |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Form | | | ✓ | | | | ✓ | | | | ✓ | |
| Line | | | ✓ | | | | ✓ | | | | ✓ | |
| Color | | | ✓ | | | | ✓ | | | | ✓ | |
| Texture | | | ✓ | | | | ✓ | | | | ✓ | |

2. Does project design meet visual resource management objectives? ☑ Yes ☐ No (Explain on reverse side) VRM IV

3. Additional mitigating measures recommended ☐ Yes ☑ No (Explain on reverse side)

Evaluator's Names — Date

Lynn Bowdidge 4-16-04

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# VISUAL CONTRAST RATING WORKSHEET

Date 4-16-07

District

Resource Area Lake Mead Dr. @ 3 Kids Mine

Activity (program) SCOP.

## SECTION A. PROJECT INFORMATION

1. Project Name SCOP

2. Key Observation Point 6

3. VRM Class II

4. Location
Township
Range
Section

5. Location Sketch Lake Mead Dr - near 3 Kids Mine / Magic Way -

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | | see form 8400-1 | |
| LINE | | for existing conditions | |
| COLOR | | | |
| TEXTURE | | | |

## SECTION C. PROPOSED ACTIVITY DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | no water - No change to form. | some additional Veg w/ be disturbed | N/A - |
| LINE | Scar from trenching would be visible - | same - | N/A - none visible from KOP. |
| COLOR | no change - | | |
| TEXTURE | broken | broken - | |

## SECTION D. CONTRAST RATING ☐ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONTRAST

| ELEMENTS | FEATURES: LAND/WATER BODY (1) Strong | Moderate | Weak | None | VEGETATION (2) Strong | Moderate | Weak | None | STRUCTURES (3) Strong | Moderate | Weak | None |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Form | | | | | | | | | | | | |
| Line | | | | | | | | | | | | |
| Color | | | | | | | | | | | | |
| Texture | | | | | | | | | | | | |

2. Does project design meet visual resource management objectives? ☑ Yes ☐ No (Explain on reverse side) Class IV

3. Additional mitigating measures recommended ☐ Yes ☑ No (Explain on reverse side)

Evaluator's Names — Date

Lynn Bowdidge 4-16-07

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**VISUAL CONTRAST RATING WORKSHEET**

Date 4-16-04
District
Resource Area SCOP - KQP7
Activity (program)

## SECTION A. PROJECT INFORMATION

1. Project Name: SCOP
2. Key Observation Point: #7 - CCWRD
3. VRM Class: IV

4. Location
Township
Range
Section

5. Location Sketch: north side of wash @ Telephone Line Rd - @ CCWRD discharge point photo: 7.1

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | See form 8400-1 for existing conditions | | |
| LINE | | | |
| COLOR | | | |
| TEXTURE | | | |

## SECTION C. PROPOSED ACTIVITY DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | water is below line of sight | except for wash - the area is clear of veg - | structure would be below line of sight from Telephone Line Rd. |
| LINE | | | |
| COLOR | brown - cleared area. | | |
| TEXTURE | rough - | | |

## SECTION D. CONTRAST RATING ☐ SHORT TERM ☐ ~~LONG~~ TERM

1. DEGREE OF CONTRAST

| ELEMENTS | FEATURES: LAND/WATER BODY (1) Strong | Moderate | Weak | None | VEGETATION (2) Strong | Moderate | Weak | None | STRUCTURES (3) Strong | Moderate | Weak | None |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Form | | | | | | | | | | | | |
| Line | | | | | | | | | | | | |
| Color | | | | | | | | | | | | |
| Texture | | | | | | | | | | | | |

2. Does project design meet visual resource management objectives? ☑ ~~Yes~~ ☐ No
(Explain on reverse side) Class IV

3. Additional mitigating measures recommended
☐ Yes ☑ ~~No~~ (Explain on reverse side)

Evaluator's Names — Date
Lynn Bowdidge 4-16-04

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# VISUAL CONTRAST RATING WORKSHEET

Date 4-16-04
District
Resource Area Boulder Beach
Activity (program) SCUP Construction

## SECTION A. PROJECT INFORMATION

1. Project Name SCUP
2. Key Observation Point #8 - Boulder Beach
3. VRM Class II
4. Location
Township
Range
Section
5. Location Sketch Boulder Beach campground
KOP photos - 8.1, 8.2, 8.3, 8.4

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | | see form 8400-1 for existing conditions - | |
| LINE | | | |
| COLOR | | | |
| TEXTURE | | | |

## SECTION C. PROPOSED ACTIVITY DESCRIPTION - Construction impacts -

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | Water dominate feature - land form changed @ point of dredging - | N/A | Permanent structure = none barge will be visible from beach |
| LINE | line of sight would be drawn to barge & dredging equipment | | silt screen would NOT be visably intrusive |
| COLOR | turbidity may change $H_2O$ color to brown. | | |
| TEXTURE | from smooth to broken | | |

## SECTION D. CONTRAST RATING ☑ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONTRAST

| ELEMENTS | FEATURES: LAND/WATER BODY (1) | | | | VEGETATION (2) | | | | STRUCTURES (3) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None |
| Form | | ✓ | | | | | | | | ✓ | | |
| Line | | ✓ | | | | | | | | ✓ | | |
| Color | ✓ | | | | | | | | | ✓ | | |
| Texture | | ✓ | | | | | | | | ✓ | | |

2. Does project design meet visual resource management objectives? ☐ Yes ☐ No (Explain on reverse side) Partially - BLM discretion to allow
3. Additional mitigating measures recommended ☑ Yes ☐ No (Explain on reverse side)

Evaluator's Names: Lynn Bowdidge
Date: 4-16-04

construction activities to be completed during off-season to minimize volume of people being impacted by construction activities

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# VISUAL CONTRAST RATING WORKSHEET

Date 4-16-04
District
Resource Area Lake Shore Dr.
Activity (program) SCOP

## SECTION A. PROJECT INFORMATION

1. Project Name SCOP
2. Key Observation Point #9 & 10
3. VRM Class II

4. Location
Township
Range
Section

5. Location Sketch at parts the LCS would tunnel under the road. photos not taken. ~~The~~ The LCS would be xx ft under ground

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | | | |
| LINE | | | |
| COLOR | | | |
| TEXTURE | | | |

## SECTION C. PROPOSED ACTIVITY DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | | See Other Side | |
| LINE | | | |
| COLOR | | | |
| TEXTURE | | | |

## SECTION D. CONTRAST RATING ☐ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONTRAST

| ELEMENTS | FEATURES: LAND/WATER BODY (1) Strong | Moderate | Weak | None | VEGETATION (2) Strong | Moderate | Weak | None | STRUCTURES (3) Strong | Moderate | Weak | None |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Form | | | | | | | | | | | | |
| Line | | | | | | | | | | | | |
| Color | | | | | | | | | | | | |
| Texture | | | | | | | | | | | | |

2. Does project design meet visual resource management objectives? ☑ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☑ No (Explain on reverse side)

Evaluator's Names Date

Some equipment would be visible from Lakeshore Drive during certain periods of construction, but vehicular traffic & view scapes. would not be effected.

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**VISUAL CONTRAST RATING WORKSHEET**

Date 4-16-04
District
Resource Area L.V. Bay
Activity (program) Scop

## SECTION A. PROJECT INFORMATION

1. Project Name: Scop
2. Key Observation Point: #11 - L.V. Bay Public overlook
3. VRM Class: II
4. Location
   Township
   Range
   Section
5. Location Sketch: L.V. Bay overlook

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | See | form 8400-1 | |
| LINE | | for existing condition | |
| COLOR | | | |
| TEXTURE | | | |

## SECTION C. PROPOSED ACTIVITY DESCRIPTION (construction)

| | 1. LAND/WATER | 2. VEGETATION | 3. STRUCTURES |
|---|---|---|---|
| FORM | water dominate feature | Underground pipe not seen | Structure @ pump station would be seen |
| LINE | from the lake toward shore - some break in consistancy of line | " | no chang |
| COLOR | no chang | " | " |
| TEXTURE | no chage | " | " |

## SECTION D. CONTRAST RATING ☑ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONTRAST

| ELEMENTS | FEATURES: LAND/WATER BODY (1) Strong | Moderate | Weak | None | VEGETATION (2) Strong | Moderate | Weak | None | STRUCTURES (3) Strong | Moderate | Weak | None |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Form | ✓ | | | | | ✓ | | | | | ✓ | |
| Line | | ✓ | | | | ✓ | | | | | ✓ | |
| Color | | ✓ | | | | ✓ | | | | | ✓ | |
| Texture | | ✓ | | | | ✓ | | | | | ✓ | |

2. Does project design meet visual resource management objectives? ☑ Yes ☐ No
(Explain on reverse side) NPS discretion to allow

3. Additional mitigating measures recommended
☐ Yes ☑ No (Explain on reverse side)

Evaluator's Names — Date

Lynn Bowdidge — 4-16-04

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**SENSITIVITY LEVEL RATING SHEET**

Date March 22, 2004

District SCOP

Resource Area Las Vegas Wash

1. Evaluators *(names)*

Lynn Bowdidge, Kelly Shook

| SENSITIVITY LEVEL RATING UNIT (1) | Type of User (2) | Amount of Use (3) | Public Interest (4) | Adjacent Land Uses (5) | Special Areas (6) | Other Factors (7) | Overall Rating (8) | EXPLANATION (9) |
|---|---|---|---|---|---|---|---|---|
| KOP-1 | L | L | M | L | | | L | Type of user defined as construction workers.<br>Amount of use defined as low because of the relatively small number of workers<br>Public interest defined as medium based on general public interest in wash maintenance.<br>Adjacent land use is cleared - barren<br><br>Note: This area has been cleared for housing development. The visual sensitivity is in transition from low to no use, to developed residential<br>KOP - along embankment of L.V. Wash at Woodside Homes development. |

*(Instructions on reverse)*

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BUREAU OF LAND MANAGEMENT

**SENSITIVITY LEVEL RATING SHEET**

Date: March 22, 2004

District: SCOP

Resource Area: Las Vegas Wash - Reach 2

1. Evaluators (*names*)
Lynn Bowdidge, Kelly Shook

| SENSITIVITY LEVEL RATING UNIT (1) | Type of User (2) | Amount of Use (3) | Public Interest (4) | Adjacent Land Uses (5) | Special Areas (6) | Other Factors (7) | Overall Rating (8) | EXPLANATION (9) |
|---|---|---|---|---|---|---|---|---|
| KOP -2 | H | M | H | H | H | | H | Type of use defined as recreation - hiker<br>Amount of use defined as current users of Wetlands Park from this access<br>Public interest defined as desire to maintain visual quality within the Wetlands Park<br>Adjacent land use is Wetlands Park - desire to maintain visual quality is important<br>Special Area is defined as the Wetlands Park - management directive to maintain visual quality<br>Note: KOP-2 is at the Wetlands Park Duck Creek nature path. |

(*Instructions on reverse*)

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**SENSITIVITY LEVEL RATING SHEET**

Date March 22, 2004

District SCOP

Resource Area Rainbow Garden Rd/Lava Butte Rd.

1. Evaluators *(names)*

Lynn Bowdidge, Kelly Shook

| SENSITIVITY LEVEL RATING UNIT (1) | Type of User (2) | Amount of Use (3) | Public Interest (4) | Adjacent Land Uses (5) | Special Areas (6) | Other Factors (7) | Overall Rating (8) | EXPLANATION (9) |
|---|---|---|---|---|---|---|---|---|
| KOP-3 | H | M | M/H | M | | | M | Type of user mainly recreation. Some workers<br>Recreation use along this trail mostly limited to weekend or short term<br>Public interest assumed at moderate to high based on type of recreation use (off-road vehicles)<br>Adjacent land use is open desert with trails criss-crossing area. Some construction activity of SNWA Lateral. Visible large phone lines<br>KOP-3 is Rainbow Garden Rd/Lava Butte Rd. junction. An area of medium to high recreation use. |

*(Instructions on reverse)*

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

**SENSITIVITY LEVEL RATING SHEET**

Date March 22, 3004

District SCOP

Resource Area Las Vegas Wash - Terminus Site

1. Evaluators *(names)*

| SENSITIVITY LEVEL RATING UNIT (1) | Type of User (2) | Amount of Use (3) | Public Interest (4) | Adjacent Land Uses (5) | Special Areas (6) | Other Factors (7) | Overall Rating (8) | EXPLANATION (9) |
|---|---|---|---|---|---|---|---|---|
| KOP-4 | M | H | L | L | | | L | Type of user defined as worker (dominant) recreation (secondary)<br>Amount of use is daily - through SNWA activities<br>Public interest in visual defined as low based on approved SNWA activities<br>Adjacent land use is defined as construction activitiy - highly disturbed area<br><br>KOP-4 is proposed terminus site. The area is highly disturbed and cross cut by several roads. Vegetation is highly disturbed and construction activities for SNWA lateral is prominent, high power electric lines and fencing. |

*(Instructions on reverse)*

Form 8400-6
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

**SENSITIVITY LEVEL RATING SHEET**

Date March 22, 2004

District SCOP

Resource Area Las Vegas Wash/C-1 Channel

1. Evaluators *(names)*

| SENSITIVITY LEVEL RATING UNIT (1) | Type of User (2) | Amount of Use (3) | Public Interest (4) | Adjacent Land Uses (5) | Special Areas (6) | Other Factors (7) | Overall Rating (8) | EXPLANATION (9) |
|---|---|---|---|---|---|---|---|---|
| KOP-5 | L | M | L | L | | | L | Type of user defined as worker (construction and SNWA for access to projects)<br>Amount of use based on number of workers - relatively low<br>Public interest based on the area being developed for housing<br>Adjacent land use is disturbed land graded for development and dirt roads for for access to SNWA projects<br><br>KOP-5 is the south lateral pipeline alignment at C-1 Channel juncture adjacent to Tuscany Hills residential development |

*(Instructions on reverse)*

Form 8400-6
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

**SENSITIVITY LEVEL RATING SHEET**

Date March 22, 2004

District SCOP - Boulder Islands Alternative

Resource Area Lake Mead Drive at Three Kids Mine

1. Evaluators *(names)*

| SENSITIVITY LEVEL RATING UNIT (1) | Type of User (2) | Amount of Use (3) | Public Interest (4) | Adjacent Land Uses (5) | Special Areas (6) | Other Factors (7) | Overall Rating (8) | EXPLANATION (9) |
|---|---|---|---|---|---|---|---|---|
| KOP-6 | L | H | L | L | | | L | Type of user defined as commuter or recreationist traveling at 55+ MPH<br>Amount of use based on greater than 45,000 visits/yr on Lake Mead Dr.<br>Public interest based on surrounding view - broken by mine tailings power lines and construction<br>Adjacent land use is commercial, residential and mine workings. Residential areas to the west are mainly not in line-of-sight. High power lines are dominant.<br>KOP-6 is along Lake Mead Drive at the Three Kids Mine, looking toward area where proposed Terminus Building would be and access portal. |

*(Instructions on reverse)*

Form 8400-6
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

**SENSITIVITY LEVEL RATING SHEET**

Date March 22, 2004

District SCOP

Resource Area Las Vegas Wash

1. Evaluators *(names)*

| SENSITIVITY LEVEL RATING UNIT (1) | Type of User (2) | Amount of Use (3) | Public Interest (4) | Adjacent Land Uses (5) | Special Areas (6) | Other Factors (7) | Overall Rating (8) | EXPLANATION (9) |
|---|---|---|---|---|---|---|---|---|
| KOP 7 | M | L | L | L | | | L | Type of user defined as maintenance workers and some sightseers<br>Current level of use is low - except for construction workers accessing other projects in the area<br>Public interest low based on distance of telephone road to wash - middle groun<br>Adjacent land use defined as access to Telephone Line Road<br>Area adjacent to Telephone Line Road KOP is very disturbed by cross-cutting of trails, roads. The draw of sightseers would be backgound visual of mounta and city-scape.<br>KOP - along Reach 2 on Telephone Line Road. approximately T21SR62ES23 |

*(Instructions on reverse)*

Form 8400-6
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

**SENSITIVITY LEVEL RATING SHEET**

Date March 24, 2004

District SCOP - Boulder Beach Alternative

Resource Area Boulder Beach

1. Evaluators *(names)*

Lynn Bowdidge, Kelly Shook, Jeff Geller

| SENSITIVITY LEVEL RATING UNIT (1) | Type of User (2) | Amount of Use (3) | Public Interest (4) | Adjacent Land Uses (5) | Special Areas (6) | Other Factors (7) | Overall Rating (8) | EXPLANATION (9) |
|---|---|---|---|---|---|---|---|---|
| KOP-8 | H | M | H | H | H | | H | Type of user is defined as recreation/sight-seeing public.<br>Amount of use is moderate due to seasonality of use.<br>Amount of public interest is based on proposed placement of the exit portal, and assumption that if public takes time to go to the beach ithe nterest in maintaining the visual quality would be high.<br>Adjacent land use is a National Recreation Area -maintenance of scenic quality would be high<br>This KOP is within the LMNRA. |

*(Instructions on reverse)*

Form 8400-6
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

**SENSITIVITY LEVEL RATING SHEET**

Date March 24, 2004

District SCOP - Las Vegas Bay Alternative

Resource Area Las Vegas Bay Scenit Overlook

1. Evaluators *(names)*

Lynn Bowdidge, Kelly Shook, Jeff Geller

| SENSITIVITY LEVEL RATING UNIT (1) | Type of User (2) | Amount of Use (3) | Public Interest (4) | Adjacent Land Uses (5) | Special Areas (6) | Other Factors (7) | Overall Rating (8) | EXPLANATION (9) |
|---|---|---|---|---|---|---|---|---|
| KOP-11 | H | M | H | H | H | | H | Type of user is defined as recreation/sight-seeing public.<br>Amount of use is moderate due to seasonality of use.<br>Amount of public interest is based on placement of scenic overlook and assumption that if public takes time to stop at the overlook, the interest in maintaining the visual quality would be high.<br>Adjacent land use is a National Recreation Area -maintenance of scenic quality would be high<br>This KOP is within the LMNRA. |

*(Instructions on reverse)*

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# Appendix H

## Attachment B – Photos

**Included:**

Key Observation Point:
KOP 1
KOP 2
KOP 3
KOP 4
KOP 5
KOP 6
KOP 7
KOP 8
KOP 9
KOP 10
KOP 11

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**Key Observation Point 1**
Las Vegas Treatment Plant
*Southeast corner of Desert Inn and wash looking toward proposed outfall area*



**Key Observation Point 2**
Wetlands Park at Duck Creek Walk
*Looking northeast toward Telephone Line Road – telephone lines in far background*



**Key Observation Point 3**
From Rainbow Gardens Dirt Road
*Looking southeast toward was and proposed chat trail – with zoom in*



**Key Observation Point 4**
Terminus Site
*Looking Southeast toward placement of proposed terminus site building*



**Key Observation Point 5**
C-1 Channel at Wash
*North side of C-1 Channel looking southeast toward proposed site of pedestrian bridge*



**Key Observation Point 6.1**
From Lake Mead Drive
*Looking northwest toward proposed EI Terminus site*



**Key Observation Point 7.1**
CCWRD
*Looking northwest toward facility where proposed EI control structure would be*



**Key Observation Point 8.1**
Boulder Beach
*Looking southeast toward Boulder Islands – with zoom in*

**Key Observation Points 9 & 10**
Lakeshore Drive
*No photos taken because the pipeline would be underground*



**Key Observation Point 11.2**
Las Vegas Bay – Scenic Overlook
*Looking north at the Delta*

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# Appendix I

Socioeconomics

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# I.0 Socioeconomics

## I.1 Baseline Socioeconomic Tables

Chapter 3.11 provides baseline information concerning the socioeconomic and demographic information on the Project Region and Study Area. Specific socioeconomic patterns are not discussed in this appendix. The following tables are provided in addition to the discussion provided in Chapter 3.11.

- Table I.1-1, Employment, Establishments, and Earnings by Industry in Clark County, Nevada, 2000
- Table I.1-2, Employment By Industry Sector In Clark County, Nevada, 1993 and 1997
- Table I.1-3, Earnings by Industry in Clark County, Nevada, 1993 and 1997
- Table I.1-4, Project Region Historic Population Trends, 1980 to 2000
- Table I.1-5, Clark County and State of Nevada Population Projections, 2000 to 2020
- Table I.1-6, Residential Building Permits, Clark County, Nevada, 1999 to 2003

The employment, establishment, and earnings data were obtained from two separate USBOC publications: the *2000 County Business Patterns* (USBOC 2000b) and the *Economic Census* (1992 and 1997) (USBOC 1992, 1997). The *2000 County Business Patterns* publication uses the North American Industry Classification (NAICS), and the *Economic Census* (1992 and 1997) uses the Standard Industrial Classification (SIC) system. The SIC classification system is an organizational system that identifies business establishments by the principal activity in which they are engaged. The NAICS system, like the SIC system, uses a coding system that classifies industries by the principal activity in which they are engaged and is used in the U.S., Canada, and Mexico. Because the industry categories used in the NAICS and SIC systems are slightly different, it is difficult to make direct comparisons concerning industry changes over time.

## I.2 Impacts

IMPLAN Professional (Version 2.0) (IMPLAN), a computer-based modeling program, was used to predict economic effects associated with the proposed project alternatives. IMPLAN uses industry and employment data from the target county to predict indirect and induced effects of proposed project implementation. This input-output model is used by the analyst in conjunction with a detailed set of assumptions that are developed by the analyst and related to project details, to predict how project related expenditures would impact the economies of the target county. The input-output model predicts how dollars spent on the proposed project would affect specific industries within the county as dollars are spent and re-spent locally. The results are expressed as indirect and induced impacts to employment, value-added, total output, and indirect business taxes.

Table I.1-1 Employment, Establishments, and Earnings by Industry in Clark County, Nevada, 2000.

| Industry Sector | Number of Employees | Number of Establishments | Annual Payroll |
|---|---|---|---|
| Accommodation & Food Services | 220,354 | 2,439 | $5,405,715 |
| Retail Trade | 73,341 | 4,454 | $1,736,142 |
| Construction | 63,271 | 2,717 | $2,225,206 |
| Admin, Support, Waste Mgt, Remediation Services | 44,058 | 2,131 | $1,063,365 |
| Health Care and Social Assistance | 42,906 | 2,582 | $1,542,783 |
| Professional, Scientific & Technical Services | 28,999 | 3,330 | $1,307,545 |
| Finance & Insurance | 22,776 | 2,453 | $843,459 |
| Transportation & Warehousing | 21,230 | 543 | $490,610 |
| Arts, Entertainment & Recreation | 19,539 | 662 | $482,094 |
| Other Services | 19,138 | 2,171 | $414,111 |
| Wholesale Trade | 19,117 | 1,539 | $752,715 |
| Manufacturing | 17,875 | 882 | $615,098 |
| Real Estate & Rental & Leasing | 14,798 | 1,777 | $416,206 |
| Information | 14,423 | 536 | $612,632 |
| Management of Companies & Enterprises | 6,754 | 436 | $363,321 |
| Auxiliaries | 3,085 | 49 | $107,209 |
| Utilities | 2,500-4,999 | 41 | $0 N/A |
| Educational Services | 2,765 | 226 | $117,789 |
| Unclassified Establishments | 965 | 608 | $29,958 |
| Mining | 250-499 | 39 | $0 N/A |
| Forestry, Fishing, Hunting, and Agriculture Support | 100-249 | 16 | $0 N/A |
| **Total** | **638,244 -641,141** | **29,631** | **$18,525,958** |

Note:

The industry categories contained in this table are different from the industry categories contained in Tables I.1-2 and I.1-3. Table I.1-1 is based on 2000 County Business Patterns data, which use NAICS; Tables I.1-2 and I.1-3 are based on Economic Census data, which use the SIC System.

*Source: USBOC 2000b.*

Table I.1-2 Employment By Industry Sector in Clark County, Nevada, 1993 and 1997.

| Industry Sector | 1993 | | | | 1997 | | | | % Change in No. of Employees (1993 - 1997) | % Change in No. of Establish-ments (1993 - 1997) |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. of Employees | % of Total | No. of Establish-ments | % of Total | No. of Employees | % of Total | No. of Establish-ments | % of Total | | |
| Services | 210,437 | 55.8 | 7,257 | 38.2 | 274,313 | 52.4 | 9,482 | 37.9 | 30.4 | 30.7 |
| Retail Trade | 69,803 | 18.5 | 4,588 | 24.2 | 94,369 | 18.0 | 5,713 | 22.8 | 35.2 | 24.5 |
| Construction | 29,524 | 7.8 | 1,832 | 9.6 | 56,591 | 10.8 | 2,389 | 9.6 | 91.7 | 30.4 |
| Finance, Insurance and Real Estate | 20,031 | 5.3 | 2,185 | 11.5 | 29,030 | 5.5 | 3,282 | 13.1 | 44.9 | 50.2 |
| Transport and Public Utilities | 18,958 | 5.0 | 724 | 3.8 | 25,892 | 4.9 | 938 | 3.8 | 36.6 | 29.6 |
| Wholesale Trade | 13,652 | 3.6 | 1,212 | 6.4 | 19,746 | 3.8 | 1,551 | 6.2 | 44.6 | 28.0 |
| Manufacturing | 11,981 | 3.2 | 635 | 3.3 | 18,315 | 3.5 | 837 | 3.3 | 52.9 | 31.8 |
| Agricultural Services, Forestry, and Fishing | 2,217 | 0.6 | 351 | 1.8 | 4,451 | 0.9 | 480 | 1.9 | 100.8 | 36.8 |
| Mining | 295 | 0.1 | 33 | 0.2 | 786 | 0.2 | 53 | 0.2 | 166.4 | 60.6 |
| Unclassified Establishments | 215 | 0.1 | 169 | 0.9 | 144 | 0.0 | 288 | 1.2 | -33.0 | 70.4 |
| **Total** | **377,113** | **100.0** | **18,986** | **100.0** | **523,637** | **100.0** | **25,013** | **100.0** | **38.9** | **31.7** |

Note:
Employment and Establishments data in 1993 and 1997 are based on the SIC System. The SIC employee data does not capture the number of workers who are self-employed, employees of private households, railroad employees, agricultural production workers, and most government workers. Therefore, the SIC system tends to slightly undercount the total number of employees.
*Source*: *USBOC* 1993, 1997.

Table I.1-3 Earning By Industry in Clark County, Nevada, 1993 and 1997.

| Industry Sector | 1993 | | 1997 | | Percent of Change |
|---|---|---|---|---|---|
| | Annual Payroll ($1,000) | Percent of Total 1993 | Annual Payroll ($1,000) | Percent of Total 1997 | |
| Services | 4,729,037 | 54.8 | 7,032,619 | 52.1 | 48.7 |
| Retail Trade | 1,036,184 | 12.0 | 1,626,492 | 12.0 | 57.0 |
| Construction | 921,186 | 10.7 | 1,767,408 | 13.1 | 91.9 |
| Finance, Insurance, and Real Estate | 580,009 | 6.7 | 931,305 | 6.9 | 60.6 |
| Transportation and Public Utilities | 575,557 | 6.7 | 777,892 | 5.8 | 35.2 |
| Wholesale Trade | 391,793 | 4.5 | 640,629 | 4.7 | 63-5 |
| Manufacturing | 343,171 | 4.0 | 604,797 | 4.5 | 76.2 |
| Agricultural Services, Forestry, and Fishing | 38,729 | 0.4 | 87,619 | 0.6 | 126.2 |
| Mining | 9,639 | 0.1 | 32,373 | 0.2 | 235.9 |
| Unclassified Establishments | 3,825 | 0.0 | 7,820 | 0.1 | 104.4 |
| **Total** | **8,629,130** | **100.0** | **13,508,954** | **100.0** | **56.6** |

Note:
Employment and Establishments data in 1993 and 1997 are based on the SIC System. The SIC employee data does not capture the number of workers who are self-employed, employees of private households, railroad employees, agricultural production workers, and most government workers. Therefore, the SIC system tends to slightly undercount the total number of employees.
*Source: USBOC 1993, 1997.*

Table I.1-4 Project Region Historic Population Trends, 1980 to 2000.

| Place | Population | | | Percent Change | | Average Annual 1980-2000 |
|---|---|---|---|---|---|---|
| | 1980 | 1990 | 2000 | 1980-90 | 1990-2000 | |
| City of Boulder, NV | 9,590 | 12,567 | 14,966 | 31.0 | 19.1 | 1.4 |
| City of Henderson, NV | 23,376 | 64,942 | 176,048 | 177.8 | 171.1 | 5.2 |
| Town of Whitney, NV | 6,449 | 11,870 | 17,731 | 84.1 | 49.4 | 3.1 |
| City of North Las Vegas, NV | 42,739 | 47,707 | 115,488 | 11.6 | 142.1 | 0.6 |
| City of Las Vegas, NV | 164,674 | 258,295 | 478,868 | 56.9 | 85.4 | 2.3 |
| Las Vegas, NV/AZ MSA | 463,087 | 741,459 | 1,563,282 | 60.0 | 110.8 | 2.4 |
| Study Area Census Tracts | N/A | N/A | 57,615 | N/A | N/A | N/A |
| Clark County, NV | 463,087 | 741,459 | 1,375,765 | 60.1 | 85.5 | 2.4 |
| State of Nevada | 800,508 | 1,201,833 | 1,998,257 | 50.1 | 66.3 | 2.1 |

Notes:
N/A = Not available.
*Source: USBOC 1980, 1990, 2000a; and Hardcastle 2002.*

Table I.1-5 Clark County and State of Nevada Population Projections, 2000 to 2020.

| Place | Population Projections | | | | | Percentage Change | | | | Average Annual Increase (Percent) |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2000 | 2005 | 2010 | 2015 | 2020 | 2000-2005 | 2005-2010 | 2010-2015 | 2015-2020 | |
| Clark County, NV | 1,375,765 | 1,761,614 | 1,969,348 | 2,082,455 | 2,123,277 | 28.0 | 11.8 | 5.7 | 2.0 | 2.7 |
| State of Nevada | 1,998,257 | 2,442,116 | 2,690,078 | 2,837,522 | 2,910,959 | 22.2 | 10.0 | 5.5 | 2.0 | 2.3 |

*Source: Hardcastle 2002.*

Table I.1-6 Residential Building Permits, Clark County, Nevada, 1999 to 2003.

| Type of Residential Unit | | | | | |
|---|---|---|---|---|---|
| **Permit Data By Year** | **Single Family Residential** | **Townhouses** | **Condominiums** | **Duplex/ Apartment Buildings** | **Total** |
| **1999** | | | | | |
| No. of Units | 6,994 | 385 | 795 | 2,627 | **10,801.0** |
| No. of Permits | 6,994 | 137 | 80 | 259 | **7,470.0** |
| Valuation ($ Millions) | $566.9 | $34.3 | $50.6 | $149.1 | **$800.9** |
| **2000** | | | | | |
| No. of Units | 8,303 | 127 | 1,068 | 2,238 | **11,736.0** |
| No. of Permits | 8,303 | 127 | 185 | 252 | **8,867.0** |
| Valuation ($ Millions) | $848.0 | $8.7 | $81.5 | $102.2 | **$1,040.4** |
| **2001** | | | | | |
| No. of Units | 10,323 | 175 | 1,093 | 4,276 | **15,867.0** |
| No. of Permits | 10,323 | 175 | 122 | 414 | **11,034.0** |
| Valuation ($ Millions) | $1,101.7 | $11.3 | $91.5 | $185.9 | **$1,392.4.0** |
| **2002** | | | | | |
| No. of Units | 10,432 | 190 | 1,700 | 3,287 | **15,609.0** |
| No. of Permits | 10,432 | 190 | 181 | 330 | **11,133.0** |
| Valuation ($ Millions) | $1,079 | $12.5 | $190.5 | $168.6 | **$1,451.3** |
| **2003** | | | | | |
| No. of Units | 11,150 | 29 | 1,530 | 4,531 | **17,240.0** |
| No. of Permits | 11,150 | 29 | 147 | 498 | **11,824.0** |
| Valuation ($ Millions) | $1,159.4 | $1.7 | $77.4 | $214.6 | **$1,451.1** |

*Source: Clark County 2003b.*

Direct impacts are the changes in the industries to which a final demand change was made. Indirect effects are changes in inter-industry purchases as they respond to the new demands of the directly affected industries. Induced effects typically reflect changes in spending from households as income increases or decreases due to the changes in production. Total impacts are simply the summation of the direct, indirect and induced impacts. Value-added is a measurement of the value that is added to intermediate goods and services. It is equal to the total of employee compensation, proprietor income, other property income, and indirect business taxes. Total-output is a measure of the total value of purchases by intermediate and final consumers, or by intermediate outlays plus value-added. Employment impacts show the number of new jobs that would be created as a result of the project as project related dollars are spent and re-spent within the regional economy and new jobs are created in other industries within the target counties. Indirect business tax impacts measure the amount of local (county, city and other local taxing entities), and State sales taxes combined that would occur as a result of project-related expenditures.

For purposes of environmental document preparation, more specifically Environmental Impact Statement (EIS) documents, IMPLAN allows for economic impacts to be quantified that are associated with the construction of a variety of projects (i.e., dams, pipelines, highways, loss of agricultural land, residential, etc.). For each type of economic impact, IMPLAN can generate reports that indicate the amount of impact to each industry in a local economy. The results can then be compared to baseline economic data to determine how the proposed project would affect a particular community (i.e., what industries would gain or lose the most jobs?, how would it affect the housing industry?, etc.)

### I.2.1 Assumptions

Below is a list of key assumptions and project-related details that were used as a basis to predict economic impacts associated with the No Action Alternative and four action alternatives for the SCOP using IMPLAN.

All project construction expenditures are assumed to occur in Clark County, Nevada.

All project construction associated with the pipeline alternatives is assumed to occur over six years beginning in January 2007 and ending approximately in 2012 for both proposed action alternatives.

Construction of the EI is assumed to occur over two years beginning in January 2007 and ending in approximately 2009. The EI is evaluated in both action alternatives during the first two years of project construction of each action alternative.

All project construction for the No Action Alternative is assumed to occur in years 2012 and 2025. Construction impacts would occur as a result of the water treatment facilities unable to meet water quality standards at some point in the future and those facilities would need improvements to meet these standards.

- All of the alternatives include a $29 million cost associated with treatment plant optimization. This cost was not used in the I-O model, and therefore the beneficial economic impacts do not reflect these expenditures.
- All project construction expenditures were applied to IMPLAN industry sector #40, Water, Sewer, and Pipeline Construction, which most closely represents construction of the proposed project).
- All dollars are presented in present day (2005) dollars.

## I.2.2 Methodology

An Input-Output Model (IMPLAN) was used to predict economic effects resulting from pipeline construction of the pipeline alternatives and the EI based on cost estimates (2003 dollars) provided by Black and Veatch (B&V), the project engineer.

The average annual percentage change in the Consumer Price Index (CPI) from 1998 to 2003 was used as the basis to deflate construction costs from 2003 dollars to 2001 dollars for use in IMPLAN and to inflate economic impacts generated by IMPLAN from 2001 dollars to 2005 dollars.

The deflator was calculated at 1.022 and the inflator was calculated at 1.023. The inflator and deflator were then multiplied by the cost estimate given by B&V in 2003 dollars for each year. For example, the total construction costs for the EI in 2003 dollars of $83,202,278 was multiplied by the deflator of 1.022 for years 2002 and 2001 to calculate the cost estimate in 2001 dollars to enter into IMPLAN. A formula was then entered into an Excel spreadsheet for each alternative and the different components of the EI to calculate all of the cost impacts for each year of construction using the inflator, deflator and original construction cost estimates from B&V.

Cost estimates in 2001 dollars were then entered into IMPLAN and a model was run for construction of the pipeline alternatives.

From these cost estimates, IMPLAN generated the direct, indirect, induced and total impacts for total output, value-added, employment and government taxation and revenue impacts for the three pipeline alternatives in 2001 (IMPLAN), 2003 (estimates provided by B&V), 2005 (present day estimates), and 2007 to 2012 dollars (project construction).

The impacts for the EI were calculated between 2007 and 2009. The impacts for the three pipeline alternatives were calculated between 2007 and 2012.

Only the top 10 industries that were expected to benefit in terms of total output, value-added, employment and government taxation and revenue were identified within the IMPLAN generated reports and within the EIS. For the three pipeline alternatives and the EI, the same top 10 industries are expected to benefit from construction of the proposed project.

The economic effects associated with operation and maintenance of the proposed project was not evaluated in this study.

For each of the alternatives involving pipeline construction, tables have been created from the IMPLAN model results that represent construction costs in terms of direct, indirect and induced impacts. Direct impacts are construction industry related, indirect impacts are changes in inter-industry related and induced impacts are from changes in spending from households as dollars are spent and re-spent in the community. For each of the pipeline alternatives, the top ten industries that are expected to benefit in terms of total output and value-added are presented in tabular form. The first two sectors represent construction and engineering services directly related to the wastewater treatment facilities. Sectors 3 through 10 are industries that are affected more through indirect and induced effects, as intermediate goods and services are purchased to supply the construction of the new development, and as income generated through construction is re-spent in the local economy on housing, food real estate, health care, etc. The tables created from the IMPLAN model are available upon request.

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# Appendix J

Realty Program Stipulations

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# J.0 Realty Program Stipulations

1) The Holder shall be responsible for weed control on disturbed areas within the limits of the right-of-way/lease area. The Holder is responsible for consultation with the Authorized Officer and/or local authorities for acceptable weed control methods within limits imposed in the grant stipulations.

2) Any cultural and/or paleontological resources (historic or prehistoric site or object) discovered by the Holder, or any person working on his behalf on public or Federal lands shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The Holder will be responsible for the cost of evaluation. Any decision regarding suitable mitigation measures will be made by the Authorized Officer after consulting with the Holder. Holder shall be responsible for the resultant mitigation costs.

3) Holder shall construct, maintain, operate and/or modify structures and facilities as directed by the Authorized Officer to protect and minimize adverse effects upon raptors and other wildlife.

4) Holder shall report wildlife fatalities, including raptor electrocutions that are discovered on or near project facilities.

5) Holder shall comply with all applicable local, state, and federal air, water, hazardous substance, solid waste, or other environmental laws and regulations, existing or hereafter enacted or promulgated. To the full extent permissible by law, the Holder agrees to indemnify and hold harmless, within the limits, if any, established by state law (as state law exists on the effective date of the right-of-way/lease), the United States against any liability arising from the Holder's use or occupancy of the right-of way/lease area, regardless of whether the Holder has actually developed or caused development to occur on the right-of-way/lease area, from the time of the issuance of this right-of-way/lease to the Holder, and during the term of this right-of-way/lease. This agreement to indemnify and hold harmless the United States against any liability shall apply without regard to whether the liability is caused by the Holder, its agents, contractors, or third parties. If the liability is caused by third parties, the Holder will pursue legal remedies against such third parties as if the Holder were the fee owner of the right-of-way/lease area.

   Notwithstanding any limits to the Holder's ability to indemnify and hold harmless the United States which may exist under state law, the Holder agrees to bear all responsibility (financial or other) for any and all liability or responsibility of any kind or nature assessed against the United States arising from the Holder's use or occupancy of the right-of way/lease area regardless of whether the Holder has actually developed or caused development to occur on the right-of-way/lease area from the time of the issuance of this right-of-way/lease to the Holder and during the term of this right-of-way/lease.

6) The Holder shall not violate applicable air standards or related facility siting standards established by or pursuant to applicable federal, state, or local laws or regulations.

The Holder shall be responsible for dust abatement within the limits of the right-of-way/lease area and is responsible for obtaining all necessary permits from appropriate authorities for acceptable dust abatement and control methods (e.g., water, chemicals). The Holder shall be solely responsible for all violations of any air quality permit, law or regulation, as a result of its action, inaction, use or occupancy of the right-of-way/lease area.

Notwithstanding whether a violation of any air quality permit, law or regulation results, the Holder will cooperate with the Authorized Officer in implementing and maintaining reasonable and appropriate dust control methods in conformance with law and appropriate to the circumstances at the sole cost of the Holder.

Prior to relinquishment, abandonment, or termination of this right-of-way/lease, the Holder shall apply reasonable and appropriate dust abatement and control measures to all disturbed areas. The abatement and measures shall be designed to be effective over the long-term (e.g., rock mulch or other means) and acceptable to the Authorized Officer.

7) No hazardous material, substance, or hazardous waste, (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, *et seq*., or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et seq*.) shall be used, produced, transported, released, disposed of, or stored within the right-of-way/lease area at any time by the Holder. The Holder shall immediately report any release of hazardous substances (leaks, spills, etc.) caused by the Holder or third parties in excess of the reportable quantity as required by federal, state, or local laws and regulations. A copy of any report required or requested by any federal, state or local government agency as a result of a reportable release or spill of any hazardous substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved federal, state or local government agency.

   The Holder shall immediately notify the Authorized Officer of any release of hazardous substances, toxic substances, or hazardous waste on or near the right-of-way/lease area potentially affecting the right-of-way/lease area of which the Holder is aware.

   As required by law, Holder shall have responsibility for and shall take all action(s) necessary to fully remediate and address the hazardous substance(s) on or emanating from the right-of way/lease area.

8) The right-of-way/lease area shall be maintained in a sanitary condition at all times. Waste materials at those sites shall be disposed of promptly at an approved waste disposal site. “Waste,” as used in this paragraph, shall mean all discarded matter of any kind.

9) Holder shall mark the exterior boundaries of the right-of-way/lease area with stake and/or lath at 100 to 200 foot intervals. The intervals may be varied at the time of staking at the discretion of the Authorized Officer. The tops of the stakes and/or laths will be painted and the laths flagged in a distinctive color as determined by the Holder. Holder shall maintain all boundary stakes and/or laths in place until final cleanup and restoration is completed.

10) Holder shall conduct all activities associated with construction, operation, and termination of this right-of-way/lease within its authorized limits.

11) Holder shall maintain the right-of-way/lease in a safe, useable condition, as directed by the Authorized Officer. A regular maintenance program shall include, but is not limited to, soil stabilization.

12) Within 90 days of construction completion, the Holder shall provide the Authorized Officer (the Assistant Field Manager, Division of Lands) with data in a format compatible with the Bureau's Arc-Info Geographic Information System to accurately locate and identify the right-of-way/lease:

    Acceptable data formats are:

    - Corrected Global Positioning System files with sub-meter accuracy or better, in NAD 27 or NAD 83;
    - An AUTOCAD dxf file;
    - Or ARCInfo export files on a CD ROM, 100 mb ZIP disk or 1gb Jazz disk.

    Data may be submitted in any of the following formats:

    - ARCInfo export file;
    - On a 3.5 inch floppy disk in compressed or uncompressed format. Compressed or ZIPed data must include a copy of the UNZIP.EXE file on the disk.

    All data shall include metadata for each coverage, and conform to the Content Standards for Digital Geospatial Metadata Federal Geographic Data Committee standards. Contact Mr. Robert Taylor, GIS Coordinator at (702) 515-5051.

13) Holder shall protect all survey monuments found within the authorization area. Survey monuments include, but are not limited to, General Land Office and Bureau of Land Management Cadastral Survey Corners, reference corners, witness points, U.S. Coast and Geodetic Survey benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. If any of the above are to be disturbed during operations, the holder shall secure the services of a Professional Land Surveyor or Bureau cadastral surveyor to perpetuate the disturbed monuments and references using surveying procedures found in the Manual of Instructions for the Survey of the Public Lands of the United States and Nevada Revised Statutes, Chapter 329, Perpetuation of Corners. The holder shall record such survey in the appropriate county and send a copy to the authorized officer. If the Bureau cadastral surveyors or other Federal surveyors are used to restore the disturbed survey monuments, the holder shall be responsible for the survey cost.

14) Between the periods of March 15 through July 30, surveys for nests of migratory birds shall be completed prior to surface disturbance. If any active nests are found, the area must be avoided until the young birds fledge. If disturbance in Riparian or at higher elevations is required, Holder shall consult with the Authorized officer prior to proceeding. Please contact a BLM Biologist at (702) 515-5000 for guidance.

15) Use of pesticides shall comply with the applicable Federal and state laws. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides, the Holder shall obtain from

the Authorized Officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers and any other information deemed necessary by the Authorized Officer.

The plan shall be submitted no later than December 1 of any calendar year that covers the proposed activities for the next fiscal year.

Pesticides shall not be permanently stored on public lands authorized for use under this grant/permit.

16) Holder shall maintain copy of the authorization along with stipulations on construction site at all times.

17) The grant is issued subject to all valid existing rights.

18) Holder will comply with the terms and conditions of the Biological Opinion, File No. 1-5-96-F-23R.2 for the Las Vegas Valley, on file at the Bureau of Land Management, Las Vegas Field Office. In order to be exempt from the prohibitions of section 9 of the Endangered Species Act, BLM must comply with the following terms and conditions, which implement the reasonable and prudent measures described below. These terms and conditions are non-discretionary.

A. Although not required, applicants or project proponents may voluntarily choose to search for and remove tortoises from lands to be disturbed within the project [programmatic] area. However, such applicants or project proponents who choose to do voluntary search and removal shall contract or appoint a qualified individual to oversee the process. Only individuals trained to handle desert tortoises in accordance with USFWS approved guidelines shall be authorized to handle desert tortoises, unless they are in imminent danger. Currently, the USFWS approved handling guidelines are described in *Guidelines for Handling Desert Tortoises during Construction Projects* (Desert Tortoise Council 1994, revised 1999). For tortoise removals, the applicant shall make arrangements with the Clark County tortoise pick-up service at (702) 593-9027 at least 10 days prior to the commencement of tortoise collection. Tortoises shall not be placed on private lands or lands under management by an agency other than BLM without written permission of the landowner or agency.

B. If a tortoise is in imminent danger with immediate death or injury likely (such as from an approaching vehicle or equipment) and the tortoise has been given the opportunity to move but has withdrawn in its shell and is not moving, onsite personnel may capture the tortoise and place it in a clean unused cardboard box or similar container. The Clark County tortoise pick-up service will be notified immediately. The contained tortoise will be held in the shade or temperature-controlled environment until removed by the pick-up service.

C. BLM has established an exclusionary zone within the project Sec. 7 programmatic area, which is identified as having a low probability for desert tortoises to occur. Desert tortoise surveys, removal efforts, and remuneration fees will not be required for projects within the exclusionary zone.

D. Payment of $660 per acre, as indexed for inflation, shall be required for projects occurring outside of the exclusionary zone prior to issuance of the lease, permit, or other BLM authorization, with the following exceptions:

R&PP leases would be issued prior to payment of remuneration fees. Payment of fees on R&PP leases shall be deferred until immediately prior to surface disturbance. If the R&PP project consists of phased development of the lease area, fees shall be paid for each phase immediately prior to surface disturbance. Likewise, road rights-of-way issued to local governments (e.g., Clark County, cities of Las Vegas, North Las Vegas, Henderson, Mesquite, and Boulder City) may be issued before payment of fees. If payment of remuneration fees is postponed for any project, the applicant must submit a request for a Notice to Proceed before surface disturbance. The applicant shall provide BLM with proof of payment of the required remuneration fees before BLM issues the Notice to Proceed. Both of these actions shall occur prior to surface disturbance. A Notice to Proceed shall be issued for each segment as payment is made.

- Because mining plans of operation are phased in over a number of years, remuneration fees shall be paid for each phase immediately prior to surface disturbance.
- Projects impacting less than 0.25 acres will not be assessed a remuneration fee.
- Mineral material sales will be charged a fee of 25 cents per yard up to the equivalent of $550.00 per acre of disturbance.

E. An assessment of $660, as indexed for inflation, will be applied for each acre of surface disturbance with the exceptions described in letter D above. This rate will be indexed for inflation based on the Bureau of Labor Statistics Consumer Price Index for All Urban Consumers (CPI-U) on January 31st of each year. The next adjustment shall occur on January 31, 2004, and will become effective March 1, 2004. Fees assessed or collected for projects covered under this biological opinion after January 31st of each year will be adjusted based on the CPI-U. Information on the CPI-U can be found on the Internet at: http://stats.bls.gov/news.release/cpi.nws.htm

F. The payment shall be accompanied by the *Section 7 Fee Payment Form* (attachment), and completed by the payee. Payment shall be by certified check or money order payable to Clark County (or other administrator named by the USFWS), and delivered to:

Clark County
Department of Comprehensive Planning
Attn: Sandra Helvey
500 South Grand Central Parkway, Third Floor
Las Vegas, Nevada 89155-1712

G. Remuneration fees will be used to fund management actions that are expected to provide a direct and indirect benefit to the desert tortoise over time. Actions may involve: habitat acquisition, population or habitat enhancement or protection, research that increases our knowledge of desert tortoise biology, habitat requirements or factors affecting habitat attributes, reducing loss of individual animals, documenting the species current status and trend and preserving distinct population attributes or any other action described in the

Management Oversight report entitled *Compensation for the Desert Tortoise* (Hastey et al. 1991) or the Desert Tortoise Recovery Plan (USFWS 1994).

If the applicant or project proponent desires, tortoises encountered during construction may be moved out of harms way to adjacent habitat in accordance with USFWS approved protocol described in Term and Condition 1 above. If adjacent habitat is not available, arrangements must be made with the Clark County pick-up service for disposition of collected tortoises.

H. All necessary information sheets and forms shall be completed by BLM prior to authorizing specific actions (See Attachment A). These forms will be modified as necessary with the USFWS concurrence.

I. BLM will keep an up-to-date log of all actions taken under this consultation, including acreage affected, voluntary survey and removal activities (including reported number of desert tortoises injured, killed, or removed from the project site), and fees paid for each project. BLM will continue to provide the above information to the Las Vegas USFWS office on an annual basis. Information will be cumulative throughout the life of this consultation.

Attachment A

**SECTION 7 FEE PAYMENT FORM**
****PAYMENT CANNOT BE ACCEPTED WITHOUT FORM****
**Entire form is to be completed by project proponent**

**Biological Opinion File Number:** _____

**U.S. Fish and Wildlife Service Office that Issued the Opinion:**
Nevada Fish and Wildlife Office, Reno, Nevada

**Species:** Desert tortoise (*Gopherus agassizii*)
**Project:**
_____

Amount of Payment Received: $_____
Total Payment Required: $_____
Date of Receipt: _____
Check or Money Order Number: _____
Number of Acres to be Disturbed: _____

**Project Proponent:** _____
**Telephone Number:** _____
**Authorizing Agencies:** _____

**Make checks payable to:** Clark County Treasurer

**Deliver check to:** Clark County Desert Conservation Program
c/o Dept. of Air Quality and Environmental Management
Clark County Government Center
500 So. Grand Central Parkway, first floor (front counter)
Las Vegas, Nevada 89106
(Contact: Sandy Helvey at (702) 455-5821)

**If you have questions, you may call the Southern Nevada Field Office of the U.S. Fish and Wildlife Service at (702) 515-5230.**
*Revised 6/16/04*

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# Appendix K

Pharmaceuticals and Personal Care Products (PPCPs)

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# K.0 Endocrine Disrupting Chemicals (EDCs) and Pharmaceuticals and Personal Care Products (PPCPs)

During the past 30 years, studies of environmental pollutants have concentrated predominantly on conventional pollutants such as dichlorodiphenyltrichloroethane (DDT), polychlorinated biphenyls (PCBs), and chlorinated dioxins that are used in agricultural and industrial activities. However, these conventional pollutants represent a small percentage of the chemicals being released to the environment. The use and disposal of consumer chemicals have become a global issue in recent years. In the last 10 to 12 years, a more concerted effort has been made to research the multitude of other pollutants, including contaminants of emerging concern such as pharmaceuticals and personal care products (PPCPs) and endocrine disrupting chemicals (EDCs), in the environment.

The presence of EDCs and PPCPs in waters is not a new phenomenon. It is reasonable to assume that PPCPs have been discharged to groundwater and surface waters for as long as people have been using them. Likewise, endocrine disrupting steroid hormones were reported to occur in surface water as early as 1965 (Stumm-Zollinger and Fair 1965). However, recent advances in analytical chemistry methods and instrumentation have allowed the detection of progressively smaller concentrations of some EDCs and PPCPs in the environment, and particularly in surface water and in effluents from municipal and industrial wastewater treatment plants (WWTP). It is now apparent that these contaminants are present ubiquitously in the effluents of municipal and industrial WWTP and in surface waters impacted by these effluents, including source waters for drinking water treatment plants. Some of these chemicals also have been reported to appear in raw and finished drinking water in the United States (Lee et al. 2004, Stackelberg et al. 2004) and elsewhere.

Pharmaceuticals found in the environment include both prescription and non-prescription (over-the-counter [OTC]) pharmaceuticals used in human and veterinary medicine. Because some pharmaceutical metabolites and degradates can retain significant bioactivity, the term "pharmaceutically-active chemicals" (PhAC) is sometimes used to encompass these along with the parent compounds. Pharmaceuticals found in the environment include, but are not limited to, analgesics, anti-inflammatories, antibiotics (veterinary and human), antiepileptics, antineoplastics, beta blockers, anti-hyperlipidaemics, diagnostic X-ray contrast media, tranquillizers, narcotics (prescription and illicit), broncholytics, expectorants, and antiparasitics (Puijker and Mons 2004). Some potential sources of pharmaceuticals to the environment include municipal WWTP effluents, hospital effluents, runoff from concentrated animal feeding operations (CAFOs), effluents from pharmaceutical manufacturing facilities, landfill leachate, and urban runoff containing waste from medicated pets. However, municipal WWTP effluents have been identified as a major source of pharmaceuticals (as well as personal care products and EDCs) to surface waters (Lee et al. 2004, Daughton 2001b). Pharmaceuticals enter WWTP when people taking medications excrete pharmaceuticals and their metabolites, rinse them from their bodies during bathing, or flush unused medications down the sink or toilet.

Personal care products are chemicals marketed for direct use by the consumer (excluding non-prescription medication with documented physiological effects) and generally intended to be

applied to the human body rather than ingested (with the exception of food supplements). Most are ingredients or preservatives in cosmetics, toiletries, or fragrances. They are not intended as treatments for disease but may be intended to prevent diseases (e.g., sunscreen agents like oxybenzone, antimicrobial agents like triclosan in hand soap). Caffeine and its metabolite 1,7-dimethylxanthine; the nicotine metabolite cotinine; and the flame retardant chemical tris (2-chloroethyl) phosphate (TCEP) often are classified as personal care products, or as degradates or metabolites of personal care products. Many personal care products are used in very large amounts, and, compared with pharmaceuticals, relatively little is known about their environmental fate or effects. Like pharmaceuticals, personal care products often enter the environment via municipal WWTP effluents. Personal care products such as sunscreen agents and fragrance musks might be released directly to the environment (e.g., washed from the body into surface waters during recreational activities), thus by-passing treatment in WWTP (Daughton and Ternes 1999).

Chemicals with the potential to interfere with endocrine systems are called EDCs. Other terms used to describe these chemicals are "endocrine disruptors," "hormonally active agents" (HAAs), "endocrine active chemicals" (EACs), or similar variations of these. The U.S. Environmental Protection Agency (EPA) (1997) defines endocrine disrupting chemicals as exogenous agents that interfere with the production, release, transport, metabolism, binding, action, or elimination of the natural hormones in the body responsible for the maintenance of homeostasis and the regulation of developmental processes. However, other agencies and organizations use different definitions. The EPA developed the Endocrine Disrupter Screening Program (EDSP) to identify screening methods and toxicity testing strategies that can be used to definitively determine whether a chemical is, or is not, an EDC. This process is incomplete, and there currently is no scientific consensus regarding the criteria that can be used to identify EDCs. Many chemicals have not been tested by any method for potential endocrine activity, and controversy surrounds the assignment of the label "EDC" to many chemicals. However, certain chemicals are widely considered to be EDCs. In this report, the term "EDC" refers to known or potential EDCs.

Endocrine disrupting chemicals include a vast number of chemicals with widely varying structures. For example, the Institute for Environment and Health (IEH 2005) in the United Kingdom identified 966 chemicals or elements that have been suggested in the published literature to be potential endocrine disrupters. Endocrine disrupting chemicals include chemicals arising from natural sources as well as anthropogenic chemicals. Naturally occurring EDCs that enter the aquatic environment include: hormones excreted by humans and discharged in WWTP effluent, hormones excreted by livestock at CAFOs and then washed into runoff from these facilities or leached from manure applied to land, hormones excreted by fish in aquaculture, phytoestrogens and mycoestrogens (produced by plants and fungi, respectively), dioxins produced by forest fires and volcanic activity, and naturally occurring ions like nitrate. Anthropogenic sources of EDCs include: industrial chemicals and their degradation products (PCBs, nonylphenol, bisphenol-A); petroleum products, incinerators, power plants, and vehicle exhaust (PAHs, dioxins); biocides (tributyltin, DDT, chlordane, atrazine), and certain pharmaceuticals (ethinylestradiol, or EE2, an active ingredient in oral contraceptive medications). A small subset of PPCPs, primarily synthetic steroids and other synthetic hormones, are known or suspected to be direct-acting EDCs (Daughton 2001a). Given the wide range of chemicals that can be considered to be EDCs, their sources to the environment and routes of exposure to humans and ecological receptors are numerous, and it is not surprising that many EDCs enter WWTP.

Although wastewater treatment processes are capable of removing EDCs and PPCPs to varying degrees, chemicals that resist degradation many remain in treated effluents discharged to surface waters. In the environment, these chemicals may be subject to dilution and environmental degradation, but some persist in the environment. Even when chemicals are efficiently removed, trace concentrations often can still be detected in effluents due to ultra-sensitive analytical methods. Chemicals that are not persistent in the environment sometimes can still be detected in surface water downstream of WWTP outfalls due to constant loading.

## K.1 Regulations

Currently, there are no monitoring, remediation, or regulatory requirements for PPCPs in water in the U.S. (and most other countries). The EPA Office of Research and Development has begun gathering results from studies on the various aspects of PPCPs including:

- Sources and origins,
- Environmental occurrence and distribution,
- Transport and fate,
- Exposure of biological receptors,
- Effects,
- Remediation (engineered treatment processes),
- Pollution prevention, and
- Risk communication and perception.

As of 2004, most research had been devoted to sources and origins, environmental occurrence and distribution, and remediation. Only in the last few years have efforts begun to be invested toward identification of effects, pollution prevention, and risk communication and perception (Daughton 2001a).

As with PPCPs, the concentrations of EDCs in drinking water currently are not regulated in the United States. Although certain contaminants that are regulated in drinking water may be considered to be EDCs, they currently are not regulated on the basis of potential endocrine disruptive effects. To the best of the authors' knowledge, no regulatory limits have been established in the United States for EDCs in municipal WWTP effluents. However, the U.S. Food and Drug Administration (FDA) requires environmental risk assessments for new pharmaceuticals with predicted environmental concentrations greater than 1 µg/L in water.

## K.2 Potential Human Exposure and Effects Related to EDCs/PPCPs in Water

The focus of this report is the potential risk to humans and ecological receptors (primarily fish) as a result of exposure to EDCs and PPCPs in surface water of the Las Vegas Wash and Boulder Basin of Lake Mead, as well as potential risks related to exposure of humans to these same chemicals through drinking water drawn from the Boulder Basin as a source.

Risk is the probability of adverse effects resulting from exposure to an environmental agent or mixture of agents (EPA 2005a). Risk results from the interaction of exposure and potential for

effects. Humans are expected to be exposed to waterborne EDCs and PPCPs primarily through drinking water. Other routes of exposure are possible. Inhalational and dermal exposure during showering and bathing with potable water might occur. During recreational activities at Lake Mead, inhalational and dermal exposure and exposure by incidental ingestion of small amounts of water also are possible, but contact with lake water and particularly with the more contaminated water of the Las Vegas Wash generally will be limited. As a result, waterborne exposure to humans occurring through routes other than ingestion of drinking water is expected to be minor for most of the EDCs and PPCPs of interest here.

For many of these contaminants, exposures to people through water are expected to be small compared with potential exposure to the same contaminant received through food and beverages, prescription and non-prescription medications, occupational exposures, and residential activities (e.g., cleaning products, personal care products, hobby chemicals, pesticides). Thus, the relative importance of non-water-related exposures should be considered. Furthermore, people and organisms in the environment are not exposed to individual contaminants but rather to mixture of contaminants, and constituents of these mixtures may interact with or overwhelm the potential effects of EDCs/PPCPs in drinking water.

Table K-1 presents the maximum concentrations of selected EDCs and PPCPs reported to date in surface water samples from the Las Vegas Wash and its tributaries and Las Vegas Bay of Lake Mead. Table K-2 presents concentrations of some EDCs or PPCPs detected in tertiary-treated effluent collected from one of the municipal WWTPs that discharge to the Las Vegas Wash. These tables do not include all of the potential EDCs that have been detected in Boulder Basin of Lake Mead. For example, certain PCBs and their metabolites have been reported to be EDCs and have been detected in fish and sediment samples from the Las Vegas Wash and Las Vegas Bay. Polychlorinated biphenyls are often associated with municipal wastewater and particularly with sewage sludge or sediments downstream of WWTP. Perchlorate is a known EDC arising from the Las Vegas Wash and has been a concern for Lake Mead and for downstream users of the Colorado River. However, perchlorate in the Boulder Basin of Lake Mead does not originate from municipal wastewater but rather from contaminated groundwater arising from past industrial activities and resultant groundwater contamination.

While a wide range of PPCPs and EDCs have been detected in the Boulder Basin of Lake Mead and in WWTP effluents that discharge to the Las Vegas Wash, monitoring efforts for these chemicals in Lake Mead are still in their infancy, and few of the available data have been published in formal reports or in the peer-reviewed literature. The number of target analytes examined to date represents a relatively small subset of the vast number of contaminants of emerging concern that could be considered. For the limited set of contaminants that has been analyzed to date, the number of samples is insufficient to characterize their spatial and temporal variation or their range of concentrations occurring in the Las Vegas Wash and Boulder Basin. For most of the EDCs, and particularly for the PPCPs, the data are insufficient to adequately characterize exposure to aquatic organisms or humans for risk assessment. At best, preliminary, screening-level risk assessments could be undertaken for some of these chemicals because the duration, intensity, and timing of exposure cannot be established.

## K.2.1 Pharmaceuticals

Currently, no regulatory guidance exists regarding methods for assessing risks to human health associated with exposure to low concentrations of pharmaceuticals in drinking water. Likewise, no regulatory guidance levels that take into account potential human health risks have been published. Evaluations of the human risk of pharmaceuticals in drinking water have been made by Christensen (1998), Webb (2001), Webb et al. (2003), Schulman et al. (2002), and Schwab et al. (2005). All concluded that no appreciable risk for humans exists at the low levels measured in drinking water. Recently Versteegh et al. (2003) calculated provisional "no-effect levels" for a number of pharmaceuticals detected in Dutch drinking water, based on acceptable daily intake (ADI) or maximum residue levels (MRL) for veterinary pharmaceuticals in milk, and these investigators drew similar conclusions.

Other authors (Schwab et al. 2005, Webb et al. 2003, Webb 2001) have proposed estimating the potential for adverse health effects from exposure to pharmaceuticals in drinking water by comparing exposures one would get from drinking the untreated water to the therapeutic dose, divided by several uncertainty or safety factors to account for uncertainties in extrapolating from these doses to levels that would be safe for different population groups. However, while the dose-response relationships of pharmaceuticals in their target organisms are very well-documented, uncertainty exists about the potential effects of these pharmaceuticals on non-target population groups, or about the effect of such factors as differences in dosing and timing of exposure or exposure to multiple chemicals at the same time (Jones et al. 2004).

Table K-3 lists the pharmaceuticals that have been detected in surface water in the Las Vegas Wash and Lake Mead, their maximum detected concentrations, and their lowest therapeutic doses (i.e., the lowest recommended dosage level indicated on the package labeling, assumed to be the lowest exposure level at which the compound produces the desired pharmacologic effect). The table also shows water concentrations for each pharmaceutical that correspond to the lowest therapeutic dose— these concentrations were calculated assuming a person drinks two liters of water at this concentration every day. Because people do not consume untreated surface water from Lake Mead, this is a conservative exposure assumption for waterborne pharmaceuticals. To provide an additional margin of safety, these therapeutic dose concentrations were divided by a factor of 1,000. As shown, the maximum detected concentrations in water are well below equivalent concentrations calculated based on the lowest therapeutic dose divided by a factor of 1,000. No-effect levels calculated by Versteegh et al. (2003) are also shown, where available. Overall, the maximum detected concentrations in drinking water are a factor of 5 to 120,000 lower than the levels calculated as "safe" using either method, and are far below therapeutic dose levels.

Daughton and Ternes (1999) discussed possible effects of long-term exposure to pharmaceuticals. These could include endocrine disrupting activity, induction of antibiotic resistance, genotoxicity, carcinogenicity, or allergic reactions, as well as effects on reproduction or fetal/ child development. Ongoing studies are working to develop toxicity guidance levels for pharmaceuticals in drinking water that take into consideration the full database of toxicity information for each compound, including information about potential effects to the most sensitive subgroups, such as reproductive and developmental effects, as well as cancer risks. Initial results, however, indicate that water concentrations based on the therapeutic dose divided by a factor of 1,000 will likely be protective of these endpoints.

Table K-1 Maximum Concentrations of Detected PPCPs and EDCs in Surface Water Samples Collected From Las Vegas Wash and Its Tributaries and Las Vegas Bay of Lake Mead.*

| Chemical | Maximum Conc. (ng/L) | Sample Location | Chemical Description |
|---|---|---|---|
| 1,7-Dimethylxanthine | 42 | Lake Mead near Saddle Island | Personal care product metabolite, metabolite of caffeine (stimulant) |
| Acenaphthene | 13 | Las Vegas Wash at Pabco Road | EDC, polycyclic aromatic hydrocarbon (PAH) |
| Acetaminophen | 51 | Las Vegas Wash at Pabco Road | Pharmaceutical, analgesic |
| Acetophenone | Qualitative | Las Vegas Bay | Personal care product, solvent and production intermediate. [b] |
| Androstenedione | 2.6 | Las Vegas Wash at Pabco Road | EDC, hormone |
| Arsenic | 117,300 | Kerr-McGee Seeps | EDC, metalloid |
| Atrazine | 1.6 | Las Vegas Wash at Pabco Road | EDC, pesticide |
| Benz[a]anthracene | 19 | Las Vegas Wash at Pabco Road | EDC, polycyclic aromatic hydrocarbon (PAH) |
| Benzo[a]pyrene | 15 | Las Vegas Wash at Pabco Road | EDC, polycyclic aromatic hydrocarbon (PAH) |
| Benzo[b]fluoranthene | 16 | Las Vegas Wash at Pabco Road | EDC, polycyclic aromatic hydrocarbon (PAH) |
| Benzo[k]fluoranthene | 22 | Las Vegas Wash at Pabco Road | EDC, polycyclic aromatic hydrocarbon (PAH) |
| beta-BHC | 21 | Las Vegas Wash at Pabco Road | EDC, pesticide[d] |
| Bisphenol A | 2.4 | Las Vegas Bay | EDC, plasticizer |
| Butylbenzylphthalate | 900 | Las Vegas Creek | EDC, phthalate |
| Caffeine | 660 | Sloan Channel | Personal care product, stimulant |
| Carbamazepine | 180 | Las Vegas Wash at Pabco Road | Pharmaceutical, antiepileptic |
| Carisoprodol | Qualitative | Las Vegas Bay | Pharmaceutical, muscle relaxant |
| Chloroform | 1500 | Meadows Detention Basin | Disinfection byproduct |
| Cimetidine | 63 | Las Vegas Wash below Lake Las Vegas | Pharmaceutical, histamine H 2-receptor antagonists (stomach acid reducer) |
| Clarithromycin | 3 | Las Vegas Wash below Lake Las Vegas | Pharmaceutical, antibiotic |
| Codeine | 17 - 123 | Las Vegas Bay | Pharmaceutical, narcotic analgesic |
| Cotinine | 130 | Las Vegas Wash below Lake Las Vegas | Personal care product metabolite, metabolite of nicotine (stimulant) |
| DDT | 20 | Las Vegas Wash at Pabco Road | EDC, pesticide |
| DEET (or N-N-diethyltoluamide) | 383 | Las Vegas Wash at Pabco Road | Personal care product, insect repellant |
| Dehydronifedipine | 10 | Las Vegas Wash below Lake Las Vegas | Pharmaceutical metabolite, metabolite of nifedipine (hypertension medication) |
| Di(2-ethylhexyl)phthalate | 4650 | Las Vegas Creek | EDC, phthalate |
| Diazepam | 3 - 62 | Las Vegas Bay | Pharmaceutical, tranquillizer |
| Diclofenac | 7.4 | Las Vegas Wash at Pabco Road | Pharmaceutical, analgesic |
| Phenytoin (Dilantin) | 53 - 261 | Las Vegas Bay | Pharmaceutical, antiepileptic |
| Diltiazem | 7 | Las Vegas Wash below Lake Las Vegas | Pharmaceutical, antihypertensive |
| Di-n-butylphthalate | 700 | Meadows Detention Basin | EDC, phthalate |
| Erythromycin | 184 | Las Vegas Wash below Lake Las Vegas | Pharmaceutical, antibiotic |
| Erythromycin - $H_20$ | 210 | Las Vegas Wash at Pabco Road | Pharmaceutical metabolite, metabolite of erythromycin (antibiotic) |
| Estradiol | 2.4[a] | Maximum LVB 6.7 | EDC, hormone |
| 17ß-Estradiol (E2) | 2.67 | Las Vegas Wash | EDC, hormone |
| Estriol | 17 | Las Vegas Wash at Pabco Road | EDC, hormone |
| Estrone | 36 | Las Vegas Wash at Pabco Road | EDC, hormone |
| Ethinylestradiol (EE2) | 0.52 | Las Vegas Bay | Pharmaceutical & EDC, synthetic hormone |
| Fluoxetine | 12 | Las Vegas Wash at Pabco Road | Pharmaceutical, antidepressant |
| Galaxolide (HHCB) | 1093 | Las Vegas Wash at Pabco Road | Personal care product, polycyclic musk |
| Gemfibrozil | 271 | Las Vegas Wash at Pabco Road | Pharmaceutical, lipid-lowering agent (antihyperlipidaemic) |

Table K-1 Maximum Concentrations of Detected PPCPs and EDCs in Surface Water Samples Collected From Las Vegas Wash and Its Tributaries and Las Vegas Bay of Lake Mead.*

| Chemical | Maximum Conc. (ng/L) | Sample Location | Chemical Description |
|---|---|---|---|
| Griseofulvin (Fulvicin) | Qualitative | Las Vegas Bay | Pharmaceutical, antifungal agent |
| Guaifenesin | 21 - 52 | Las Vegas Bay | Pharmaceutical, expectorant |
| Heptachlor | 13 | Las Vegas Wash at Pabco Road | EDC, pesticide |
| Homomenthyl salicylate | Qualitative | Las Vegas Bay | Personal care product, sunscreen agent |
| Hydrocodone | 104 | Las Vegas Wash at Pabco Road | Pharmaceutical, narcotic analgesic |
| Ibuprofen | 37 | Las Vegas Wash at Pabco Road | Pharmaceutical, analgesic |
| Iopromide | 253 | Las Vegas Wash at Pabco Road | Pharmaceutical, X-ray contrast media |
| Lead | 18,000 | Las Vegas Wash @ Northshore Dr (CL3) | EDC, metal |
| Lindane (gamma-BHC) | 180 | Kerr-McGee Seeps | EDC, pesticide |
| Meprobamate | 440 | Las Vegas Wash at Pabco Road | Pharmaceutical, anti-anxiety medication |
| Mequinol | Qualitative | Las Vegas Bay | Personal care product, used to treat skin darkened by the sun |
| Mercury | 200 | LW6.05 | EDC, metal |
| Methocarbamol | Qualitative | Las Vegas Bay | Pharmaceutical, muscle relaxant |
| Musk Ketone | 167 | Las Vegas Wash at Pabco Road | Personal care product, nitromusk |
| Naproxen | 99 | Las Vegas Wash at Pabco Road | Pharmaceutical, analgesic |
| Nicotine | 5 - 23 | Las Vegas Bay | Personal care product, stimulant |
| Nonylphenol (NP) | 1140 | Las Vegas Wash | EDC, degradate of NPE (nonionic surfactants) |
| Nonylphenol polyethoxylates (NPE) | 8990 | Las Vegas Wash | EDC, nonionic surfactants |
| Octylphenol (OP) | 43 | Las Vegas Wash | EDC, degradate of nonionic surfactants |
| Oxybenzone | 30 - 364 | Las Vegas Bay | Personal care product, sunscreen agent |
| para-Chloroaniline | Qualitative | Las Vegas Bay | EDC, production intermediate and degradation product [c] |
| Pentoxifylline | 5 - 50 | Las Vegas Bay | Pharmaceutical, blood thinner |
| Phenobarbitol | 11 - 39 | Las Vegas Bay | Pharmaceutical, sedative and anticonvulsant |
| Primidone | 11 - 130 | Las Vegas Bay | Pharmaceutical, antiepileptic |
| Progesterone | 44 | Confluence of Las Vegas Wash and Lake Mead | EDC, hormone |
| Pyrene | 14 | Las Vegas Wash at Pabco Road | EDC, polycyclic aromatic hydrocarbon (PAH) |
| Sulfamethoxazole | 318 | Las Vegas Wash at Pabco Road | Pharmaceutical, antibiotic |
| TCEP | 354 | Las Vegas Wash at Pabco Road | Personal care Product, flame retardant (not applied to body but to clothing) |
| Testosterone | 1.5 | Las Vegas Wash at Pabco Road | EDC, hormone |
| Triclosan | 241 | Las Vegas Wash at Pabco Road | Personal care product, antimicrobial agent |
| Trimethoprim | 98 | Las Vegas Wash below Lake Las Vegas | Pharmaceutical, antibiotic |
| Vanillin | Qualitative | Las Vegas Bay | Personal care product, flavoring agent |

Conc. = Concentration; TCEP= tris(2-chloroethyl) phosphate; HHCB= hexahydrohexamethylcyclopentabenzopyran; BHC= benzene hexachloride, or hexachlorocyclohexane (HCH); DDT=dichlorodiphenyltrichloroethane.

*Chemicals not detected (with detection or reporting limit, in ng/L, if provided) include: alpha-BHC (<10), alpha-chlordane (<10), aldrin (<10), amoxicillin, anthracene (<10), azithromycin, cadmium (<2000), cephalexin, delta-BHC (<10), chrysene (<10), DDD (<10), DDE (<10), dieldrin (<10), digoxigenin (<8), digoxin (<260), diphenhydramine, enalaprilat (<152), endrin (<10), furosemide, gamma-chlordane (lindane) (<10), heptachlor epoxide (<10), lisinopril, metolachlor (<10), metformin (<3), methoxychlor (<10), miconazole, mirex (<10), paroxetine metabolite (<260), ranitidine (<10), salbutamol (albuterol; <29), thiabendazole, urobilin, and warfarin (<1).

a Assuming that estradiol is the same as 17ß-estradiol, the maximum concentration of estradiol is 2.67 ng/L.

b Personal care product, solvent used to create fragrances, intermediate in production of pharmaceuticals, agrochemicals, and other organic chemicals.

c Intermediate in the manufacture of dyes, pigments, agricultural chemicals and pharmaceuticals; persistent environmental degradate of some herbicides and fungicides.

d BHC(mixture) is a potential EDC, and beta-BHC is a component of this mixture.

*Sources: Boyd and Furlong 2002; Snyder et al. 1999; Snyder et al. 2001; Vanderford et al. 2003, Zhou et al. 2004; Nevada DEP, http://ndep.nv.gov/bwqp/cl3amtls.xls; SNWA monitoring data (Shane Snyder, personal communication; March 2006).*

Table K-2 Concentrations of EDCs or PPCPs Detected in Tertiary-treated Effluent Collected From an Anonymous Municipal WWTP in the Las Vegas Valley.

| EDC/PPCP | Concentration (ng/L) |
|---|---|
| Acetaminophen | 1.6 |
| Androstenedione | 1.5 |
| Atrazine | 1 |
| Caffeine | 29 |
| Carbamazepine | 129 |
| DEET (or N-N-diethyltoluamide) | 383 |
| Diazepam | 2.3 |
| Diclofenac | 3.3 |
| Dilantin | 106 |
| Erythromycin | 51 |
| Estradiol | <1 |
| Estriol | 7.8 |
| Estrone | 20 |
| Ethinylestradiol | <1 |
| Fluoxetine | <1 |
| Galaxolide (HHCB) | 395 |
| gamma-BHC (Lindane) | <10 |
| beta-BHC* | 11 |
| Gemfibrozil | 5.7 |
| Hydrocodone | 68 |
| Ibuprofen | 5.6 |
| Iopromide | 4.6 |
| Meprobamate | 424 |
| Mirex | <10 |
| Musk ketone | 37 |
| Naproxen | 5.1 |
| Oxybenzone | <1 |
| Pentoxyfylline | <1 |
| Sulfamethoxazole | 187 |
| TCEP | 354 |
| Testosterone | 1.1 |
| Triclosan | 4.1 |
| Trimethoprim | 6.6 |

Notes:

Data are taken from Trenholm *et al.* (unpublished manuscript). The data describe concentrations of contaminants detected in tertiary-treated effluent from one of the area municipal WWTP. The specific WWTP is not identified.

TCEP= tris(2-chloroethyl) phosphate;
HHCB= hexahydrohexamethylcyclopentabenzopyran; BHC= benzene hexachloride, or hexachlorocyclohexane (HCH). *BHC (mixture) is a potential EDC, and beta-BHC is a component of this mixture.

Table K-3. Comparison of Maximum Detected Pharmaceutical Concentrations in the Las Vegas Wash or Lake Mead and Water Concentrations Equivalent to the Therapeutic Dose and Other Values.

| Drug | Maximum-Detected Water Conc. (µg/L) | Minimum Therapeutic Dose (mg/d) | Equivalent Drinking Water Conc. (µg/L) h | Equivalent Drinking Water Conc./1000 (µg/L) | Versteeg et al. PDWL (µg/L) [i] | | Margin of Safety Relative to Therapeutic Dose/1000 | Margin of Safety Relative to Versteeg et al. PDWL |
|---|---|---|---|---|---|---|---|---|
| Acetaminophen | 0.051 | 160 [a] | 560,000 | 560 | NA | | 11,000 | NA |
| Caffeine | 0.66 | NA | NA | NA | 1500 | | NA | 2,300 |
| Carbamazepine | 0.18 | 10 [b] | 35,000 | 35 | 50 | | 190 | 280 |
| Cimetidine | 0.063 | 200 [c] | 101,500 | 100 | NA | | 1,600 | NA |
| Clarithromycin | 0.003 | 500 [c] | 248,500 | 250 | NA | | 83,000 | NA |
| Codeine | 0.123 | 16 [c] | 8,050 | 8.1 | NA | | 66 | NA |
| DEET | 0.4 | NA | NA | NA | NA | | NA | NA |
| Dehydronifedipine | 0.01 | 30 [c] | 15,050 | 15 | NA | | 1,500 | NA |
| Diazepam | 0.062 | 2 [c] | 1,015 | 1 | NA | | 16 | NA |
| Diclofenac | 0.0074 | 100 [c] | 49,000 | 49 | 7.5 | | 6,600 | 1,000 |
| Dilantin | 0.261 | 100 [d] | 350,000 | 350 | NA | | 1,300 | NA |
| Diltiazem | 0.007 | 120 [c] | 59,500 | 60 | NA | | 8,600 | NA |
| Erythromycin | 0.184 | 300 [d] | 1,050,000 | 1100 | 15 | | 6,000 | 82 |
| Erythromycin - H20 | 0.210 | 300 [d] | 1,050,000 | 1100 | 15 | | 5,200 | 71 |
| Ethinylestradiol (EE2) | 0.00052 | 0.005 [c] | 2.7 | 0.0027 | NA | | 5.2 | NA |
| Fluoxetine | 0.012 | 10 d | 1,400,000 | 1400 | NA | | 120,000 | NA |
| Gemfibrozil | 0.271 | 1200 [c] | 595,000 | 600 | NA | | 2,200 | NA |
| Guafenesin | 0.052 | 400 [c] | 199,500 | 200 | NA | | 3,800 | NA |
| Hydrocodone | 0.104 | 30 [c] | 15,050 | 15 | NA | | 140 | NA |
| Ibuprofen | 0.037 | 50 [e] | 350,000 | 350 | 150 | | 9,500 | 4,100 |
| Iopromide | 0.253 | NA | NA | NA | NA | | NA | NA |

Table K-3. Comparison of Maximum Detected Pharmaceutical Concentrations in the Las Vegas Wash or Lake Mead and Water Concentrations Equivalent to the Therapeutic Dose and Other Values (Continued).

| Drug | Maximum-Detected Water Conc. (µg/L) | Minimum Therapeutic Dose (mg/d) | Equivalent Drinking Water Conc. (µg/L) [h] | Equivalent Drinking Water Conc./1000 (µg/L) | Versteeg et al. PDWL (µg/L) [i] | | Margin of Safety Relative to Therapeutic Dose/1000 | Margin of Safety Relative to Versteeg et al. PDWL |
|---|---|---|---|---|---|---|---|---|
| Meprobamate | 0.440 | 200 [f] | 220,500 | 220 | NA | | 500 | NA |
| Naproxen | 0.099 [d] | 125 | 455,000 | 460 | NA | | 4,600 | NA |
| Oxybenzone | 0.364 | NA | NA | NA | NA | | NA | NA |
| Pentoxifylline | 0.050 | 800 [c] | 385,000 | 390 | NA | | 7,800 | NA |
| Phenobarbitol | 0.039 | 125 [c] | 63,000 | 63 | NA | | 1,600 | NA |
| Primidone | 0.13 | 50 [c] | 24,850 | 25 | NA | | 190 | NA |
| Sulfamethoxazole | 0.318 | 400 [g] | 2,800,000 | 2800 | 75 | | ,8800 | 240 |
| Triclosan | 0.241 | NA | NA | NA | NA | | NA | NA |
| Trimethoprim | 0.098 | 80 [d] | 280,000 | 280 | NA | | 2,900 | NA |

Notes:

[a] Dose recommended for a child, age 2-3 years; body weight of 10 kg assumed.

[b] Dose recommended for a child, age less than 6 years; body weight of 10 kg assumed.

[c] Dose recommended for an adult; body weight of 70 kg assumed.

[d] Dose recommended for a "child" or "pediatric" ; body weight of 10 kg assumed.

[e] Dose recommended for a child, age 6-12 months; body weight of 5 kg assumed.

[f] Dose recommended for a child, age 6-12 years; body weight of 32 kg assumed.

[g] Dose recommended for a child, age greater than 2 months; body weight of 2 kg assumed.

[h] Calculated by first estimating the minimum therapeutic dose in mg/kg-day, based on the subject's assumed body weight, then multiplying the dose by an assumed adult body weight of 70 kg, dividing by an assumed drinking water ingestion rate of 2 L/day, and multiplying by a conversion factor of 1,000 (µg/mg).

[i] PDWL = Provisional Drinking Water Limit.

These ongoing studies are also examining the potential cumulative effects of trace levels of pharmaceuticals that act on the same biological endpoint. Although toxicologists are beginning to examine schemes by which to evaluate hazards from chemical mixtures, toxicological understanding in this area is in its early stages. It is known that pharmaceuticals and other chemicals, when administered together, can influence the toxicity of one another. For example, a chemical may block the access of another to a biological receptor, and thus reduce the overall activity of the second compound. In other cases, a chemical may act to increase the relative activity of another. Predicting these types of effects is difficult, however, since interactions are expected to change depending on the composition and relative concentrations of compounds in a mixture, and it is impossible to test all possible combinations. Nonetheless, it is expected that very low level exposures to multiple compounds are not a concern in this regard, if exposures are at levels below the lowest doses at which the compounds are "biologically active."

Some potential effects of pharmaceuticals are difficult to predict. For example, some pharmaceuticals (e.g., antibiotics) are known to cause allergic reactions in humans, but predicting the likelihood of eliciting allergic effects at very low doses is difficult, because when people become sensitized to the compound, they can respond to it at extremely low levels of exposure. The possibility of microbial resistance induced by antibiotics in the environment is a subject that remains controversial. Microbial resistance to antibiotics has been noted in surface water and sewage effluent. Ayscough et al. (2000) concluded that the most likely cause is not the induction of resistance caused by exposure to low levels of antibiotics, but the excretion of resistant organisms by humans and animals receiving antibiotic treatment.

## EDCs

Toxicity assessments for EDCs are complicated by a number of factors. Endocrine disrupting chemicals can act at multiple sites in the body and through many mechanisms. For example, some EDCs bind to hormone receptors, while others affect hormone synthesis, transport, metabolism, and distribution. While much is known about the early molecular events involved in hormone response, relatively little is known about the potential for changes in hormone responses to result in adverse effects in an organism. Internal homeostatic controls on the endocrine system can sometimes compensate for the effects of EDC exposure such that no adverse effect results. However, different life stages of the same organism might be affected by the same EDC in different ways. For example, while the homeostatic controls in an adult organism might readily adjust for changes caused by EDC exposure and prevent adverse consequences, a developing organism of the same species might be permanently and severely affected by the same dose. Exposures that occur during sensitive periods of development might result in apparent adverse effects only when the exposed organism reaches adulthood or attempts to reproduce (WHO 2002).

Humans and organisms in the environment are exposed to mixtures of EDCs rather than to individual chemicals. It is possible for simultaneous exposure to multiple EDCs in a mixture to produce an additive effect on an endocrine system, or one chemical might increase (synergism) or decrease (antagonism) an organism's response to concurrent EDC exposure. Although the EPA recommended that common mixtures of EDCs should be screened for endocrine activity, they also determined that screening of mixtures for endocrine activity should be deferred until EPA is confident in its screening methods for individual chemicals (EPA 2005b). The picture is further complicated by the fact that

there are multiple mechanisms by which EDCs could affect the functioning of a single endocrine system and that interactions among the different endocrine systems can occur (WHO 2002).

Controversy surrounding the assignment of the label "EDC" to a chemical stems in part from the lack of a consistent definition. Some definitions include chemicals for which the only evidence of endocrine activity is an effect at the molecular or cellular level (e.g., receptor binding assay, in vitro cellular bioassay). Others use a qualifier such as "potential" or "putative" to describe such a chemical and require demonstration of an adverse effect in an intact organism (in vivo) to designate a chemical as an EDC. In most cases where adverse effects have been reported to be associated with EDC exposure, the mechanism by which the effects occurred is poorly understood, making it difficult to conclude that a causal relationship exists between exposure and effect.

Historically, the adverse effects of diethylstilbestrol (DES), a medication once prescribed to pregnant women, on the children exposed during gestation have clearly demonstrated that humans are susceptible to the effects of EDCs. However, DES was a drug intentionally administered and ingested at high doses. Doses of EDCs that might be accrued from typical environmental exposures or to trace concentrations of EDCs in drinking water are expected to be quite small by comparison. Based on the available information, Ayscough et al. (2000) concluded that the only pharmaceutical for which subtle endocrine disrupting effects have been currently demonstrated in laboratory studies at environmentally relevant concentrations is EE2. Human and animal studies of the effects of long-term exposures to environmentally-relevant doses are unavailable for most potential EDCs, but certain studies, some of which are controversial, indicate that a few EDCs can cause effects at very small doses. Industrial chemicals, organochlorine pesticides, and naturally occurring chemicals have been implicated as potential causes for a suite of effects reported in humans, but specific chemical causes have not been established, and in some cases, the existence of the effects has been disputed.

The International Programme on Chemical Safety (IPCS) conducted an assessment of the state-of-the-science for endocrine disruptors (WHO 2002) that provided the following conclusions with regard to potential effects of EDCs on human health.

"Although it is clear that certain environmental chemicals can interfere with normal hormonal processes, there is weak evidence that human health has been adversely affected by exposure to endocrine-active chemicals… Generally, studies examining EDC-induced effects in humans have yielded inconsistent and inconclusive results, which is responsible for the overall data being classified as "weak." This classification is not meant to downplay the potential effects of EDCs; rather, it highlights the need for more rigorous studies…The only evidence showing that humans are susceptible to EDCs is currently provided by studies of high exposure levels. Our understanding of the effects of chronic, low levels of EDCs are much more obscure. In particular, the relationship between early-life exposures to EDCs in humans and functioning in adult life is poorly understood. This is a concern because laboratory animal studies have indicated that early life stages may be especially sensitive to the effects of EDCs. Only recently have human epidemiological studies been conducted with the necessary rigor to sufficiently address potential cause-and-effect relationships in regards to EDC exposures."

"Analysis of human data by itself, while generating concerns, has so far failed to provide firm evidence of direct causal associations between low-level (i.e., levels measured in the general population) exposure to EDCs and adverse health outcomes."

"Overall, the biological plausibility of possible damage to certain human functions (particularly reproductive and developmental systems) from exposure to EDCs seems strong when viewed against the background of known influences of endogenous and exogenous hormones on many of these processes. Furthermore, the evidence of adverse outcomes in wildlife and laboratory animals exposed to EDCs substantiates human concerns. The changes in human health trends in some areas (for some outcomes) are also sufficient to warrant concern and make this area a high research priority, but non-EDC mechanisms also need to be explored."

According to Anderson (2005), "Large studies have not indicated any association with a list of effects that have sometimes been attributed to environmental exposure to EDCs: low sperm counts, premature puberty in girls, testicular cancer in young men, and breast cancer in some women." Assessments of the potential for effects in humans due to exposure to EDCs in wastewater and reuse water also have not indicated a risk. Studies evaluating the health effects of using treated wastewater for groundwater recharge in Los Angeles County showed that after nearly 30 years of recharge, there is no association between exposure to reuse water and cancer rates, mortality, infectious disease, or adverse birth outcomes including effects on prenatal development, infant mortality, and birth defects (EPA 2004). Similarly, Anderson (2005) concluded that no studies to date have effectively linked low concentrations of EDCs in wastewater to adverse effects in people.

## K.3 Potential EDC/PPCP Exposures and Effects on Fish

Fish and other aquatic organisms are expected to receive much greater exposure than humans to EDCs and PPCPs in the aquatic environment. Fish are constantly immersed in water and can bioconcentrate waterborne contaminants by direct uptake from water across the gill. Fish also can be exposed to lipophilic contaminants through diet or exposure to contaminated sediment or suspended particulate material. Humans are likely to receive much less exposure to wastewater-derived contaminants by these routes. In oligotrophic to mesotrophic water bodies like Lake Mead, fish often congregate near municipal wastewater discharges where increased nutrient input can result in greater availability of food and plant cover. This behavior also results in greater exposure to wastewater-related contaminants. While people are exposed intermittently to waterborne contaminants, fish may be exposed continuously and are more likely to be exposed during critical periods of development when organisms are most sensitive to the effects of contaminants.

While evidence that widespread endocrine disruption is occurring among humans exposed to commonly encountered concentrations of EDCs is weak, there is substantial evidence that EDCs and PPCPs at levels found in WWTP effluents can cause endocrine disruption in fish. Studies conducted in Europe (Jobling et al. 1998, Harries et al. 1997, Rodgers-Gray et al. 2001, Routledge et al. 1998), Canada (Schoenfuss et al. 2002), the United States (Hemming et al. 2001), and elsewhere have reported estrogenic effects in fish due to exposure to municipal and industrial WWTP effluents. Because WWTP effluents contain complex mixtures of EDCs and PPCPs, most of these studies have been unable to pinpoint the specific chemicals that are responsible for the observed effects, but likely causative agents include the animal hormones 17β-estradiol (E2) and estrone, the pharmaceutical EE2, and in some cases nonylphenol (NP) and octylphenol (OP).

Several studies of EDC occurrence and ecological effects have been conducted in the Boulder Basin of Lake Mead, which receives a significant input of tertiary treated effluent from the Las Vegas Wash. Various locations in the Las Vegas Wash and Boulder Basin including the Las Vegas Bay were investigated between 1992 and 2001. Target aquatic species included the common carp

(Cyprinus carpio), the largemouth bass (Micropterus salmoides), and the endangered razorback sucker (Xyrauchen texanus). Target compounds included pesticides, PCBs, semivolatile industrial compounds, alkylphenols, polycyclic aromatic hydrocarbons (PAHs), polychlorinated dibenzo-p-dioxins, polychlorinated dibenzofurans, and steroid hormones. The focus of this discussion will be on those studies published in the peer-reviewed literature.

From 1992 to 1995, Bevans et al. (1996) investigated the occurrence of organochlorines and semivolatile industrial compounds in the water column, bottom sediment, and common carp tissue collected from the Las Vegas Wash and Boulder Basin of Lake Mead. The study used semi-permeable membrane devices (SPMDs) to identify contaminants in the water column. The SPMDs did not allow for determination of waterborne concentrations of the contaminants under study but rather were used to make comparisons of the relative degree of contamination among sites of interest. In addition, the researchers assessed the endocrine status of carp by analyzing blood plasma concentrations of the sex steroid hormones E2 and 11-ketotestosterone (11-KT) and the estrogen-inducible egg-yolk-protein precursor vitellogenin (VTG). Elevated plasma or serum VTG in male fish is used as a biomarker of exposure to estrogen-like (estrogenic) chemicals, as this protein usually is produced in appreciable amounts only in female fish and has no known function in males. Histology of carp gonads and other organs also was examined for evidence of effects that might result from exposure to EDCs.

The investigators reported that carp collected from Las Vegas Wash and Las Vegas Bay (as compared to those from reference location Callville Bay) demonstrated effects indicative of endocrine disruption, including elevated blood-plasma concentrations of 11-KT (an androgen, or male hormone) in female carp in Las Vegas Wash and depressed plasma 11-KT and E2 in male carp from Las Vegas Bay. It has been suggested that the ratio of E2:11-KT in the blood typically is less than 1 in male fish and greater than 1 in female fish and that deviations indicate endocrine disruption. Half of the female carp from Las Vegas Wash had plasma E2:11-KT ratios less than 1 (similar to males), while ratios of plasma E2:11-KT generally were normal for male and female carp from Las Vegas Bay and Callville Bay. According to Bevans et al. (1996), the most compelling evidence of endocrine disruption in carp was the presence of high levels of VTG in blood plasma of male carp collected from Las Vegas Wash and Bay, as well as elevated concentrations in female carp from Las Vegas Bay. Elevated VTG suggests that these fish were exposed to an estrogenic EDC. However, the normal appearance of the histology of all gonad samples and similar degree of sexual maturity among carp of the same sex among the sampling sites indicates that the effects did not result in damage to gonad tissue structure. Slight necrotic changes observed in carp hetapopancreas and kidney samples from all sampling locations (including the reference location) were reported to be consistent with long-term subchronic exposure to toxicants (Bevans et al. 1996).

Bevans et al. (1996) reported that SPMDs (which sample waterborne contaminants), sediment, and carp tissue from Las Vegas Wash and Las Vegas Bay contained elevated levels of known or suspected EDCs relative to the reference location. More details on contaminants detected in SPMDs are provided in the discussion of the report by Tuttle and Orsak (2002) below. The investigators concluded that the endocrine disruption they observed in carp from Las Vegas Wash and Las Vegas Bay could be due to the presence of organochlorine compounds and semivolatile industrial compounds detected in environmental samples from those locations. Many of the detected contaminants have been reported to be associated with endocrine disruption. Dichlorodiphenyltrichloroethane (and/or its metabolite DDE), PCBs, and PAHs have been associated with possible endocrine disruption resulting in reduced reproductive success in fish, though non-endocrine modes of action have not been discounted (WHO 2002). However, benchmark concentrations of these contaminants in sediment or

fish tissue that are known to cause endocrine disruption, or that are known to be less than levels that cause endocrine disruption, in fish currently are unavailable.

In response to the 1996 report, additional studies were initiated to confirm evidence of endocrine disruption and to attempt to identify EDCs in water samples collected from the Las Vegas Wash and Bay. Large-volume water extraction and mass spectrometry were used in 1998 and 1999 to measure waterborne concentrations of estrogenic EDCs (Snyder et al. 1999). Estrogenic EDCs that were detected included EE2 (active estrogenic ingredient in oral contraceptive medication); the hormone E2; and NP, OP, and nonylphenol ethoxylates (NPE), all of which are estrogenic degradation products of the widely used nonionic alkylphenol polythoxylate surfactants used in several personal care products and in other applications. These compounds were found in the Las Vegas Wash and Las Vegas Bay, but were not detected at other locations in the Boulder Basin (Snyder et al. 1999). EE2 and E2 were not detected using conventional analytical instruments but were detected in the Las Vegas Wash and Las Vegas Bay using radioimmunoassay.

Snyder et al. (2001) then used an estrogen-responsive cell bioassay in combination with analytical chemistry techniques in a bioassay-directed fractionation and identification scheme designed to identify estrogenic EDCs of greatest bioactivity in water samples collected from the Las Vegas Wash and Boulder Basin of Lake Mead. The investigators concluded that E2 and EE2 were the dominant estrogenic EDCs in these waters. Results of in vitro cellular bioassays are not always predictive of in vivo effects such as those reported in Lake Mead carp, and it is premature to infer that exposure to EE2 and E2 are solely responsible for estrogenic effects observed in feral fish from the Las Vegas Wash and Las Vegas Bay. However, laboratory studies have shown that small concentrations of E2 and EE2 can induce estrogenic effects in fish (Purdom et al. 1994, Länge et al. 2001, Nash et al. 2004, Sumpter and Johnson 2005).

Further investigations of common carp from Lake Mead were begun in 1999 in an attempt to confirm evidence of endocrine disruption in vivo as well as to account for some difficulties in interpreting results of the previous work. One of the difficulties in identifying the potential chemical cause(s) for the effects reported in fish from Las Vegas Wash and Las Vegas Bay is the lack of an entirely suitable reference site. Differences in general water quality parameters/or habitat between the Las Vegas Wash and Las Vegas Bay and potential reference sites within Lake Mead tend to confound the results of site comparisons. In particular, water temperature has a strong influence on timing of reproduction and associated changes in reproductive physiology of carp. Differences in water temperature and other factors such as food availability can result in differences among fish at various locations with regard to reproductive timing and status and associated endpoints used to assess endocrine disruption. Carp reproductive status varies over the course of a year, and effects of EDCs might be more readily detected at certain periods during the reproductive cycle. Fish from different sites, then, must be in similar stages of reproductive development (or expected to be) to draw appropriate conclusions regarding potential differences due to EDC exposure.

Patiño et al. (2003) conducted a seasonal study of carp collected from two locations in Lake Mead, one in the general area of the Las Vegas Bay (more contaminated site) and one on the Overton Arm of Lake Mead (less contaminated site). The sampling period included two spawning seasons. The investigators reported that male carp showed similar patterns of seasonal changes in gonadal development between these sites, but male carp from Las Vegas Bay consistently had less-developed gonads and, during one sampling event, a lower proportion of fully developed sperm. Female carp demonstrated differences in reproductive timing between locations that appeared to follow differences

in water temperature profiles. For female carp, estimates of fecundity based on development of oocytes (unovulated eggs) in the gonads indicated that females from the Overton Arm produced a smaller number of fully developed oocytes and might have failed to spawn during the second spawning season. The reason for this difference is not clear but the investigators proposed that this might be related to relatively inferior nutritional status of fish from the Overton Arm. Fish from Las Vegas Bay generally were longer and heavier than fish from the Overton Arm, indicating better nutritional status for the former. The investigators concluded that environmental contamination was the only variable that could explain differences in gonadal development between males at different locations, while the differences between females at the two locations were likely due to differences in water temperature and nutritional status of the fish.

Little is known about the potential for common carp to move among the various locations where the fish have been collected for endocrine disruption studies in Lake Mead. As a result, there is some question whether effects observed in the fish are truly related to contaminant exposure received at the locations where the fish were collected. Holding fish in cages at the locations of interest ensures that observed differences among locations are site-related, though it does not ensure that chemical exposure is the only site-related variable that might explain differences in endocrine endpoints. In such a "caged fish" study, site-related differences in temperature and other water quality parameters and availability of natural food remain, but it is simpler to assess the temperature differences because the fish are held in one location that can be more readily monitored.

In late winter to early spring of 1999, Snyder et al. (2004) placed farm-raised adult male and female common carp in cages at four locations in the Boulder Basin of Lake Mead. Sites included Las Vegas Wash, Las Vegas Bay, Moon Cove (reference site 1), and Water Barge Cove (reference site 2). Two reference sites were used because previous studies suggested that this approach aids in accounting for differences in reproductive timing and other site-related differences not related to contamination that can confound the results of endocrine disruption studies in fish. Fish were held in cages for 42 to 48 days. Endpoints that were examined included gonad development and histology, profiles of blood plasma concentrations of sex steroids (testosterone [T], E2, 11-KT) and VTG, steroidogenic potential of gonad tissue, and induction of hepatic xenobiotic biotransformation enzymes. It is important to note that the fish in this study were not exposed to bottom sediment and were not exposed to contaminants in the Las Vegas Wash or Las Vegas Bay for the entire duration of their life-cycle, as feral fish might be.

There were no significant differences in gonad development or histology among carp held at different locations. Slightly greater plasma VTG in male carp held in the Las Vegas Wash compared to those at the other exposure sites and modest elevation in plasma E2 in male carp held at Las Vegas Wash and Las Vegas Bay might indicate exposure to estrogenic contaminants, but causes other than contaminant exposure (such as site-related temperature differences) cannot be discounted. Slight elevation in plasma VTG is not considered to be an adverse effect. There were no differences in plasma T concentrations or in ratios of plasma estrogen to androgens among male fish at different sites and no significant differences in plasma 11-KT concentrations among male fish at Las Vegas Wash, Las Vegas Bay, and one reference site (Water Barge Cove). There were no differences in plasma 11-KT among female carp at different sites, and no differences in plasma E2 among female carp at Las Vegas Wash, Las Vegas Bay, and one reference site (Moon Cove). There were differences in plasma T among females at different locations, but the differences did not appear to be related to exposure to the flow of the Las Vegas Wash. No differences in plasma E2:11-KT ratios were observed among female carp at Las Vegas Wash, Las Vegas Bay, and one reference site (Moon Cove). Female carp held at

Las Vegas Wash had elevated plasma E2:T ratios compared with those at the other three sites; this could indicate that these fish were in a less advanced stage of reproductive development, possibly due to contaminant exposure, or it might indicate slight site-related differences in reproductive timing that are unrelated to contaminant exposure (Snyder et al. 2004).

Gonad tissue taken from both male and female carp held at Las Vegas Bay showed greater basal capacity to produce T than did tissue taken from carp held at the other sites (which is opposite what generally would be expected for an endocrine disrupter effect), but this did not result in greater blood plasma levels of T in these fish relative to those at both reference sites. Gonad tissue taken from female carp held at Las Vegas Wash had less capacity to produce T than did tissue from females at other sites, but this did not result in significantly reduced sex steroid levels in the blood plasma. Measurements of the activity of a certain enzyme in the hepatopancreas indicated that dioxin-like contaminants did not have a substantial effect on the caged carp, and the small elevation in enzyme activity observed in fish held in the Las Vegas Wash might have been related to the elevated water temperature at that site relative to the other sites. The investigators reported that few differences among fish caged at different locations were potentially attributable to contaminant exposure in the Las Vegas Wash and Las Vegas Bay. Water temperature differences among locations complicated interpretation of the results. Variation in some endpoints between carp at the two reference locations supports the use of multiple reference sites in these types of studies. For a brief comparison of the results of various studies of potential endocrine disruption in Lake Mead carp (see Snyder et al. 2004).

In 1998, the U.S. Geological Survey (USGS) Biological Resources Division and the U.S. Fish and Wildlife Service (USFWS) initiated a cooperative effort to assess contaminants associated with the Las Vegas Wash and potential effects on fish and wildlife. The investigation was expanded in 2000 and field data were collected in 2001. The following were the objectives of the USFWS.

1) Review existing data to assess the existence and degree of threats to fish and wildlife,

2) Assess organochlorine compounds and trace elements in bird eggs,

3) Assess razorback sucker (*Xyrauchen texanus*) exposure to endocrine disrupting compounds and other contaminants, and

4) Assess the potential for downstream impacts to endangered fishes and critical habitat.

The results of the USFWS portion of this expanded effort are reported by Tuttle and Orsak (2002). Our review of the USFWS report emphasizes the occurrence of EDCs and PPCPs and their potential effects on fish, including the razorback sucker.

The razorback sucker was once abundant throughout the Colorado River and its major tributaries but is now endangered. The primary reasons for its decline are changes in biological and physical features of its habitat. Predation of larval razorback suckers by non-native species is an important contributing factor to the decline of this species, and environmental contaminants might play a role in poor recruitment in some areas. Two populations of razorback suckers occur in Lake Mead—one at Echo Bay on the Overton Arm and one in the Las Vegas Bay. Razorback suckers occur throughout Las Vegas Bay and have been found in the lower Las Vegas Wash, and they are believed to spawn in the vicinity of Blackbird Point in Las Vegas Bay. The USFWS is particularly concerned about potential effects of contaminants, especially EDCs, associated with the Las Vegas Wash on this species (Tuttle and Orsak 2002).

To address objective (3) above, USFWS began a study to assess exposure of razorback suckers to EDCs and other contaminants in the Las Vegas Wash and to evaluate potential implications to survival and reproduction. Two frozen whole razorback suckers (one adult from Blackbird Point in Las Vegas Bay and one juvenile from Echo Bay) were opportunistically obtained when these fish died during a telemetry study conducted by a private consultant. Whole fish were analyzed for the presence of trace elements and organochlorine compounds. The investigators reported that 9 of 22 analyzed organochlorine compounds were detected in the razorback sucker collected from the Las Vegas Bay, while none of these contaminants were detected in the razorback sucker from Echo Bay. DDT residues (DDT and metabolites DDE and DDD) accounted for more than half of the total detected organochlorines in the Las Vegas Bay razorback sucker, while total PCBs accounted for about a third (Tuttle and Orsak 2002).

Comparisons made between the concentrations of contaminants in the fish from these two locations should be viewed with extreme caution because the number of samples is small (one from each location) and there is great disparity in body size and age. Larger, older fish often contain greater concentrations of contaminants than smaller, younger fish (WSDOH 2005). Likewise, comparisons that were made between concentrations of contaminants in razorback suckers and carp should be considered with skepticism because of the small sample sizes; potential species-dependent differences in contaminant uptake, metabolism, and excretion; and lack of information regarding the ages and sizes of the carp; and differences in the tissue collection techniques for the two species. Tissue-based criteria for these contaminants to protect fish from endocrine disruption are not available. However, the investigators indicated that tissue concentrations of DDT and PCBs in razorback suckers and carp from the Las Vegas Wash and Las Vegas Bay were less than levels associated with effects to survival, growth, reproduction, biochemical changes, and cellular-level effects (Tuttle and Orsak 2002).

As part of the same study (Tuttle and Orsak 2002), razorback suckers at Las Vegas Bay and Echo Bay (reference site) were caught in trammel nets to evaluate their blood plasma reproductive hormone concentrations and ratios, blood plasma contaminant concentrations, and sperm quality. Because of their endangered status, these fish were not killed for histological examination. Razorback suckers were caught in 2000 and 2001, but results currently are available only for the fish sampled in 2000, which included 11 males and 1 female from Las Vegas Bay and 10 males and 4 females from Echo Bay (reference site). These fish showed no overt external indications of adverse health effects of environmental contaminants, and there were no significant differences in length, weight, or condition factor between males at the two sampling locations. The number of female fish sampled is too small to make statistical comparisons. The investigators report that razorback suckers from Las Vegas Bay exhibited evidence of endocrine disruption. Male fish collected from Las Vegas Bay had higher blood plasma concentrations of E2, lower concentrations of 11-KT (not statistically significant), and greater plasma E2:11-KT ratio than males from Echo Bay. Though sample sizes for female fish were too small to draw any conclusions with confidence, the single female razorback sucker collected from Las Vegas Bay was reported to have lower plasma E2 and E2:11-KT ratio than the females from Echo Bay. The implications to razorback sucker physiology and function are uncertain. Results of blood plasma contaminant concentrations are not yet available, and attempts to assess sperm motility and viability were not successful. The investigators stated that ethinylestradiol was detected in the blood of razorback suckers from Las Vegas Bay and in carp from Las Vegas Bay and Callville Bay, with significantly greater concentrations in those from Las Vegas Bay, but these apparently are preliminary findings and the method of detection and concentrations are not provided. Additional

preliminary findings for common carp and largemouth bass are provided by Tuttle and Orsak (2002) but are not discussed in the current report because the data are not available for evaluation.

The USGS and USFWS joint investigation also included a study that employed SPMDs and common carp to assess the occurrence of contaminants and fish endocrine disruption in the Colorado River downstream of Hoover Dam and in Lake Mohave. Sites that were investigated include Las Vegas Bay, the USGS gauging station on the Colorado River downstream of Hoover Dam, a site near the Willow Beach boat launch area, and a site in Cottonwood Cove on Lake Mohave. In 1998, SPMDs were used to assess the occurrence of selected organochlorine compounds in the water column at these sites. The results were compared with SPMD data collected in 1995 for Las Vegas Wash, Las Vegas Bay, and Callville Bay (Bevans et al. 1996). In 1998, common carp were collected from some of the sites where the SPMDs were placed that same year: Hemenway Beach (n=7), Willow Beach (n=19), and Cottonwood Cove (n=20). Blood and tissue samples were taken from the carp for assessment of endocrine disruption biomarkers, followed by analysis of the carcasses for concentrations of organochlorine pesticides and PCBs. The tissue residue data were compared with similar data for carp collected in 1995 at Las Vegas Wash, Las Vegas Bay, and Callville Bay (Bevans et al. 1996).

The number of detected organochlorine compounds and combined organochlorine concentrations were greatest in SPMDs from Las Vegas Wash, generally less in Las Vegas Bay, and significantly less (not detected) in those from sites downstream of the Hoover Dam (Tuttle and Orsak 2002). The DDT metabolites DDD and DDE comprised approximately one-half of the combined organochlorine concentration, while PCBs comprised about one-quarter. For SPMDs deployed in 1995, the combined concentrations of tetrachlorodibenzo-p-dioxins and tetrachlorodibenzofurans were greatest in SPMDs from the Las Vegas Wash, less in those from Las Vegas Bay, and least in those from Callville Bay (Bevans et al. 1996). PAHs were elevated at all sampling sites (Bevans et al. 1996). Elevated concentrations of perchlorate downstream of the Hoover Dam indicate that some contaminants originating in the Las Vegas Wash can reach the lower Colorado River (Tuttle and Orsak 2002). However, occurrence data obtained with SPMDs suggest that lipid-soluble contaminants did not pass through the Hoover Dam during the sampling period, which coincided with the maximum intrusion of the flow of the Las Vegas Wash into Lake Mead at that time (Tuttle and Orsak 2002).

Of the 13 organochlorine compounds that were detected in carp in 1995 and 1998, the number of detected compounds and the total combined concentrations were greatest in fish from Las Vegas Bay. With the exception of Cottonwood Cove, DDE, DDD, and PCBs accounted for the majority of the total organochlorine residues in carp tissue. While organochlorine compounds were detected in fish in the Colorado River downstream of Hoover Dam and in Lake Mohave, the source(s) of those contaminants have not been identified, and the investigators did not believe that the contaminant levels in the fish posed a significant threat to their reproduction or survival (Tuttle and Orsak 2002).

In general, carp collected downstream of the Las Vegas Wash and Las Vegas Bay were in good condition. Female carp from Hemenway Beach were in significantly better condition than those from Cottonwood Cove. Gonadosomatic index (a measure of gonad size in relation to body weight) was less in male carp from Willow Beach than in males from Hemenway Beach or Cottonwood Cove, possibly due to cooler water temperatures at Willow Beach relative to the other sites resulting in delayed sexual maturation. Assessment of blood plasma E2 and 11-KT concentrations and ratios of E2:11-KT in male and female carp did not reveal significant abnormalities. VTG was not detected in the plasma of either of the two male carp collected from Hemenway Beach (note the small sample

size) but was detected in a few of the male carp from Willow Beach and Cottonwood Cove (Tuttle and Orsak 2002).

Past and ongoing research at Lake Mead has produced unequivocal evidence that EDCs and PPCPs occur in the Boulder Basin of Lake Mead and that some of these contaminants are associated with the Las Vegas Wash. A growing body of evidence suggests that endocrine disruption has been observed in common carp collected from Las Vegas Wash and Las Vegas Bay, but a specific chemical cause has not yet been identified. The sources of potential EDCs and PPCPs to the Las Vegas Wash include tertiary-treated municipal wastewater effluent, contaminated shallow groundwater seeps, urban runoff, and stormwater flows. Any or all of these flows are likely to contain EDCs, but there currently is insufficient information to determine whether these chemicals, either alone or in combination, are present at concentrations great enough to cause the reported effects in fish or to pinpoint their exact source. Pharmaceuticals and personal care products probably are associated to the greatest extent with municipal wastewater treatment plant effluents but also could enter Lake Mead from other sources. For example, pharmaceuticals in excreta from medicated pets and hormones in excreta of pets and wildlife might enter the Las Vegas Wash with irrigation water or stormwater flows, and personal care products could be washed directly into the water from the bodies of swimmers in Boulder Basin. In these cases, the contaminated water enters Lake Mead without the potential benefits of treatment and removal in a WWTP. It is unclear at this time whether altering the volumes or relative volumes or attempting to remove or treat the contaminants present in these constituent flows would change the current endocrine status of fish in Lake Mead.

There is an increasing body of literature describing the effects of waterborne exposure to EDCs and PPCPs on fish and other aquatic life. However, no guidelines, benchmarks, water quality criteria, or "safe" levels of EDCs or PPCPs in wastewater have been developed in the United States for the protection of aquatic life. While surface water criteria and regulations do exist for some chemicals that might be considered to be EDCs, these guidelines or criteria are not based on potential endocrine disruptive effects, but rather on more traditional toxicity testing endpoints used for aquatic life, such as mortality, effects on reproduction, decreased growth, etc. While these test results are useful for identifying concentrations that can cause adverse effects on aquatic life, they often do not address the potential for more subtle, long-term effects of chronic exposure to environmentally relevant concentrations of EDCs and PPCPs. Basing levels of concern on acute or overt effects, which might occur at higher concentrations than would effects occurring through an endocrine-mediated or pharmaceutical mode of action, could lead to over-confidence in the level of protection that they afford. For most EDCs and PPCPs, more information is needed to identify concentrations in water that are protective of aquatic life.

Nonylphenol (NP) is an example of an EDC for which water quality criteria for protection of aquatic life have been developed. NP is an organic chemical used primarily as an intermediate to produce other chemicals such as NPE, which are nonionic surfactants produced and used in large quantities in the United States and elsewhere. NP is moderately soluble and persistent in water and is toxic to aquatic organisms, and is a common contaminant of surface waters. NP in the environment occurs primarily as a result of degradation of NPE by sewage sludge in industrial and municipal WWTP and further transformation of degradates in effluents discharged to the environment. NP has a log KOW of 3.80 to 4.77, indicating that moderate bioaccumulation in aquatic organisms may be expected. However, bioconcentration factors (BCF) and bioaccumulation factors (BAF) for NP suggest that it is metabolized to some extent. Lipid-normalized BCF for freshwater fish ranged from 39 to 209 (EPA 2005b).

The EPA has set ambient water quality criteria for NP for protection of aquatic life. According to EPA (2005b), aquatic life should not be affected unacceptably if the one-hour average concentration of NP does not exceed 28 µg/L more than once every three years on the average (Criteria Maximum Concentration (CMC) or Acute Criterion), and the four-day average concentration of NP does not exceed 6.6 µg/L more than once every three years on the average (Criteria Continuous Concentration (CCC) or Chronic Criterion). To date, the maximum reported concentration of NP in surface water of the Las Vegas Wash or Boulder Basin of Lake Mead is 1140 ng/L (or 1.140 µg/L) for a sample collected from the Las Vegas Wash (Table K-1); this concentration does not exceed the EPA criteria for NP. Several review articles have described the estrogenic (endocrine disruptive) effects of NP, primarily demonstrated by effects on aquatic species using endpoints that do not meet acceptability requirements for data used to derive National Ambient Water Quality Criteria. Hence, this information was not considered in setting the EPA criteria, except to the extent that the effects on these endpoints were integrated into whole organism endpoints such as growth and development that are deemed suitable for deriving the EPA criteria (EPA 2005b).

According to data summarized by EPA (2005b), NP seldom has been reported to induce estrogenic effects at concentrations less than the EPA chronic aquatic criterion of 6.6 µg/L. However, one study reported effects at 1 µg/L or less. Giesy et al. (2000) reported that exposure to waterborne NP for 42 days at concentrations of >0.3 to 0.4 µg/L appeared to reduce fecundity in fathead minnows, while fish exposed to 0.09 and 0.1 µg/L produced more eggs than control fish, possibly indicating a hormetic response of fecundity to NP. A hormetic response is one that results in a U-shaped dose-response curve, meaning that a response occurs at a low dose, does not occur or occurs to a lesser degree at a higher dose, then reappears or increases at an even greater dose. However, sample sizes used in this study were small, and it is not clear whether the observed effects would be likely to cause population-level impacts in fathead minnows.

## K.4 Drinking Water and Wastewater Treatment Technologies

Recently, substantial effort and large amounts of funds have been directed toward assessing the capabilities of WWTP and drinking water treatment plants (DWTP) to remove EDCs and PPCPs. Treatment plant effectiveness at removing these contaminants depends on the properties of the target chemicals and on the treatment process train and operating parameters that are employed. Each wastewater or drinking water treatment process has advantages and disadvantages in terms of effectiveness, cost, and other considerations. For example, reverse osmosis is highly effective at removing most contaminants from drinking water and wastewater (Snyder et al. 2003), but it is costly, and the resulting waste brine presents a serious problem with regard to disposal. Advanced oxidation processes (AOPs) are highly effective at reducing the concentrations of steroids, vary in their effectiveness for other classes of contaminants, and perform poorly for removal of metals and organics (Snyder et al. 2003). Ozonation, chlorination, and AOPs might not actually destroy the target contaminants but rather convert them, at least partially, to byproducts (Petrovic et al. 2003). In many cases, these byproducts or degradation products have not been characterized chemically or toxicologically. In some cases, byproducts appear to retain at least part of the toxicity of the parent compound or might demonstrate even greater toxicity (Hu et al. 2002). Consequently, where oxidation processes are being considered for reduction of toxic effects from wastewater to aquatic organisms, pilot-scale toxicity testing should be conducted prior to installation of costly upgrades and before significant changes to treatment processes are made, to ensure that toxicity is reduced and that treatment byproducts do not cause unexpected toxic effects of their own.

Concentrations of most commonly studied contaminants of emerging concern in wastewater effluent are in the low ng/L range, and often below detection limits (Scruggs et al. 2005), with some notable exceptions. Data presented in Table K-2 show that some of the EDCs and PPCPs analyzed in effluent from a WWTP in the current study area occurred in the higher ng/L range, but all levels were less than 500 ng/L. Although it is understood that effluents from WWTP will contain detectable concentrations of some EDCs and PPCPs, in general, wastewater treatment processes provide a marked reduction in their concentrations. Snyder et al. (2003) reviewed the effectiveness of various water treatment technologies for reducing the levels of different classes of compounds. For comparison, Table K-4 shows the treatment processes used at WWTP in the Las Vegas area.

A variety of treatment technologies are employed at the three WWTP in the study area, and for most classes of EDCs and PPCPS, at least one process rated by Snyder et al. (2003) as "G" (good, 70 – 90 percent) or "E" (excellent, >90 percent) is employed at each plant. For example, each plant uses chlorination, which has an estimated removal efficiency of greater than 90 percent for steroids (a class of EDC). Although chlorination is not very effective (poor <20 percent) to fair (40 – 70 percent) at removing sunscreen agents, each plant uses a degradation step (activated sludge) that is effective in reducing concentrations of these chemicals ("G-E"). Exceptions are the organometallics, lipid regulating drugs, antimicrobials, and surfactants/detergents, which might be removed to a lesser degree than the other classes of EDCs and PPCPs.

Table K-4. Treatment Processes Used at WWTP in the Study Area.

| Wastewater Treatment Plant | Activated Sludge | Clarifier | Metal Oxides | Chlorination | Filtration |
|---|---|---|---|---|---|
| City of Henderson | X | X | X | X | X |
| Clark County | X | X | X | X | X |
| City of Las Vegas | X | X | X | X | X |

In general, less is known about EDCs and PPCPs in receiving waters (including source waters for DWTP) and drinking water because analyses for these compounds are rare, and levels often fluctuate around analytical detection limits (Snyder et al. 2003, Scruggs et al. 2005). Many EDCs, such as estrogenic hormones and xenobiotics, appear to be substantially removed during conventional drinking water treatment processes, while these plants generally are not as efficient at removing PPCPs (Snyder et al. 2003).

The drinking water treatment processes used at the three DWTP in the study area are summarized in Table K-5.

As with the WWTP processes, it is possible to compare the treatment technologies used at DWTP in the study area to those with known efficacy at removing certain classes of contaminants. For a review of drinking water treatment process effectiveness for removal of EDCs and PPCPs, see Snyder et al. (2003). It is important to note that that the UV treatment process described in Table 2 of the article by

Table K-5. Treatment Technologies Used at Drinking Water Facilities in the Study Area.

| Drinking Water Treatment Plant | Ozone | Coagulation/ Flocculation | UV | Chlorination | Filtration |
|---|---|---|---|---|---|
| City of Henderson DWTF | | X | X | X | X |
| Alfred Merritt Smith DWTF | X | X | | X | X |
| River Mountain Water Treatment Facility | X | X | | X | X |

Snyder et al. (2003) refers to a UV dose much greater than that typically used for disinfection purposes; typical UV doses used for disinfection are relatively ineffective for removal of many contaminants (Shane Snyder, personal communication, April 2006). Information presented here indicates that the DWTPs in the study area that use ozone for disinfection are likely to achieve better removal of some EDCs and PPCPs (industrial chemicals, anti-inflammatory drugs, lipid regulating drugs, and surfactants/detergents, as well as some constituents of other classes) than the plant using UV, assuming that the typical UV dose for disinfection is applied. All of the DWTP should effectively removed steroids (>90 percent), but are expected to perform less efficiently for removal of inorganics.

The concentration of a contaminant remaining in a WWTP effluent or in drinking water depends not only on removal efficiencies of the treatment processes employed, but also on the influent concentration. To determine whether significant benefits are achieved by additional or altered water treatment processes, one would need to characterize influent concentrations, estimate effluent concentrations based on expected removal rates, and compare the estimated effluent concentration to a health-based benchmark. Alternatively, pilot-scale treatment processes can be used to determine effluent or drinking water concentrations, and bioassays can be used to assess changes in toxicity of effluents or drinking water. Bioassays vary in their ability to predict in vivo toxicity to human and ecological receptors, so they should be selected carefully and their results interpreted with caution. Currently, data describing influent concentrations of EDCs and PPCPs in the area WWTP and DWTP are sparse, as are bioassay data for EDCs and PPCPs in area WWTP effluents and drinking water. Furthermore, there currently is no consensus in the scientific community regarding the most appropriate bioassays for EDCs and PPCPs in drinking water or wastewater effluent.

While it might be tempting to set a goal of reducing the concentrations of contaminants of emerging concern in wastewater or particularly in drinking water to levels below the analytical detection limits, this approach is not scientifically valid. First, it is becoming increasingly clear that analytical chemistry techniques are rapidly out-pacing improvements in treatment technologies such that it is impossible to remove all contaminants to levels below detection limits. Furthermore, analytical detection limits may have no relationship to health-based levels of concern. It is possible for toxic effects of a chemical to occur at concentrations less than the achievable analytical detection limits for that chemical. Conversely, as analytical equipment becomes more exquisitely sensitive, it is likely that detectable concentrations for many EDCs and PPCPs will fall far below any concentrations that produce an observable toxic effect. Forcing water treatment technologies to arbitrarily reduce contaminant concentrations below analytical detection limits could result in substantial waste of public funds while achieving no appreciable benefit to public or environmental health. Striving to reach an increasingly unattainable goal of non-detectable levels of contaminants should be abandoned in favor of tailoring drinking water and wastewater treatment goals to achieve concentrations of contaminants of emerging concern that are safe by using the most cost-effective and feasible means.

Because "safe" levels for most EDCs and PPCPs are not known at this time, it is challenging to develop health-based treatment goals. In the absence of regulatory guidelines and toxicity and exposure data required to set health-based goals, each community must determine whether it will wait for additional information and guidance or take proactive measures to treat and remove EDCs and PPCPs from wastewater and drinking water despite the costs and uncertain benefits.

## K.5 Conclusions

The toxicological relevance of the occurrence of EDCs and PPCPs in Lake Mead and around the world is under study at this time to determine whether these chemicals are capable of producing adverse effects at environmentally relevant concentrations. There is little evidence to suggest that EDCs and PPCPs in wastewater are having an effect on human populations anywhere. However, substantial evidence from laboratory studies and from field studies in other locations indicates that EDCs and at least one PPCP (EE2) at concentrations that occur in some municipal WWTP effluents can adversely affect fish. While recent research suggests that common carp in the Las Vegas Wash and Las Vegas Bay of Lake Mead might be affected by endocrine disruption, no causative chemical agents or specific sources have been identified. If EDCs or PPCPs are responsible for the reported effects, they might have arisen from WWTP effluent, contaminated groundwater seeps, urban runoff, stormwater flow, or a combination of these. More information would be needed to determine whether the SCOP project is likely to alter potential exposure and effects of EDCs or PPCPs. For example, if contaminants present primarily in the groundwater seeps are responsible for reported effects, removal of the treated municipal WWTP effluent from the Las Vegas Wash might cause these contaminant concentrations to increase in the Las Vegas Wash and inner Las Vegas Bay, though total loading to Lake Mead probably would not change. If contaminants associated primarily with municipal WWTP effluent are causing adverse effects in fish, dilution of the effluent in the main body of the lake might decrease exposure to aquatic organisms in the Las Vegas Wash and inner Las Vegas Bay but increase exposure near the new discharge point, though probably at significantly diluted concentrations. In some cases, passage of treated wastewater through constructed wetlands results in some attenuation of wastewater-related contaminants. However, it is not known whether attenuation of this type currently occurs in the Las Vegas Wash.

## K.6 List of Acronyms and Abbreviations

| | |
|---|---|
| 11-KT | 11-ketotestosterone |
| ADI | acceptable daily intake |
| AOPs | advanced oxidation processes |
| CAFO | concentrated animal feeding operation |
| Conc. | concentration |
| BAF | bioaccumulation factor |
| BCF | bioconcentration factor |
| BHC | benzene hexachloride (or hexachlorocyclohexane (HCH)) |
| CCC | criteria continuous concentration |
| CMC | criteria maximum concentration |
| DDD | dichlorodiphenyldichloroethane |
| DDE | dichlorodiphenyldichloroethene |
| DDT | dichlorodiphenyltrichloroethane |
| DEET | N,N-diethyltoluamide |
| DES | diethylstilbestrol |
| DWTP | drinking water treatment plant |
| E2 | 17ß-estradiol |
| EDSP | Endocrine Disrupter Screening Program |
| EE2 | ethinylestradiol |
| EAC | endocrine active chemical |
| EDC | endocrine disrupting chemical |
| HAA | hormonally-active agent |
| HHCB | hexahydrohexamethylcyclopentabenzopyran (Galaxolide) |
| IPCS | International Programme on Chemical Safety |
| MRL | maximum residue level |
| NP | nonylphenol |
| NPE | nonylphenol ethoxylates |
| OP | octylphenol |
| OTC | over-the-counter |
| PAH | polycyclic aromatic hydrocarbon |
| PCBs | polychlorinated biphenyls |
| PPCP | pharmaceuticals and personal care products |
| PhAC | pharmaceutically-active chemical |
| SPMD | semi-permeable membrane device |
| TCEP | tris(2-chloroethyl)phosphate |
| EPA | United States Environmental Protection Agency |
| FDA | United States Food and Drug Administration |
| UV | ultraviolet light |
| VTG | vitellogenin |
| WWTP | wastewater treatment plant |

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# Appendix L

Comment Letters and Responses

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# L.0 Comment Letters and Responses

This appendix contains copies of the comments received regarding the Systems Conveyance and Operations Program (SCOP) Draft Environmental Impact Statement (EIS) and the associated responses of the Bureau of Reclamation (Reclamation) and the National Park Service (NPS). The comment letters were received during the 60-day comment period from October 7, 2005, through December 7, 2005. The comment period was unofficially extended one week for the Environmental Protection Agency (EPA), as well as other interested parties that needed additional time to comment. Comment letters were accepted through January 30, 2006. The chronology of the comment letters is random. Each numbered comment letter is subdivided into specific comments and these comments are numbered sequentially. Each comment and its corresponding response are included in this appendix. Table L-1 lists the letters in the order in which they have been presented in this appendix and the number assigned to each comment letter.

Table L-1. Commenters

| Number* | Commenter | Representing |
|---|---|---|
| F1 | Cynthia Martinez | U.S. Fish & Wildlife Service |
| F2 | Duane James | U.S. Environmental Protection Agency |
| T1 | Shan Lewis | Fort Mojave Indian Tribe |
| S1 | Rebecca Palmer | Nevada State Clearinghouse, Dept. of Administration, Budget and Planning (State of Nevada-State Historic Preservation Office) |
| S2 | Gerald Zimmerman | Colorado River Board (State of California) |
| S3 | William E. Werner | Arizona Dept. of Water Resources (State of Arizona) |
| S4 | Jon C. Sjoberg | Nevada Department of Wildlife (State of Nevada) |
| S5 | Stephen A. Owens | Arizona Department of Environmental Quality (State of Arizona) |
| S6 | Leo Drozdoff | Nevada Division of Environmental Protection |
| E1 | Diane Rae Vick | Mayor (City of Bullhead City, AZ) |
| E2 | Harvey Jackson | Mayor (Lake Havasu City, AZ) |
| E3 | Buster Johnson | Mojave County (District III), Arizona |
| E4 | William J. Ekstrom Jr. | Mojave County Board of Supervisors |
| L1 | Mary A. Scott | La Paz County Board of Supervisors |
| L2 | Michel D. Remington | Imperial Irrigation District |
| L3 | Patricia Marchese | Clark County Department of Parks and Recreation |
| L4 | Kay Brothers | Southern Nevada Water Authority |
| L5 | Laura Simonek | Metropolitan Water District of Southern California |
| L6 | David Mansfield | City of Scottsdale Water Resources Dept |
| L7 | Clifford Edey | La Paz County Board of Supervisors |
| L8 | Gene Fisher | La Paz County Board of Supervisors |
| O1 | Rayond Lee | Foundation of North American Wild Sheep |
| O2 | Walter Johnson | Citizens Advisory Committee |

Table L-1. Commenters (continued)

| Number* | Commenter | Representing |
|---|---|---|
| O3 | James E. Brooks | Desert Fishes Council |
| O4 | Gerald R. Zimmerman | Lower Colorado River Multi-Species Conservation Program |
| O5 | Clifford Edey | Colorado river Regional Sewer Coalition |
| O6 | Dennis Ghiglieri | Sierra Club (Toiyabe Chapter) |
| I1 | Walt Johnson | |
| I2 | Mark Carlton | |
| I3 | James Deacon | |
| I4 | Lorraine J. Tucker | |
| I5 | Adrian LaPiene | |
| I6 | James Deacon | |
| I7 | Jeanjcb2@aol.com | |
| I8 | Merna L. Wagner | |
| I9 | Bill McLeod | |
| I10 | Robert Glenn | |
| I11 | Michael R. Davis | |
| I12 | Steven Taylor | |
| I13 | Carol Mayer | |
| I14 | Carol Mayer (2) | |
| I15 | mayerjg@scglobal.net | |
| I16 | riverbrat@cilink.net | |
| I17 | Sam Gay | |
| I18 | Martin Koppel | |
| I19 | Bill Harton | |
| I20 | Stan Davis | |
| I21 | Jeanne Kentch | |
| I22 | Bill Losasso | |
| I23 | Steven Ahrens | |
| I24 | Tom and Nan Nicoll | |
| I25 | Richard & Peggy Ashmead | |
| I26 | Bill and Judy Kendrick | |
| I27 | Steve Webster | |
| I28 | Bob and Joal Morrison | |
| I29 | Rusty Coad | |
| I30 | Kris Kidder | |
| I31 | Patricia Young | |
| I32 | Laura L. Smith | |
| I33 | Wildflowerlhc1@webtv.net | |

Table L-1. Commenters (continued)

| Number* | Commenter | Representing |
|---|---|---|
| I34 | Bill and Pat Wallace | |
| I35 | Bob Vessells | |
| I36 | Michael R. Davis | |
| I37 | H. Bruce Wallace | |
| I38 | John Scully | |
| I39 | Edsigamay@aol.com | |
| I40 | Dan Hernandez | |
| I41 | Gary Hoskins | |
| I42 | Cecilia and Dean Tweedy | |
| I43 | Peggy Sheppard | |
| I44 | Eleanor Koppel | |
| I45 | Gordon Atteberry | |
| I46 | Mary Helen Hollensbe | |

Notes:
* Comment Identifier Number
F – Federal Agency T – Tribe S – State
L – Local Agency (City or County) O – Organization I – Individual

A number of comments received had common concerns. Because these issues were reoccurring, a general response to each issue has been prepared. These general responses are presented in the following pages and are referred to by name in the responses to individual comments.

## General Response 1 – Process Improvements Alternative

*Comment:*

Certain comments suggested that the NPS and Reclamation analyze a Process Improvements or "enhanced treatment" alternative in the Final EIS. Some comments referenced a study conducted by Dr. David Jenkins for the Metropolitan Water District of Southern California (MWD) in which Dr. Jenkins stated that there are currently available treatment technologies that can be employed to meet the purpose and need of the proposed action (Jenkins 2005).

*Response***:**

In the Draft EIS, plant optimization and additional treatment technologies were considered as part of the No Action Alternative. In response to comments that additional treatment should be considered as a separate alternative, the existing No Action Alternative has been divided into a Process Improvements Alternative, in which optimization plus additional treatment are provided, and a No Action Alternative, in which optimization is provided but additional treatment is not. In the Final EIS, the Process Improvements Alternative includes information provided by commenters and analysis developed in response to those comments.

After reviewing the additional information and analyses, the Final EIS concludes that the Process Improvements Alternative cannot meet key elements of the purpose and need of the project. As described

in the Purpose and Need, Section 1.5 of the Draft and Final EIS, management flexibility and adaptability are important reasons for the proposed project. The alternatives that continue to discharge the treated effluent to only the Las Vegas Wash do not provide flexibility in the management of the flows and cannot adapt to low Lake conditions. Reclamation predicts the Lake to drop to levels between 1,050 and 1,000 ft. This would require the plants to treat to phosphorus levels lower than 0.02 milligrams per liter (mg/L) and still have a high probability of exceeding water quality standards.

There may be differing professional opinions, but based on the knowledge and expertise of the Wastewater Treatment Specialists and Engineers consulted, in 2006 it was determined that reverse osmosis (RO) may be the only technology that can reliably achieve combined effluent TP levels of between 0.02 and 0.05 mg/L on an annual average basis. However, implementation of RO was eliminated from further consideration, as described in Section 2.7.12, because it would result in a significant loss of return flow credits for southern Nevada and it creates a large waste stream that would require disposal.

Although the Process Improvements Alternative has been analyzed, after reviewing the additional information and analyses, the Final EIS concludes that the Process Improvements Alternative cannot meet key elements of the purpose and need of the project. The elements of the purpose and need that are not met include the need to ensure compliance with water quality standards for Lake Mead at a Lake level of 1,000 ft, and to provide the management flexibility to respond to future water quality issues and regulatory requirements.

The analysis provided by Dr. David Jenkins provides specific confirmation of the statement made in the Draft EIS that additional treatment sufficient to attain water quality standards would result in significant water losses. Dr. Jenkins confirmed that even microfiltration could not reduce phosphorus concentrations below 0.05 µg/l (Jenkins 2005). Lower concentrations require treatment technologies such as RO, which result in large water losses because they produce wastestreams that cannot be returned to the Colorado River. Even relatively minor water losses are incompatible with the purpose of the project and the needs of southern Nevada. Although Dr. Jenkins concluded that microfiltration would be sufficient to meet the existing permit requirements for phosphorus, he did not consider whether it would be sufficient to ensure compliance with chlorophyll standards for Lake Mead. Modeling discussed in the Draft EIS, combined with the data provided by Dr. Jenkins, show that the minimum loadings obtainable through microfiltration would still be too high to ensure compliance with chlorophyll standards in Lake Mead when lake levels are low, so long as the phosphorus continues to be discharged to Las Vegas Wash.

Discharging through a deep outfall in Lake Mead provides at least three types of benefits that are not provided by the Process Improvements Alternative. First, it places the discharge deeper in the Lake, where constituents in the discharge are less likely to promote algal growth, and less likely to affect fish frequenting shallower waters, while remaining subject to natural assimilative processes in which the Lake cleanses itself. Second, it broadly disperses the discharge across a wide expanse, rather than concentrating it in a small area at the mouth of Las Vegas Wash, a location where large numbers of fish are present and spawning (Kaczynski 1991). Third, it allows for flexibility in managing the discharge, including flexibility in adjusting the depth of the discharge to avoid affecting the drinking water supply, limit algal growth, promote fish productivity, and maintain water quality as Lake levels decrease.

Increased treatment without an alternate discharge location does not provide the flexibility that is clearly the key concept described in the purpose and need for the action.

The Process Improvements Alternative is described in Section 2.5 of the SCOP Final EIS, and potential impacts are described throughout Chapter 4.

## General Response 2 – Range of Alternatives

*Comment*:

Certain comments suggested that a broader range of alternatives be analyzed in the EIS. Example alternatives that were suggested for analysis included: increasing reuse of tertiary effluent, changing of effluent flows to the Las Vegas Wash and Lake Mead, water conservation, and percolating effluent into the desert. There was also concern that the water quality modeling conducted for SCOP did not consider water that is reused in its calculations.

*Response:*

The Las Vegas Valley (Valley) currently reuses treated effluent for golf courses, cemeteries, parks, landscape medians, and cooling water for power plants. However, the amount of area available to reuse the treated effluent represents only about 20 percent of the effluent that is produced. The other 80 percent of the treated effluent is sent to the Colorado River, where it produces "water return flow credits" for Nevada. Every gallon of Colorado River water that is used in Las Vegas and is returned to the Colorado River system produces a gallon that can be re-used again. Nevada's consumptive rights to Colorado River water total 300,000 acre-feet per year (AFY). But, Nevada is able to divert nearly 480,000 AFY because of return flow credits. Water is a very important resource to Nevada, and all the Colorado River states in this time of drought. Wastewater reuse flows have been included in all flow rate calculations presented in the Draft and Final EIS. A summary of the ongoing reuse of treated effluent in the Valley and its limitations has been added to Section 1.4.1.4 of the EIS.

As described in Section 1.4.1, return flow credits are extremely important to southern Nevada. Therefore, any alternative that reduces or eliminates Nevada's ability to earn return flow credits, such as percolation into the desert, does not meet the purpose and need for the project and is not considered a reasonable alternative.

The Southern Nevada Water Authority (SNWA) is implementing aggressive water conservation measures in the Valley. These measures are not part of the SCOP. The goal of the water-conservation measures is to reduce the actual water use in the Valley. Although the results of conservation efforts affect the urban-runoff flows in the Las Vegas Wash, the wastewater treatment agencies are not responsible for urban runoff. A list of the water conservation measures being implemented by SNWA has been added to Section 1.4.1.3. A reference to Section 1.4.1.3 has been added to Appendix D, Section D.1.3.1.

Many alternatives were considered throughout the alternatives development process, which began in 1994. The alternatives considered and eliminated from further study are described in Section 2.7 of the Final EIS.

## General Response 3 – More detail regarding plant optimization

*Comment:*

Commenters suggested that more detail be provided regarding plant optimization, which is a component of all alternatives.

*Response:*

As described in Chapter 2 of the Draft and Final EIS, optimization of the plants would be implemented as needed as part of all alternatives. A description of the optimization that would occur at each plant is provided in Section 2.1 of the Final EIS. The text in Section 2.1 has been revised to read, **"**Optimization

of the plants would continue to be implemented to treat wastewater to levels needed to meet water quality objectives. The treatment plants would be able to achieve combined total phosphorus (TP) levels of 0.14 mg/L during plant optimization."

### General Response 4 – Impacts to downstream users

*Comment:*

Concerns were raised about the possible change in water quality downstream of Hoover Dam and its impact on humans. The impacts to downstream users from constituents such as TP, total organic carbon (TOC), salinity, N-nitrosodimethylamine (NDMA), pathogens, and xenobiotics were requested.

*Response:*

In the *Colorado River Watershed Sanitary Survey—2000 Update* (MWD 2001), none of these substances are among the four substances identified by the MWD, the largest downstream drinking water user, as the key constituents of concern. The constituents of concern were pathogens (mainly Cryptosporium, Giardia, and enteric viruses), coliforms, MTBE, and perchlorate (MWD 2001).

The impacts to downstream users from potential changes in water quality resulting from the SCOP are described in Section 4.1 of the Final EIS. The potential impacts to other resources are presented throughout Chapter 4 of the Final EIS.

Total phosphorus is discussed in General Response 8.

Xenobiotics and NDMA are currently not regulated by National Pollutant Discharge Elimination System (NPDES) permit requirements and are not the subject of water quality standards. They are being investigated by EPA and other agencies, and may be regulated in the future. Available data do not establish a significant effect from any of these substances on downstream users. Changing the point of discharge would not be expected to have any effect on downstream users. That is, the annual average mass load of these and other chemically stable (conservative) substances through the Hoover Dam outlets would be nearly identical for all of the discharge locations. Future increased discharge volumes may produce additional mass loadings of these substances, but the project would not preclude, or have any effect on, the ability of the dischargers to respond to any issue identified in the future. Text briefly describing NDMA and xenobiotics is provided in Sections 1.4.2.4 and 1.4.2.5 of the Final EIS.

Wastewater discharged by the treatment plants contains potential endocrine disrupting chemicals (EDCs) and pharmaceuticals and personal care products (PPCPs). Concentrations of these substances generally decrease with increasing distance from Las Vegas Wash, and drop to nondetectable levels, but the data are limited. It is not clear whether detectable levels are found below Hoover Dam. Even if there are detectable levels, or if detectable levels result from the project, downstream water users are unlikely to be affected by discharges of EDCs and PPCPs attributable to the project, because scientific evaluations have concluded that "no appreciable risk for humans exists at the low levels measured in drinking water" (Appendix K). The MWD has reported that nondetectable levels of potential endocrine disrupters have been found at its water intake, although the majority of compounds of interest were not monitored (MWD 2001 [page 4-34]). Pharmaceuticals and personal care products were not identified as one of the four key constituents of concern to MWD (MWD 2001).

Pathogens are currently regulated through the use of indicator fecal coliform (FC) and E. coli bacteria. Because existing discharges are given exceptionally high levels of treatment, their bacterial concentrations are well under those required by their permits, and well under those levels established to protect water quality in Lake Mead and the Colorado River.

The Draft EIS presented modeling results that showed insignificant impacts of each of the alternatives on the Total Dissolved Solids (TDS) concentrations within Lake Mead and the Hoover Dam outlet. Salinity is closely represented by TDS, so it can be concluded that none of the alternatives would have significant impacts on salinity for water users in the Valley and downstream of Hoover Dam.

Concentrations of TOC in Lake Mead result from biological productivity, which tends to generate organic carbon, or from biological and physical processes, including ingestion, respiration, and sedimentation, that tend to remove organic carbon. Total organic carbon concentrations at Hoover Dam appear to have decreased since the 1970s. The data show no sign of an increase, despite the substantial increase in wastewater flow. Increasing wastewater flows in the future are not expected to increase TOC concentrations. Total organic carbon is one of the monitoring parameters in the Boulder Basin AMP as indicated in Section 2.2.2.6.

### General Response 5 – Impacts to water quality in the Las Vegas Wash

*Comment:*

Requests were made to evaluate the effects of increased concentrations of TDS, selenium, and perchlorate in the Las Vegas Wash and Las Vegas Bay. The decrease in effluent flows to the Las Vegas Wash would result in less dilution of non-effluent related constituents.

*Response:*

The impacts to the Las Vegas Wash and the Las Vegas Bay due to the decrease in effluent flows to the Las Vegas Wash are described in Sections 4.1 and 4.2 of the Final EIS. The potential impacts to other resources are presented throughout Chapter 4 of the Final EIS.

The reduction of effluent flows through the Las Vegas Wash would decrease dilution, which would increase the concentration of selenium in the water, thus potentially impacting wildlife species in the Las Vegas Wash. Selenium enters the Las Vegas Wash through tributaries, shallow groundwater, and treated wastewater effluent. The EPA recommended water quality criterion for bioaccumulation (accumulation in the tissues of organisms) in aquatic life is 5 micrograms per liter (µg/L). It is estimated that the selenium concentration in the Las Vegas Wash would increase from the baseline level of approximately 2.5 µg/L (City of Henderson [COH] 2002d) to a value between 5 µg/L and 7 µg/L, depending on the location within the Las Vegas Wash. However, the method used to predict the future concentration was conservative. Therefore, the conservative estimate is likely higher than the actual concentration. Selenium may be present in water in a number of oxidation states depending on conditions such as pH, the presence of other chemicals, and the presence and type of aquatic life. Although the different oxidation states are combined in the Las Vegas Wash Model (Black & Veatch 2005a), not all oxidation states pose bioaccumulation hazards. The model also did not include two potential removal methods of selenium from the system. Some oxidation states of selenium are volatile and will leave the water to the air. Other oxidation states are accumulated in aquatic vegetation. The only removal method included in the model was the precipitation of selenium into the sediment. The proposed SCOP project, however, may result in an increase in selenium concentrations in the Las Vegas Wash to a level slightly higher than the EPA-recommended water quality criterion for bioaccumulation in aquatic life of 5 µg/L.

The question of the appropriate concentration for protecting birds, however, is complex and is outside the scope of EPA's recommended aquatic life criterion (EPA 2006). Although not included in the EPA recommended standards, the southwestern willow flycatcher may be affected, but is not expected to be adversely impacted by the bioaccumulation of selenium because it is migratory in this area. It does not nest in this area and thus does not stay long enough to be adversely impacted. However, because of its

migratory nature in this area, it is difficult to quantify the exact impacts from selenium levels within the Las Vegas Wash because some sources of selenium within the Las Vegas Wash are nearby tributaries such as Duck Creek Wash. It would be difficult to identify where the birds would be getting the selenium in their system.

The level of perchlorate in the Las Vegas Wash, which was approximately 900 to 1,000 lbs/day (408 to 454 kilograms per day [kg/day]) in 1998, has decreased to approximately 120 to 130 lbs/day (54 to 59 kg/day) in 2004 (Croft 2004a). The decrease in perchlorate concentrations is the result of the groundwater remediation program, and levels are expected to be much lower in the future. Although decreased flows in the Las Vegas Wash may result in an increase in perchlorate concentrations in the Las Vegas Wash, current remediation is expected to reduce concentrations enough that the reduced flows would not result in impacts to wildlife.

Although the concentrations of selenium, perchlorate, and TDS in the Las Vegas Wash would increase, the decreased volume exiting the Las Vegas Wash would be diluted by the water in the Las Vegas Bay and have the same impact as the No Action Alternative. Therefore, elevated selenium and TDS concentrations in the Las Vegas Wash would not impact the razorback sucker or other organisms in the Las Vegas Bay. Water quality modeling indicates that during operation of the Lake Conveyance System (LCS), parameters such as conductivity, density, dissolved oxygen (DO) content, and temperature of the waters in the Las Vegas Bay would remain within the ranges preferred by razorback suckers. The razorback sucker would not likely be adversely affected by the reduction of effluent flows through the Las Vegas Wash.

The adaptive management of flows in the Las Vegas Wash under the Boulder Basin Adaptive Management Plan (AMP) will help balance potentially unfavorable conditions in the Las Vegas Wash and the Las Vegas Bay. The Core Management Team (CMT), in coordination with associated committees and workgroups, may direct the treatment facilities to increase effluent delivery to the Las Vegas Wash.

Standards for toxic materials applicable to designated waters, including the Las Vegas Wash and Lake Mead, are listed in Nevada Administrative Code (NAC) 445.144. For aquatic life, the 1-hour average standard for selenium is 20 µg/L and the 96-hour average for selenium is 5.0 µg/L. The 5-mile (8-kilometers [km]) segment of the Las Vegas Wash between Telephone Line Road and Lake Mead is on Nevada's 2004 303(d) lists of "waterbodies warranting further investigation" due to total selenium concentrations exceeding the 96-hour toxicity criterion (Nevada Division of Environmental Protection [NDEP] 2004). Waterbodies exceeding the 96-hour criteria (with 10 samples, 2 or more exceedances during any 3 year period) but not the 1-hour criteria were placed on this list because there was not sufficient evidence to be included on the 303(d) List. In general, a waterbody was included on the 2004 303(d) List if any of its numeric beneficial use standards were exceeded more than 10 percent of the time during the 7-year period of October 1, 1997 through September 30, 2003. This list is intended to serve as a planning tool for future NDEP assessment activities and total maximum daily loads (TMDLs) are not currently required for these waterbodies.

In Nevada, the NDEP Bureau of Water Quality Planning is responsible for developing the 303(d) List, establishing priorities, and developing TMDLs as needed. The NDEP is required by Section 303(d) of the Clean Water Act (CWA) to identify and prioritize those waters for which TMDLs are needed. If the Las Vegas Wash is included on the 303(d) List for selenium, the NDEP would need to establish a TMDL for selenium for the portion of the Las Vegas Wash impaired. When a TMDL is developed, the draft is noticed for public comment. After making any appropriate modifications in response to public comment, the TMDL is sent to the EPA for approval. Once approved, the TMDL is implemented through existing NPDES permits for point source discharges and voluntary non-point source control programs, to achieve

the necessary pollutant reductions. The NDEP would also be required to develop a monitoring plan (to monitor effectiveness of the TMDL), a schedule for reviewing and (if necessary) revising the TMDL and associated implementation elements. This plan may include a description of best management practices (BMPs) and point-source controls or other actions needed to reduce loadings to the allocated levels.

### General Response 6 – Impacts of Endocrine Disrupting Chemicals and Pharmaceuticals and Personal Care Products

*Comment:*

Commenters expressed concerns about the potential impacts to humans and wildlife from EDCs and PPCPs that may be present in the highly treated effluent.

*Response:*

Appendix K, Endocrine Disrupting Chemicals (EDCs) and Pharmaceuticals and Personal Care Products (PPCPs), has been rewritten after a more extensive review of the studies and literature that are available on the subject. A discussion of the treatment capabilities of the plants and the effectiveness in removal of EDCs and PPCPs is presented in Appendix K.

Some uncertainty exists about the effects on fish. Studies in Lake Mead have suggested that EDCs or PPCPs may have some effect on fish, although the cause of the effect has not been identified, and the magnitude is uncertain. This uncertainty may not to be relevant to possible effects below Hoover Dam, however, because the effect appears to be associated with discharges from Las Vegas Wash, which are highly concentrated as they enter Las Vegas Bay, but are rapidly diluted as they mix with Lake waters. A summary of existing credible scientific evidence is provided in Appendix K. Based on this evidence and the environmental setting, it is reasonable to conclude that potential effects are likely to be focused on the area near the mouth of the Las Vegas Wash, where concentrations are high, and to dissipate as the elevated concentrations decrease through mixing and assimilation. Even in the area of higher concentrations, the potential effects appear modest. They are not lethal. No effect has been identified on fish population levels, which are high at the mouth of the Las Vegas Wash. Because the effect is uncertain and modest, even at the higher concentration levels, and because of the great dilution and assimilation capacity of Lake Mead, EDCs and PPCPs are not expected to affect fish below Hoover Dam. See Section 5.0 of Appendix K for the conclusions drawn upon completion of the literature review.

A long-term water-quality monitoring program, which includes monitoring of emerging compounds, would be implemented as part of the Boulder Basin AMP. A summary of the AMP including the emerging compounds to be monitored, is presented in Section 2.2.2.6 of the Final EIS.

### General Response 7 – Destratification of Lake Mead and its Effect on Water Quality

*Comment:*

Concerns were expressed regarding the water quality modeling results when Lake Mead does/does not destratify. Requests were made to rerun the model to provide a detailed discussion of water quality for the years that the Lake completely destratifies, as well as years when destratification does not occur.

*Response:*

Based upon the 10 years of data spanning 1995 through 2004, Lake Mead did not completely destratify 40 percent of the time (LaBounty & Burns 2005). Thus, additional refined simulations were carried out using meteorological and hydrological conditions from 2003, which is one of the years when Lake Mead

did not completely destratify. These simulations confirm that the reservoir did not destratify and that the original modeling conclusions do not change as a result of the incomplete destratification. Specifically, the modeling indicates that effluent from a diffuser at Boulder Islands does *not* accumulate in the bottom of the hypolimnion in the event that Lake Mead does not completely destratify. This is due to the effluent being discharged more than 200 ft above the lowest elevations in Boulder Basin and then rising as a result of it being warmer than the ambient Lake water. The following text addressing destratification of Lake Mead has been added to Section 4.1 of the Final EIS. "Simulations using the Estuary and Lake Computer Model/Computational Aquatic Ecosystem Dynamic Model (ELCOM/CAEDYM) model were performed for the years 1999 through 2003 (Black & Veatch 2005b). Of those years, complete destratification of Lake Mead occurred in 1999, 2001, and 2002. Complete destratification did not occur in 2000 and 2003 (LaBounty & Burns 2005). The modeling indicates that there is no accumulation of effluent when it is discharged into the hypolimnion through a diffuser, whether complete destratification of the Lake occurs or not. This is mainly a result of the effluent being significantly warmer and thus less dense than the ambient reservoir water." Note that even when the Lake did not destratify completely, the lake was mostly destratified. Also note that the decoupling of the discharge from the highly-saline Las Vegas Wash baseflow would prevent the discharge from sinking to the very bottom (currently, the combined effluent/baseflow flows along the bottom in a part of the reservoir during periods in the winter). Additional information regarding destratification is presented in Attachment 1 of Appendix D of the Final EIS.

A description of the factors that affect stratification of Lake Mead are presented in Section 3.1.3.4.1 of the Draft and Final EIS.

In early 2005 flooding in the Virgin and Muddy Rivers resulted in a large flow of cold, salty, dense water that flowed through Lake Mead and came to rest in the deepest portion of Boulder Basin, below the proposed diffuser level of 880 ft. There was concern that this layer of dense water could remain for years or even decades, because of questions about whether there was sufficient energy to stir up the dense water and flush it out, particularly in years when the Lake does not fully destratify. However, personnel from Reclamation and SNWA, who were tracking the event, have reported that it was flushed out in a few months.

### General Response 8 – Phosphorus loading in Lake Mead and through Hoover Dam, related concerns regarding the years used for the Baseline

*Comment:*

Concerns were expressed regarding the increase in phosphorus loads as a result of the increase in effluent flows. The TMDL for phosphorus in the Las Vegas Wash would not apply to discharges in the vicinity of Boulder Islands or the Las Vegas Bay. Therefore, there is concern that increasing loads of phosphorus would be discharged to Lake Mead and would flow through Hoover Dam to downstream users. It was suggested that the Clean Water Coalition (CWC) commit to a maximum TP concentration through Hoover Dam of 10 parts per billion (ppb). Commenters also expressed concern that baseline water quality conditions in Boulder Basin were developed using one year (2002) of data. It was suggested that a longer time period of baseline data should be incorporated. One commenter suggested that 10 years of baseline data be used.

*Response:*

As a result of the comments received, the description of the alternatives have been revised to indicate that under ordinary operating conditions, the TP discharged to Lake Mead would not exceed 334 pounds per day (lbs/day) on an annual average basis. Therefore, the Boulder Islands North, Boulder Islands South,

and Las Vegas Bay alternatives include a pipeline, plant optimization, and increased treatment (as needed). The revised alternatives are described in Chapter 2 of the SCOP Final EIS, and potential impacts are described throughout Chapter 4.

The Final EIS presents modeling results for the alternatives at effluent TP loads of 334 lbs/day on an annual average basis, which represents the maximum expected phosphorus load under ordinary operating conditions. At these loads the Boulder Islands alternatives (at the 1,178-ft and 1,000-ft water surface elevations) are predicted to result in an increase from 5 ppb to 6 ppb of TP through Hoover Dam. This concentration of TP through Hoover Dam is comparable to the baseline period, and lower than historical levels over an extended period of time. No impacts to downstream users were identified for the 1999 to 2003 conditions or historical conditions. Therefore, the impact to downstream users, including Lake Mohave, from the Boulder Islands alternatives would be insignificant. These model results and the impact to downstream users are fully described in Attachment 2 of Appendix D of the Final EIS.

The description of the alternatives have been revised as previously stated. However, no commitment is made to not exceed 10 ppb of TP leaving Hoover Dam as suggested by one commenter. There are too many factors that are not in the control of the CWC to make such a commitment. Data will be collected and used to develop a methodology for determining management decisions that will maintain TP through Hoover Dam below the State of Nevada Requirement to Maintain Higher Water Quality (RMHQ) level.

The following paragraphs provide additional information that addresses MWD's comments regarding a commitment for TP through Hoover Dam to not exceed 10 ppb, and the baseline conditions used in the water quality modeling and impacts analyses.

Although the Draft EIS reported that average annual phosphorus levels passing through Hoover Dam were less than 10 ppb, there is some variation in the concentration throughout the year, and data indicates that it exceeds 10 ppb at times.

Consideration was given to the effects of phosphorus leaving Hoover Dam on users downstream. Regular meetings were organized with federal, state, and local agencies; downstream users; and public representatives. As part of these meetings, which continued over years, issues relating to the effects of alternatives were identified and considered. Following those meetings, there have been continued meetings and discussions with downstream users. Information requests were made to identify operational issues that may be affected by water quality in the Colorado River. Nevertheless, the suggested 10 ppb limit was not previously identified as a need or goal.

Consistent with the commenter's request that comparisons with baseline conditions not be limited to the year 2002, conditions extending back as far as 30 years were considered. Because phosphorus is of concern not in itself but because it has the potential to increase algal growth, consideration was also given to chlorophyll concentrations and algal growth below Hoover Dam.

In recent years, the Valley wastewater treatment plants have been discharging less phosphorus than they have been at any time during the last 30 years. From the early 1970s until 1981, phosphorus loadings entering Lake Mead from the Las Vegas Wash routinely exceeded 1,500 lbs/day (NDEP 1987). In July 1981, a phosphorus limit on discharges from the municipal wastewater treatment plants went into effect. The dischargers began adding chemicals to reduce phosphorus concentrations, and the phosphorus loadings generally decreased to the range of 500 to 1,000 lbs/day (NDEP 1987). In 1987, the Nevada State Environmental Commission adopted chlorophyll standards for the Las Vegas Bay and Lake Mead, and in 1989 NDEP established a TMDL for phosphorus loadings to Lake Mead through the Las Vegas Wash. The NPDES permits for Valley dischargers were revised, and beginning in 1994 the dischargers

met the wasteload allocations (WLAs) limiting them to 334 lbs/day during the growing season of March through October. In the wintertime months of November through February, when the permit limits did not apply and temperatures were too low for significant algal growth, higher concentrations of phosphorus were discharged. In 2001, following the unusual algal bloom of that year, the dischargers began providing year-round phosphorus removal.

According to data collected by the U.S. Geological Survey (USGS), concentrations of phosphorus leaving Lake Mead were higher in the past than they are now (USGS 2006). Before treatment plants implemented phosphorus removal in July 1981, phosphorus concentrations measured at Hoover Dam were often 20 ppb or more. They reached 310 ppb in December 1979, 280 ppb in March 1980, and 160 ppb in May 1981. Concentrations dropped after the dischargers began removing phosphorus, but were occasionally 20 ppb or more. They reached 110 ppb in March 1988, and 280 ppb in November 1988. Phosphorus concentrations decreased again after additional phosphorus removal was implemented in 1994. The average annual phosphorus levels passing through Hoover Dam vary throughout the year, and data indicates that it exceeds 10 ppb at times.

The University of Nevada Las Vegas (UNLV), under contract to Reclamation, investigated water quality in the Colorado River in the early 1980s. The UNLV study reported average TP concentrations of 17 ppb in the canyon downstream of Hoover Dam, and in the 10 to 15 ppb range in Lake Mohave and Lake Havasu. The UNLV study reported that chlorophyll concentrations were in the 2 to 4 ppb range in Lake Mohave, and 3 to 4 ppb in Lake Havasu.

Extensive data collection in Lake Mead has shown that chlorophyll concentrations are elevated near the mouth of the Las Vegas Wash, where effluent and urban runoff enter the Lake. However, chlorophyll concentrations decrease with increasing distance from the Las Vegas Wash, owing to mixing and natural attenuation. In Boulder Basin (i.e. outside of Las Vegas Bay), concentrations are much lower, and the water is noticeably clear. Discharges leaving Hoover Dam undergo additional natural attenuation, including removal and retention by reservoirs. Southern California's diversion of water from the Colorado River is located more than 100 miles downstream of Hoover Dam.

No data have been received identifying impairment of water uses in the Colorado River downstream of Hoover Dam, either in the present or past. The MWD, the largest downstream drinking water user, did not identify phosphorus or algae as a concern in its survey of potential sources of contamination within the Colorado River basin (MWD 2001). Phosphorus concentrations tend to increase between Hoover Dam and Lake Havasu, despite natural removal and retention in Lake Mohave, because of additional sources downstream. Even in Lake Havasu, however, phosphorus concentrations are low in comparison with other sources of California's water supply. Water received by MWD from northern California, in comparison, contains phosphorus concentrations in the 150 to 200 ppb range.

Phosphorus concentrations in the Colorado River are usually much lower than the water quality standard of 50 ppb established by the State of Nevada (NAC 445A.193). Normally, conditions are also well below the antidegradation requirements, known as RMHQ established by the State of Nevada. These numeric requirements are established when existing water quality is better than the quality required to maintain beneficial uses. The RMHQ criteria prevent water quality from being degraded without special consideration and approval. The RMHQ criteria for the Colorado River below Hoover Dam include 20 ppb of phosphorus as an annual average, and 33 ppb of phosphorus as a single value.

For an average annual TP loading of 334 lbs/day, modeling results for the Boulder Islands alternatives at water surface elevations of 1,178 ft and 1,000 ft, indicate that the Boulder Islands alternatives result in

predicted phosphorus levels through Hoover Dam that are similar to those that occurred over the extended baseline period of 1999 through 2003.

It is clear that with an average annual TP loading of 334 lbs/day, the Boulder Islands alternatives are predicted to result in TP loads through Hoover Dam that are essentially equal to recent historical values. In particular, at a water surface elevation of 1,178 ft, which is comparable to recent historical years, the TP loads through Hoover Dam are predicted to be less than three of the five modeled recent historical years. At a water surface elevation of 1,000 ft, which is much lower than recent historical years, the load is predicted to be less than that experienced in year 2000.

The USGS data extending back to 1974 indicates that the TP concentration through the Hoover Dam has historically been far higher than in recent years. Clearly, the predicted TP concentrations through Hoover Dam for the Boulder Islands alternatives are lower than historical levels over an extended period of time.

Worst-case conditions are not likely to occur. The project would not inevitably produce any specific level of phosphorus. Rather, phosphorus levels would continue to be regulated by NDEP, acting under authority of the CWA and Nevada law. The NDEP and EPA are responsible for establishing water quality standards that protect downstream water uses, including the use of the Colorado River for municipal water supply, and for ensuring that water quality is not impaired. For these reasons, a not to exceed level of 10 ppb phosphorus is not appropriate.

### General Response 9 – Potential impacts to the Razorback sucker and the Lower Colorado River Multi-species Conservation Program

*Comment:*

Concerns were expressed regarding the impact of the project on razorback suckers in the Las Vegas Bay and downstream of Hoover Dam. Commenters requested further information on down stream impacts to the razorback in relation to the Lower Colorado Multi-species Conservation Program (LCR MSCP).

*Response:*

The information addressing the existing conditions and the effects of the proposed SCOP on selenium levels in the Las Vegas Wash and Lake Mead, as well as the potential impact to biological resources have been inserted into the Final EIS in Sections 4.2.1.3 and 4.2.2.1.3. Further information regarding the impacts of other contaminants is contained in Section 4.2.1.3.

The reduction of effluent flows to the Las Vegas Wash would reduce the dilution of non-effluent related constituents such as TDS, selenium, and perchlorate. The total volume of water entering the Las Vegas Bay would remain the same. Perchlorate and TDS would be diluted by the water in the Las Vegas Bay and not likely affect the razorback sucker. Selenium would also be diluted by the water in the Las Vegas Bay, however, it has been determined through consultation with the U.S. Fish and Wildlife Service (USFWS) as required under Section 7 of the ESA, that selenium may adversely impact the razorback sucker population in the Las Vegas Bay. There would be no change in selenium concentrations downstream of Hoover Dam resulting from the proposed alternatives.

Discussions of the LCR MSCP have been added to Section 1.8 and 5.2.2.7 of the Final EIS. In addition, impacts to downstream users including the LCR MSCP have been added throughout Chapter 4 of the Final EIS.

Section 3.0 of Appendix K describes the studies and conclusions regarding the potential impacts of EDCs to fish. Sections 1.4 and 4.2 of the Final EIS have been revised to include the information presented in Appendix K.

### General Response 10 – Adaptive Management Plan

*Comment:*

Additional details regarding the Boulder Basin AMP were requested. The specific information requested included the organizational structure for the Boulder Basin AMP, water quality monitoring parameters and locations, and actions to be taken if necessary. There were several requests that the Boulder Basin AMP CMT meet at least twice per year, once before and once after the growing season, to determine whether action is needed. Additionally, commenters were concerned that the public would not have an opportunity to be involved in the Boulder Basin AMP.

*Response:*

The decision was made by the federal co-lead agencies to provide a summary of the Boulder Basin AMP in the Draft EIS. This decision was based on the fact that by nature, the AMP is a living document that will be revised as needs, goals, and environmental conditions change and additional data becomes available. However, additional information regarding the AMP has been added to Section 2.2.2.6 of the Final EIS. Preparation of the Boulder Basin AMP is ongoing.

The Boulder Basin AMP is different from the type of adaptive management program in which management is adapted to achieve identified goals. The Boulder Basin AMP is not needed to achieve project goals or comply with requirements, which will be achieved and complied with no matter how the project is managed. Instead, the AMP envisioned by the Draft and Final EIS has four main purposes. First, the AMP allows for operational changes in response to future requirements. Although unknown future requirements are by definition unknown, the AMP is likely to improve the ability of the project to comply with future requirements by providing more flexibility. Second, the AMP allows for additional improvements through fine tuning. The Boulder Islands alternatives, for example, would improve chlorophyll levels, compared with baseline conditions. The AMP may allow for even more improvement. Third, whenever operation of the facilities results in a balance, so that an increase of one benefit results in a decrease in another, the AMP allows for adjustment of the balance. It may, for example, be best to use additional energy at one time of year to promote mixing, while saving energy at another time of year when natural processes produce all the mixing necessary. Fourth, the AMP allows for responses to unexpected ambient conditions. If, for example, an unprecedented condition should arise (e.g. the 2001 bloom, an unprecedented condition that has not recurred since) the facilities could be managed to respond to the conditions observed.

Long-term water-quality monitoring of the Las Vegas Bay, Boulder Basin, and downstream of Hoover Dam would be implemented through the Boulder Basin AMP. The information presented includes the parameters to be monitored and the monitoring locations. In addition to regulated parameters, a host of non-regulated parameters would be monitored as presented in Table 2.2-8 of the Final EIS. The results of this monitoring program would be reviewed and the program adjusted, if necessary, under the provisions in the Boulder Basin AMP. A protocol for testing in the total water column including the hypolimnion has been developed and is presented in the Boulder Basin AMP. Monitoring data would provide the information necessary to evaluate and adjust the diffuser operations.

The Las Vegas Wash monitoring program is implemented and managed by SNWA. As a member of the CMT for the Boulder Basin AMP, SNWA would participate in management decisions to address impacts in Lake Mead and the Las Vegas Wash resulting from SCOP.

As requested by several commenters, the Boulder Basin AMP management team would meet at least twice a year, once before and once after the growing season. Individuals with appropriate technical expertise would be included in the process. The Boulder Basin AMP CMT would develop procedures for taking appropriate action to maintain water quality. Sampling and analysis would be ongoing, and the data would be continuously monitored.

### General Response 11 – Effluent Flow Volume in the Las Vegas Wash

*Comment:*

Additional information regarding the criteria used to determine the 30 million gallons per day (mgd) effluent flows for the Las Vegas Wash was requested. Some commenters expressed concern that additional flows to the Las Vegas Wash (to the extent water quality standards for phosphorus would allow) were not considered.

*Response:*

The suggestion to maintain a minimum base flow of 50 mgd of flow in the Las Vegas Wash was in response to water quality standards set for the Las Vegas Wash and the inner Las Vegas Bay. Results of the modeling undertaken as part of the Las Vegas Wash Model Report indicate that a 30 mgd flow added to the Las Vegas Wash base flow of 20 mgd would result in meeting the water quality standards established by NDEP for the Las Vegas Wash. However, selenium concentrations in the Las Vegas Wash may increase due to less dilution by treated effluent.

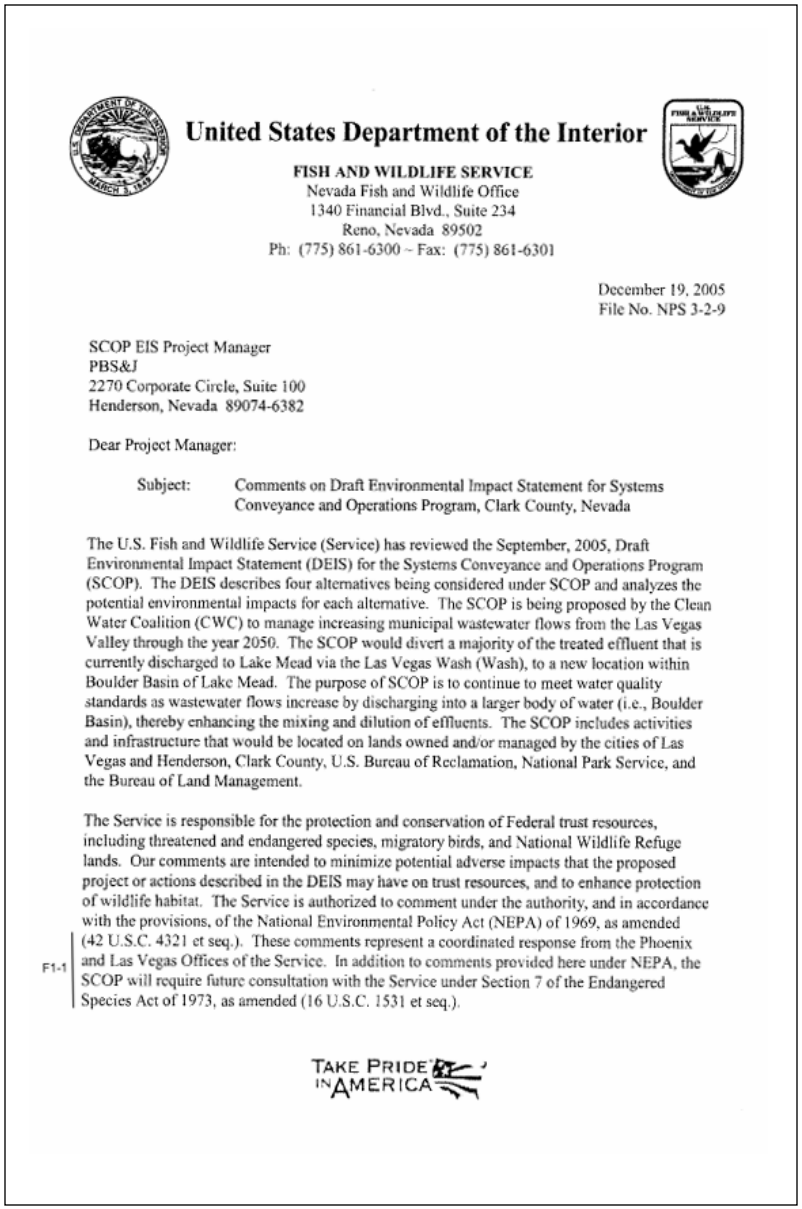
The concentrations of selenium in the Las Vegas Wash are a matter of concern even with 100 percent of the effluent being discharged to the Las Vegas Wash. A large portion of the selenium loading enters the Las Vegas Wash from the tributary system with Duck Creek, the Monson Channel, and Flamingo washes being the largest contributors. The Las Vegas Wash Model indicates that if urban BMPs and/or selenium removal processes are not implemented to reduce tributary selenium concentrations, the water quality standard of 5 µg/L on an average annual basis may be exceeded if a minimum base flow of 30 mgd of effluent is discharged to the Las Vegas Wash. For example, if the loading from the three tributaries were reduced by 50 percent, and 30 mgd of effluent were discharged to the Las Vegas Wash, the selenium concentrations in the Las Vegas Wash would be below the water quality standard of 5 µg/L. The local agencies with jurisdiction over the tributary system are reviewing mitigation measures for the selenium concentrations in the Las Vegas Wash as this EIS is being prepared.

The 5-mile (8-km) segment of the Las Vegas Wash between Telephone Line Road and Lake Mead is on Nevada's 2004 303(d) lists of "waterbodies warranting further investigation" due to total selenium concentrations exceeding the 96-hour toxicity criterion (NDEP 2004). In Nevada, the NDEP Bureau of Water Quality Planning is responsible for developing the 303(d) List, establishing priorities, and developing TMDLs as needed. The NDEP is required by Section 303(d) of the CWA to identify and prioritize those waters for which TMDLs are needed. If the Las Vegas Wash is included on the 303(d) List for selenium, the NDEP would establish a TMDL for selenium for the portion of the Las Vegas Wash impaired. When a TMDL is developed, the draft is noticed for public comment. After making any appropriate modifications in response to public comment, the TMDL is sent to the EPA for approval. Once approved, the TMDL is implemented through existing NPDES permits for point source discharges and voluntary non-point source control programs, to achieve the necessary pollutant reductions. The

NDEP would also be required to develop a monitoring plan (to monitor effectiveness of the TMDL), a schedule for reviewing and, if necessary, revising the TMDL and associated implementation elements. This plan may include a description of BMPs and point-source controls or other actions needed to reduce loadings to the allocated levels

The Integrated Water Managers Operations Group (Operations Group) agreed that for planning purposes, the range of flows for the Las Vegas Wash would be a minimum of 30 mgd of treated effluent. The Operations Group will coordinate the routine management of flows to the Las Vegas Wash. In order to maintain the Clark County Wetlands Park (Wetlands Park), as well as water quality, habitat, and vegetation in the Las Vegas Wash, a constant minimum inflow of water is necessary. The Operations Group is intended to ensure that multilateral decisions are made concerning flows in the Las Vegas Wash and includes representatives from Clark County Parks and Community Services, Clark County Regional Flood Control District, CWC, and SNWA.

In addition, as stated in Section 2.2 of the Final EIS, the local agencies responsible for water quality management in the Las Vegas Wash have agreed to meet at least once a year and review the need for flow augmentation in the Las Vegas Wash. The SCOP facilities, managed through the Boulder Basin AMP, would be able to accommodate flow adjustments as determined by this management group. The 30 mgd of effluent carried forward in the EIS is for a minimum base flow. Additional effluent discharged to the Las Vegas Wash will consider Las Vegas Wash ecosystem needs and the continuing requirement to meet water quality standards in the Las Vegas Bay and Boulder Basin.



**United States Department of the Interior**

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December 19, 2005
File No. NPS 3-2-9

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, Nevada 89074-6382

Dear Project Manager:

Subject: Comments on Draft Environmental Impact Statement for Systems Conveyance and Operations Program, Clark County, Nevada

The U.S. Fish and Wildlife Service (Service) has reviewed the September, 2005, Draft Environmental Impact Statement (DEIS) for the Systems Conveyance and Operations Program (SCOP). The DEIS describes four alternatives being considered under SCOP and analyzes the potential environmental impacts for each alternative. The SCOP is being proposed by the Clean Water Coalition (CWC) to manage increasing municipal wastewater flows from the Las Vegas Valley through the year 2050. The SCOP would divert a majority of the treated effluent that is currently discharged to Lake Mead via the Las Vegas Wash (Wash), to a new location within Boulder Basin of Lake Mead. The purpose of SCOP is to continue to meet water quality standards as wastewater flows increase by discharging into a larger body of water (i.e., Boulder Basin), thereby enhancing the mixing and dilution of effluents. The SCOP includes activities and infrastructure that would be located on lands owned and/or managed by the cities of Las Vegas and Henderson, Clark County, U.S. Bureau of Reclamation, National Park Service, and the Bureau of Land Management.

The Service is responsible for the protection and conservation of Federal trust resources, including threatened and endangered species, migratory birds, and National Wildlife Refuge lands. Our comments are intended to minimize potential adverse impacts that the proposed project or actions described in the DEIS may have on trust resources, and to enhance protection of wildlife habitat. The Service is authorized to comment under the authority, and in accordance with the provisions, of the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 et seq.). These comments represent a coordinated response from the Phoenix and Las Vegas Offices of the Service. In addition to comments provided here under NEPA, the SCOP will require future consultation with the Service under Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

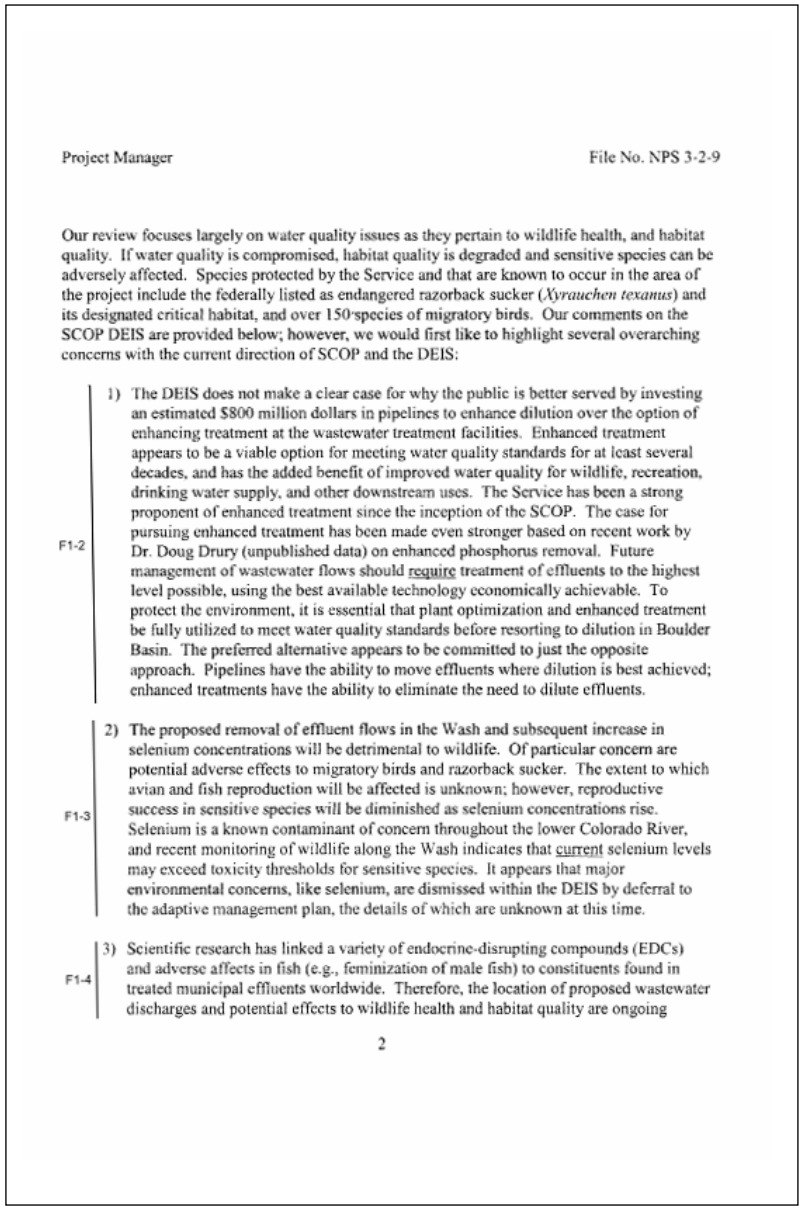
F1-1

TAKE PRIDE IN AMERICA

## Response F-1 U.S. Fish & Wildlife Service

### F1-1

Endangered Species Act Section 7 consultation is in progress. The record of decision (ROD) will not be issued until Section 7 consultation is complete. Compliance with the Biological Opinion will be included as part of the ROD.



Project Manager File No. NPS 3-2-9

Our review focuses largely on water quality issues as they pertain to wildlife health, and habitat quality. If water quality is compromised, habitat quality is degraded and sensitive species can be adversely affected. Species protected by the Service and that are known to occur in the area of the project include the federally listed as endangered razorback sucker (*Xyrauchen texanus*) and its designated critical habitat, and over 150 species of migratory birds. Our comments on the SCOP DEIS are provided below; however, we would first like to highlight several overarching concerns with the current direction of SCOP and the DEIS:

F1-2

1) The DEIS does not make a clear case for why the public is better served by investing an estimated $800 million dollars in pipelines to enhance dilution over the option of enhancing treatment at the wastewater treatment facilities. Enhanced treatment appears to be a viable option for meeting water quality standards for at least several decades, and has the added benefit of improved water quality for wildlife, recreation, drinking water supply, and other downstream uses. The Service has been a strong proponent of enhanced treatment since the inception of the SCOP. The case for pursuing enhanced treatment has been made even stronger based on recent work by Dr. Doug Drury (unpublished data) on enhanced phosphorus removal. Future management of wastewater flows should require treatment of effluents to the highest level possible, using the best available technology economically achievable. To protect the environment, it is essential that plant optimization and enhanced treatment be fully utilized to meet water quality standards before resorting to dilution in Boulder Basin. The preferred alternative appears to be committed to just the opposite approach. Pipelines have the ability to move effluents where dilution is best achieved; enhanced treatments have the ability to eliminate the need to dilute effluents.

F1-3

2) The proposed removal of effluent flows in the Wash and subsequent increase in selenium concentrations will be detrimental to wildlife. Of particular concern are potential adverse effects to migratory birds and razorback sucker. The extent to which avian and fish reproduction will be affected is unknown; however, reproductive success in sensitive species will be diminished as selenium concentrations rise. Selenium is a known contaminant of concern throughout the lower Colorado River, and recent monitoring of wildlife along the Wash indicates that current selenium levels may exceed toxicity thresholds for sensitive species. It appears that major environmental concerns, like selenium, are dismissed within the DEIS by deferral to the adaptive management plan, the details of which are unknown at this time.

F1-4

3) Scientific research has linked a variety of endocrine-disrupting compounds (EDCs) and adverse affects in fish (e.g., feminization of male fish) to constituents found in treated municipal effluents worldwide. Therefore, the location of proposed wastewater discharges and potential effects to wildlife health and habitat quality are ongoing

2

### F1-2

See General Response 1.

Enhanced treatment to meet the chlorophyll standard would be directed at additional removal of phosphorus. The commenter has provided no evidence that additional phosphorus removal would provide added benefit for wildlife, drinking water supply, or recreation, compared with the other alternatives. Phosphorus is a nutrient that is essential for living organisms. Although elevated levels of phosphorus may reduce the clarity of water, they may also increase biological productivity. The unpublished work referred to is limited to optimization of phosphorus removal at the Clark County Water Reclamation District (CCWRD) plant, and does not assess the capabilities of the other plants or provide information on any potential benefits of reduced phosphorus concentrations on beneficial uses.

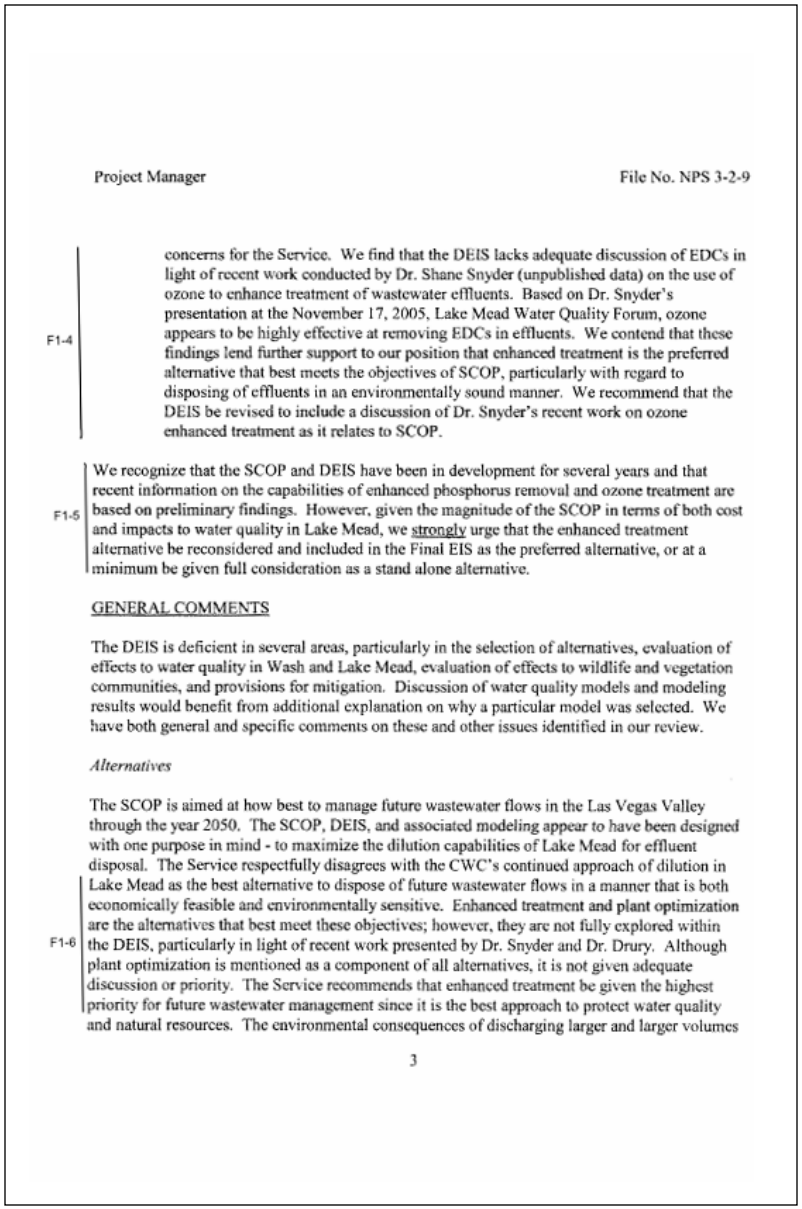
Although one plant may be able to achieve lower concentrations of certain constituents, the other plants may not be able to achieve the same performance. Information regarding each plant's current capabilities has been added to Section 2.1 of the Final EIS.

The CWA requires the "best available treatment economically achievable" for industrial discharges. The equivalent requirement for municipal discharges, including the CWC members, is secondary treatment. The CWC members currently provide tertiary treatment at a level far better than secondary treatment.

See General Response 8.

### F1-3

See General Response 9.Based on preliminary consultation with the USFWS as required under Section 7 of the ESA, it has been determined that the razorback sucker may be impacted by selenium. Although the mass of selenium entering the Las Vegas Bay would be lower due to reduced effluent-based selenium entering the Las Vegas Wash, it may still impact the razorback sucker. The extent of the 'selenium plume' and precise location of dilution with the waters of the Las Vegas Bay, are relatively unknown. Monitoring of selenium concentrations in the Las Vegas Bay would be conducted through the Boulder Basin AMP. The text in Sections 4.2.1.3 and 4.2.2.2.3 of the Final EIS has been revised.



Project Manager File No. NPS 3-2-9

F1-4 concerns for the Service. We find that the DEIS lacks adequate discussion of EDCs in light of recent work conducted by Dr. Shane Snyder (unpublished data) on the use of ozone to enhance treatment of wastewater effluents. Based on Dr. Snyder's presentation at the November 17, 2005, Lake Mead Water Quality Forum, ozone appears to be highly effective at removing EDCs in effluents. We contend that these findings lend further support to our position that enhanced treatment is the preferred alternative that best meets the objectives of SCOP, particularly with regard to disposing of effluents in an environmentally sound manner. We recommend that the DEIS be revised to include a discussion of Dr. Snyder's recent work on ozone enhanced treatment as it relates to SCOP.

F1-5 We recognize that the SCOP and DEIS have been in development for several years and that recent information on the capabilities of enhanced phosphorus removal and ozone treatment are based on preliminary findings. However, given the magnitude of the SCOP in terms of both cost and impacts to water quality in Lake Mead, we strongly urge that the enhanced treatment alternative be reconsidered and included in the Final EIS as the preferred alternative, or at a minimum be given full consideration as a stand alone alternative.

GENERAL COMMENTS

The DEIS is deficient in several areas, particularly in the selection of alternatives, evaluation of effects to water quality in Wash and Lake Mead, evaluation of effects to wildlife and vegetation communities, and provisions for mitigation. Discussion of water quality models and modeling results would benefit from additional explanation on why a particular model was selected. We have both general and specific comments on these and other issues identified in our review.

*Alternatives*

F1-6 The SCOP is aimed at how best to manage future wastewater flows in the Las Vegas Valley through the year 2050. The SCOP, DEIS, and associated modeling appear to have been designed with one purpose in mind - to maximize the dilution capabilities of Lake Mead for effluent disposal. The Service respectfully disagrees with the CWC's continued approach of dilution in Lake Mead as the best alternative to dispose of future wastewater flows in a manner that is both economically feasible and environmentally sensitive. Enhanced treatment and plant optimization are the alternatives that best meet these objectives; however, they are not fully explored within the DEIS, particularly in light of recent work presented by Dr. Snyder and Dr. Drury. Although plant optimization is mentioned as a component of all alternatives, it is not given adequate discussion or priority. The Service recommends that enhanced treatment be given the highest priority for future wastewater management since it is the best approach to protect water quality and natural resources. The environmental consequences of discharging larger and larger volumes

3

**F1-4**

See General Response 6.

See General Response 1.

Work conducted by Dr. Snyder and others does indicate that ozone is effective at removing many EDCs from wastewater, or at least converting them to other products. However, the individual wastewater effluents have not been subjected to bioassay testing to determine whether effluents from one or more of the area wastewater treatment plants causes endocrine disruption in fish. Bioassays would be required to determine whether these effluents are cause for concern and also to ensure that the ozonated effluents do not retain their ability to cause endocrine disruption and that the ozonation byproducts do not have toxic effects of their own. There is no consensus in the scientific community regarding the suite of bioassays that would be necessary to ensure that treated effluent does not cause endocrine disruption in fish.

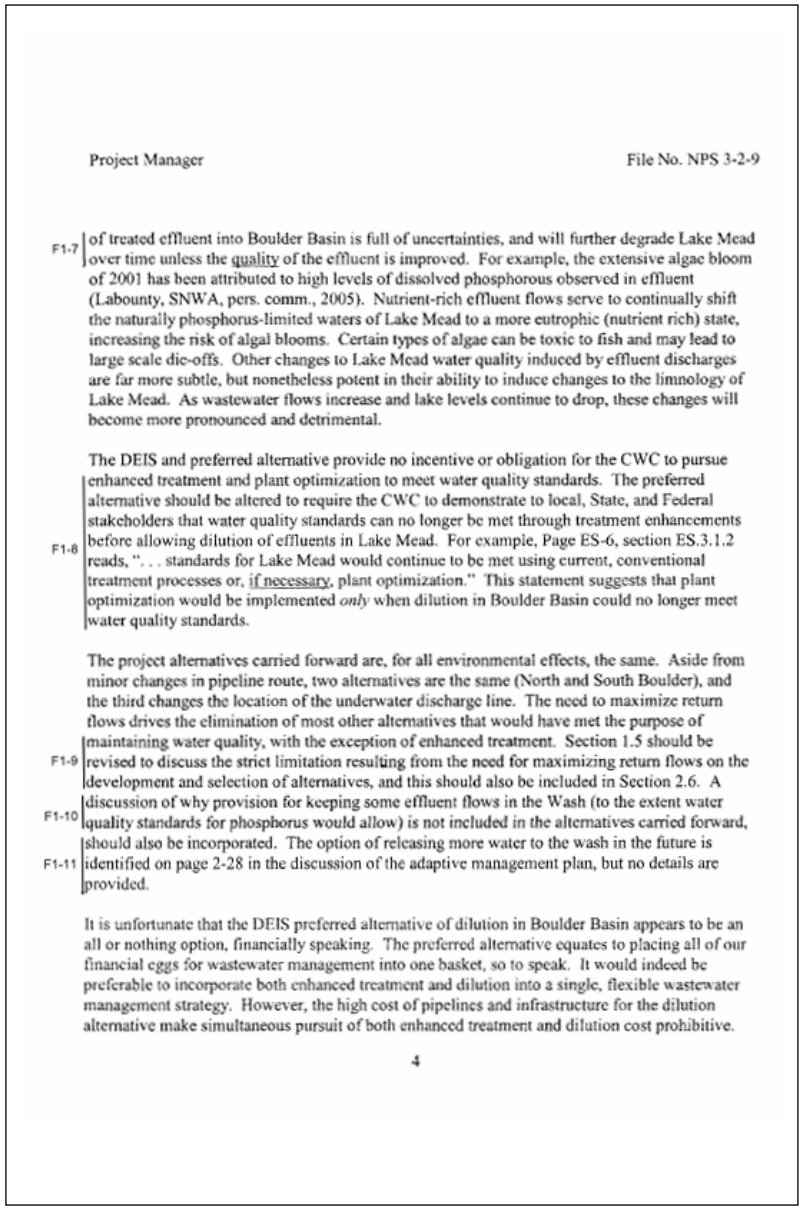
The commenter has for years expressed its concern that EDCs in municipal wastewater, which is relatively concentrated in the inner Las Vegas Bay, may be detrimental to razorback suckers. By moving most of the discharge away from inner bay, the preferred alternative would greatly reduce concentrations in the inner Las Vegas Bay and thereby alleviate the concerns raised by the commenter. By providing for greatly increased mixing, the preferred alternative would alleviate concerns about elevating concentrations in Boulder Basin.

**F1-5**

See General Response 1.

**F1-6**

See General Response 1.



Project Manager File No. NPS 3-2-9

F1-7 of treated effluent into Boulder Basin is full of uncertainties, and will further degrade Lake Mead over time unless the quality of the effluent is improved. For example, the extensive algae bloom of 2001 has been attributed to high levels of dissolved phosphorous observed in effluent (Labounty, SNWA, pers. comm., 2005). Nutrient-rich effluent flows serve to continually shift the naturally phosphorus-limited waters of Lake Mead to a more eutrophic (nutrient rich) state, increasing the risk of algal blooms. Certain types of algae can be toxic to fish and may lead to large scale die-offs. Other changes to Lake Mead water quality induced by effluent discharges are far more subtle, but nonetheless potent in their ability to induce changes to the limnology of Lake Mead. As wastewater flows increase and lake levels continue to drop, these changes will become more pronounced and detrimental.

The DEIS and preferred alternative provide no incentive or obligation for the CWC to pursue enhanced treatment and plant optimization to meet water quality standards. The preferred alternative should be altered to require the CWC to demonstrate to local, State, and Federal stakeholders that water quality standards can no longer be met through treatment enhancements

F1-8 before allowing dilution of effluents in Lake Mead. For example, Page ES-6, section ES.3.1.2 reads, "... standards for Lake Mead would continue to be met using current, conventional treatment processes or, if necessary, plant optimization." This statement suggests that plant optimization would be implemented *only* when dilution in Boulder Basin could no longer meet water quality standards.

The project alternatives carried forward are, for all environmental effects, the same. Aside from minor changes in pipeline route, two alternatives are the same (North and South Boulder), and the third changes the location of the underwater discharge line. The need to maximize return flows drives the elimination of most other alternatives that would have met the purpose of maintaining water quality, with the exception of enhanced treatment. Section 1.5 should be

F1-9 revised to discuss the strict limitation resulting from the need for maximizing return flows on the development and selection of alternatives, and this should also be included in Section 2.6. A

F1-10 discussion of why provision for keeping some effluent flows in the Wash (to the extent water quality standards for phosphorus would allow) is not included in the alternatives carried forward, should also be incorporated. The option of releasing more water to the wash in the future is

F1-11 identified on page 2-28 in the discussion of the adaptive management plan, but no details are provided.

It is unfortunate that the DEIS preferred alternative of dilution in Boulder Basin appears to be an all or nothing option, financially speaking. The preferred alternative equates to placing all of our financial eggs for wastewater management into one basket, so to speak. It would indeed be preferable to incorporate both enhanced treatment and dilution into a single, flexible wastewater management strategy. However, the high cost of pipelines and infrastructure for the dilution alternative make simultaneous pursuit of both enhanced treatment and dilution cost prohibitive.

4

### F1-7

Results of the sophisticated water quality modeling indicate no significant changes to water quality in Lake Mead would occur if the Boulder Islands North Alternative is implemented. In addition, the quality of water in the Las Vegas Bay, in terms of chlorophyll concentrations and Secchi depths, is predicted to improve if the Boulder Islands Alternative is implemented (see, for example, Figures 4.1-3 and 4.1-5 in the Draft EIS or Figures 4.1-3 and 4.1-5 in the Final EIS).

### F1-8

See General Response 3.

The text in the Executive Summary has been revised as necessary.

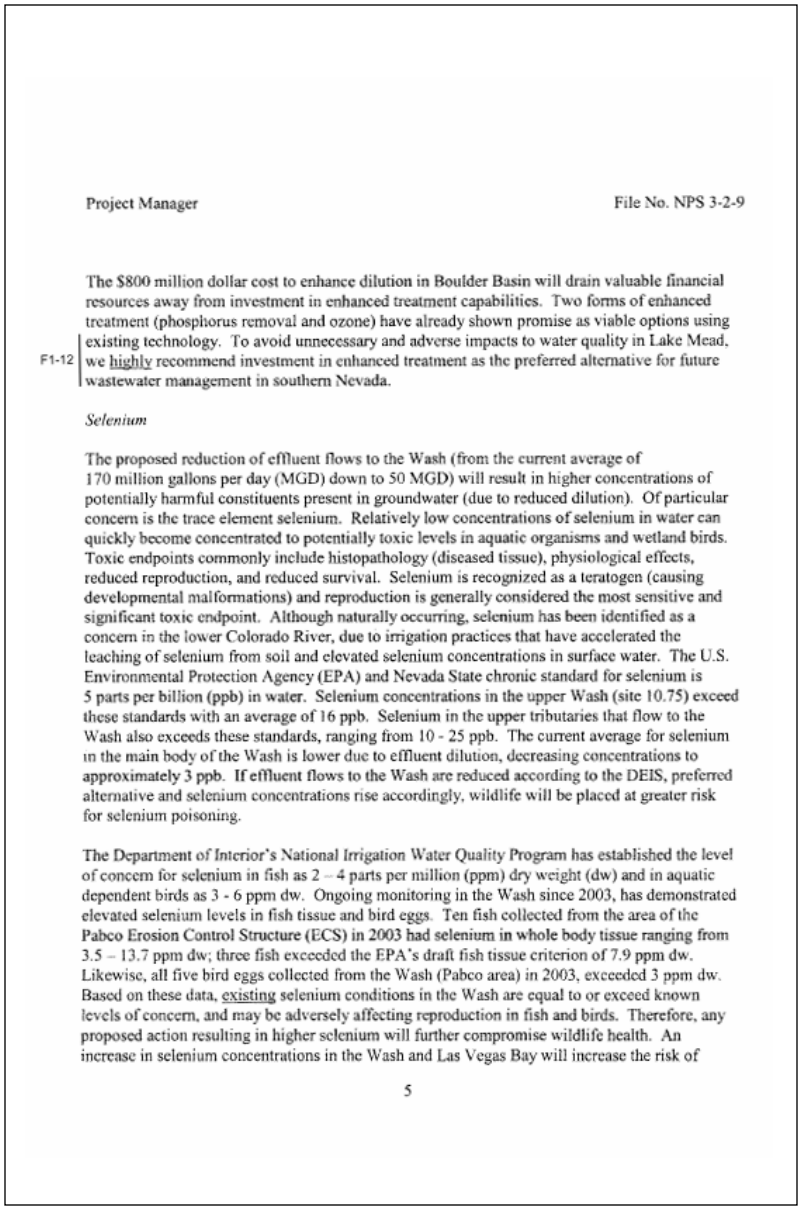
Extensive highly sophisticated water quality modeling has been completed. This model has been peer reviewed by independent experts, continuously reviewed and developed with all agencies involved, including the USFWS, and has been accepted as a management tool for making water quality management decisions for the SCOP EIS. This model clearly indicates that water quality standards cannot be met and impacts would occur to the return flow credits for the SNWA water supply to Las Vegas.

### F1-9

The importance of return flow credits is stated in Section 1.4.1. Section 1.5 of the Draft EIS and Final EIS includes "Integration with southern Nevada's overall water resource plan, including return flow credits, direct effluent reuse…" as "factors that have been identified as part of the need for the project." Section 2.7 (formerly Section 2.6) of the Final EIS includes the following sentence that relates the purpose and need to the alternatives eliminated from further analysis, "A potential alternative might be eliminated from detailed consideration for many reasons including, but not limited to, if the alternative does not meet the purpose and need for the project, would take too long to implement…"

### F1-10

See General Response 11.



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The $800 million dollar cost to enhance dilution in Boulder Basin will drain valuable financial resources away from investment in enhanced treatment capabilities. Two forms of enhanced treatment (phosphorus removal and ozone) have already shown promise as viable options using existing technology. To avoid unnecessary and adverse impacts to water quality in Lake Mead, F1-12 we highly recommend investment in enhanced treatment as the preferred alternative for future wastewater management in southern Nevada.

*Selenium*

The proposed reduction of effluent flows to the Wash (from the current average of 170 million gallons per day (MGD) down to 50 MGD) will result in higher concentrations of potentially harmful constituents present in groundwater (due to reduced dilution). Of particular concern is the trace element selenium. Relatively low concentrations of selenium in water can quickly become concentrated to potentially toxic levels in aquatic organisms and wetland birds. Toxic endpoints commonly include histopathology (diseased tissue), physiological effects, reduced reproduction, and reduced survival. Selenium is recognized as a teratogen (causing developmental malformations) and reproduction is generally considered the most sensitive and significant toxic endpoint. Although naturally occurring, selenium has been identified as a concern in the lower Colorado River, due to irrigation practices that have accelerated the leaching of selenium from soil and elevated selenium concentrations in surface water. The U.S. Environmental Protection Agency (EPA) and Nevada State chronic standard for selenium is 5 parts per billion (ppb) in water. Selenium concentrations in the upper Wash (site 10.75) exceed these standards with an average of 16 ppb. Selenium in the upper tributaries that flow to the Wash also exceeds these standards, ranging from 10 - 25 ppb. The current average for selenium in the main body of the Wash is lower due to effluent dilution, decreasing concentrations to approximately 3 ppb. If effluent flows to the Wash are reduced according to the DEIS, preferred alternative and selenium concentrations rise accordingly, wildlife will be placed at greater risk for selenium poisoning.

The Department of Interior's National Irrigation Water Quality Program has established the level of concern for selenium in fish as 2 – 4 parts per million (ppm) dry weight (dw) and in aquatic dependent birds as 3 - 6 ppm dw. Ongoing monitoring in the Wash since 2003, has demonstrated elevated selenium levels in fish tissue and bird eggs. Ten fish collected from the area of the Pabco Erosion Control Structure (ECS) in 2003 had selenium in whole body tissue ranging from 3.5 – 13.7 ppm dw; three fish exceeded the EPA's draft fish tissue criterion of 7.9 ppm dw. Likewise, all five bird eggs collected from the Wash (Pabco area) in 2003, exceeded 3 ppm dw. Based on these data, existing selenium conditions in the Wash are equal to or exceed known levels of concern, and may be adversely affecting reproduction in fish and birds. Therefore, any proposed action resulting in higher selenium will further compromise wildlife health. An increase in selenium concentrations in the Wash and Las Vegas Bay will increase the risk of

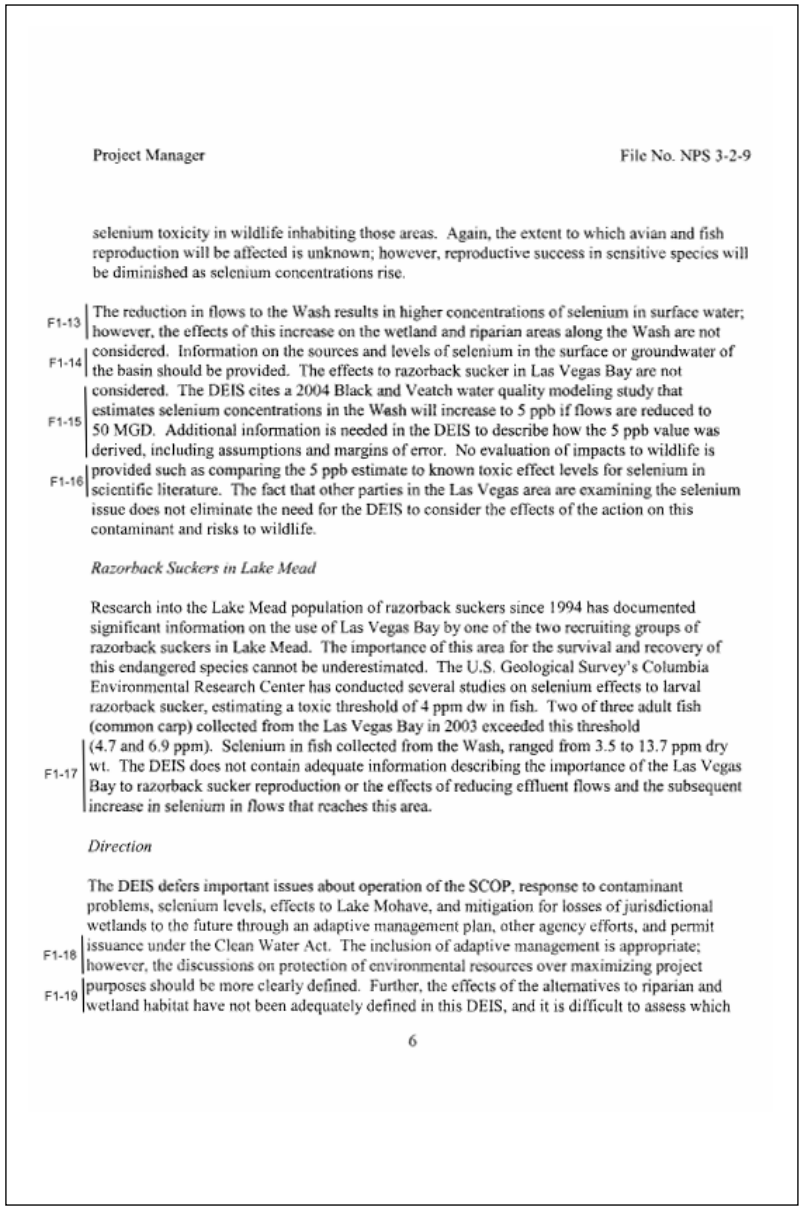
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**F1-11**

See General Response 11.

**F1-12**

See General Response 1.



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selenium toxicity in wildlife inhabiting those areas. Again, the extent to which avian and fish reproduction will be affected is unknown; however, reproductive success in sensitive species will be diminished as selenium concentrations rise.

F1-13 The reduction in flows to the Wash results in higher concentrations of selenium in surface water; however, the effects of this increase on the wetland and riparian areas along the Wash are not considered.

F1-14 Information on the sources and levels of selenium in the surface or groundwater of the basin should be provided. The effects to razorback sucker in Las Vegas Bay are not considered.

F1-15 The DEIS cites a 2004 Black and Veatch water quality modeling study that estimates selenium concentrations in the Wash will increase to 5 ppb if flows are reduced to 50 MGD. Additional information is needed in the DEIS to describe how the 5 ppb value was derived, including assumptions and margins of error.

F1-16 No evaluation of impacts to wildlife is provided such as comparing the 5 ppb estimate to known toxic effect levels for selenium in scientific literature. The fact that other parties in the Las Vegas area are examining the selenium issue does not eliminate the need for the DEIS to consider the effects of the action on this contaminant and risks to wildlife.

*Razorback Suckers in Lake Mead*

Research into the Lake Mead population of razorback suckers since 1994 has documented significant information on the use of Las Vegas Bay by one of the two recruiting groups of razorback suckers in Lake Mead. The importance of this area for the survival and recovery of this endangered species cannot be underestimated. The U.S. Geological Survey's Columbia Environmental Research Center has conducted several studies on selenium effects to larval razorback sucker, estimating a toxic threshold of 4 ppm dw in fish. Two of three adult fish (common carp) collected from the Las Vegas Bay in 2003 exceeded this threshold (4.7 and 6.9 ppm). Selenium in fish collected from the Wash, ranged from 3.5 to 13.7 ppm dry

F1-17 wt. The DEIS does not contain adequate information describing the importance of the Las Vegas Bay to razorback sucker reproduction or the effects of reducing effluent flows and the subsequent increase in selenium in flows that reaches this area.

*Direction*

The DEIS defers important issues about operation of the SCOP, response to contaminant problems, selenium levels, effects to Lake Mohave, and mitigation for losses of jurisdictional wetlands to the future through an adaptive management plan, other agency efforts, and permit

F1-18 issuance under the Clean Water Act. The inclusion of adaptive management is appropriate; however, the discussions on protection of environmental resources over maximizing project

F1-19 purposes should be more clearly defined. Further, the effects of the alternatives to riparian and wetland habitat have not been adequately defined in this DEIS, and it is difficult to assess which

6

### F1-13

Text has been added to Section 4.2.2.1.2 to describe that decreased flows would result in increased selenium concentrations in the Las Vegas Wash. Text describing the potential impact this may have on the wildlife in wetland and riparian areas along the Las Vegas Wash has been added.

See General Response 11.

### F1-14

A brief description of selenium has been added to Section 1.4.2.6 of the Final EIS.

Additionally, selenium is discussed in Section 3.1 of the Final EIS.

### F1-15

See General Response 9.

See response to comment F1-13.

### F1-16

Text has been added to Section 4.2.2.1.2 evaluating potential impacts to wildlife and comparing predicted levels of selenium to the EPA-recommended threshold for bioaccumulation in wildlife of 5 ppb.

### F1-17

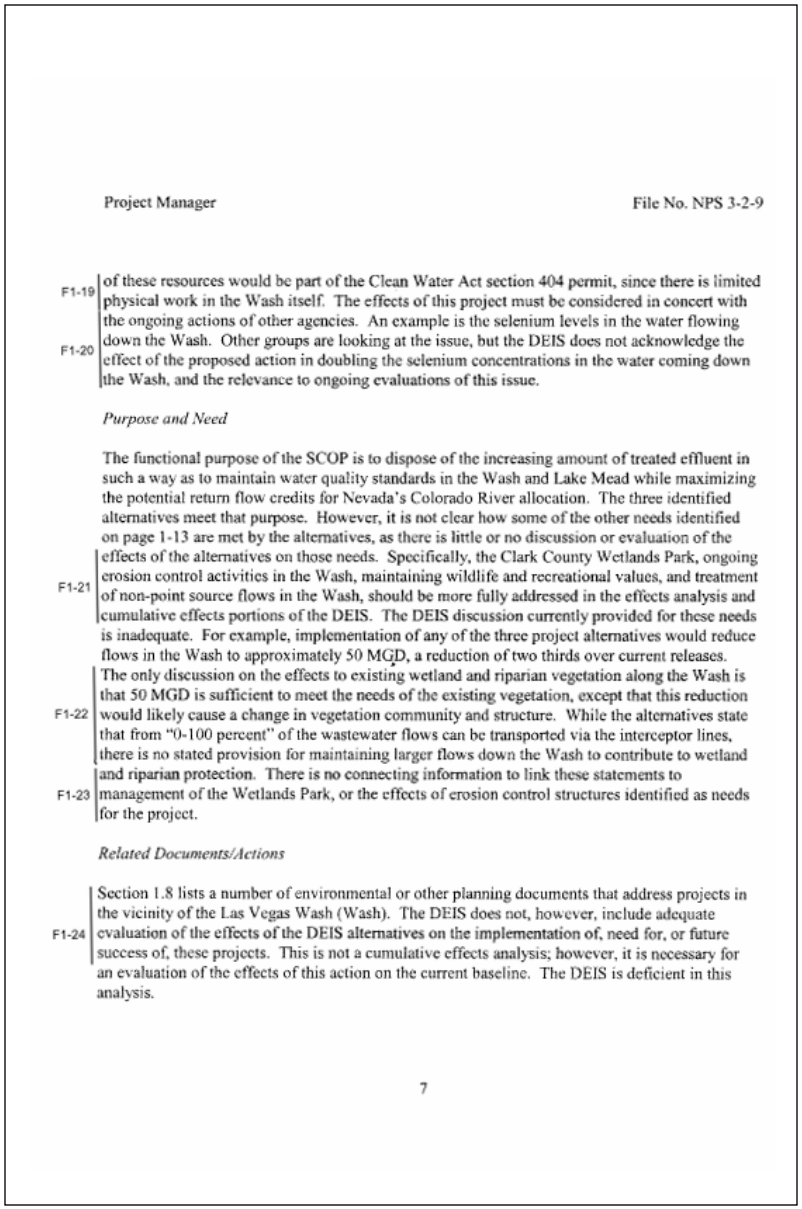
See General Response 9.

### F1-18

Comment noted.

### F1-19

It is stated in Section 4.2.2.1.1 that wetland habitat may transition to drier riparian habitats, such as alkali scrub and tamarisk. The water budget for the



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F1-19 of these resources would be part of the Clean Water Act section 404 permit, since there is limited physical work in the Wash itself. The effects of this project must be considered in concert with the ongoing actions of other agencies. An example is the selenium levels in the water flowing down the Wash. Other groups are looking at the issue, but the DEIS does not acknowledge the
F1-20 effect of the proposed action in doubling the selenium concentrations in the water coming down the Wash, and the relevance to ongoing evaluations of this issue.

*Purpose and Need*

The functional purpose of the SCOP is to dispose of the increasing amount of treated effluent in such a way as to maintain water quality standards in the Wash and Lake Mead while maximizing the potential return flow credits for Nevada's Colorado River allocation. The three identified alternatives meet that purpose. However, it is not clear how some of the other needs identified on page 1-13 are met by the alternatives, as there is little or no discussion or evaluation of the
F1-21 effects of the alternatives on those needs. Specifically, the Clark County Wetlands Park, ongoing erosion control activities in the Wash, maintaining wildlife and recreational values, and treatment of non-point source flows in the Wash, should be more fully addressed in the effects analysis and cumulative effects portions of the DEIS. The DEIS discussion currently provided for these needs is inadequate. For example, implementation of any of the three project alternatives would reduce flows in the Wash to approximately 50 MGD, a reduction of two thirds over current releases.
F1-22 The only discussion on the effects to existing wetland and riparian vegetation along the Wash is that 50 MGD is sufficient to meet the needs of the existing vegetation, except that this reduction would likely cause a change in vegetation community and structure. While the alternatives state that from "0-100 percent" of the wastewater flows can be transported via the interceptor lines, there is no stated provision for maintaining larger flows down the Wash to contribute to wetland
F1-23 and riparian protection. There is no connecting information to link these statements to management of the Wetlands Park, or the effects of erosion control structures identified as needs for the project.

*Related Documents/Actions*

F1-24 Section 1.8 lists a number of environmental or other planning documents that address projects in the vicinity of the Las Vegas Wash (Wash). The DEIS does not, however, include adequate evaluation of the effects of the DEIS alternatives on the implementation of, need for, or future success of, these projects. This is not a cumulative effects analysis; however, it is necessary for an evaluation of the effects of this action on the current baseline. The DEIS is deficient in this analysis.

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**(F1-19 continued)**

Las Vegas Wash indicates that these community types can be supported at 50 mgd, however, the composition and diversity may change.

Only filling or dredging within waters of the U.S. is covered by the CWA Section 404 permit. Changes in flows are not covered by the 404 permit. The permit will only apply to Lake Mead because no filling or dredging activities would occur in the Las Vegas Wash. No such permit is required for the Las Vegas Wash.

Coordination with other agencies, committees, and workgroups who have ongoing management responsibilities and actions in the Las Vegas Wash will be implemented through the Boulder Basin AMP and SNWA Erosion Control Structure (ECS) plan, and is explained in sections 4.2.2.1.1 and 4.2.2.1.2.

**F1-20**

The information addressing the existing conditions and the effects of the proposed SCOP on selenium levels in the Las Vegas Wash and Lake Mead, as well as the potential impact to biological resources have been inserted into the Final EIS in sections 4.2.1.3 and 4.2.2.1.3. Further information on other contaminants is contained in Section 4.2.1.3.

**F1-21**

The purpose and need states that effluent-management flexibility is needed to adapt to potential changes in the Las Vegas Wash resulting from development of the ECSs and Wetlands Park. The SCOP EIS addresses the potential impacts of constructing and operating the SCOP. The impacts from the ECSs and Wetlands Park have been analyzed in other National Environmental Policy Act (NEPA) documents. The ECSs are designed to accommodate flows greater than the projected effluent flows; therefore, it has been determined that the SCOP does not impact the ECSs. The potential impacts to the Wetlands Park are described in the appropriate sections of Chapter 4 of the Final EIS. Riparian vegetation and wetlands developed upstream of the ECSs would have a calmer water environment, greater hydraulic residence time (HRT), and a longer plant establishment period. The cumulative impacts section, Chapter 5, has been revised based on comments received during the public comment period.

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**F1-22**

See General Response 11.

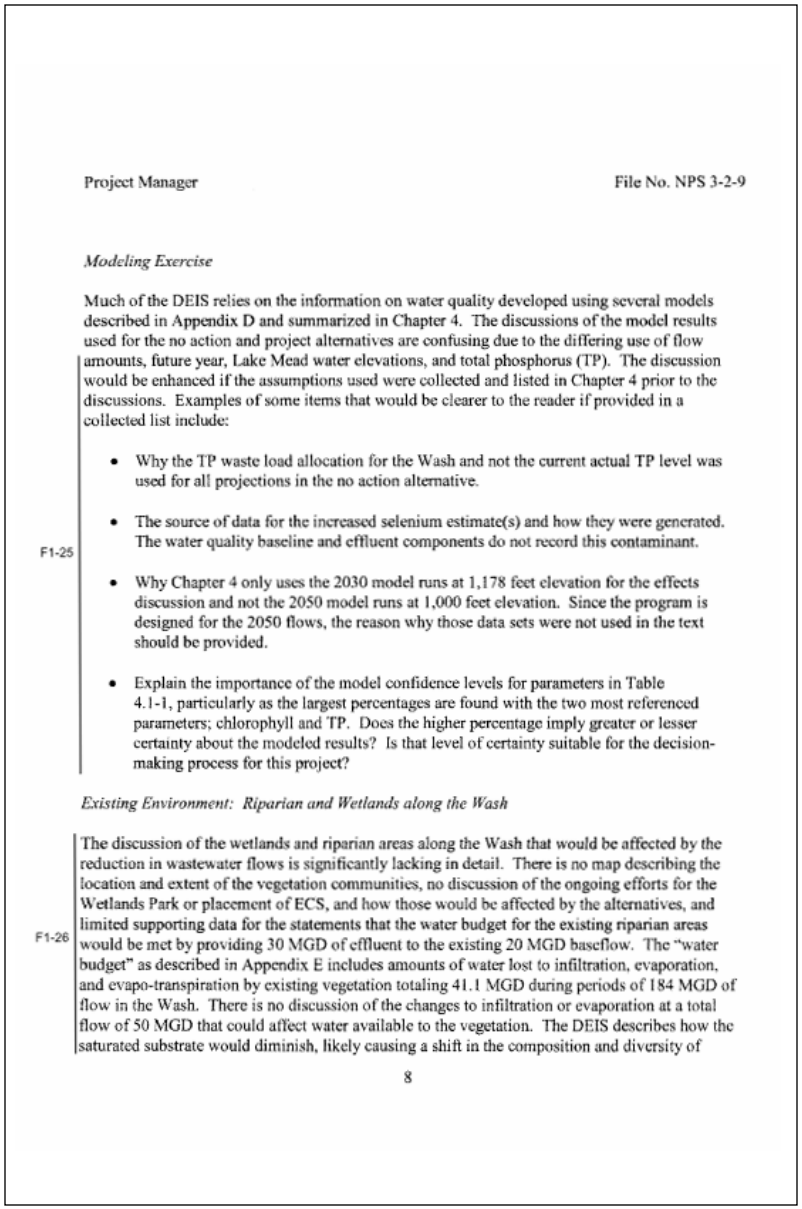
Text has been added to sections 4.2.2.1.1 and 4.2.2.1.2 to describe how ECSs and the Boulder Basin AMP will manage flows to sustain existing vegetation community composition and structure.

**F1-23**

The purpose and need states that effluent-management flexibility is needed to adapt to potential changes in the Las Vegas Wash resulting from development of the ECSs and Wetlands Park. The SCOP EIS addresses the potential impacts of constructing and operating the SCOP. The impacts from the ECSs and Wetlands Park have been analyzed in other NEPA documents. The ECSs are designed to accommodate flows greater than the projected effluent flows; therefore, it has been determined that the SCOP does not impact the ECSs. The potential impacts to the Wetlands Park are described in the appropriate sections of Chapter 4 of the Final EIS.

**F1-24**

Section 1.8 lists the documents used to determine baseline conditions in the project area. Section 4.9 describes the potential impacts of the proposed alternatives on land use plans and community goals, currently established uses of the area, and other land use related issues. Cumulative impacts are addressed in Section 5.0.



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*Modeling Exercise*

Much of the DEIS relies on the information on water quality developed using several models described in Appendix D and summarized in Chapter 4. The discussions of the model results used for the no action and project alternatives are confusing due to the differing use of flow amounts, future year, Lake Mead water elevations, and total phosphorus (TP). The discussion would be enhanced if the assumptions used were collected and listed in Chapter 4 prior to the discussions. Examples of some items that would be clearer to the reader if provided in a collected list include:

- Why the TP waste load allocation for the Wash and not the current actual TP level was used for all projections in the no action alternative.
- The source of data for the increased selenium estimate(s) and how they were generated. The water quality baseline and effluent components do not record this contaminant.
- Why Chapter 4 only uses the 2030 model runs at 1,178 feet elevation for the effects discussion and not the 2050 model runs at 1,000 feet elevation. Since the program is designed for the 2050 flows, the reason why those data sets were not used in the text should be provided.
- Explain the importance of the model confidence levels for parameters in Table 4.1-1, particularly as the largest percentages are found with the two most referenced parameters; chlorophyll and TP. Does the higher percentage imply greater or lesser certainty about the modeled results? Is that level of certainty suitable for the decision-making process for this project?

F1-25

*Existing Environment: Riparian and Wetlands along the Wash*

The discussion of the wetlands and riparian areas along the Wash that would be affected by the reduction in wastewater flows is significantly lacking in detail. There is no map describing the location and extent of the vegetation communities, no discussion of the ongoing efforts for the Wetlands Park or placement of ECS, and how those would be affected by the alternatives, and limited supporting data for the statements that the water budget for the existing riparian areas would be met by providing 30 MGD of effluent to the existing 20 MGD baseflow. The "water budget" as described in Appendix E includes amounts of water lost to infiltration, evaporation, and evapo-transpiration by existing vegetation totaling 41.1 MGD during periods of 184 MGD of flow in the Wash. There is no discussion of the changes to infiltration or evaporation at a total flow of 50 MGD that could affect water available to the vegetation. The DEIS describes how the saturated substrate would diminish, likely causing a shift in the composition and diversity of

F1-26

8

**F1-25**

Model confidence is explained in Section 4.1 and more detail is presented in Appendix D. Text has been added to Section 4.1 to assist with understanding the model confidence percentages in Table 4.1-1.

The model used for the SCOP EIS has been peer reviewed by independent experts, continuously reviewed and developed with all agencies involved, and has been accepted as a management tool for making water quality management decisions for the SCOP EIS. The uncertainty (confidence) levels of the model have been determined to be acceptable.

The Draft EIS presented data for the 2030 modeling runs at Lake elevations of 1,178 and 1,000 ft. Similar tables for the 2050 flows were included in Appendix D as stated throughout the text. This was done in an effort to simplify the text and avoid confusion for the reader. However, as requested by this commenter, the tables containing information for 2050 flows have been included in Section 4.1 of the Final EIS.

**F1-26**

See General Response 11.

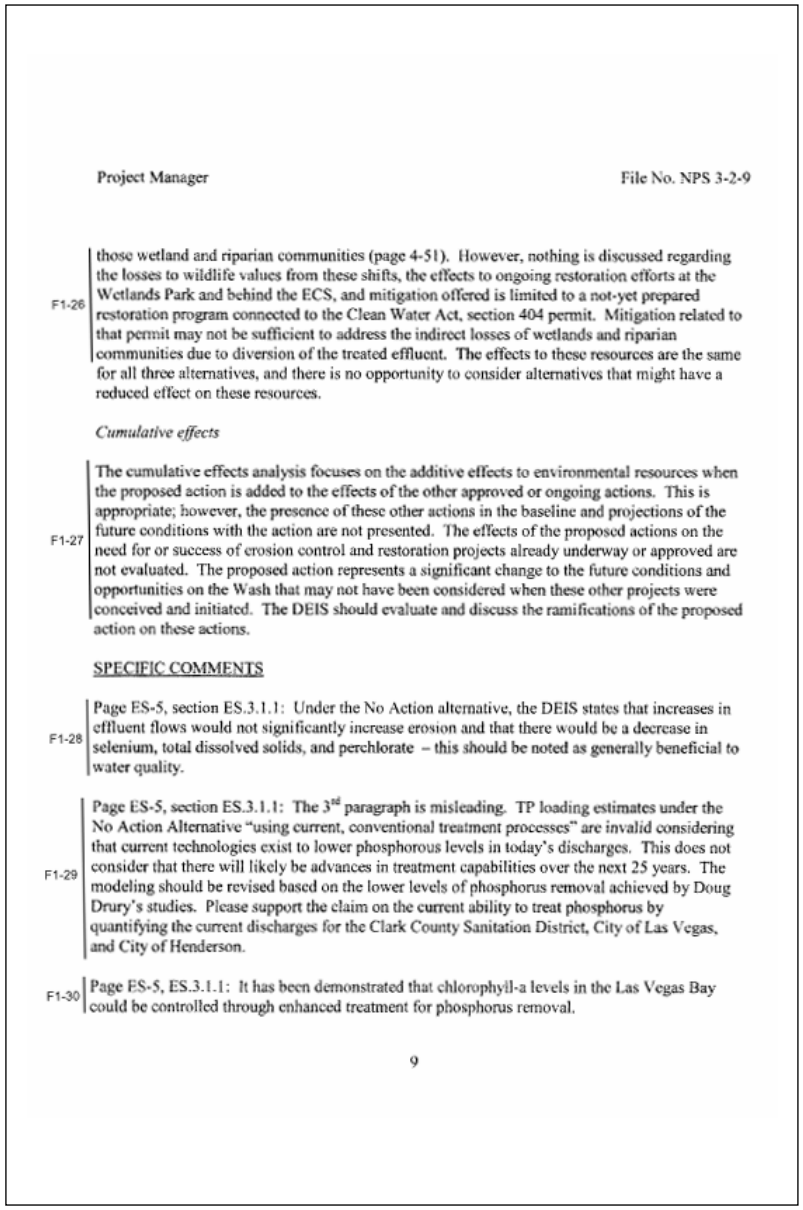
A map of the vegetation communities within the Wetlands Park has been added to Appendix E.

Potential impacts to wildlife resulting from reduced effluent flow and a shift in habitat composition and diversity has been added to Section 4.2.2.1.2.

Mitigation related to a Section 404 permit is not applicable in this situation. No such permit would be required for the Las Vegas Wash.

Potential indirect losses of wetlands and riparian communities due to diversion of the treated effluent are explained in Section 4.2.2.1.2.

Text has been added to sections 4.2.2.1.1 and 4.2.2.1.2 to describe the implementation of the Boulder Basin AMP in response to potential condition changes in the Las Vegas Wash. The continuing construction of ECSs would provide improvement to wetland and riparian vegetation communities in the Las Vegas Wash.



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F1-26 those wetland and riparian communities (page 4-51). However, nothing is discussed regarding the losses to wildlife values from these shifts, the effects to ongoing restoration efforts at the Wetlands Park and behind the ECS, and mitigation offered is limited to a not-yet prepared restoration program connected to the Clean Water Act, section 404 permit. Mitigation related to that permit may not be sufficient to address the indirect losses of wetlands and riparian communities due to diversion of the treated effluent. The effects to these resources are the same for all three alternatives, and there is no opportunity to consider alternatives that might have a reduced effect on these resources.

*Cumulative effects*

F1-27 The cumulative effects analysis focuses on the additive effects to environmental resources when the proposed action is added to the effects of the other approved or ongoing actions. This is appropriate; however, the presence of these other actions in the baseline and projections of the future conditions with the action are not presented. The effects of the proposed actions on the need for or success of erosion control and restoration projects already underway or approved are not evaluated. The proposed action represents a significant change to the future conditions and opportunities on the Wash that may not have been considered when these other projects were conceived and initiated. The DEIS should evaluate and discuss the ramifications of the proposed action on these actions.

SPECIFIC COMMENTS

F1-28 Page ES-5, section ES.3.1.1: Under the No Action alternative, the DEIS states that increases in effluent flows would not significantly increase erosion and that there would be a decrease in selenium, total dissolved solids, and perchlorate – this should be noted as generally beneficial to water quality.

F1-29 Page ES-5, section ES.3.1.1: The 3rd paragraph is misleading. TP loading estimates under the No Action Alternative "using current, conventional treatment processes" are invalid considering that current technologies exist to lower phosphorous levels in today's discharges. This does not consider that there will likely be advances in treatment capabilities over the next 25 years. The modeling should be revised based on the lower levels of phosphorus removal achieved by Doug Drury's studies. Please support the claim on the current ability to treat phosphorus by quantifying the current discharges for the Clark County Sanitation District, City of Las Vegas, and City of Henderson.

F1-30 Page ES-5, ES.3.1.1: It has been demonstrated that chlorophyll-a levels in the Las Vegas Bay could be controlled through enhanced treatment for phosphorus removal.

9

### F1-27

The SCOP EIS addresses the potential impacts of constructing and operating the SCOP. The impacts from the ECSs and Wetlands Park have been analyzed in other NEPA documents. The ECS in the Las Vegas Wash are being designed and constructed to manage storm flows and to reduce the impacts resulting from storm flows. Therefore, the need for the ECSs in the Las Vegas Wash is not affected by the proposed project. The following sentence has been added to Section 1.4.2.3 of the Final EIS, "The ECSs are designed and constructed to manage storm flows and to reduce the impacts of storm flows on the Las Vegas Wash."

The potential impacts to the Wetlands Park are described in the appropriate sections of Chapter 4 of the Final EIS. Riparian vegetation and wetlands developed upstream of the ECSs would have a calmer water environment, greater HRT, and a longer plant establishment period.

The cumulative impacts section, Chapter 5, has been revised based on comments received during the public comment period.

See General Response 11.

### F1-28

See General Response 11.

The Executive Summary has been revised as necessary.

### F1-29

See response to comment F1-2.

See General Response 8.

The information is accurate as stated in the Executive Summary based on the definition of the No Action Alternative. The No Action Alternative includes the use of current, conventional treatment processes and plant optimization. No change to the Executive Summary is required.

### F1-30

See response to comment F1-2.

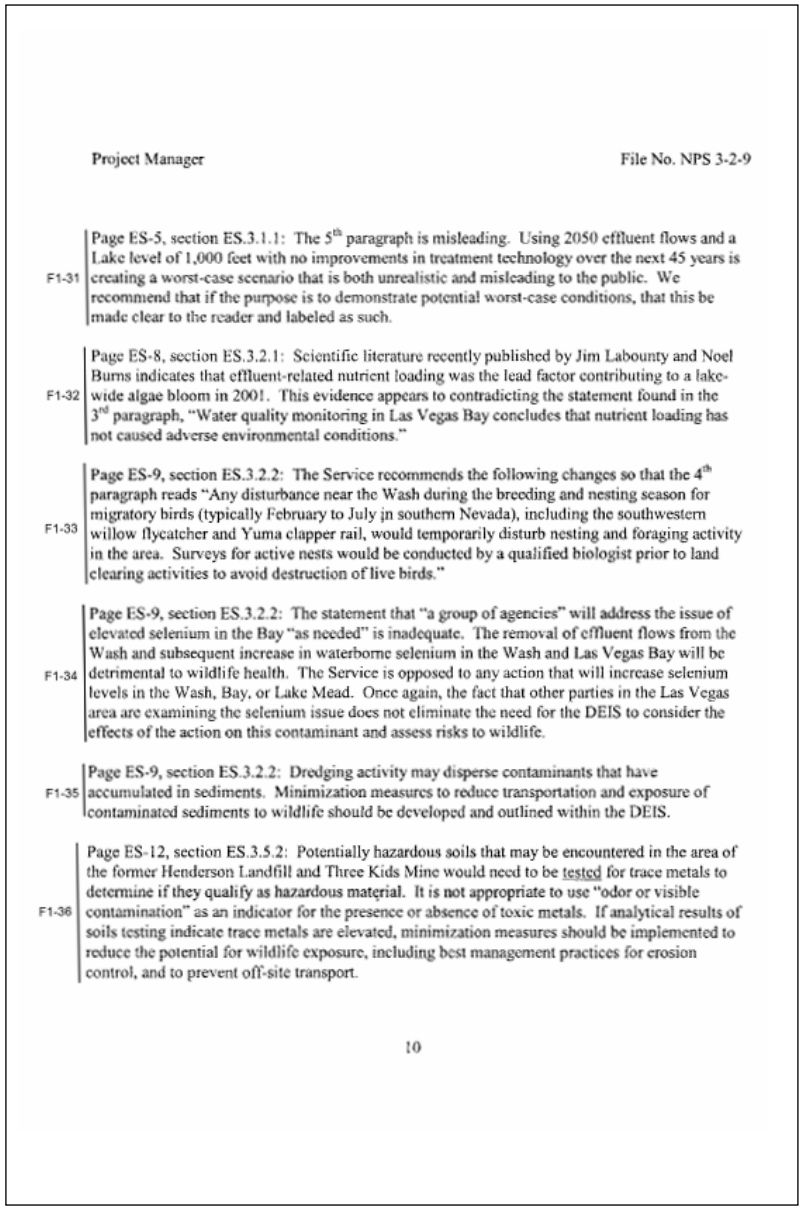
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**(F1-30 continued)**

See General Response 8.

See General Response 1.

The information is accurate as stated in the Executive Summary. No change to the Executive Summary is required.



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F1-31 Page ES-5, section ES.3.1.1: The 5th paragraph is misleading. Using 2050 effluent flows and a Lake level of 1,000 feet with no improvements in treatment technology over the next 45 years is creating a worst-case scenario that is both unrealistic and misleading to the public. We recommend that if the purpose is to demonstrate potential worst-case conditions, that this be made clear to the reader and labeled as such.

F1-32 Page ES-8, section ES.3.2.1: Scientific literature recently published by Jim Labounty and Noel Burns indicates that effluent-related nutrient loading was the lead factor contributing to a lake-wide algae bloom in 2001. This evidence appears to contradicting the statement found in the 3rd paragraph, "Water quality monitoring in Las Vegas Bay concludes that nutrient loading has not caused adverse environmental conditions."

F1-33 Page ES-9, section ES.3.2.2: The Service recommends the following changes so that the 4th paragraph reads "Any disturbance near the Wash during the breeding and nesting season for migratory birds (typically February to July in southern Nevada), including the southwestern willow flycatcher and Yuma clapper rail, would temporarily disturb nesting and foraging activity in the area. Surveys for active nests would be conducted by a qualified biologist prior to land clearing activities to avoid destruction of live birds."

F1-34 Page ES-9, section ES.3.2.2: The statement that "a group of agencies" will address the issue of elevated selenium in the Bay "as needed" is inadequate. The removal of effluent flows from the Wash and subsequent increase in waterborne selenium in the Wash and Las Vegas Bay will be detrimental to wildlife health. The Service is opposed to any action that will increase selenium levels in the Wash, Bay, or Lake Mead. Once again, the fact that other parties in the Las Vegas area are examining the selenium issue does not eliminate the need for the DEIS to consider the effects of the action on this contaminant and assess risks to wildlife.

F1-35 Page ES-9, section ES.3.2.2: Dredging activity may disperse contaminants that have accumulated in sediments. Minimization measures to reduce transportation and exposure of contaminated sediments to wildlife should be developed and outlined within the DEIS.

F1-36 Page ES-12, section ES.3.5.2: Potentially hazardous soils that may be encountered in the area of the former Henderson Landfill and Three Kids Mine would need to be tested for trace metals to determine if they qualify as hazardous material. It is not appropriate to use "odor or visible contamination" as an indicator for the presence or absence of toxic metals. If analytical results of soils testing indicate trace metals are elevated, minimization measures should be implemented to reduce the potential for wildlife exposure, including best management practices for erosion control, and to prevent off-site transport.

10

### F1-31

See General Response 8.

Under the No Action Alternative, with a Lake level of 1,000 ft and using the projected 2050 effluent flows while meeting the current TMDL, there would be an unacceptable statistical probability of violating the chlorophyll water quality standard of 5 micrograms per liter in the open waters of Boulder Basin and chlorophyll levels at Boulder Beach would exceed the 5 micrograms per liter water quality standard.

The information is accurate as stated in the Executive Summary based on the definition of the No Action Alternative. The No Action Alternative includes the use of current, conventional treatment processes and plant optimization. The Process Improvements Alternative includes the use of membrane technologies. Clarifying text was added to the specified paragraph in section ES 3.1.1.

### F1-32

The journal article by LaBounty and Burns (2005) in part attributes the 2001 algal bloom in Boulder Basin to increased phosphorus loads. However, they also attribute the bloom to an extended period of overflow from the Las Vegas Wash resulting in more nutrients in the epilimnion and photic zone. In contrast to the present day and No Action Alternative, the modeling indicates that the Boulder Islands alternatives would result in the majority of the effluent being inserted below the photic zone, thereby resulting in decreased algal growth. Thus, the probability of algal blooms similar to the 2001 event occurring would decrease with discharge in the vicinity of the Boulder Islands.

No changes to the Executive Summary are required.

### F1-33

Mitigation measures to minimize the potential for impacts to nesting birds are included in Section 4.2.6 of the Final EIS. In addition, a map of the vegetation communities along the Las Vegas Wash has been added to Appendix E of the Final EIS.

The Executive Summary has been revised as requested.

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**F1-34**

Text has been added to the Executive Summary to expand on "a group of agencies" and how they would monitor the increase in constituent concentrations. Text was also added to further summarize the potential risks of the constituents on wildlife.

**F1-35**

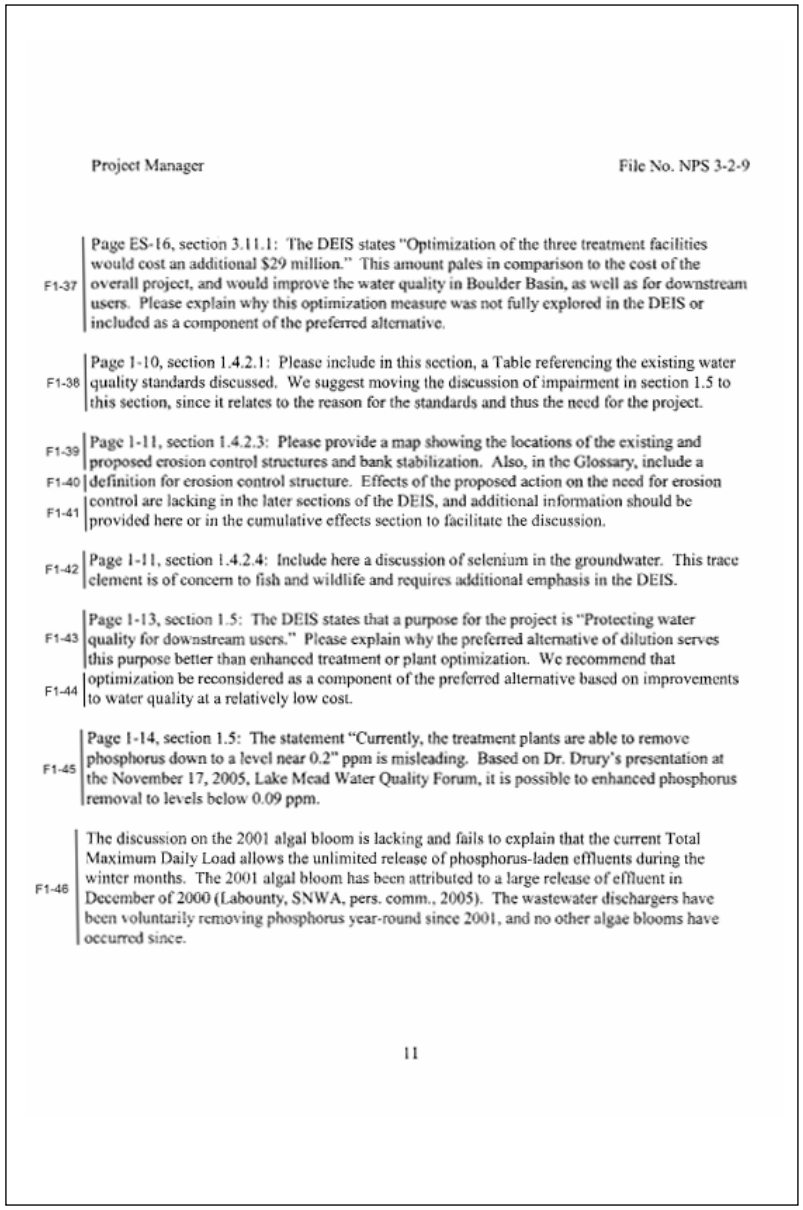
Dredging activities would result in short-term negative impacts to benthic organisms in the immediate area. The area would recolonize with organisms that move in once construction activities cease. The effect of redistribution of benthic contaminants is unknown for this area of the Lake. Similar text has been added to Section 4.2.2.2.3 of the Final EIS. Minimization measures (turbidity curtain) are explained in Section 2.2.2.4. The permit process for dredging, required and administered by the EPA and U.S. Army Corps of Engineers (USACE), are explained in Section 4.1.2.1.2.

The requested information has been added to the appropriate sections of the Final EIS as stated above. No change to the Executive Summary is required.

**F1-36**

Geotechnical studies and sampling and analysis of the soils will be conducted during final design of the pipeline. It is premature to conduct these studies prior to the issuance of a ROD. The sampling and analyses required to determine the presence and extent of contamination will be conducted in accordance with NDEP guidance and directions. In addition, all required permits for handling potential soil contamination will be acquired before construction and any required mitigation measures will be implemented in accordance with NDEP and EPA guidelines. Text has been added to the specified sections of the Final EIS.

The Executive Summary and associated sections have been updated as necessary.



Project Manager File No. NPS 3-2-9

F1-37 Page ES-16, section 3.11.1: The DEIS states "Optimization of the three treatment facilities would cost an additional $29 million." This amount pales in comparison to the cost of the overall project, and would improve the water quality in Boulder Basin, as well as for downstream users. Please explain why this optimization measure was not fully explored in the DEIS or included as a component of the preferred alternative.

F1-38 Page 1-10, section 1.4.2.1: Please include in this section, a Table referencing the existing water quality standards discussed. We suggest moving the discussion of impairment in section 1.5 to this section, since it relates to the reason for the standards and thus the need for the project.

F1-39 Page 1-11, section 1.4.2.3: Please provide a map showing the locations of the existing and proposed erosion control structures and bank stabilization. Also, in the Glossary, include a
F1-40 definition for erosion control structure. Effects of the proposed action on the need for erosion
F1-41 control are lacking in the later sections of the DEIS, and additional information should be provided here or in the cumulative effects section to facilitate the discussion.

F1-42 Page 1-11, section 1.4.2.4: Include here a discussion of selenium in the groundwater. This trace element is of concern to fish and wildlife and requires additional emphasis in the DEIS.

F1-43 Page 1-13, section 1.5: The DEIS states that a purpose for the project is "Protecting water quality for downstream users." Please explain why the preferred alternative of dilution serves this purpose better than enhanced treatment or plant optimization. We recommend that
F1-44 optimization be reconsidered as a component of the preferred alternative based on improvements to water quality at a relatively low cost.

F1-45 Page 1-14, section 1.5: The statement "Currently, the treatment plants are able to remove phosphorus down to a level near 0.2" ppm is misleading. Based on Dr. Drury's presentation at the November 17, 2005, Lake Mead Water Quality Forum, it is possible to enhanced phosphorus removal to levels below 0.09 ppm.

F1-46 The discussion on the 2001 algal bloom is lacking and fails to explain that the current Total Maximum Daily Load allows the unlimited release of phosphorus-laden effluents during the winter months. The 2001 algal bloom has been attributed to a large release of effluent in December of 2000 (Labounty, SNWA, pers. comm., 2005). The wastewater dischargers have been voluntarily removing phosphorus year-round since 2001, and no other algae blooms have occurred since.

11

**F1-37**

See General Response 3.

The Executive Summary has been revised to more clearly explain that plant optimization is part of all the alternatives.

**F1-38**

Water quality standards are presented in Table 3.1-2 of the Water Quality Affected Environment Section.

As stated by the commenter, the discussion of impairment supports the need for the project. Therefore, the impairment discussion does not need to be moved because it is currently in Section 1.5, Purpose and Need for the Action.

**F1-39**

Figure 3.1-6 shows the locations of SNWA's ECSs.

**F1-40**

The definition of ECS has been added to Chapter 11, Glossary, of the Final EIS as requested.

**F1-41**

See response to comment F1-27.

**F1-42**

Text regarding selenium has been added as Section 1.4.2.6 of the Final EIS.

**F1-43**

See General Response 3.

See General Response 8.

Section 2.8 of the Final EIS explains the rationale for selecting the Boulder Islands North Alternative as the Preferred Alternative.

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**F1-44**

See General Response 3.

**F1-45**

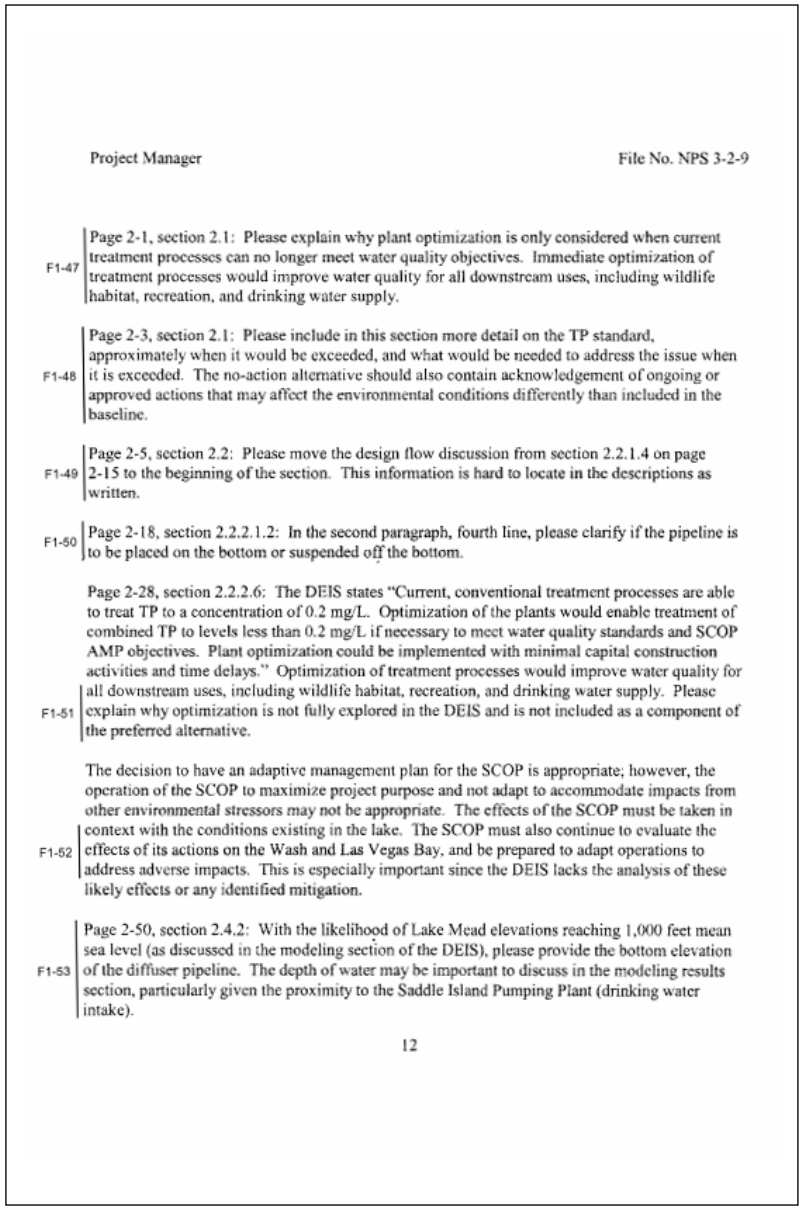
See response to comment F1-2.See General Response 8.

The referenced sentence in Section 1.5 has been updated based on the treatment facilities' current capabilities.

**F1-46**

The commenter is correct that the wastewater dischargers have agreed to voluntarily remove phosphorus year round since the 2001 algae bloom. However, the cause of the 2001 algae bloom has not been determined with any scientific certainty.

See response to comment F1-32.



Project Manager File No. NPS 3-2-9

F1-47 Page 2-1, section 2.1: Please explain why plant optimization is only considered when current treatment processes can no longer meet water quality objectives. Immediate optimization of treatment processes would improve water quality for all downstream uses, including wildlife habitat, recreation, and drinking water supply.

F1-48 Page 2-3, section 2.1: Please include in this section more detail on the TP standard, approximately when it would be exceeded, and what would be needed to address the issue when it is exceeded. The no-action alternative should also contain acknowledgement of ongoing or approved actions that may affect the environmental conditions differently than included in the baseline.

F1-49 Page 2-5, section 2.2: Please move the design flow discussion from section 2.2.1.4 on page 2-15 to the beginning of the section. This information is hard to locate in the descriptions as written.

F1-50 Page 2-18, section 2.2.2.1.2: In the second paragraph, fourth line, please clarify if the pipeline is to be placed on the bottom or suspended off the bottom.

F1-51 Page 2-28, section 2.2.2.6: The DEIS states "Current, conventional treatment processes are able to treat TP to a concentration of 0.2 mg/L. Optimization of the plants would enable treatment of combined TP to levels less than 0.2 mg/L if necessary to meet water quality standards and SCOP AMP objectives. Plant optimization could be implemented with minimal capital construction activities and time delays." Optimization of treatment processes would improve water quality for all downstream uses, including wildlife habitat, recreation, and drinking water supply. Please explain why optimization is not fully explored in the DEIS and is not included as a component of the preferred alternative.

F1-52 The decision to have an adaptive management plan for the SCOP is appropriate; however, the operation of the SCOP to maximize project purpose and not adapt to accommodate impacts from other environmental stressors may not be appropriate. The effects of the SCOP must be taken in context with the conditions existing in the lake. The SCOP must also continue to evaluate the effects of its actions on the Wash and Las Vegas Bay, and be prepared to adapt operations to address adverse impacts. This is especially important since the DEIS lacks the analysis of these likely effects or any identified mitigation.

F1-53 Page 2-50, section 2.4.2: With the likelihood of Lake Mead elevations reaching 1,000 feet mean sea level (as discussed in the modeling section of the DEIS), please provide the bottom elevation of the diffuser pipeline. The depth of water may be important to discuss in the modeling results section, particularly given the proximity to the Saddle Island Pumping Plant (drinking water intake).

12

### F1-47

See General Response 3.

### F1-48

Water quality standards, including the standard for TP, are presented in Section 3.1.3.4.2 of the Draft and Final EIS.

As the effluent flows increase, the treatment facilities would need to reduce TP and total inorganic nitrogen (TIN) levels in the effluent through process enhancements. As the projected Lake levels approach 1,000 ft, the TP loadings would cause the chlorophyll standards in the inner Las Vegas Bay and the open waters of Boulder Basin to be exceeded. Current treatment technologies would require each treatment facility to mitigate this situation differently. However, current technology would require RO, which would cause an unacceptable loss of return flow credits.

More detail has been added to the description of the No Action Alternative in the Final EIS.

### F1-49

The text has been moved as requested and the sections in the Final EIS have been renumbered to accommodate the requested change.

### F1-50

The text in Section 2.2.2.1.2 has been revised for clarity purposes.

### F1-51

See General Response 3.

### F1-52

Impacts analyses for many resources have been revisited and expanded. The potential impacts resulting from the proposed alternatives and mitigation, if necessary, are presented in Chapter 4.

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**(F1-52 continued)**

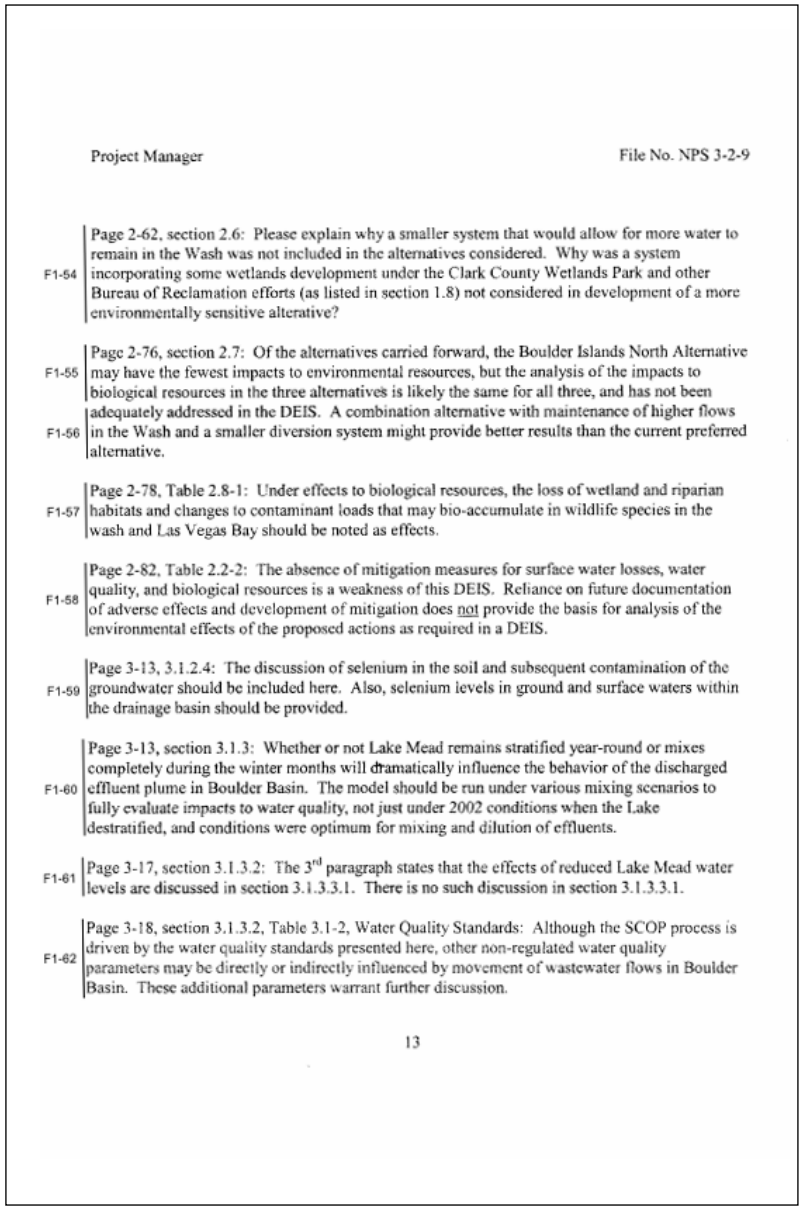
See General Response 10.

See General Response 11.

**F1-53**

The Draft EIS Section 2.4.2.1.2 referred the reader to Section 2.3 for the requested diffuser elevation. The diffuser elevation information has been added to Section 2.4.2.1.2 of the Final EIS as requested.

The Lake Mead modeling addresses the depth of the diffuser and discharge, as well as the potential changes to water quality at the SNWA intake structures on Saddle Island. The potential impacts to water quality at various locations in Boulder Basin, including the SNWA intake structures, are presented in Section 4.1 of the Draft and Final EIS.



Project Manager File No. NPS 3-2-9

F1-54 Page 2-62, section 2.6: Please explain why a smaller system that would allow for more water to remain in the Wash was not included in the alternatives considered. Why was a system incorporating some wetlands development under the Clark County Wetlands Park and other Bureau of Reclamation efforts (as listed in section 1.8) not considered in development of a more environmentally sensitive alterative?

F1-55 Page 2-76, section 2.7: Of the alternatives carried forward, the Boulder Islands North Alternative may have the fewest impacts to environmental resources, but the analysis of the impacts to biological resources in the three alternatives is likely the same for all three, and has not been

F1-56 adequately addressed in the DEIS. A combination alternative with maintenance of higher flows in the Wash and a smaller diversion system might provide better results than the current preferred alternative.

F1-57 Page 2-78, Table 2.8-1: Under effects to biological resources, the loss of wetland and riparian habitats and changes to contaminant loads that may bio-accumulate in wildlife species in the wash and Las Vegas Bay should be noted as effects.

F1-58 Page 2-82, Table 2.2-2: The absence of mitigation measures for surface water losses, water quality, and biological resources is a weakness of this DEIS. Reliance on future documentation of adverse effects and development of mitigation does not provide the basis for analysis of the environmental effects of the proposed actions as required in a DEIS.

F1-59 Page 3-13, 3.1.2.4: The discussion of selenium in the soil and subsequent contamination of the groundwater should be included here. Also, selenium levels in ground and surface waters within the drainage basin should be provided.

F1-60 Page 3-13, section 3.1.3: Whether or not Lake Mead remains stratified year-round or mixes completely during the winter months will dramatically influence the behavior of the discharged effluent plume in Boulder Basin. The model should be run under various mixing scenarios to fully evaluate impacts to water quality, not just under 2002 conditions when the Lake destratified, and conditions were optimum for mixing and dilution of effluents.

F1-61 Page 3-17, section 3.1.3.2: The 3rd paragraph states that the effects of reduced Lake Mead water levels are discussed in section 3.1.3.3.1. There is no such discussion in section 3.1.3.3.1.

F1-62 Page 3-18, section 3.1.3.2, Table 3.1-2, Water Quality Standards: Although the SCOP process is driven by the water quality standards presented here, other non-regulated water quality parameters may be directly or indirectly influenced by movement of wastewater flows in Boulder Basin. These additional parameters warrant further discussion.

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### F1-54

See General Response 11.

See response to comment F1-10.

Wetlands development was considered and not pursued due to the impacts to the return flow credits and the water quality requirements that would need to be met for future flows. Wetlands have a limited capability to remove phosphorus to concentrations necessary when the Lake levels reach between 1,050 ft and 1,000 ft.

The process used to develop the alternatives, and alternatives considered but eliminated from further analysis are described in sections 2.6 and 2.7, respectively.

### F1-55

The impacts to biological resources from the three pipeline alternatives is likely the same (or similar) for all three pipeline alternatives. That is addressed in sections 4.2.3.1, 4.2.3.2, 4.2.4.1 and 4.2.4.2. Any minor differences in impacts to biological resources affiliated with the alternatives are described in the various subsections. Additional information regarding potential impacts to the biological resources of the Las Vegas Wash and aquatic resources of Lake Mead has been added to Section 4.2 of the Final EIS.

The Boulder Islands North Alternative was selected as the environmentally preferable alternative because although similar in biological impacts, a smaller quantity of spoils would be generated (compared to Boulder Islands South Alternative) and increased dilution of the discharge would result (compared to Las Vegas Bay Alternative).

### F1-56

See response to comment F1-54.

### F1-57

Table 2.9-1 of the Final EIS (formerly Table 2.8-1 of the Draft EIS) has been revised.

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**F1-58**

The information addressing the impacts of the proposed SCOP and mitigation measures to reduce impacts to aquatic species in Lake Mead has been added to the Final EIS in Section 4.2. In addition, Table 2.9-2, Summary of Mitigation Measures, has been updated.

Impacts analyses for many resources have been revisited and expanded. The potential impacts resulting from the proposed alternatives and mitigation, if necessary, are presented in Chapter 4.

See General Response 10.

**F1-59**

Text regarding selenium has been added to Section 3.1.2.4 of the Final EIS.

**F1-60**

See General Response 7.

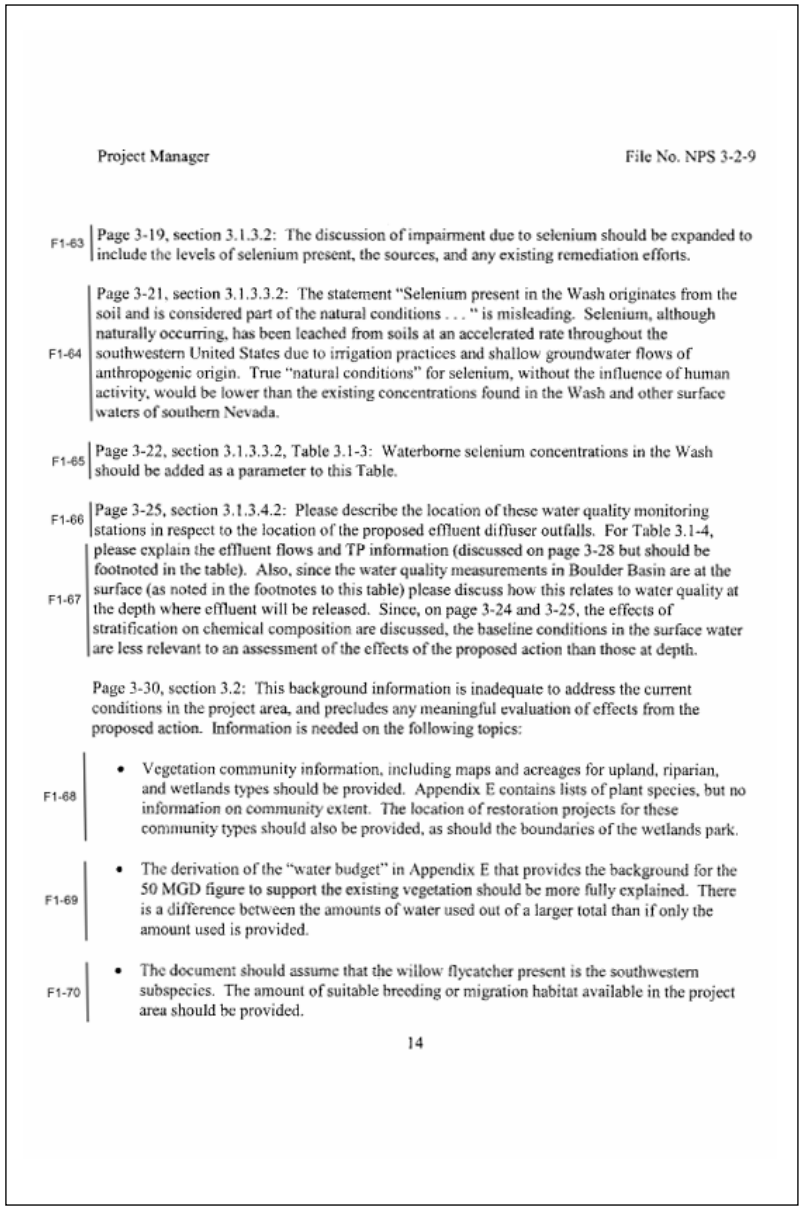
**F1-61**

The section number has been corrected. It is now 3.1.3.4.1, Factors Affecting Water Quality.

**F1-62**

A host of non-regulated water quality parameters were considered and addressed through the modeling review committee. Those parameters, as modeled, were found to not be an issue.

See General Response 10.



Project Manager File No. NPS 3-2-9

F1-63 Page 3-19, section 3.1.3.2: The discussion of impairment due to selenium should be expanded to include the levels of selenium present, the sources, and any existing remediation efforts.

F1-64 Page 3-21, section 3.1.3.3.2: The statement "Selenium present in the Wash originates from the soil and is considered part of the natural conditions . . . " is misleading. Selenium, although naturally occurring, has been leached from soils at an accelerated rate throughout the southwestern United States due to irrigation practices and shallow groundwater flows of anthropogenic origin. True "natural conditions" for selenium, without the influence of human activity, would be lower than the existing concentrations found in the Wash and other surface waters of southern Nevada.

F1-65 Page 3-22, section 3.1.3.3.2, Table 3.1-3: Waterborne selenium concentrations in the Wash should be added as a parameter to this Table.

F1-66 Page 3-25, section 3.1.3.4.2: Please describe the location of these water quality monitoring stations in respect to the location of the proposed effluent diffuser outfalls. For Table 3.1-4,

F1-67 please explain the effluent flows and TP information (discussed on page 3-28 but should be footnoted in the table). Also, since the water quality measurements in Boulder Basin are at the surface (as noted in the footnotes to this table) please discuss how this relates to water quality at the depth where effluent will be released. Since, on page 3-24 and 3-25, the effects of stratification on chemical composition are discussed, the baseline conditions in the surface water are less relevant to an assessment of the effects of the proposed action than those at depth.

Page 3-30, section 3.2: This background information is inadequate to address the current conditions in the project area, and precludes any meaningful evaluation of effects from the proposed action. Information is needed on the following topics:

F1-68 • Vegetation community information, including maps and acreages for upland, riparian, and wetlands types should be provided. Appendix E contains lists of plant species, but no information on community extent. The location of restoration projects for these community types should also be provided, as should the boundaries of the wetlands park.

F1-69 • The derivation of the "water budget" in Appendix E that provides the background for the 50 MGD figure to support the existing vegetation should be more fully explained. There is a difference between the amounts of water used out of a larger total than if only the amount used is provided.

F1-70 • The document should assume that the willow flycatcher present is the southwestern subspecies. The amount of suitable breeding or migration habitat available in the project area should be provided.

14

### F1-63

Text regarding selenium has been added to Section 3.1.3.2 of the Final EIS.

### F1-64

The text has been revised.

### F1-65

Selenium has been added to Table 3.1-3 as requested.

### F1-66

The location of the water quality monitoring locations and the diffuser outfall locations are shown on Figure 4.1-1 of the Draft and Final EIS.

### F1-67

The ELCOM/CAEDYM model is a fully three-dimensional model that accounts for variation in water chemistry and biology as a function of depth, as well as horizontal position. The model was validated by numerous comparisons to available data at various locations both at the surface and at depth.

See General Response 7.

See General Response 10.

### F1-68

Community extent within the project alignment is included in Section 3.2 of the Final EIS. The boundaries of the Wetlands Park are included on several figures in the EIS. However, a map of vegetation communities within the Wetlands Park has been added to Appendix E of the Final EIS. The SNWA is currently in the process of mapping vegetation communities along the entire Las Vegas Wash, but this information is not available at this time.

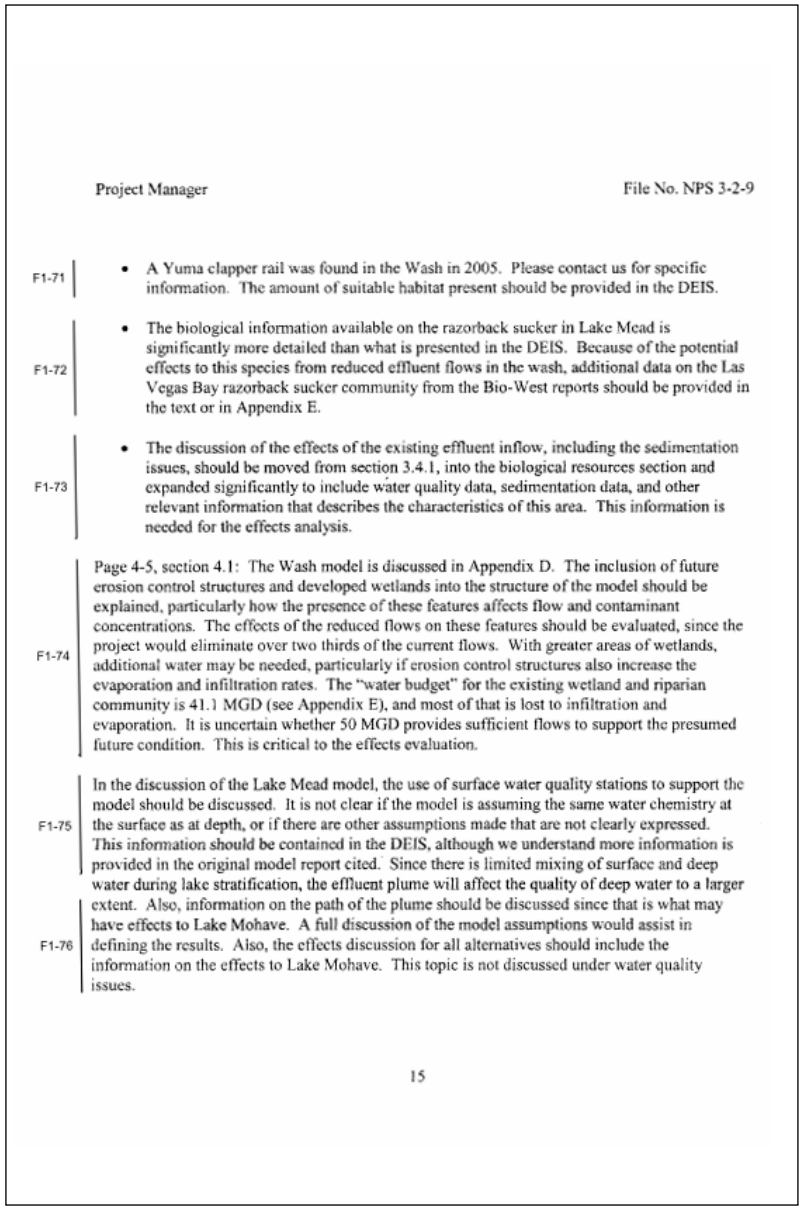
### F1-69

See General Response 11.

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**F1-70**

The text in the Final EIS was changed to describe that the flycatchers observed are assumed to be the endangered subspecies. The SNWA is currently in the process of mapping vegetation communities along the entire Las Vegas Wash. The amount of suitable breeding/migration habitat is not currently known.



Project Manager File No. NPS 3-2-9

F1-71 • A Yuma clapper rail was found in the Wash in 2005. Please contact us for specific information. The amount of suitable habitat present should be provided in the DEIS.

F1-72 • The biological information available on the razorback sucker in Lake Mead is significantly more detailed than what is presented in the DEIS. Because of the potential effects to this species from reduced effluent flows in the wash, additional data on the Las Vegas Bay razorback sucker community from the Bio-West reports should be provided in the text or in Appendix E.

F1-73 • The discussion of the effects of the existing effluent inflow, including the sedimentation issues, should be moved from section 3.4.1, into the biological resources section and expanded significantly to include water quality data, sedimentation data, and other relevant information that describes the characteristics of this area. This information is needed for the effects analysis.

F1-74 Page 4-5, section 4.1: The Wash model is discussed in Appendix D. The inclusion of future erosion control structures and developed wetlands into the structure of the model should be explained, particularly how the presence of these features affects flow and contaminant concentrations. The effects of the reduced flows on these features should be evaluated, since the project would eliminate over two thirds of the current flows. With greater areas of wetlands, additional water may be needed, particularly if erosion control structures also increase the evaporation and infiltration rates. The "water budget" for the existing wetland and riparian community is 41.1 MGD (see Appendix E), and most of that is lost to infiltration and evaporation. It is uncertain whether 50 MGD provides sufficient flows to support the presumed future condition. This is critical to the effects evaluation.

F1-75 In the discussion of the Lake Mead model, the use of surface water quality stations to support the model should be discussed. It is not clear if the model is assuming the same water chemistry at the surface as at depth, or if there are other assumptions made that are not clearly expressed. This information should be contained in the DEIS, although we understand more information is provided in the original model report cited. Since there is limited mixing of surface and deep water during lake stratification, the effluent plume will affect the quality of deep water to a larger extent. Also, information on the path of the plume should be discussed since that is what may

F1-76 have effects to Lake Mohave. A full discussion of the model assumptions would assist in defining the results. Also, the effects discussion for all alternatives should include the information on the effects to Lake Mohave. This topic is not discussed under water quality issues.

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### F1-71

Information has been added to Section 3.2 of the Final EIS. New information, such as the 2005 and 2006 detection of a Yuma clapper rail in or near the Las Vegas Wash, has been included. The SNWA is currently in the process of mapping vegetation communities along the entire Las Vegas Wash. The amount of suitable breeding/migration habitat is not currently known.

### F1-72

See General Response 9.

### F1-73

Additional information has been added to Section 3.2 as requested.

Section 3.4.1 describes recreation within the Lake Mead National Recreation Area (LMNRA). Therefore, the section referenced in the comment is incorrect. It is assumed the commenter is referring to Section 3.1.1.3, Las Vegas Wash Erosion. The discussion of erosion is located appropriately in the section describing Surface Water and Drainage, so it has not been removed from that section. However, issues regarding erosion that relate to biological resources have been added to Section 3.2.

### F1-74

The Las Vegas Wash Model used the wetland areas delineated in the SNWA ECS plans as the limits for developed wetlands behind each ECS. The reduced flows do not change the wetlands area as the area is limited by the height of the ECS and the limits of the riparian side slope of the Las Vegas Wash as shown in the SNWA ECS plans. The Las Vegas Wash Model accounts for the reduced flows and wetland areas.

See response to comment F1-10.

See response to comment F1-26.

### F1-75

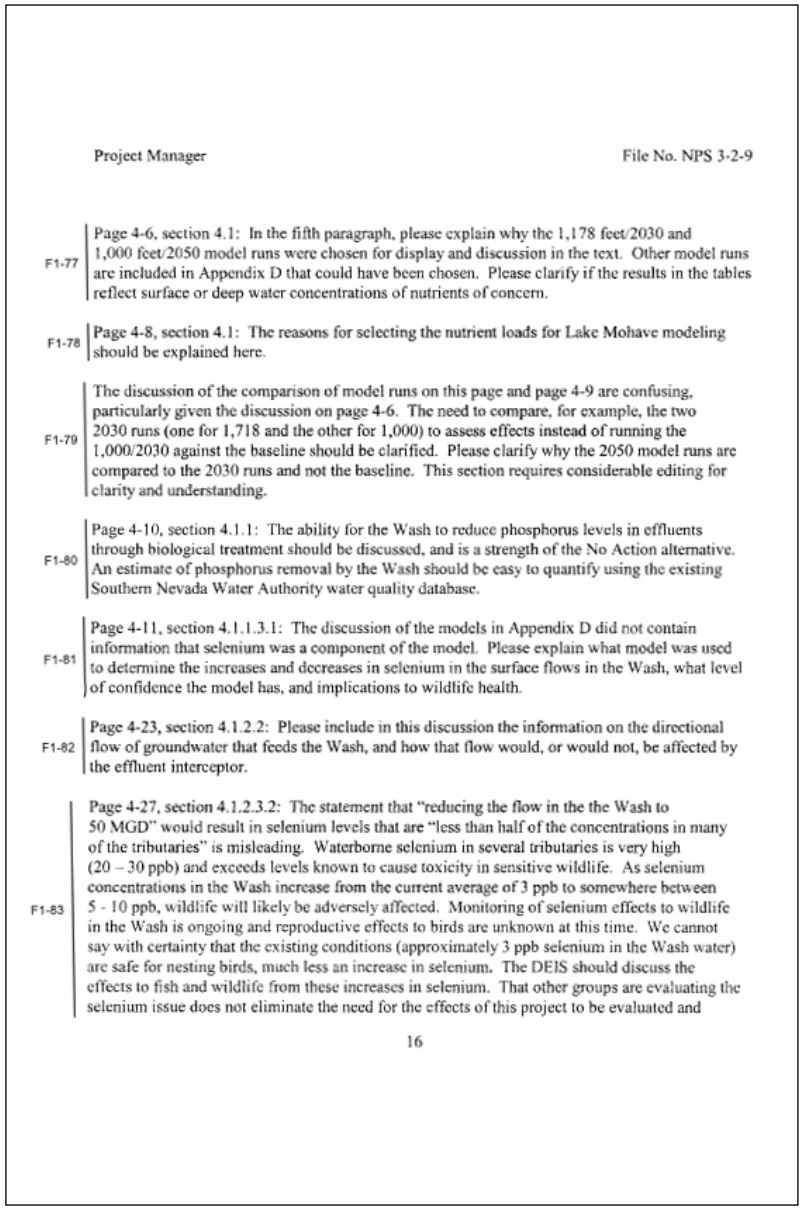
See response to comment F1-67.

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**F1-76**

The Lake Mead Modeling Report discusses the path of the effluent plume in Boulder Basin, including animations of the modeling results. In addition, the modeling results of numerous water quality parameters and nutrients at the Hoover Dam outlets are provided in both the modeling report and the Draft EIS. This information from the Lake Mead model is all that is required to assess the impacts on Lake Mohave. The impacts on Lake Mohave were assessed by separately modeling 25-percent and 100-percent increases in nutrient loads. The modeling study concluded that effects on in-lake water quality were significant when the nutrient load was increased by 100 percent, but not when increased by 25 percent (J.D. Edinger 2003).

See General Response 8.



Project Manager File No. NPS 3-2-9

F1-77 Page 4-6, section 4.1: In the fifth paragraph, please explain why the 1,178 feet/2030 and 1,000 feet/2050 model runs were chosen for display and discussion in the text. Other model runs are included in Appendix D that could have been chosen. Please clarify if the results in the tables reflect surface or deep water concentrations of nutrients of concern.

F1-78 Page 4-8, section 4.1: The reasons for selecting the nutrient loads for Lake Mohave modeling should be explained here.

F1-79 The discussion of the comparison of model runs on this page and page 4-9 are confusing, particularly given the discussion on page 4-6. The need to compare, for example, the two 2030 runs (one for 1,718 and the other for 1,000) to assess effects instead of running the 1,000/2030 against the baseline should be clarified. Please clarify why the 2050 model runs are compared to the 2030 runs and not the baseline. This section requires considerable editing for clarity and understanding.

F1-80 Page 4-10, section 4.1.1: The ability for the Wash to reduce phosphorus levels in effluents through biological treatment should be discussed, and is a strength of the No Action alternative. An estimate of phosphorus removal by the Wash should be easy to quantify using the existing Southern Nevada Water Authority water quality database.

F1-81 Page 4-11, section 4.1.1.3.1: The discussion of the models in Appendix D did not contain information that selenium was a component of the model. Please explain what model was used to determine the increases and decreases in selenium in the surface flows in the Wash, what level of confidence the model has, and implications to wildlife health.

F1-82 Page 4-23, section 4.1.2.2: Please include in this discussion the information on the directional flow of groundwater that feeds the Wash, and how that flow would, or would not, be affected by the effluent interceptor.

F1-83 Page 4-27, section 4.1.2.3.2: The statement that "reducing the flow in the the Wash to 50 MGD" would result in selenium levels that are "less than half of the concentrations in many of the tributaries" is misleading. Waterborne selenium in several tributaries is very high (20 – 30 ppb) and exceeds levels known to cause toxicity in sensitive wildlife. As selenium concentrations in the Wash increase from the current average of 3 ppb to somewhere between 5 - 10 ppb, wildlife will likely be adversely affected. Monitoring of selenium effects to wildlife in the Wash is ongoing and reproductive effects to birds are unknown at this time. We cannot say with certainty that the existing conditions (approximately 3 ppb selenium in the Wash water) are safe for nesting birds, much less an increase in selenium. The DEIS should discuss the effects to fish and wildlife from these increases in selenium. That other groups are evaluating the selenium issue does not eliminate the need for the effects of this project to be evaluated and

16

### F1-77

Section 4.1 has been revised to describe the potential impacts to water quality based on the changes to the alternatives. Appendix D has also been revised.

The analysis of water quality includes the highest and lowest Lake levels, 1,178 ft and 1,000 ft respectively, with effluent flow projected for years 2030 and 2050. This provides a modeled prediction of the optimal (2030) and the most restrictive conditions (2050).

The Draft EIS presented data for the 2030 modeling runs at Lake elevations of 1,178 and 1,000 ft. Similar tables for the 2050 flows were included in Appendix D as stated throughout the text. This was done in an effort to simplify the text and avoid confusion for the reader. However, as requested by this commenter, the tables containing information for 2050 flows have been included into Section 4.1 of the Final EIS.

### F1-78

The loading factors for Lake Mohave were selected to provide a sensitivity level that would negatively impact Lake Mohave. The Lake Mohave model indicates that up to a 25 percent increase in TP loading would not negatively impact Lake Mohave. The loading through Hoover Dam would be monitored and maintained at or below pre-project conditions through the Boulder Basin AMP monitoring program described in Section 2.2.2.6. Therefore, an increased loading to Lake Mohave would not be a factor. Similar text has been added to Section 4.1 of the Final EIS.

### F1-79

The text has been revised.

### F1-80

Removal of the phosphorus by biological processes through the Las Vegas Wash was included in the Las Vegas Wash model. Although not published, the SNWA has stated that the Las Vegas Wash may remove up to 65 percent of phosphorus due to biological processes in the Las Vegas Wash. Although SNWA has stated that this is based upon SNWA water quality data, we have

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**(F1-80 continued)**

been unable to obtain documentation supporting the 65-percent removal of phosphorus due to biological processes.

**F1-81**

Selenium is a component of the Las Vegas Wash Model. Impacts to the Las Vegas Wash have been included in Chapter 4 of the EIS. Additional information regarding the impacts to selenium concentrations in the Las Vegas Wash has been included in the text of Section 4.1. The impacts to biological resources are presented in Section 4.2.

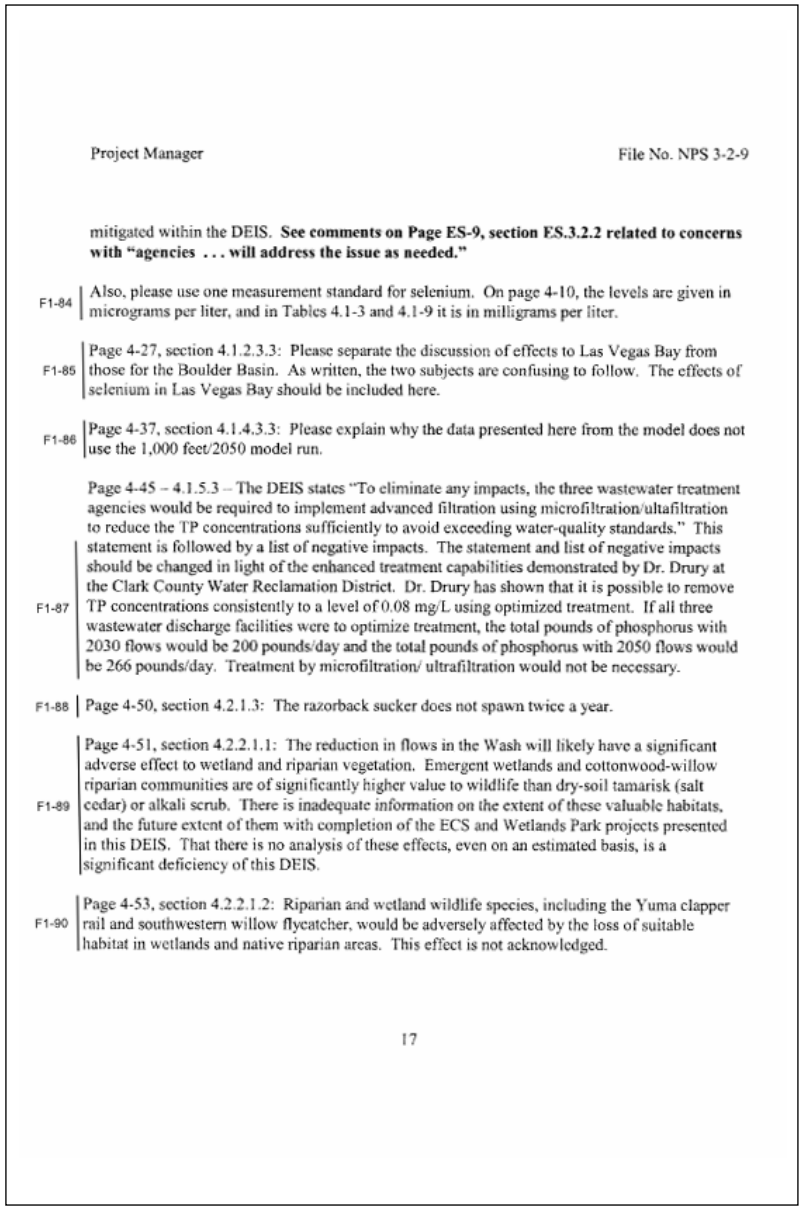
**F1-82**

The requested information is presented in the Draft and Final EIS. The directional flow of groundwater is described in Section 3.1.2.3 and shown on Figure 3.1-8 of the Draft and Final EIS. Section 4.1.2.2.1 of the Draft and Final EIS presents information regarding the impacts associated with:

- Removal of Groundwater from the Shallow Aquifer,
- Physical Disturbance of the Shallow Aquifer Creating Pathways for Groundwater Flow, and
- Physical Disturbance of the Shallow Aquifer Creating Barriers for Groundwater Flow.

**F1-83**

Clarification regarding selenium has been added to Section 4.1.2.3.2. In addition, the potential impacts to biological resources from increased selenium concentrations in the Las Vegas Wash have been inserted to Section 4.2.



Project Manager File No. NPS 3-2-9

mitigated within the DEIS. **See comments on Page ES-9, section ES.3.2.2 related to concerns with "agencies . . . will address the issue as needed."**

F1-84 Also, please use one measurement standard for selenium. On page 4-10, the levels are given in micrograms per liter, and in Tables 4.1-3 and 4.1-9 it is in milligrams per liter.

F1-85 Page 4-27, section 4.1.2.3.3: Please separate the discussion of effects to Las Vegas Bay from those for the Boulder Basin. As written, the two subjects are confusing to follow. The effects of selenium in Las Vegas Bay should be included here.

F1-86 Page 4-37, section 4.1.4.3.3: Please explain why the data presented here from the model does not use the 1,000 feet/2050 model run.

F1-87 Page 4-45 – 4.1.5.3 – The DEIS states "To eliminate any impacts, the three wastewater treatment agencies would be required to implement advanced filtration using microfiltration/ultafiltration to reduce the TP concentrations sufficiently to avoid exceeding water-quality standards." This statement is followed by a list of negative impacts. The statement and list of negative impacts should be changed in light of the enhanced treatment capabilities demonstrated by Dr. Drury at the Clark County Water Reclamation District. Dr. Drury has shown that it is possible to remove TP concentrations consistently to a level of 0.08 mg/L using optimized treatment. If all three wastewater discharge facilities were to optimize treatment, the total pounds of phosphorus with 2030 flows would be 200 pounds/day and the total pounds of phosphorus with 2050 flows would be 266 pounds/day. Treatment by microfiltration/ ultrafiltration would not be necessary.

F1-88 Page 4-50, section 4.2.1.3: The razorback sucker does not spawn twice a year.

F1-89 Page 4-51, section 4.2.2.1.1: The reduction in flows in the Wash will likely have a significant adverse effect to wetland and riparian vegetation. Emergent wetlands and cottonwood-willow riparian communities are of significantly higher value to wildlife than dry-soil tamarisk (salt cedar) or alkali scrub. There is inadequate information on the extent of these valuable habitats, and the future extent of them with completion of the ECS and Wetlands Park projects presented in this DEIS. That there is no analysis of these effects, even on an estimated basis, is a significant deficiency of this DEIS.

F1-90 Page 4-53, section 4.2.2.1.2: Riparian and wetland wildlife species, including the Yuma clapper rail and southwestern willow flycatcher, would be adversely affected by the loss of suitable habitat in wetlands and native riparian areas. This effect is not acknowledged.

17

### F1-84

All of the selenium units have been changed to micrograms per liter.

### F1-85

The Las Vegas Bay is part of the Boulder Basin. Therefore, it doesn't make sense to separate the discussion.

Selenium-concentration increases are described in Sections 4.1 and 4.2 of the Final EIS.

### F1-86

See response to comment F1-77.

### F1-87

See response to comment F1-2.

See General Response 8.

The assumption in the comment that a total loading of 266 lbs/day of phosphorus to the Las Vegas Bay in 2050 would be acceptable is incorrect. The southwest U.S. is experiencing a drought. It is predicted that the water in Lake Mead will decline to 1,000 ft. As explained in Section 4.1 of the Final EIS, the TP loading to the Las Vegas Bay would need to be approximately 100 lbs/day to meet water quality standards in the Las Vegas Bay when Lake Mead is at 1,000 ft.

See General Response 1.

### F1-88

The text has been revised.

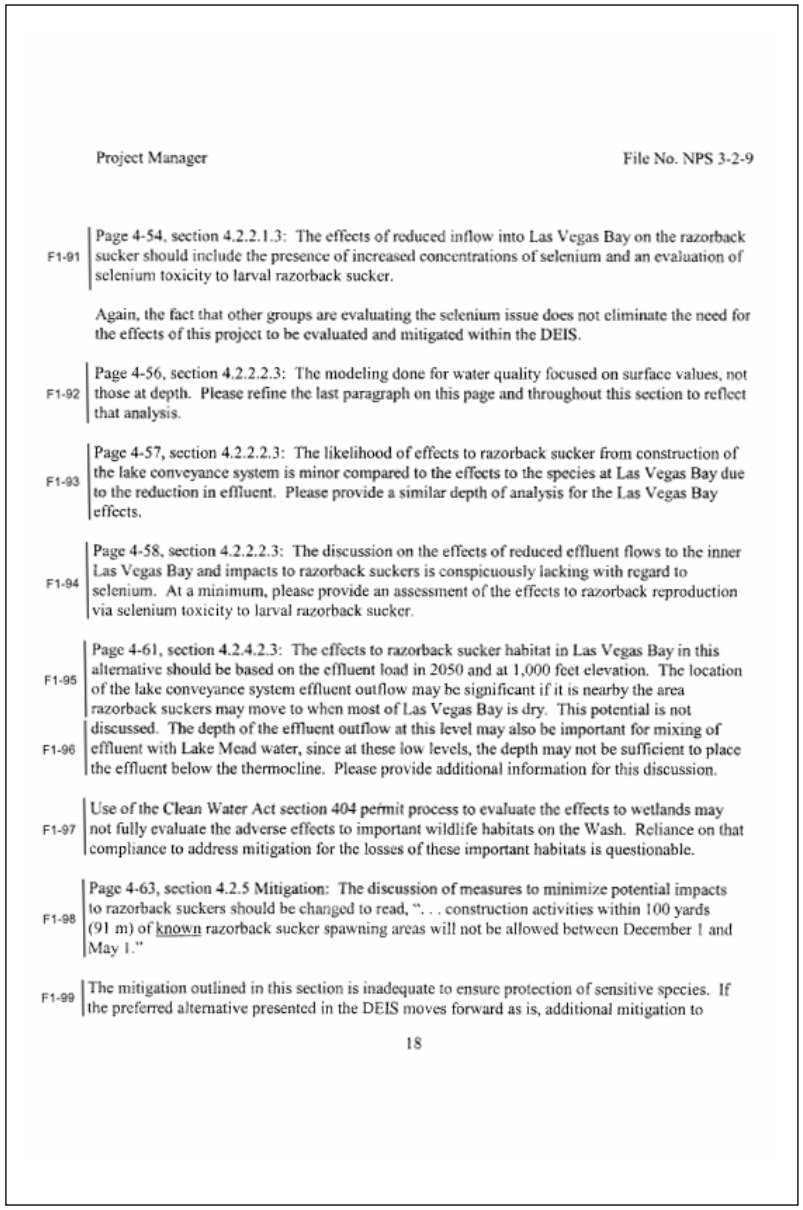
### F1-89

See response to comment F1-26.

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**F1-90**

See response to comment F1-26.



Project Manager File No. NPS 3-2-9

F1-91 Page 4-54, section 4.2.2.1.3: The effects of reduced inflow into Las Vegas Bay on the razorback sucker should include the presence of increased concentrations of selenium and an evaluation of selenium toxicity to larval razorback sucker.

Again, the fact that other groups are evaluating the selenium issue does not eliminate the need for the effects of this project to be evaluated and mitigated within the DEIS.

F1-92 Page 4-56, section 4.2.2.2.3: The modeling done for water quality focused on surface values, not those at depth. Please refine the last paragraph on this page and throughout this section to reflect that analysis.

F1-93 Page 4-57, section 4.2.2.2.3: The likelihood of effects to razorback sucker from construction of the lake conveyance system is minor compared to the effects to the species at Las Vegas Bay due to the reduction in effluent. Please provide a similar depth of analysis for the Las Vegas Bay effects.

F1-94 Page 4-58, section 4.2.2.2.3: The discussion on the effects of reduced effluent flows to the inner Las Vegas Bay and impacts to razorback suckers is conspicuously lacking with regard to selenium. At a minimum, please provide an assessment of the effects to razorback reproduction via selenium toxicity to larval razorback sucker.

F1-95 Page 4-61, section 4.2.4.2.3: The effects to razorback sucker habitat in Las Vegas Bay in this alternative should be based on the effluent load in 2050 and at 1,000 feet elevation. The location of the lake conveyance system effluent outflow may be significant if it is nearby the area razorback suckers may move to when most of Las Vegas Bay is dry. This potential is not

F1-96 discussed. The depth of the effluent outflow at this level may also be important for mixing of effluent with Lake Mead water, since at these low levels, the depth may not be sufficient to place the effluent below the thermocline. Please provide additional information for this discussion.

F1-97 Use of the Clean Water Act section 404 permit process to evaluate the effects to wetlands may not fully evaluate the adverse effects to important wildlife habitats on the Wash. Reliance on that compliance to address mitigation for the losses of these important habitats is questionable.

F1-98 Page 4-63, section 4.2.5 Mitigation: The discussion of measures to minimize potential impacts to razorback suckers should be changed to read, ". . . construction activities within 100 yards (91 m) of known razorback sucker spawning areas will not be allowed between December 1 and May 1."

F1-99 The mitigation outlined in this section is inadequate to ensure protection of sensitive species. If the preferred alternative presented in the DEIS moves forward as is, additional mitigation to

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### F1-91

See General Response 9.

Based on preliminary consultation with the USFWS as required under Section 7 of the ESA, it has been determined that the razorback sucker may be impacted by selenium. Although the volume of selenium entering the Las Vegas Bay would be lower due to reduced effluent-based selenium entering the Las Vegas Wash, it may still impact the razorback sucker. The extent of the 'selenium plume' and precise location of dilution with the waters of the Las Vegas Bay, are relatively unknown. Monitoring of selenium concentrations in the Las Vegas Bay would be conducted through the Boulder Basin AMP. The text in Sections 4.2.1.3 and 4.2.2.2.3 of the Final EIS has been revised.

### F1-92

See response to comment F1-67.

### F1-93

The text in Section 4.2.2.2.3 of the Final EIS has been revised as requested.

### F1-94

See General Response 9.

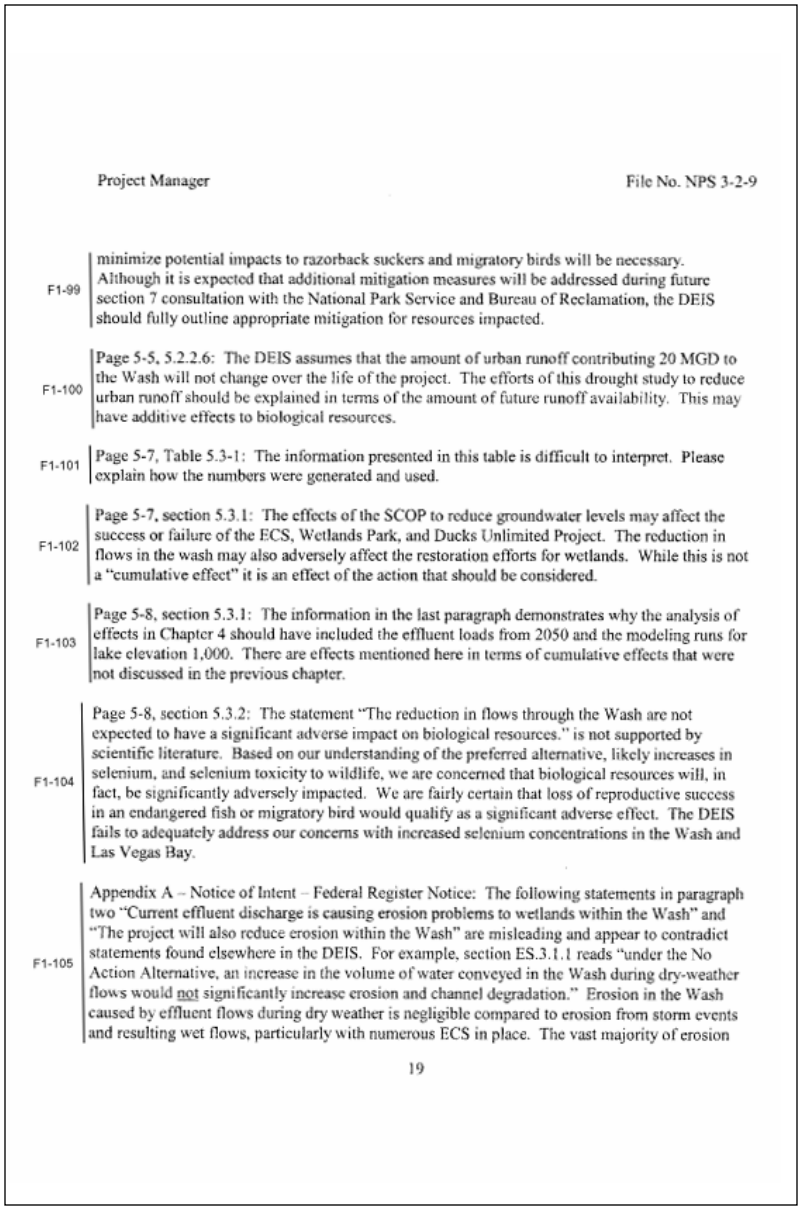
### F1-95

See General Response 9.

The effects of these activities would be short-term, negative impacts to benthic organisms in the immediate area. The area would recolonize with organisms that move in once construction activities cease.

### F1-96

See response to comment F1-67.



Project Manager File No. NPS 3-2-9

F1-99 minimize potential impacts to razorback suckers and migratory birds will be necessary. Although it is expected that additional mitigation measures will be addressed during future section 7 consultation with the National Park Service and Bureau of Reclamation, the DEIS should fully outline appropriate mitigation for resources impacted.

F1-100 Page 5-5, 5.2.2.6: The DEIS assumes that the amount of urban runoff contributing 20 MGD to the Wash will not change over the life of the project. The efforts of this drought study to reduce urban runoff should be explained in terms of the amount of future runoff availability. This may have additive effects to biological resources.

F1-101 Page 5-7, Table 5.3-1: The information presented in this table is difficult to interpret. Please explain how the numbers were generated and used.

F1-102 Page 5-7, section 5.3.1: The effects of the SCOP to reduce groundwater levels may affect the success or failure of the ECS, Wetlands Park, and Ducks Unlimited Project. The reduction in flows in the wash may also adversely affect the restoration efforts for wetlands. While this is not a "cumulative effect" it is an effect of the action that should be considered.

F1-103 Page 5-8, section 5.3.1: The information in the last paragraph demonstrates why the analysis of effects in Chapter 4 should have included the effluent loads from 2050 and the modeling runs for lake elevation 1,000. There are effects mentioned here in terms of cumulative effects that were not discussed in the previous chapter.

F1-104 Page 5-8, section 5.3.2: The statement "The reduction in flows through the Wash are not expected to have a significant adverse impact on biological resources." is not supported by scientific literature. Based on our understanding of the preferred alternative, likely increases in selenium, and selenium toxicity to wildlife, we are concerned that biological resources will, in fact, be significantly adversely impacted. We are fairly certain that loss of reproductive success in an endangered fish or migratory bird would qualify as a significant adverse effect. The DEIS fails to adequately address our concerns with increased selenium concentrations in the Wash and Las Vegas Bay.

F1-105 Appendix A – Notice of Intent – Federal Register Notice: The following statements in paragraph two "Current effluent discharge is causing erosion problems to wetlands within the Wash" and "The project will also reduce erosion within the Wash" are misleading and appear to contradict statements found elsewhere in the DEIS. For example, section ES.3.1.1 reads "under the No Action Alternative, an increase in the volume of water conveyed in the Wash during dry-weather flows would not significantly increase erosion and channel degradation." Erosion in the Wash caused by effluent flows during dry weather is negligible compared to erosion from storm events and resulting wet flows, particularly with numerous ECS in place. The vast majority of erosion

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### F1-97

Only filling or dredging within waters of the U.S. is covered by the CWA Section 404 permit. Changes in flows are not covered by the 404 permit. The permit will only apply to Lake Mead because no filling or dredging activities would occur in the Las Vegas Wash. No such permit is required for the Las Vegas Wash. The text has been revised in the Final EIS.

### F1-98

The text in Section 4.2.6 of the Final EIS has been revised as requested.

### F1-99

See General Response 9.

See response to comment F1-1.

### F1-100

The future runoff availability is unknown. The assumption that the amount of urban runoff would not change over the life of the project is based on the goal of the Drought Plan to reduce water usage in southern Nevada by 25 percent. The majority of the conservation efforts are focused on reducing inefficient and wasteful uses of water that result in runoff that does not provide return flow credits for southern Nevada.

As stated in General Response 11, the Operations Group is intended to ensure that multilateral decisions are made concerning flows in the Las Vegas Wash and includes representatives from Clark County Parks and Community Services, Clark County Regional Flood Control District, CWC, and SNWA. In addition, as stated in Section 2.2 of the Final EIS, the local agencies responsible for water quality management in the Las Vegas Wash have agreed to meet at least once a year and review the need for flow augmentation in the Las Vegas Wash. The SCOP facilities, managed through the Boulder Basin AMP, would be able to accommodate flow adjustments as determined by this management group. Therefore, should runoff quantities to the Las Vegas Wash increase and result in adverse impacts to the water quality or biological resources, additional effluent may be discharged to the Las Vegas Wash if needed.

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**F1-101**

The table has been deleted.

**F1-102**

The impacts to groundwater that may result from dewatering during construction are direct impacts that are described in Section 4.1.2. As stated in Section 4.1.6.2, monitoring of groundwater levels in the vicinity of the dewatering operations will be conducted to detect harmful groundwater lowering, which could cause the surrounding layers to settle and therefore impose hazards to structures in the area. In addition, structures will be monitored for possible movement.

The potential impacts resulting from reduction of effluent flows to the Las Vegas Wash are described in Sections 4.1 and 4.2.

The commenter is correct in her statement that the impacts mentioned in this comment are not cumulative impacts.

**F1-103**

The water quality information referenced is included in Appendix D of the Draft EIS. Based on this comment, the information has been moved to Section 4.1 of the Final EIS.

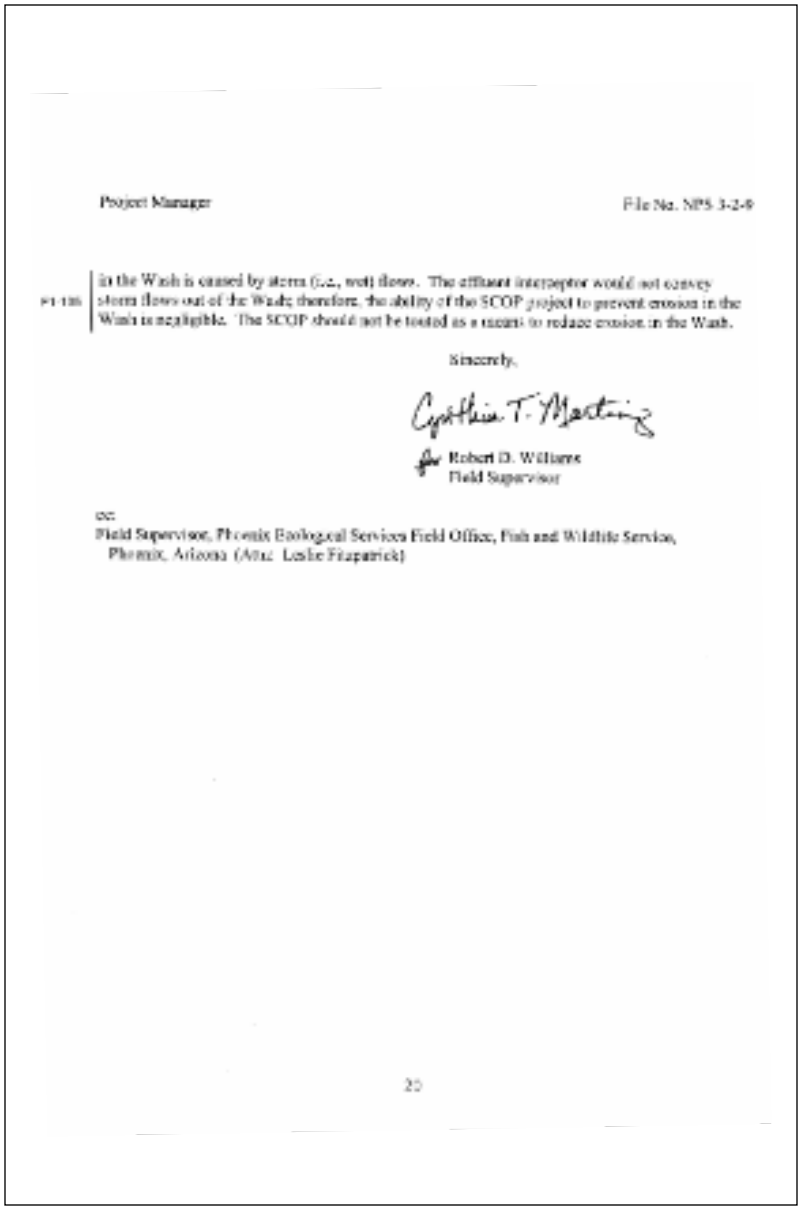
**F1-104**

The potential impacts resulting from the increased concentrations of selenium due to a reduction in effluent flows to the Las Vegas Wash are addressed in sections 4.1 and 4.2 of the Final EIS. These impacts are considered direct or indirect, not cumulative. Therefore, they are not addressed in the cumulative impacts section.

The text in Section 5.3.2 has been revised.

**F1-105**

Appendix A contains the Federal Register Notice of Intent (NOI) to prepare an EIS for the SCOP. The NOI was published in July 2002. At the time, reducing erosion in the Las Vegas Wash was part of the purpose and need for the project.



Project Manager File No. NPS 3-2-9

F1-105 in the Wash is caused by storm (i.e., wet) flows. The effluent interceptor would not convey storm flows out of the Wash; therefore, the ability of the SCOP project to prevent erosion in the Wash is negligible. The SCOP should not be touted as a means to reduce erosion in the Wash.

Sincerely,

Cynthia T. Martinez

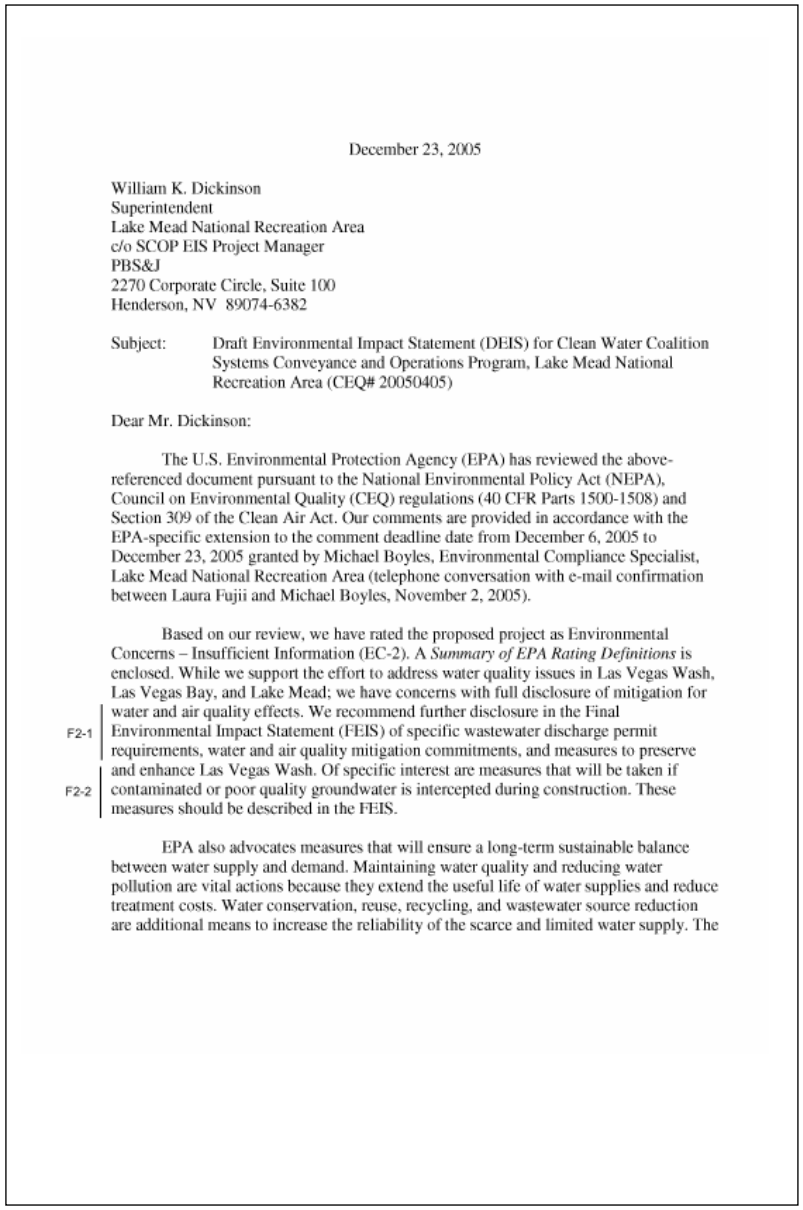
for Robert D. Williams
Field Supervisor

cc:
Field Supervisor, Phoenix Ecological Services Field Office, Fish and Wildlife Service, Phoenix, Arizona (Attn: Leslie Fitzpatrick)

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**(F1-105 continued)**

However, construction of the SNWA ECSs has reduced erosion. Therefore, the EIS does not state that the SCOP is responsible for erosion control in the Las Vegas Wash.



December 23, 2005

William K. Dickinson
Superintendent
Lake Mead National Recreation Area
c/o SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074-6382

Subject: Draft Environmental Impact Statement (DEIS) for Clean Water Coalition Systems Conveyance and Operations Program, Lake Mead National Recreation Area (CEQ# 20050405)

Dear Mr. Dickinson:

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced document 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 comments are provided in accordance with the EPA-specific extension to the comment deadline date from December 6, 2005 to December 23, 2005 granted by Michael Boyles, Environmental Compliance Specialist, Lake Mead National Recreation Area (telephone conversation with e-mail confirmation between Laura Fujii and Michael Boyles, November 2, 2005).

Based on our review, we have rated the proposed project as Environmental Concerns – Insufficient Information (EC-2). A *Summary of EPA Rating Definitions* is enclosed. While we support the effort to address water quality issues in Las Vegas Wash, Las Vegas Bay, and Lake Mead; we have concerns with full disclosure of mitigation for water and air quality effects. We recommend further disclosure in the Final
F2-1 Environmental Impact Statement (FEIS) of specific wastewater discharge permit requirements, water and air quality mitigation commitments, and measures to preserve and enhance Las Vegas Wash. Of specific interest are measures that will be taken if
F2-2 contaminated or poor quality groundwater is intercepted during construction. These measures should be described in the FEIS.

EPA also advocates measures that will ensure a long-term sustainable balance between water supply and demand. Maintaining water quality and reducing water pollution are vital actions because they extend the useful life of water supplies and reduce treatment costs. Water conservation, reuse, recycling, and wastewater source reduction are additional means to increase the reliability of the scarce and limited water supply. The

## **Response F-2** U.S. Environmental Protection Agency

### F2-1

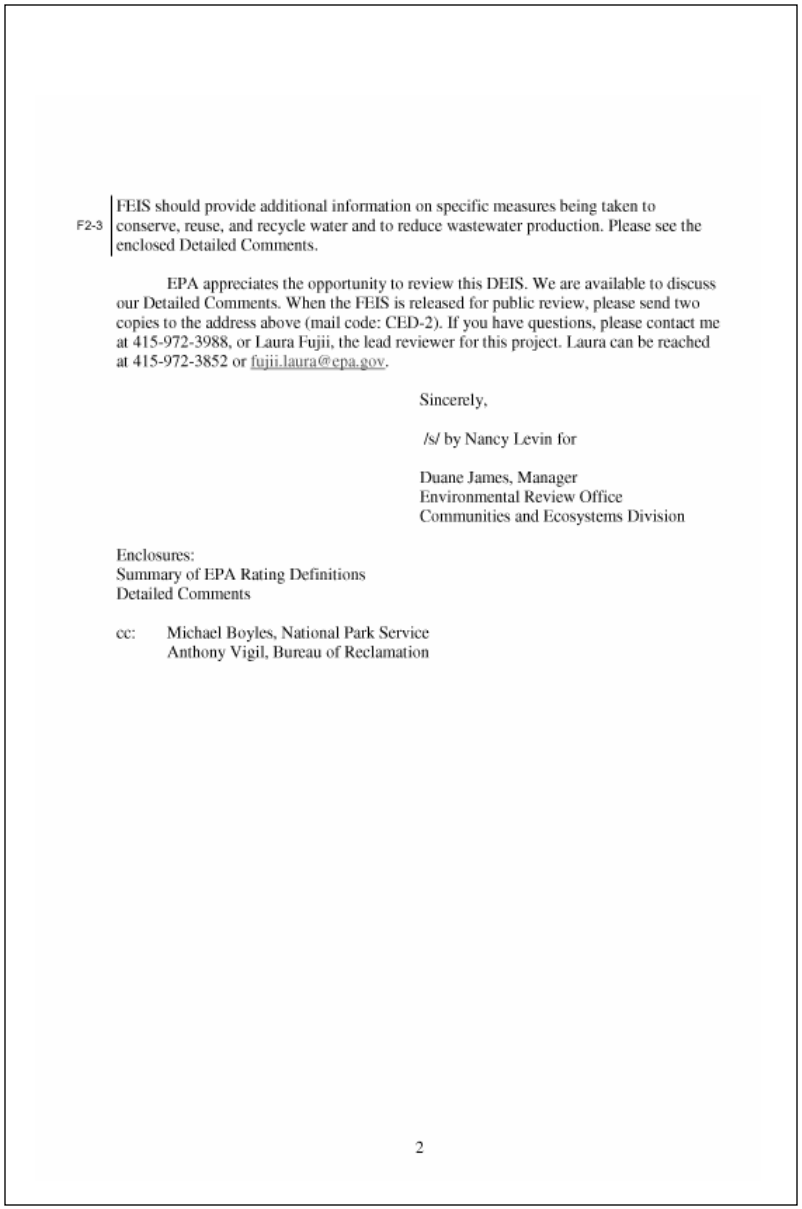
Mitigation measures to minimize the potential impacts to air quality during construction of the pipeline are described in Section 4.7.

The wastewater discharge permitting requirements for SCOP have not been determined, but will reflect the water quality standards, which must be met. The current wastewater discharge permits were renewed in July 2006, and are included in Appendix M of the Final EIS.

Management of the Las Vegas Wash is conducted in accordance with the Comprehensive Adaptive Management Plan (CAMP) for the Las Vegas Wash. In addition, as stated in Section 2.2 of the Final EIS, the local agencies responsible for water quality management in the Las Vegas Wash have agreed to meet at least once a year and review the need for flow augmentation in the Las Vegas Wash. The SCOP facilities, managed through the Boulder Basin AMP, would be able to accommodate flow adjustments as determined by this management group. The 30 mgd of effluent carried forward in the EIS is for a minimum base flow. Additional effluent discharged to the Las Vegas Wash will consider Las Vegas Wash ecosystem needs and the continuing requirement to meet water quality standards in the Las Vegas Bay and Boulder Basin.

### F2-2

All required permits for handling potentially contaminated groundwater will be acquired before construction, and groundwater will be handled in accordance with the requirements of the permits. In addition, all required mitigation measures will be implemented in accordance with NDEP and EPA guidelines. The specific measures to be implemented are unknown at this time.



F2-3 FEIS should provide additional information on specific measures being taken to conserve, reuse, and recycle water and to reduce wastewater production. Please see the enclosed Detailed Comments.

EPA appreciates the opportunity to review this DEIS. We are available to discuss our Detailed Comments. When the FEIS is released for public review, please send two copies to the address above (mail code: CED-2). If you have questions, please contact me at 415-972-3988, or Laura Fujii, the lead reviewer for this project. Laura can be reached at 415-972-3852 or fujii.laura@epa.gov.

Sincerely,

/s/ by Nancy Levin for

Duane James, Manager
Environmental Review Office
Communities and Ecosystems Division

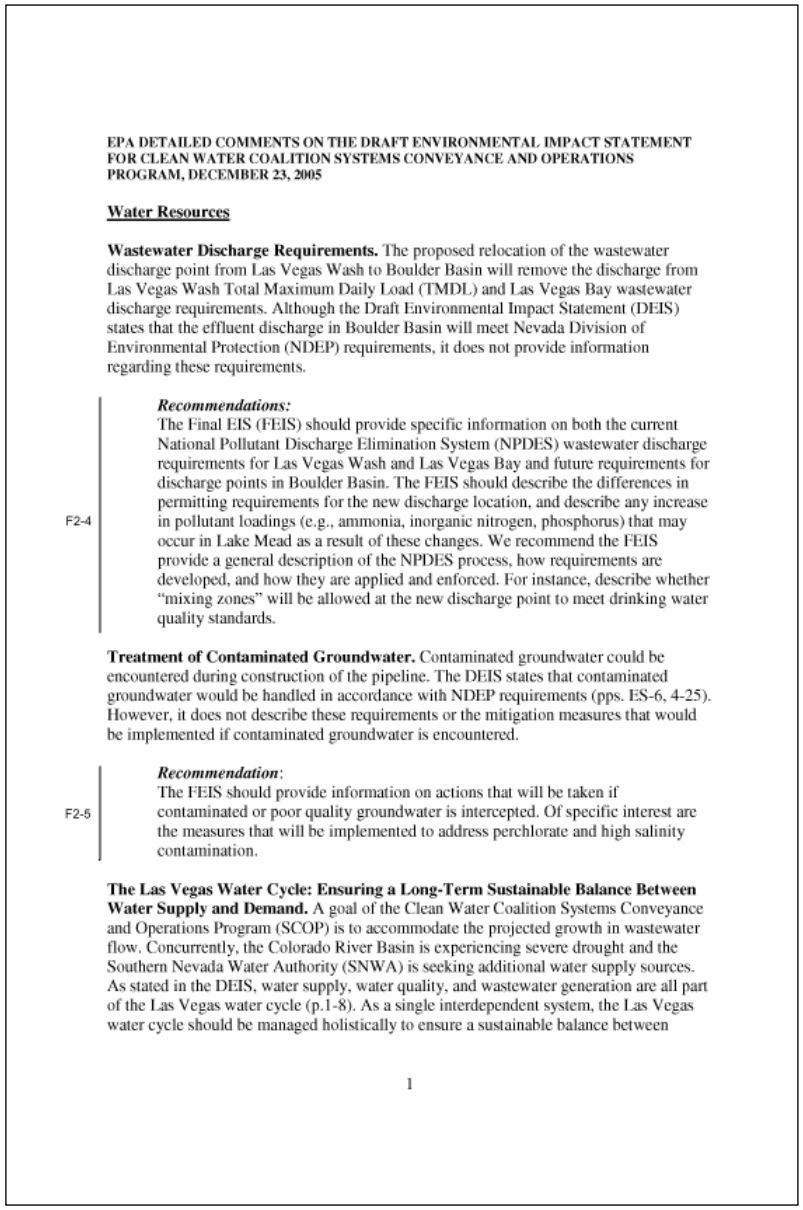
Enclosures:
Summary of EPA Rating Definitions
Detailed Comments

cc: Michael Boyles, National Park Service
Anthony Vigil, Bureau of Reclamation

2

**F2-3**

See General Response 2.



EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR CLEAN WATER COALITION SYSTEMS CONVEYANCE AND OPERATIONS PROGRAM, DECEMBER 23, 2005

**Water Resources**

**Wastewater Discharge Requirements.** The proposed relocation of the wastewater discharge point from Las Vegas Wash to Boulder Basin will remove the discharge from Las Vegas Wash Total Maximum Daily Load (TMDL) and Las Vegas Bay wastewater discharge requirements. Although the Draft Environmental Impact Statement (DEIS) states that the effluent discharge in Boulder Basin will meet Nevada Division of Environmental Protection (NDEP) requirements, it does not provide information regarding these requirements.

F2-4

***Recommendations:***
The Final EIS (FEIS) should provide specific information on both the current National Pollutant Discharge Elimination System (NPDES) wastewater discharge requirements for Las Vegas Wash and Las Vegas Bay and future requirements for discharge points in Boulder Basin. The FEIS should describe the differences in permitting requirements for the new discharge location, and describe any increase in pollutant loadings (e.g., ammonia, inorganic nitrogen, phosphorus) that may occur in Lake Mead as a result of these changes. We recommend the FEIS provide a general description of the NPDES process, how requirements are developed, and how they are applied and enforced. For instance, describe whether "mixing zones" will be allowed at the new discharge point to meet drinking water quality standards.

**Treatment of Contaminated Groundwater.** Contaminated groundwater could be encountered during construction of the pipeline. The DEIS states that contaminated groundwater would be handled in accordance with NDEP requirements (pps. ES-6, 4-25). However, it does not describe these requirements or the mitigation measures that would be implemented if contaminated groundwater is encountered.

F2-5

***Recommendation***:
The FEIS should provide information on actions that will be taken if contaminated or poor quality groundwater is intercepted. Of specific interest are the measures that will be implemented to address perchlorate and high salinity contamination.

**The Las Vegas Water Cycle: Ensuring a Long-Term Sustainable Balance Between Water Supply and Demand.** A goal of the Clean Water Coalition Systems Conveyance and Operations Program (SCOP) is to accommodate the projected growth in wastewater flow. Concurrently, the Colorado River Basin is experiencing severe drought and the Southern Nevada Water Authority (SNWA) is seeking additional water supply sources. As stated in the DEIS, water supply, water quality, and wastewater generation are all part of the Las Vegas water cycle (p.1-8). As a single interdependent system, the Las Vegas water cycle should be managed holistically to ensure a sustainable balance between

1

## F2-4

The wastewater discharge permitting requirements for SCOP have not been determined, but will reflect the water quality standards, which must be met.

The water quality conditions that would occur as a result of the alternatives are presented in Section 4.1 of the Final EIS.

A general description of the NPDES process has been included in Appendix M. The current wastewater discharge permits, issued in July 2006, are also included in Appendix M of the Final EIS.

A reference to this appendix is provided in Section 1.7.3.

## F2-5

See response to comment F2-2.

supply and demand and to maximize the beneficial use of the limited water supply. Aggressive water conservation, water reuse, water recycling, and efforts to maintain and enhance water quality can significantly extend the useful life of water and reduce treatment costs.

F2-6

***Recommendations:***
The FEIS should include specific information on water conservation efforts; and wastewater reuse, recycling, and source reduction. We recommend implementation of measures to reduce wastewater generation, such as reducing impervious cover and over-watering of landscapes, an acknowledged problem (p. 3-20).

**Return Flow Credits.** An issue of concern is the effect of the SCOP on the calculation of return flow credits. Treated effluent, which is part of the diverted flow that is not consumptively used and returned to the Lower Colorado River System via Lake Mead, earns return flow credits. The DEIS states that return flow credits are important to Nevada because water usage in the state cannot be sustained without return flow credits (p. 1-8).

F2-7

***Recommendation:***
The FEIS should provide information on how return flow credits are calculated, how they are used, and why they are so critical for sustainable water usage in Nevada. Include an evaluation of the influence of return flow credits on efforts to maximize water use efficiencies, conservation, reuse, and recycling.

**Cumulative Impacts to Water Quality.** The Lower Colorado River, of which Lake Mead is a key storage component, is an essential water supply for California, Arizona, Nevada, and Mexico. Declining water quality is already a significant concern with major efforts underway to address salinity and contaminants such as perchlorate. Therefore, discharges into Lake Mead and the Lower Colorado River need to be carefully analyzed regarding their cumulative effects on water quality of the entire system.

F2-8

***Recommendation:***
FEIS should provide a cumulative impact analysis of potential impacts to Lower Colorado River water quality from cumulative wastewater discharges from Lake Mead and other downstream major discharge sources.

**Preservation and Enhancement of Las Vegas Wash**

**Increased Concentrations of Contaminants in Flows.** The SCOP would continue to discharge a minimum of 30 million gallons per day (mgd) of effluent flow into Las Vegas Wash. Together with 20 mgd of base flow; the total flow in Las Vegas Wash is expected to be at least 50 mgd (p. 4-27). While the DEIS states this flow is sufficient to sustain the wetlands and riparian vegetation in Las Vegas Wash, the reduction in flow would result in higher concentrations of substances such as perchlorate, total dissolved solids, and

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### F2-6

See General Response 2.

### F2-7

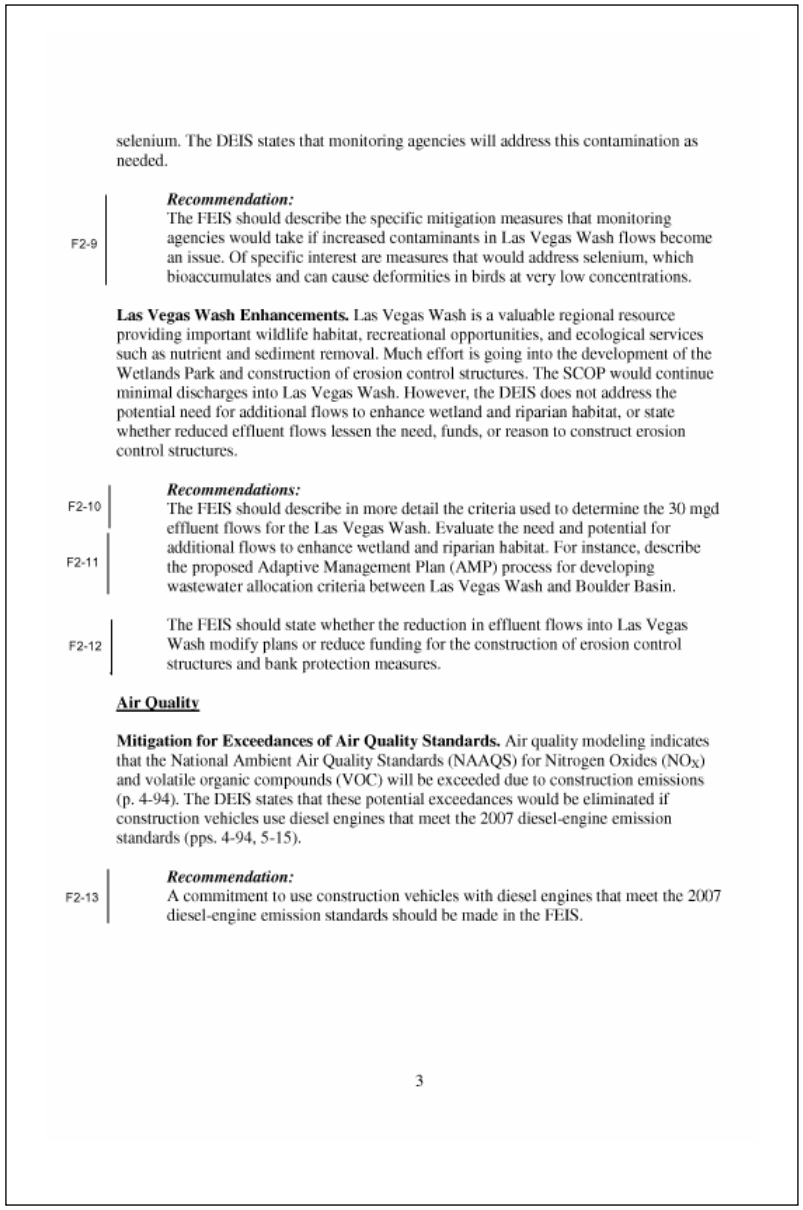
A brief description of return flow credits has been added to Section 1.4.1 of the Final EIS. The equation used to calculate return flow credits is complex and long; therefore, it is not included in the EIS.

See General Response 2.

### F2-8

The cumulative impacts section, Chapter 5, has been revised to include additional information regarding potential impacts downstream of Hoover Dam.

The discharge of wastewater from the Laughlin Wastewater Reclamation Facility to the lower Colorado River has been included in the cumulative impacts analysis presented in Chapter 5 of the Final EIS. However, we were unable to obtain information regarding future plans for additional wastewater discharges to the lower Colorado River from other sources. Reclamation's NEPA guidance (Reclamation 1990) states, "Future cumulative impacts should not normally be speculative, but based on known long-range plans and other plans developed by agencies, organizations, or individuals." Therefore, speculation regarding future wastewater discharges to the lower Colorado River is inappropriate.



selenium. The DEIS states that monitoring agencies will address this contamination as needed.

F2-9 ***Recommendation:***
The FEIS should describe the specific mitigation measures that monitoring agencies would take if increased contaminants in Las Vegas Wash flows become an issue. Of specific interest are measures that would address selenium, which bioaccumulates and can cause deformities in birds at very low concentrations.

**Las Vegas Wash Enhancements.** Las Vegas Wash is a valuable regional resource providing important wildlife habitat, recreational opportunities, and ecological services such as nutrient and sediment removal. Much effort is going into the development of the Wetlands Park and construction of erosion control structures. The SCOP would continue minimal discharges into Las Vegas Wash. However, the DEIS does not address the potential need for additional flows to enhance wetland and riparian habitat, or state whether reduced effluent flows lessen the need, funds, or reason to construct erosion control structures.

F2-10 F2-11 ***Recommendations:***
The FEIS should describe in more detail the criteria used to determine the 30 mgd effluent flows for the Las Vegas Wash. Evaluate the need and potential for additional flows to enhance wetland and riparian habitat. For instance, describe the proposed Adaptive Management Plan (AMP) process for developing wastewater allocation criteria between Las Vegas Wash and Boulder Basin.

F2-12 The FEIS should state whether the reduction in effluent flows into Las Vegas Wash modify plans or reduce funding for the construction of erosion control structures and bank protection measures.

**Air Quality**

**Mitigation for Exceedances of Air Quality Standards.** Air quality modeling indicates that the National Ambient Air Quality Standards (NAAQS) for Nitrogen Oxides ($NO_X$) and volatile organic compounds (VOC) will be exceeded due to construction emissions (p. 4-94). The DEIS states that these potential exceedances would be eliminated if construction vehicles use diesel engines that meet the 2007 diesel-engine emission standards (pps. 4-94, 5-15).

F2-13 ***Recommendation:***
A commitment to use construction vehicles with diesel engines that meet the 2007 diesel-engine emission standards should be made in the FEIS.

3

### F2-9

Mitigation measures, when necessary, have been presented throughout Chapter 4 for each resource. However, a major component of the preferred alternative is to implement the Boulder Basin AMP. Since the AMP is part of the preferred alternative, it is not considered "mitigation". Through the AMP, agencies will monitor effects of the project once operational, and will manage the effluent as necessary to maintain the objectives identified through the AMP process. A summary of the Boulder Basin AMP is provided in Section 2.2.2.6 of the Final EIS.

### F2-10

See General Response 11.

See response to comment F1-10.

### F2-11

See response to comment F1-10.

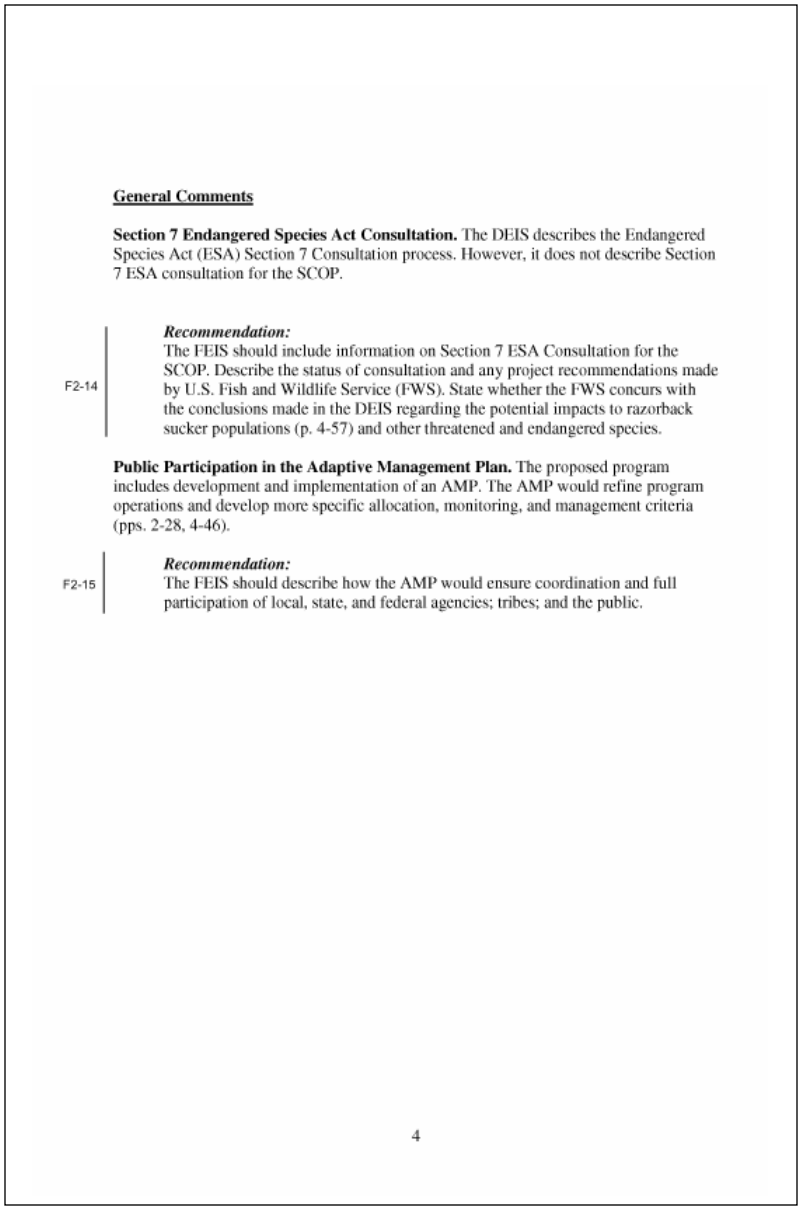
See General Response 10.

### F2-12

Erosion control structures and bank protection measures in the Las Vegas Wash are being constructed to handle storm flows. Therefore, the quantity of effluent flows in the Las Vegas Wash has no impact on the ECS plans or funding. Clarifying text has been added to Section 1.4.2.3 of the Final EIS.

### F2-13

Text has been added to Section 4.7.6 regarding the use of diesel engines that meet the 2007 emission standards.



**General Comments**

**Section 7 Endangered Species Act Consultation.** The DEIS describes the Endangered Species Act (ESA) Section 7 Consultation process. However, it does not describe Section 7 ESA consultation for the SCOP.

F2-14

***Recommendation:***
The FEIS should include information on Section 7 ESA Consultation for the SCOP. Describe the status of consultation and any project recommendations made by U.S. Fish and Wildlife Service (FWS). State whether the FWS concurs with the conclusions made in the DEIS regarding the potential impacts to razorback sucker populations (p. 4-57) and other threatened and endangered species.

**Public Participation in the Adaptive Management Plan.** The proposed program includes development and implementation of an AMP. The AMP would refine program operations and develop more specific allocation, monitoring, and management criteria (pps. 2-28, 4-46).

F2-15

***Recommendation:***
The FEIS should describe how the AMP would ensure coordination and full participation of local, state, and federal agencies; tribes; and the public.

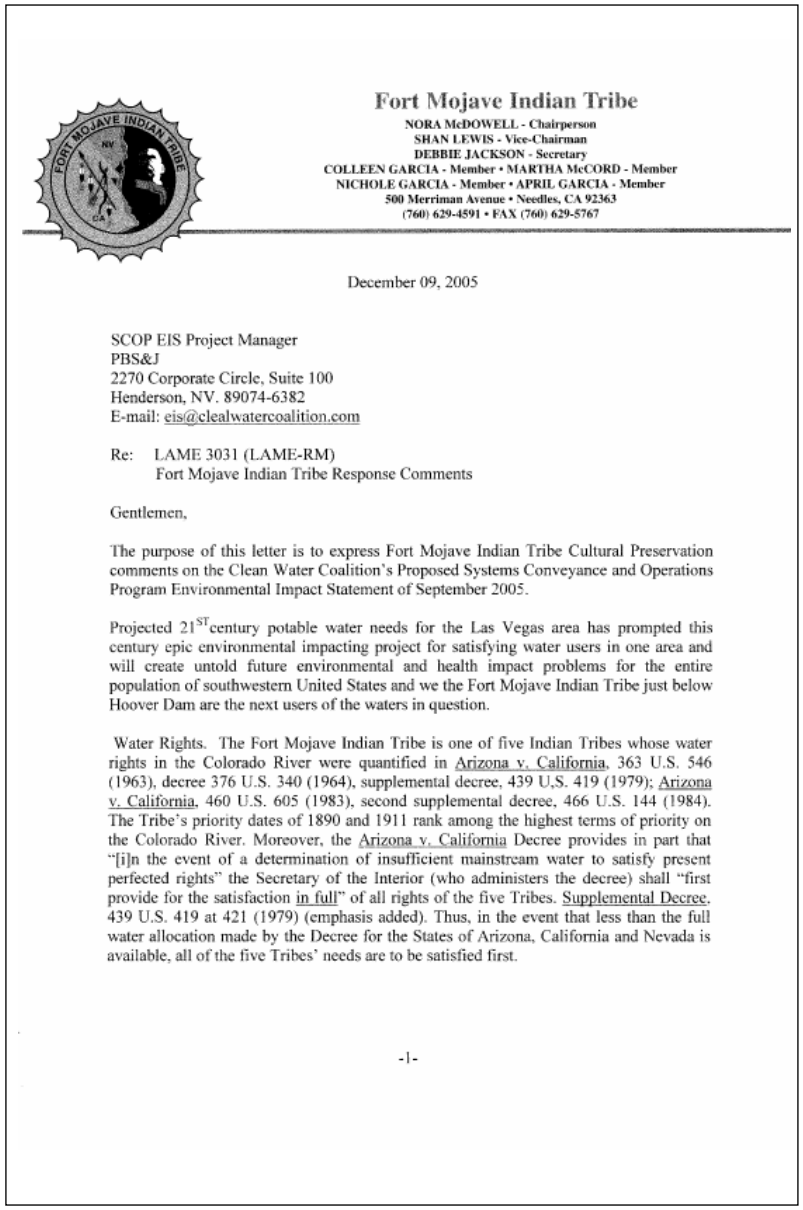
4

**F2-14**

See response to comment F1-1.

**F2-15**

See General Response 10.



**Fort Mojave Indian Tribe**

NORA McDOWELL - Chairperson
SHAN LEWIS - Vice-Chairman
DEBBIE JACKSON - Secretary
COLLEEN GARCIA - Member • MARTHA McCORD - Member
NICHOLE GARCIA - Member • APRIL GARCIA - Member
500 Merriman Avenue • Needles, CA 92363
(760) 629-4591 • FAX (760) 629-5767

December 09, 2005

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV. 89074-6382
E-mail: eis@clealwatercoalition.com

Re: LAME 3031 (LAME-RM)
Fort Mojave Indian Tribe Response Comments

Gentlemen,

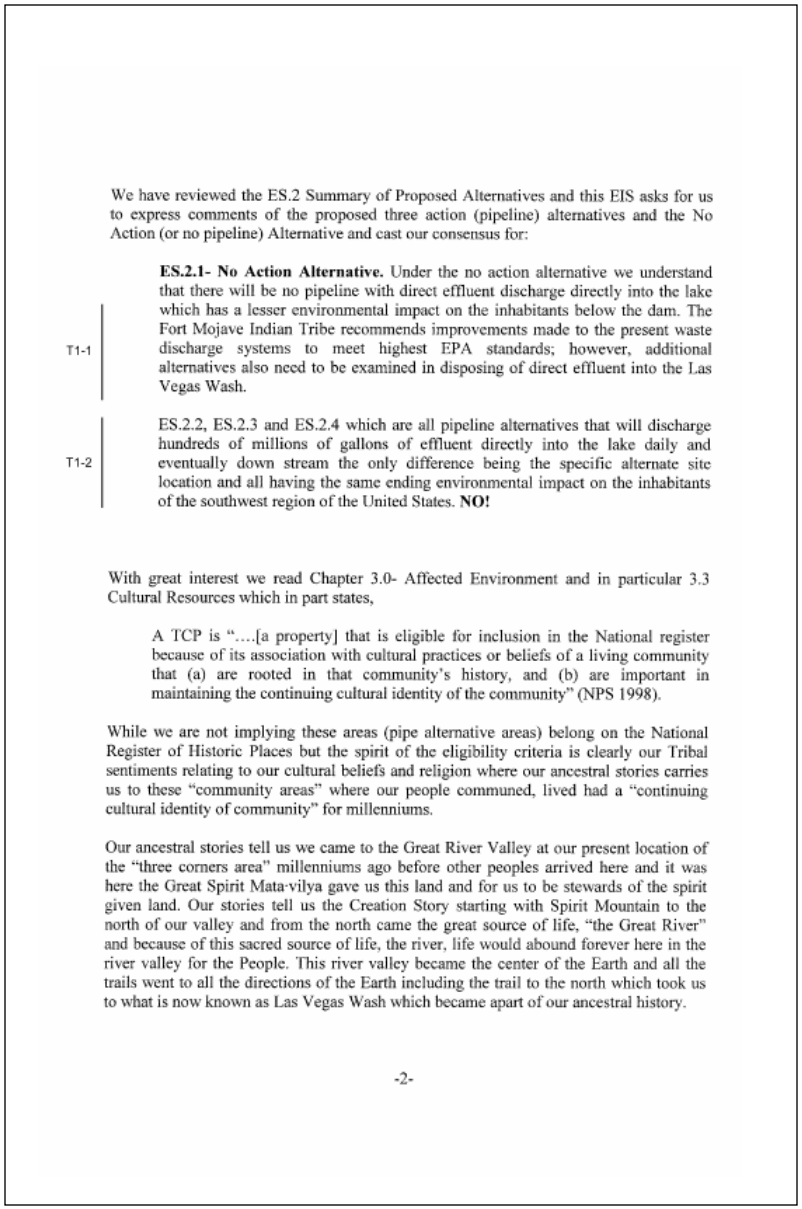
The purpose of this letter is to express Fort Mojave Indian Tribe Cultural Preservation comments on the Clean Water Coalition's Proposed Systems Conveyance and Operations Program Environmental Impact Statement of September 2005.

Projected 21ST century potable water needs for the Las Vegas area has prompted this century epic environmental impacting project for satisfying water users in one area and will create untold future environmental and health impact problems for the entire population of southwestern United States and we the Fort Mojave Indian Tribe just below Hoover Dam are the next users of the waters in question.

Water Rights. The Fort Mojave Indian Tribe is one of five Indian Tribes whose water rights in the Colorado River were quantified in Arizona v. California, 363 U.S. 546 (1963), decree 376 U.S. 340 (1964), supplemental decree, 439 U,S. 419 (1979); Arizona v. California, 460 U.S. 605 (1983), second supplemental decree, 466 U.S. 144 (1984). The Tribe's priority dates of 1890 and 1911 rank among the highest terms of priority on the Colorado River. Moreover, the Arizona v. California Decree provides in part that "[i]n the event of a determination of insufficient mainstream water to satisfy present perfected rights" the Secretary of the Interior (who administers the decree) shall "first provide for the satisfaction in full" of all rights of the five Tribes. Supplemental Decree, 439 U.S. 419 at 421 (1979) (emphasis added). Thus, in the event that less than the full water allocation made by the Decree for the States of Arizona, California and Nevada is available, all of the five Tribes' needs are to be satisfied first.

-1-

**Response T-1** Fort Mojave Indian Tribe



We have reviewed the ES.2 Summary of Proposed Alternatives and this EIS asks for us to express comments of the proposed three action (pipeline) alternatives and the No Action (or no pipeline) Alternative and cast our consensus for:

T1-1 **ES.2.1- No Action Alternative.** Under the no action alternative we understand that there will be no pipeline with direct effluent discharge directly into the lake which has a lesser environmental impact on the inhabitants below the dam. The Fort Mojave Indian Tribe recommends improvements made to the present waste discharge systems to meet highest EPA standards; however, additional alternatives also need to be examined in disposing of direct effluent into the Las Vegas Wash.

T1-2 ES.2.2, ES.2.3 and ES.2.4 which are all pipeline alternatives that will discharge hundreds of millions of gallons of effluent directly into the lake daily and eventually down stream the only difference being the specific alternate site location and all having the same ending environmental impact on the inhabitants of the southwest region of the United States. **NO!**

With great interest we read Chapter 3.0- Affected Environment and in particular 3.3 Cultural Resources which in part states,

> A TCP is "….[a property] that is eligible for inclusion in the National register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (NPS 1998).

While we are not implying these areas (pipe alternative areas) belong on the National Register of Historic Places but the spirit of the eligibility criteria is clearly our Tribal sentiments relating to our cultural beliefs and religion where our ancestral stories carries us to these "community areas" where our people communed, lived had a "continuing cultural identity of community" for millenniums.

Our ancestral stories tell us we came to the Great River Valley at our present location of the "three corners area" millenniums ago before other peoples arrived here and it was here the Great Spirit Mata-vilya gave us this land and for us to be stewards of the spirit given land. Our stories tell us the Creation Story starting with Spirit Mountain to the north of our valley and from the north came the great source of life, "the Great River" and because of this sacred source of life, the river, life would abound forever here in the river valley for the People. This river valley became the center of the Earth and all the trails went to all the directions of the Earth including the trail to the north which took us to what is now known as Las Vegas Wash which became apart of our ancestral history.

-2-

**T1-1**

Treated wastewater from the Valley has been treated and discharged to Lake Mead via the Las Vegas Wash since 1956. Treated wastewater flows will continue to be discharged to Lake Mead, even under the No Action Alternative.

Treated effluent discharged, whether via the Las Vegas Wash or a pipeline, meets CWA standards.

See General Response 1.

No change to the Executive Summary is necessary.

**T1-2**

Comment noted.

When the "white man" came we were a healthy people and numbering in the thousands in this river valley and he brought what he thought was a good idea but it was full of environmental problems of sickness and diseases to where in the 1950s we numbered less than 500 members, we almost became extinct because of so called environmentally sound ideas. Our Elders told us the white man thinks the dams are a good idea and the Elders told us the natural flooding was Mother Earths way of "flushing her toilet" cleansing the land of salt by-products and we are now experiencing the consequence of this "environmentally good idea" and we have caused Mother Earth to become constipated.

Now today in this 21ST Century the latest "good environmental idea" is to flush the toilets of Las Vegas into our source of life, our drinking water, into the river where water is obtained to farm the land and where our families by recreation enjoy the source of life in this desert region, the Colorado River Valley.

This entire region from the Las Vega Wash to Yuma is our ancient ancestral lands where "cultural practices and beliefs created a living community" and "are rooted in our community (cultural) history. Today as we stand on sacred ground at the southern end of the valley known as the "maze", and we look to the north and survey our spirit given land, the land of the AhaMakav, the People Who Live Along the Water and we observe the start of creation, Spirit Mountain and the sacred river of life coming from the north, we join in with the spiritual cry of our ancestral Elders to "stop desecrating this sacred land" and as the tradition continues we accepting our responsibility as stewards of the land that was given to us. We stand to defend the river which is our namesake and we publicly voice our "scoping comments" to be construed as **"No Action Alternative."**

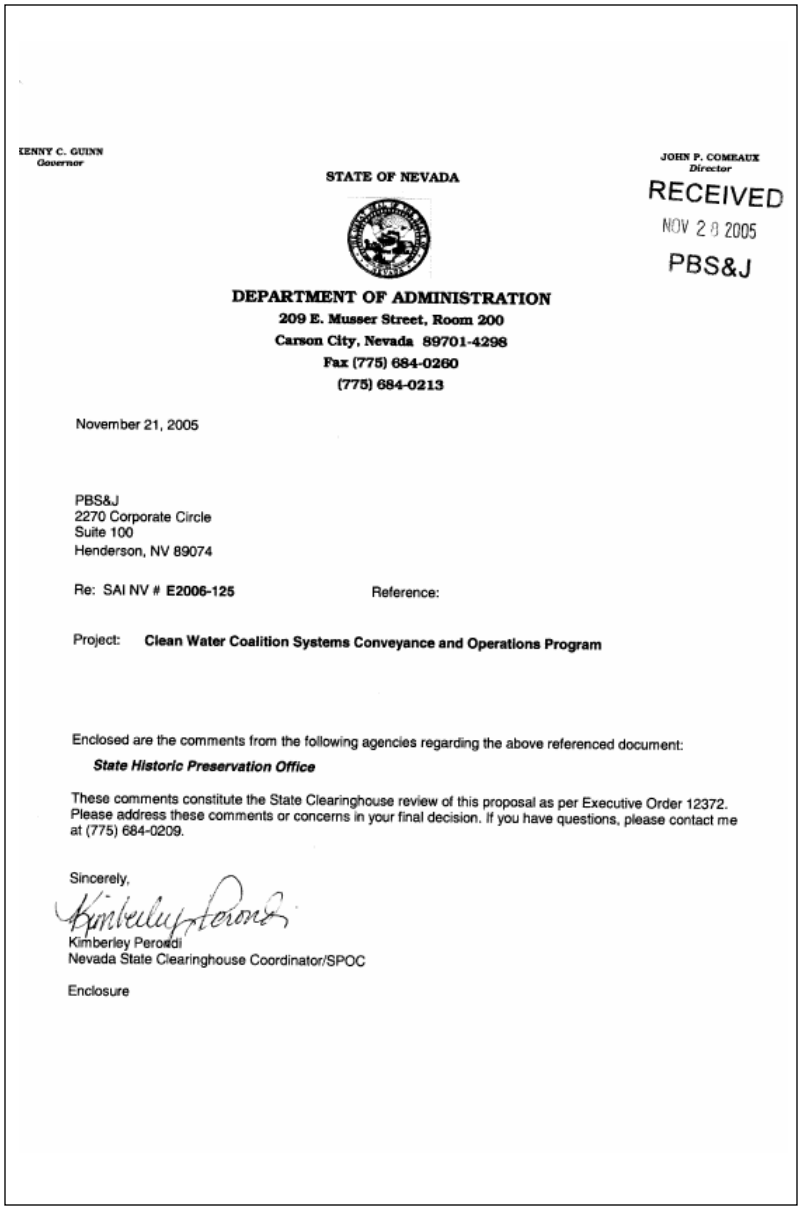
We hope this will be a useful as a decision-making document for this complex situation and that the final answer will preserve the quality of the wash, the lake, river and our drinking water.

Sincerely,

Shan Lewis, Vice Chairman
Fort Mojave Indian Tribe

cc: FMIT Council
FMIT Environmental Protection Office
Bureau of Reclaimation
Bureau of Indian Affairs
AhaMakav Cultural Society Files

-3-



KENNY C. GUINN
Governor

STATE OF NEVADA

JOHN P. COMEAUX
Director

RECEIVED
NOV 28 2005
PBS&J

DEPARTMENT OF ADMINISTRATION
209 E. Musser Street, Room 200
Carson City, Nevada 89701-4298
Fax (775) 684-0260
(775) 684-0213

November 21, 2005

PBS&J
2270 Corporate Circle
Suite 100
Henderson, NV 89074

Re: SAI NV # E2006-125 Reference:

Project: **Clean Water Coalition Systems Conveyance and Operations Program**

Enclosed are the comments from the following agencies regarding the above referenced document:

***State Historic Preservation Office***

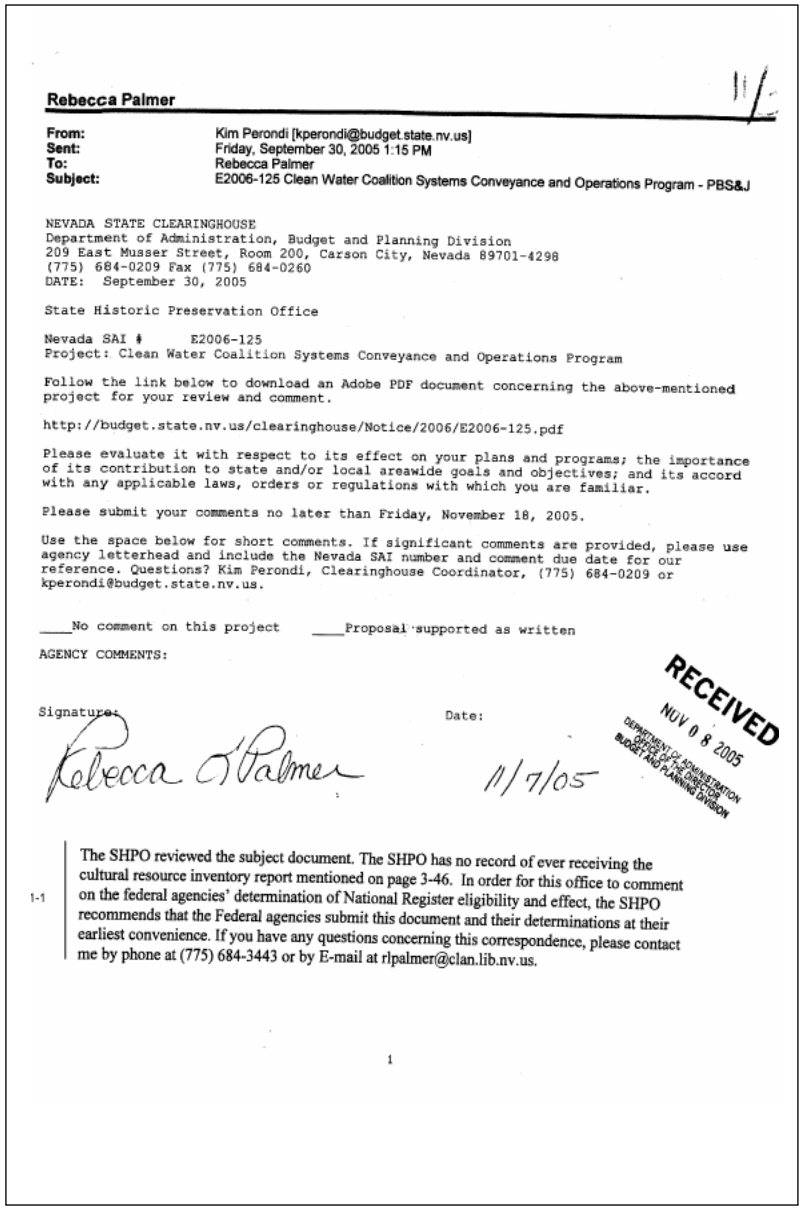
These comments constitute the State Clearinghouse review of this proposal as per Executive Order 12372. Please address these comments or concerns in your final decision. If you have questions, please contact me at (775) 684-0209.

Sincerely,

Kimberley Perondi
Nevada State Clearinghouse Coordinator/SPOC

Enclosure

**Response S-1** Nevada State Clearinghouse, Department of Administration, Budget and Planning (State of Nevada – State Historic Preservation Office)



**Rebecca Palmer**

**From:** Kim Perondi [kperondi@budget.state.nv.us]
**Sent:** Friday, September 30, 2005 1:15 PM
**To:** Rebecca Palmer
**Subject:** E2006-125 Clean Water Coalition Systems Conveyance and Operations Program - PBS&J

NEVADA STATE CLEARINGHOUSE
Department of Administration, Budget and Planning Division
209 East Musser Street, Room 200, Carson City, Nevada 89701-4298
(775) 684-0209 Fax (775) 684-0260
DATE: September 30, 2005

State Historic Preservation Office

Nevada SAI # E2006-125
Project: Clean Water Coalition Systems Conveyance and Operations Program

Follow the link below to download an Adobe PDF document concerning the above-mentioned project for your review and comment.

http://budget.state.nv.us/clearinghouse/Notice/2006/E2006-125.pdf

Please evaluate it with respect to its effect on your plans and programs; the importance of its contribution to state and/or local areawide goals and objectives; and its accord with any applicable laws, orders or regulations with which you are familiar.

Please submit your comments no later than Friday, November 18, 2005.

Use the space below for short comments. If significant comments are provided, please use agency letterhead and include the Nevada SAI number and comment due date for our reference. Questions? Kim Perondi, Clearinghouse Coordinator, (775) 684-0209 or kperondi@budget.state.nv.us.

____No comment on this project ____Proposal supported as written

AGENCY COMMENTS:

RECEIVED
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DEPARTMENT OF ADMINISTRATION
OFFICE OF THE DIRECTOR
BUDGET AND PLANNING DIVISION

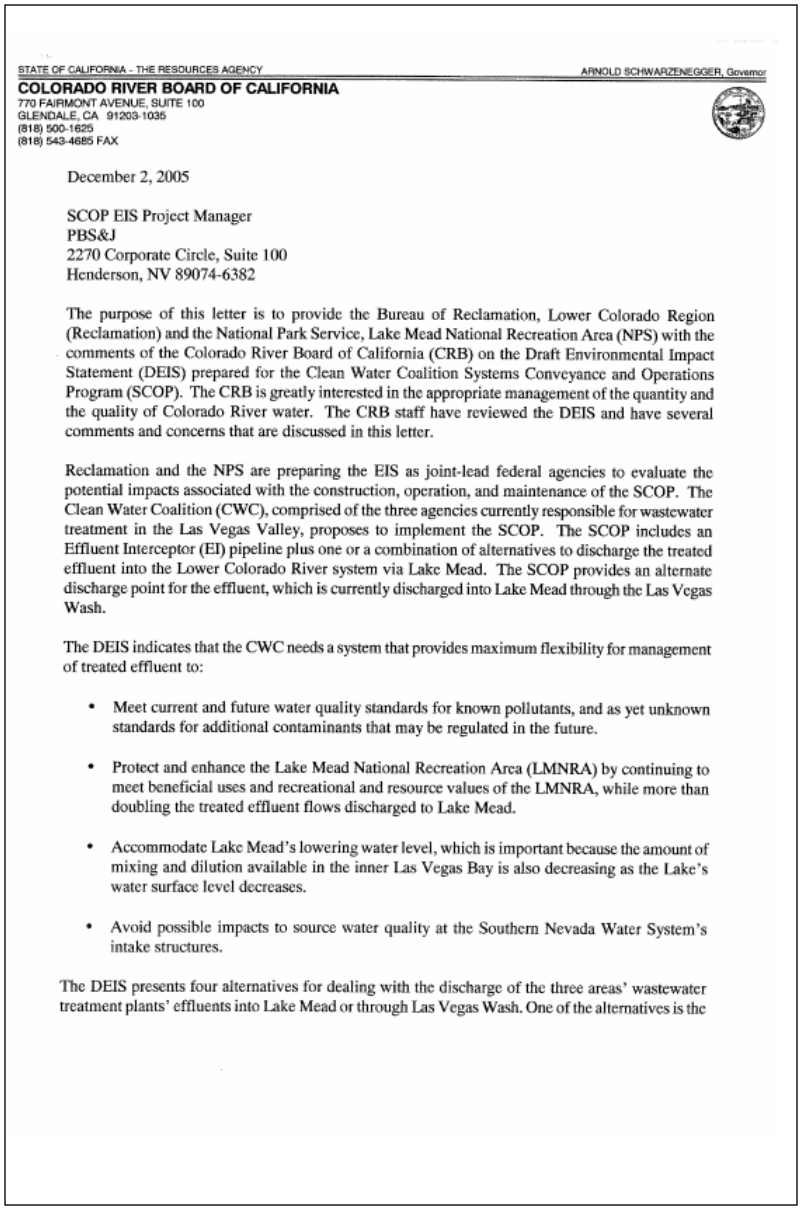
Signature: Rebecca A Palmer Date: 11/7/05

I-1 The SHPO reviewed the subject document. The SHPO has no record of ever receiving the cultural resource inventory report mentioned on page 3-46. In order for this office to comment on the federal agencies' determination of National Register eligibility and effect, the SHPO recommends that the Federal agencies submit this document and their determinations at their earliest convenience. If you have any questions concerning this correspondence, please contact me by phone at (775) 684-3443 or by E-mail at rlpalmer@clan.lib.nv.us.

1

**S1-1**

The Cultural Resource Inventory Report was submitted to the State Historic Preservation Office (SHPO) by the lead federal agencies on March 13, 2006. Consultation with SHPO and the Advisory Council for Historic Preservation has been completed. A Programmatic Agreement has been initiated to ensure that the agreed-upon mitigation measures are implemented to protect cultural resources in the project area.



STATE OF CALIFORNIA - THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor

**COLORADO RIVER BOARD OF CALIFORNIA**
770 FAIRMONT AVENUE, SUITE 100
GLENDALE, CA 91203-1035
(818) 500-1625
(818) 543-4685 FAX

December 2, 2005

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074-6382

The purpose of this letter is to provide the Bureau of Reclamation, Lower Colorado Region (Reclamation) and the National Park Service, Lake Mead National Recreation Area (NPS) with the comments of the Colorado River Board of California (CRB) on the Draft Environmental Impact Statement (DEIS) prepared for the Clean Water Coalition Systems Conveyance and Operations Program (SCOP). The CRB is greatly interested in the appropriate management of the quantity and the quality of Colorado River water. The CRB staff have reviewed the DEIS and have several comments and concerns that are discussed in this letter.

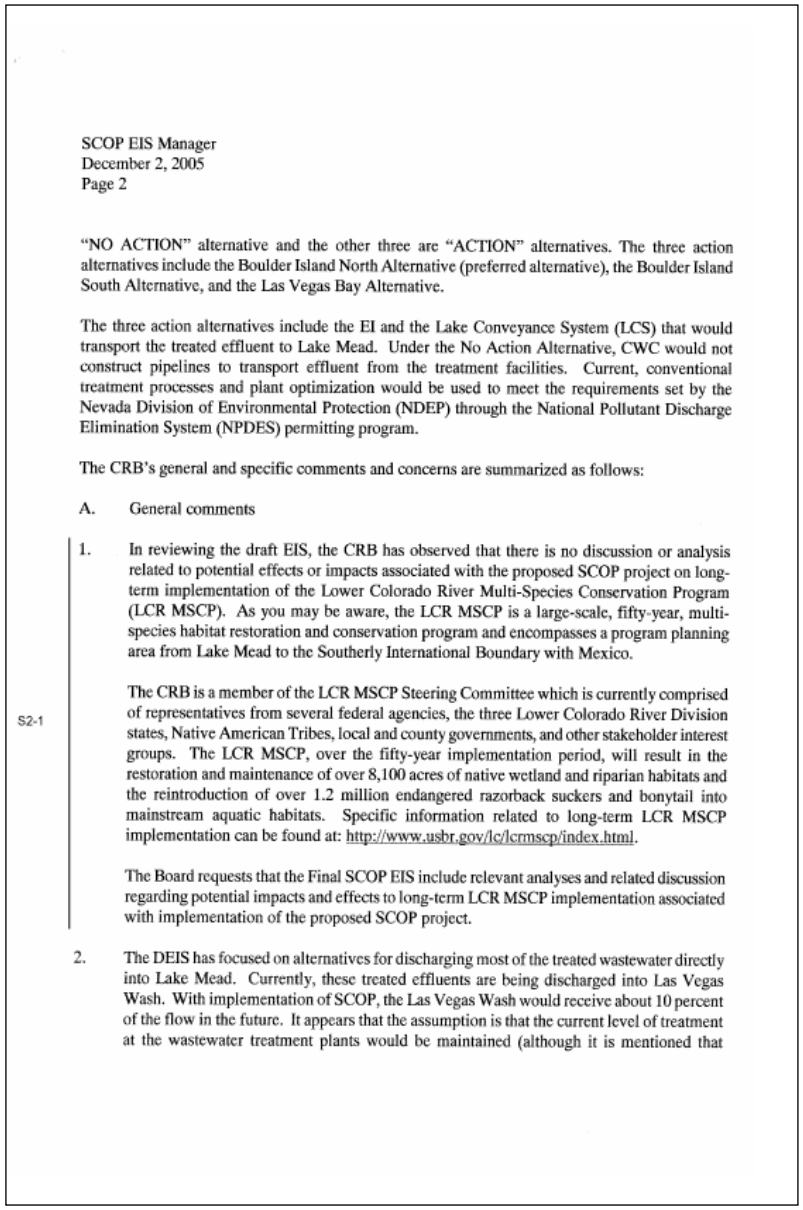
Reclamation and the NPS are preparing the EIS as joint-lead federal agencies to evaluate the potential impacts associated with the construction, operation, and maintenance of the SCOP. The Clean Water Coalition (CWC), comprised of the three agencies currently responsible for wastewater treatment in the Las Vegas Valley, proposes to implement the SCOP. The SCOP includes an Effluent Interceptor (EI) pipeline plus one or a combination of alternatives to discharge the treated effluent into the Lower Colorado River system via Lake Mead. The SCOP provides an alternate discharge point for the effluent, which is currently discharged into Lake Mead through the Las Vegas Wash.

The DEIS indicates that the CWC needs a system that provides maximum flexibility for management of treated effluent to:

- Meet current and future water quality standards for known pollutants, and as yet unknown standards for additional contaminants that may be regulated in the future.
- Protect and enhance the Lake Mead National Recreation Area (LMNRA) by continuing to meet beneficial uses and recreational and resource values of the LMNRA, while more than doubling the treated effluent flows discharged to Lake Mead.
- Accommodate Lake Mead's lowering water level, which is important because the amount of mixing and dilution available in the inner Las Vegas Bay is also decreasing as the Lake's water surface level decreases.
- Avoid possible impacts to source water quality at the Southern Nevada Water System's intake structures.

The DEIS presents four alternatives for dealing with the discharge of the three areas' wastewater treatment plants' effluents into Lake Mead or through Las Vegas Wash. One of the alternatives is the

**Response S-2** Colorado River Board of California (State of California)



SCOP EIS Manager
December 2, 2005
Page 2

"NO ACTION" alternative and the other three are "ACTION" alternatives. The three action alternatives include the Boulder Island North Alternative (preferred alternative), the Boulder Island South Alternative, and the Las Vegas Bay Alternative.

The three action alternatives include the EI and the Lake Conveyance System (LCS) that would transport the treated effluent to Lake Mead. Under the No Action Alternative, CWC would not construct pipelines to transport effluent from the treatment facilities. Current, conventional treatment processes and plant optimization would be used to meet the requirements set by the Nevada Division of Environmental Protection (NDEP) through the National Pollutant Discharge Elimination System (NPDES) permitting program.

The CRB's general and specific comments and concerns are summarized as follows:

A. General comments

1. In reviewing the draft EIS, the CRB has observed that there is no discussion or analysis related to potential effects or impacts associated with the proposed SCOP project on long-term implementation of the Lower Colorado River Multi-Species Conservation Program (LCR MSCP). As you may be aware, the LCR MSCP is a large-scale, fifty-year, multi-species habitat restoration and conservation program and encompasses a program planning area from Lake Mead to the Southerly International Boundary with Mexico.

S2-1

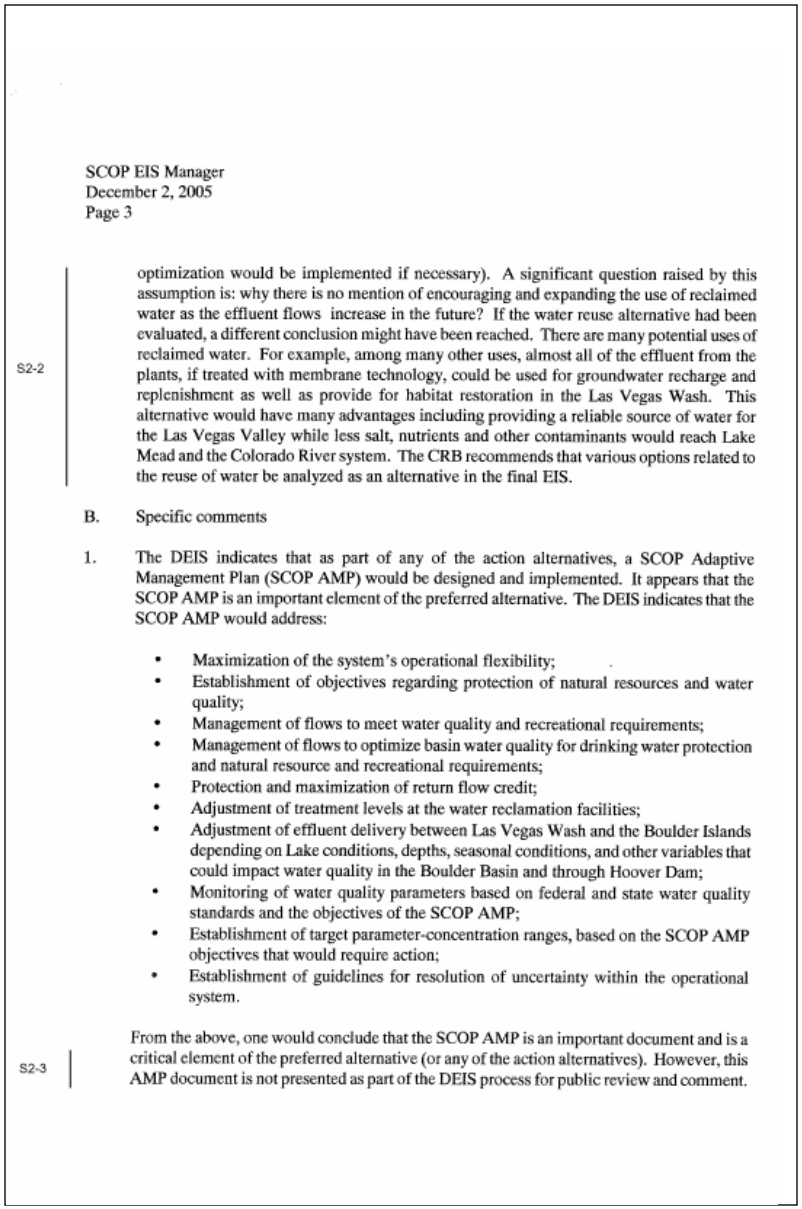
The CRB is a member of the LCR MSCP Steering Committee which is currently comprised of representatives from several federal agencies, the three Lower Colorado River Division states, Native American Tribes, local and county governments, and other stakeholder interest groups. The LCR MSCP, over the fifty-year implementation period, will result in the restoration and maintenance of over 8,100 acres of native wetland and riparian habitats and the reintroduction of over 1.2 million endangered razorback suckers and bonytail into mainstream aquatic habitats. Specific information related to long-term LCR MSCP implementation can be found at: http://www.usbr.gov/lc/lcrmscp/index.html.

The Board requests that the Final SCOP EIS include relevant analyses and related discussion regarding potential impacts and effects to long-term LCR MSCP implementation associated with implementation of the proposed SCOP project.

2. The DEIS has focused on alternatives for discharging most of the treated wastewater directly into Lake Mead. Currently, these treated effluents are being discharged into Las Vegas Wash. With implementation of SCOP, the Las Vegas Wash would receive about 10 percent of the flow in the future. It appears that the assumption is that the current level of treatment at the wastewater treatment plants would be maintained (although it is mentioned that

**S2-1**

See General Response 9.



SCOP EIS Manager
December 2, 2005
Page 3

optimization would be implemented if necessary). A significant question raised by this assumption is: why there is no mention of encouraging and expanding the use of reclaimed water as the effluent flows increase in the future? If the water reuse alternative had been evaluated, a different conclusion might have been reached. There are many potential uses of reclaimed water. For example, among many other uses, almost all of the effluent from the plants, if treated with membrane technology, could be used for groundwater recharge and replenishment as well as provide for habitat restoration in the Las Vegas Wash. This alternative would have many advantages including providing a reliable source of water for the Las Vegas Valley while less salt, nutrients and other contaminants would reach Lake Mead and the Colorado River system. The CRB recommends that various options related to the reuse of water be analyzed as an alternative in the final EIS.

S2-2

B. Specific comments

1. The DEIS indicates that as part of any of the action alternatives, a SCOP Adaptive Management Plan (SCOP AMP) would be designed and implemented. It appears that the SCOP AMP is an important element of the preferred alternative. The DEIS indicates that the SCOP AMP would address:

- Maximization of the system's operational flexibility;
- Establishment of objectives regarding protection of natural resources and water quality;
- Management of flows to meet water quality and recreational requirements;
- Management of flows to optimize basin water quality for drinking water protection and natural resource and recreational requirements;
- Protection and maximization of return flow credit;
- Adjustment of treatment levels at the water reclamation facilities;
- Adjustment of effluent delivery between Las Vegas Wash and the Boulder Islands depending on Lake conditions, depths, seasonal conditions, and other variables that could impact water quality in the Boulder Basin and through Hoover Dam;
- Monitoring of water quality parameters based on federal and state water quality standards and the objectives of the SCOP AMP;
- Establishment of target parameter-concentration ranges, based on the SCOP AMP objectives that would require action;
- Establishment of guidelines for resolution of uncertainty within the operational system.

From the above, one would conclude that the SCOP AMP is an important document and is a critical element of the preferred alternative (or any of the action alternatives). However, this AMP document is not presented as part of the DEIS process for public review and comment.

S2-3

**S2-2**

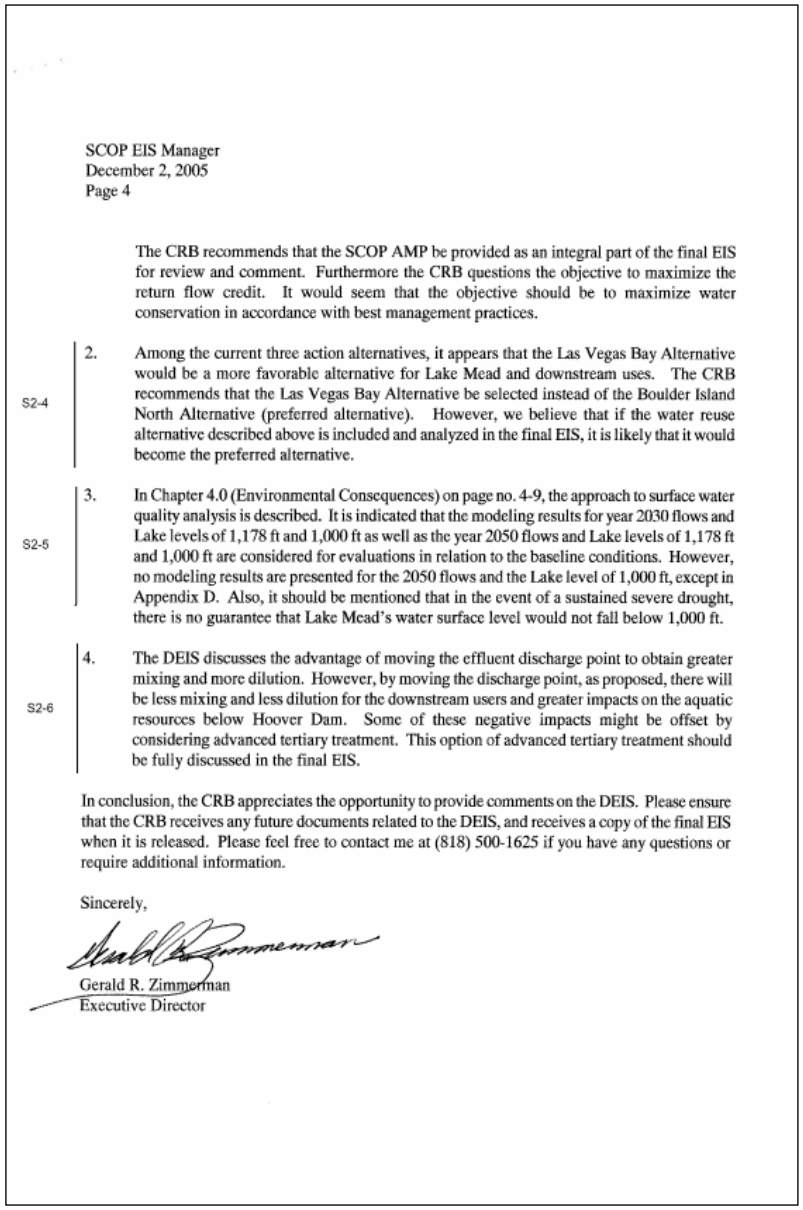
See General Response 2.

**S2-3**

See General Response 10.

Every gallon of Colorado River water that is used in Las Vegas and is returned to the Colorado River system produces a gallon that can be re-used again. Nevada's consumptive rights to Colorado River water total 300,000 AFY. But, Nevada is able to divert nearly 480,000 AFY because of return flow credits. Water is a very important resource to Nevada and all the Colorado River states in this time of drought.

The SNWA is implementing aggressive water conservation measures in the Valley. These measures are not part of the SCOP. The goal of the water-conservation measures is to reduce the actual water use in the Valley. Although the results of conservation efforts affect the urban-runoff flows in the Las Vegas Wash, the wastewater treatment agencies are not responsible for urban runoff. A list of the water conservation measures being implemented by SNWA has been added to Section 1.4.1.3. A reference to Section 1.4.1.3 has been added to Appendix D, Section D.1.3.1.



SCOP EIS Manager
December 2, 2005
Page 4

The CRB recommends that the SCOP AMP be provided as an integral part of the final EIS for review and comment. Furthermore the CRB questions the objective to maximize the return flow credit. It would seem that the objective should be to maximize water conservation in accordance with best management practices.

S2-4

2. Among the current three action alternatives, it appears that the Las Vegas Bay Alternative would be a more favorable alternative for Lake Mead and downstream uses. The CRB recommends that the Las Vegas Bay Alternative be selected instead of the Boulder Island North Alternative (preferred alternative). However, we believe that if the water reuse alternative described above is included and analyzed in the final EIS, it is likely that it would become the preferred alternative.

S2-5

3. In Chapter 4.0 (Environmental Consequences) on page no. 4-9, the approach to surface water quality analysis is described. It is indicated that the modeling results for year 2030 flows and Lake levels of 1,178 ft and 1,000 ft as well as the year 2050 flows and Lake levels of 1,178 ft and 1,000 ft are considered for evaluations in relation to the baseline conditions. However, no modeling results are presented for the 2050 flows and the Lake level of 1,000 ft, except in Appendix D. Also, it should be mentioned that in the event of a sustained severe drought, there is no guarantee that Lake Mead's water surface level would not fall below 1,000 ft.

S2-6

4. The DEIS discusses the advantage of moving the effluent discharge point to obtain greater mixing and more dilution. However, by moving the discharge point, as proposed, there will be less mixing and less dilution for the downstream users and greater impacts on the aquatic resources below Hoover Dam. Some of these negative impacts might be offset by considering advanced tertiary treatment. This option of advanced tertiary treatment should be fully discussed in the final EIS.

In conclusion, the CRB appreciates the opportunity to provide comments on the DEIS. Please ensure that the CRB receives any future documents related to the DEIS, and receives a copy of the final EIS when it is released. Please feel free to contact me at (818) 500-1625 if you have any questions or require additional information.

Sincerely,

Gerald R. Zimmerman
Executive Director

### S2-4

See General Response 2.

At Lake levels of 1,000 ft the remnants of the Las Vegas Bay are not sufficient to assimilate the discharge of effluent, even if the effluent were treated to phosphorus levels below 0.02 mg/L. There would be water quality standard exceedances that are unacceptable to the regulatory agencies and SNWA.

### S2-5

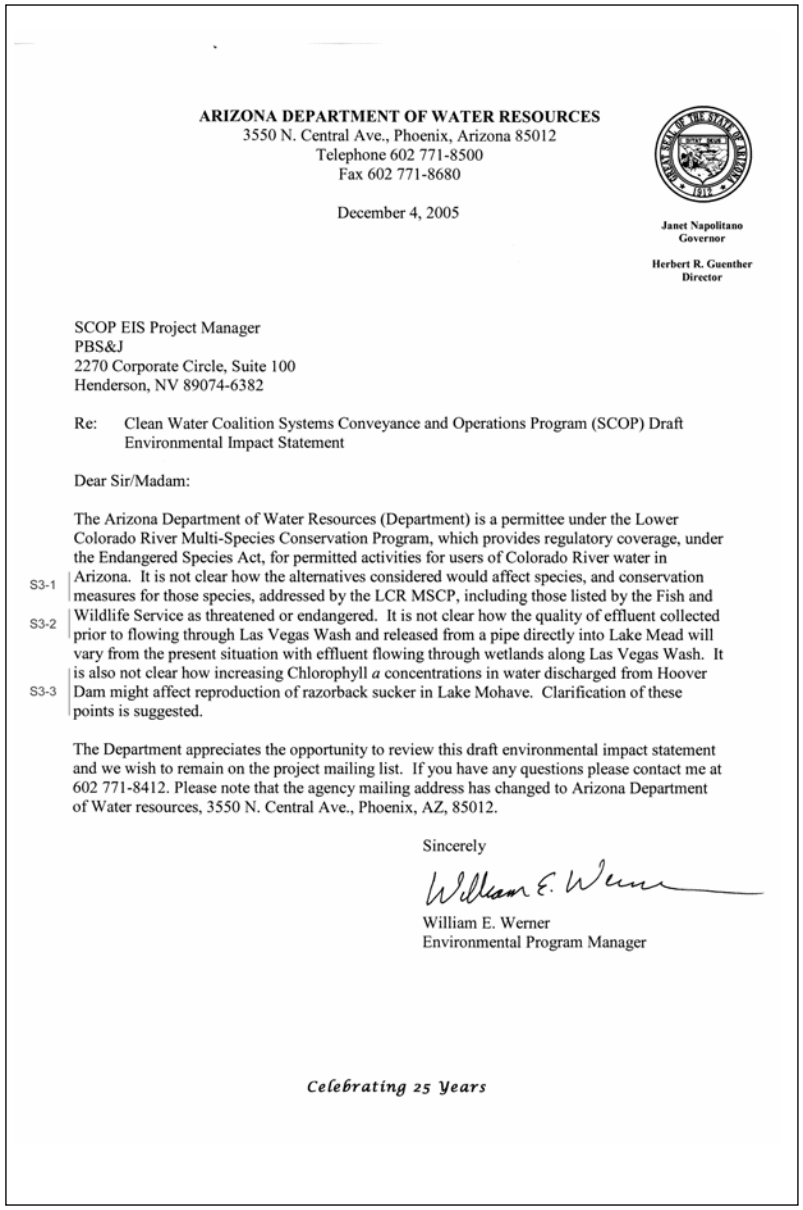
Section 4.1 has been revised to present the 2030 and 2050 year flows.

As explained in Section 1.5 of the Final EIS, the 1,000-ft (305-meter [m]) Lake level is used for planning purposes in this EIS because it is the level that has been discussed by the Colorado River states to be "protected" in future drought conditions, and has most recently been agreed to in the *Seven Basin States Preliminary Proposal Regarding Colorado River Interim Operations.*

### S2-6

See General Response 1.

C: Mr. Robert W. Johnson, Regional Director, USBR-LC-1000
Mr. George Cann, Executive Director, Colorado River Commission of Nevada
Mr. Herbert R.Guenther, Director, Arizona Department of Water Resources



ARIZONA DEPARTMENT OF WATER RESOURCES
3550 N. Central Ave., Phoenix, Arizona 85012
Telephone 602 771-8500
Fax 602 771-8680

December 4, 2005

Janet Napolitano
Governor

Herbert R. Guenther
Director

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074-6382

Re: Clean Water Coalition Systems Conveyance and Operations Program (SCOP) Draft Environmental Impact Statement

Dear Sir/Madam:

The Arizona Department of Water Resources (Department) is a permittee under the Lower Colorado River Multi-Species Conservation Program, which provides regulatory coverage, under the Endangered Species Act, for permitted activities for users of Colorado River water in Arizona. It is not clear how the alternatives considered would affect species, and conservation measures for those species, addressed by the LCR MSCP, including those listed by the Fish and Wildlife Service as threatened or endangered. It is not clear how the quality of effluent collected prior to flowing through Las Vegas Wash and released from a pipe directly into Lake Mead will vary from the present situation with effluent flowing through wetlands along Las Vegas Wash. It is also not clear how increasing Chlorophyll *a* concentrations in water discharged from Hoover Dam might affect reproduction of razorback sucker in Lake Mohave. Clarification of these points is suggested.

S3-1
S3-2
S3-3

The Department appreciates the opportunity to review this draft environmental impact statement and we wish to remain on the project mailing list. If you have any questions please contact me at 602 771-8412. Please note that the agency mailing address has changed to Arizona Department of Water resources, 3550 N. Central Ave., Phoenix, AZ, 85012.

Sincerely

William E. Werner
Environmental Program Manager

*Celebrating 25 Years*

## **Response S-3** Arizona Department of Water Resources (State of Arizona)

### S3-1

See General Response 9.

### S3-2

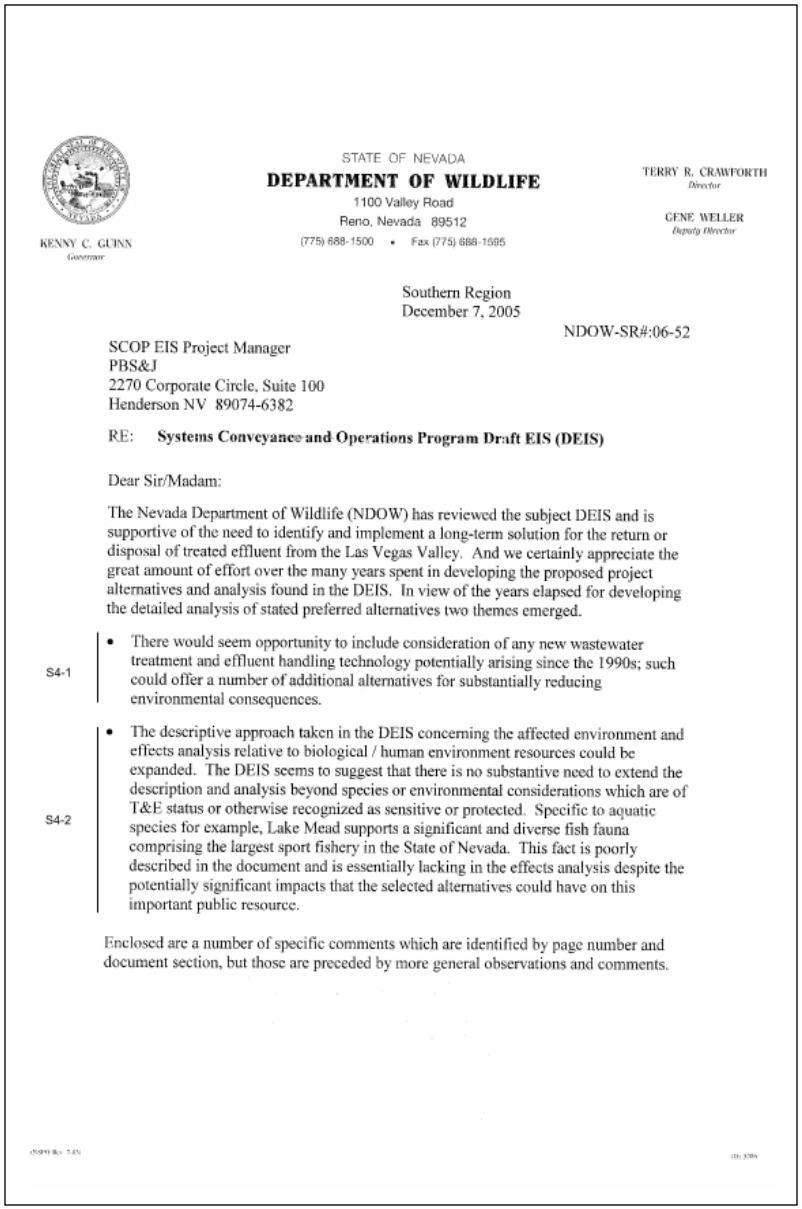
The wastewater treatment facilities in the Valley are some of the best in the nation--the quality of treatment is in the top 7 percent of wastewater treatment facilities in the nation.

The wastewater discharge permitting requirements for SCOP have not been determined, but will reflect the water quality standards, which must be met. The current wastewater discharge permits were renewed in July 2006 and are included in Appendix M of the Final EIS.

### S3-3

The ELCOM/CAEDYM modeling does not indicate any changes in chlorophyll *a* concentrations passing through Hoover Dam as a result of any of the alternatives (see Figures 4.1-3 and 4.1-5). This is a result of chlorophyll *a* existing only in the photic zone, located well above the elevations of the dam outlets. Parenthetically, it may be expected that the No Action Alternative would be the most susceptible to increased chlorophyll *a* concentrations through Hoover Dam, since modeling of this alternative indicated increased algae concentrations in Lake Mead.

These effects as modeled are negligible and not likely to affect razorback suckers in Lake Mohave.



STATE OF NEVADA
**DEPARTMENT OF WILDLIFE**
1100 Valley Road
Reno, Nevada 89512
(775) 688-1500 • Fax (775) 688-1595

KENNY C. GUINN
*Governor*

TERRY R. CRAWFORTH
*Director*

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Southern Region
December 7, 2005

NDOW-SR#:06-52

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson NV 89074-6382

RE: **Systems Conveyance and Operations Program Draft EIS (DEIS)**

Dear Sir/Madam:

The Nevada Department of Wildlife (NDOW) has reviewed the subject DEIS and is supportive of the need to identify and implement a long-term solution for the return or disposal of treated effluent from the Las Vegas Valley. And we certainly appreciate the great amount of effort over the many years spent in developing the proposed project alternatives and analysis found in the DEIS. In view of the years elapsed for developing the detailed analysis of stated preferred alternatives two themes emerged.

S4-1

- There would seem opportunity to include consideration of any new wastewater treatment and effluent handling technology potentially arising since the 1990s; such could offer a number of additional alternatives for substantially reducing environmental consequences.

S4-2

- The descriptive approach taken in the DEIS concerning the affected environment and effects analysis relative to biological / human environment resources could be expanded. The DEIS seems to suggest that there is no substantive need to extend the description and analysis beyond species or environmental considerations which are of T&E status or otherwise recognized as sensitive or protected. Specific to aquatic species for example, Lake Mead supports a significant and diverse fish fauna comprising the largest sport fishery in the State of Nevada. This fact is poorly described in the document and is essentially lacking in the effects analysis despite the potentially significant impacts that the selected alternatives could have on this important public resource.

Enclosed are a number of specific comments which are identified by page number and document section, but those are preceded by more general observations and comments.

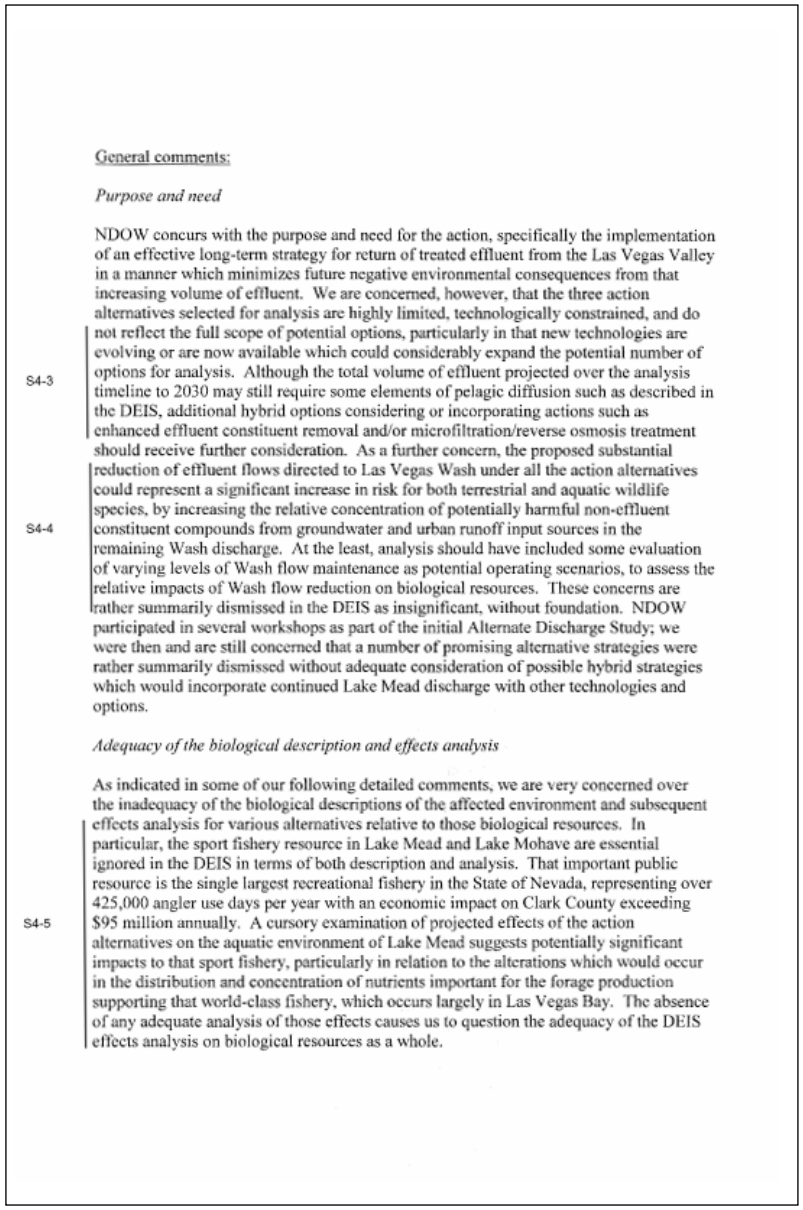
## Response S4 Nevada Department of Wildlife (State of Nevada)

### S4-1

See General Response 1.

### S4-2

A description of sport fishing at Lake Mead has been added to Section 3.2.3.3 of the Final EIS. The impacts to the sport fishery are presented in Section 4.2.



General comments:

*Purpose and need*

NDOW concurs with the purpose and need for the action, specifically the implementation of an effective long-term strategy for return of treated effluent from the Las Vegas Valley in a manner which minimizes future negative environmental consequences from that increasing volume of effluent. We are concerned, however, that the three action alternatives selected for analysis are highly limited, technologically constrained, and do not reflect the full scope of potential options, particularly in that new technologies are evolving or are now available which could considerably expand the potential number of options for analysis. Although the total volume of effluent projected over the analysis timeline to 2030 may still require some elements of pelagic diffusion such as described in the DEIS, additional hybrid options considering or incorporating actions such as enhanced effluent constituent removal and/or microfiltration/reverse osmosis treatment should receive further consideration. As a further concern, the proposed substantial reduction of effluent flows directed to Las Vegas Wash under all the action alternatives could represent a significant increase in risk for both terrestrial and aquatic wildlife species, by increasing the relative concentration of potentially harmful non-effluent constituent compounds from groundwater and urban runoff input sources in the remaining Wash discharge. At the least, analysis should have included some evaluation of varying levels of Wash flow maintenance as potential operating scenarios, to assess the relative impacts of Wash flow reduction on biological resources. These concerns are rather summarily dismissed in the DEIS as insignificant, without foundation. NDOW participated in several workshops as part of the initial Alternate Discharge Study; we were then and are still concerned that a number of promising alternative strategies were rather summarily dismissed without adequate consideration of possible hybrid strategies which would incorporate continued Lake Mead discharge with other technologies and options.

S4-3

S4-4

*Adequacy of the biological description and effects analysis*

As indicated in some of our following detailed comments, we are very concerned over the inadequacy of the biological descriptions of the affected environment and subsequent effects analysis for various alternatives relative to those biological resources. In particular, the sport fishery resource in Lake Mead and Lake Mohave are essential ignored in the DEIS in terms of both description and analysis. That important public resource is the single largest recreational fishery in the State of Nevada, representing over 425,000 angler use days per year with an economic impact on Clark County exceeding $95 million annually. A cursory examination of projected effects of the action alternatives on the aquatic environment of Lake Mead suggests potentially significant impacts to that sport fishery, particularly in relation to the alterations which would occur in the distribution and concentration of nutrients important for the forage production supporting that world-class fishery, which occurs largely in Las Vegas Bay. The absence of any adequate analysis of those effects causes us to question the adequacy of the DEIS effects analysis on biological resources as a whole.

S4-5

**S4-3**

See General Response 1.

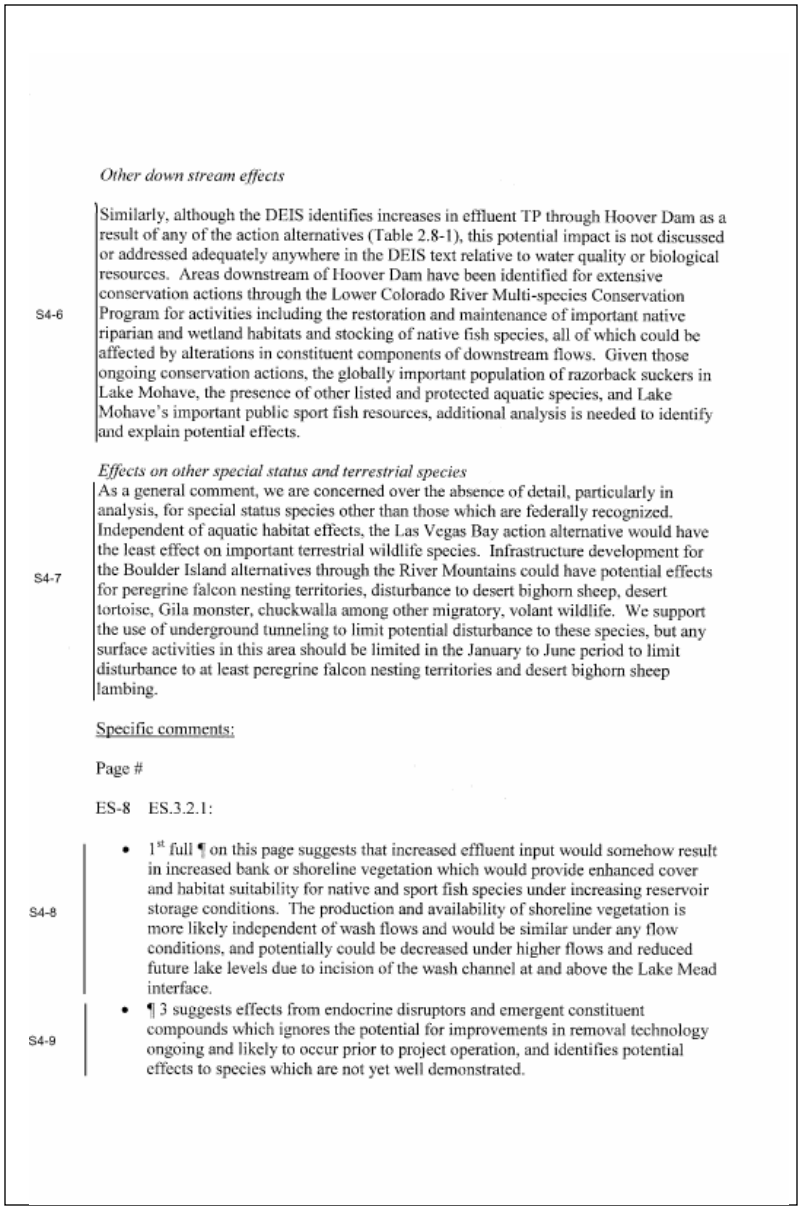
**S4-4**

See General Response 11.

Additional information addressing the existing conditions and the impacts of the proposed SCOP on biological resources has been inserted into the Final EIS in sections 3.2 and 4.2.

**S4-5**

The information addressing the existing conditions and the impacts of the proposed SCOP on the sport fishery in Lake Mead has been inserted into the Final EIS in Section 3.2.3.3 and Section 4.2.



*Other down stream effects*

S4-6 Similarly, although the DEIS identifies increases in effluent TP through Hoover Dam as a result of any of the action alternatives (Table 2.8-1), this potential impact is not discussed or addressed adequately anywhere in the DEIS text relative to water quality or biological resources. Areas downstream of Hoover Dam have been identified for extensive conservation actions through the Lower Colorado River Multi-species Conservation Program for activities including the restoration and maintenance of important native riparian and wetland habitats and stocking of native fish species, all of which could be affected by alterations in constituent components of downstream flows. Given those ongoing conservation actions, the globally important population of razorback suckers in Lake Mohave, the presence of other listed and protected aquatic species, and Lake Mohave's important public sport fish resources, additional analysis is needed to identify and explain potential effects.

*Effects on other special status and terrestrial species*

S4-7 As a general comment, we are concerned over the absence of detail, particularly in analysis, for special status species other than those which are federally recognized. Independent of aquatic habitat effects, the Las Vegas Bay action alternative would have the least effect on important terrestrial wildlife species. Infrastructure development for the Boulder Island alternatives through the River Mountains could have potential effects for peregrine falcon nesting territories, disturbance to desert bighorn sheep, desert tortoise, Gila monster, chuckwalla among other migratory, volant wildlife. We support the use of underground tunneling to limit potential disturbance to these species, but any surface activities in this area should be limited in the January to June period to limit disturbance to at least peregrine falcon nesting territories and desert bighorn sheep lambing.

Specific comments:

Page #

ES-8 ES.3.2.1:

S4-8
- 1st full ¶ on this page suggests that increased effluent input would somehow result in increased bank or shoreline vegetation which would provide enhanced cover and habitat suitability for native and sport fish species under increasing reservoir storage conditions. The production and availability of shoreline vegetation is more likely independent of wash flows and would be similar under any flow conditions, and potentially could be decreased under higher flows and reduced future lake levels due to incision of the wash channel at and above the Lake Mead interface.

S4-9
- ¶ 3 suggests effects from endocrine disruptors and emergent constituent compounds which ignores the potential for improvements in removal technology ongoing and likely to occur prior to project operation, and identifies potential effects to species which are not yet well demonstrated.

**S4-6**

The descriptions of the pipeline alternatives have been revised to indicate that under normal operating conditions, the TP discharged to Lake Mead would not exceed 334 lbs/day on an annual average basis. Modeling indicates that there would be no change to the water quality downstream of Hoover Dam. Therefore, there would be no impact to aquatic species below Hoover Dam. The revised alternatives are described in Chapter 2 of the SCOP Final EIS, and potential impacts are described throughout Chapter 4.

See General Response 9.

**S4-7**

As stated in 4.2.4.2.2, the impacts on wildlife from the construction of the Las Vegas Bay Alternative would be the same as those resulting from the construction of the Boulder Islands North Alternative. Surface disturbance in the River Mountains would not occur during tunneling of the LCS.

Text has been added to Section 4.2.2.2.2 to explain disturbance and potential impacts to bighorn sheep, reptiles, and migratory bird species.

**S4-8**

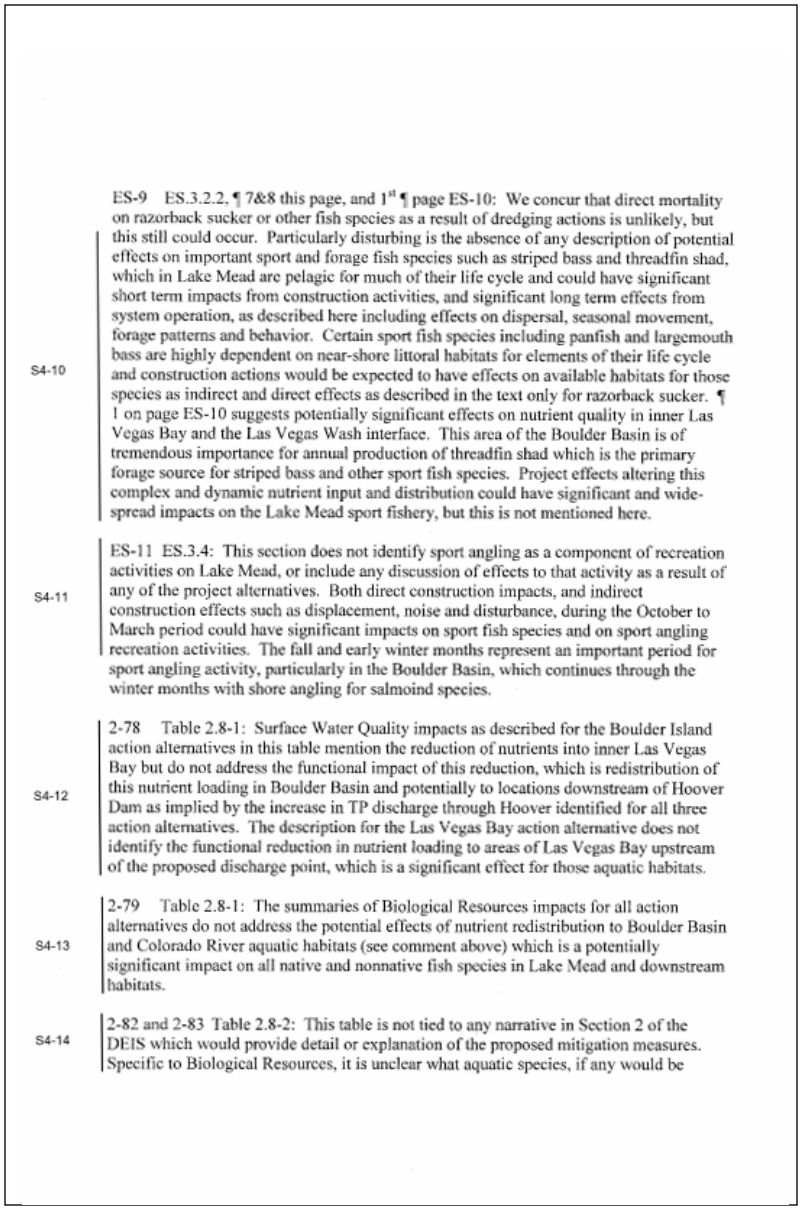
Increased effluent flows would likely widen the saturated substrate zone in the Las Vegas Wash because ongoing construction of ECSs that serve to arrest headcutting would also cause the low-flow channel to become wider at some locations. A larger saturated area would encourage the expansion of riparian plant and wetlands communities. It is likely that these communities would steadily expand in area as effluent flows to the Las Vegas Wash increase.

At the Lake Mead interface, however, Las Vegas Wash flows may or may not increase shoreline vegetation and potential habitat for fish species. Text relative to shoreline conditions in Lake Mead (Las Vegas Bay) has been deleted.

The Executive Summary has been revised.

**S4-9**

See General Response 6. No change to the Executive Summary is required.



S4-10 ES-9 ES.3.2.2, ¶ 7&8 this page, and 1st ¶ page ES-10: We concur that direct mortality on razorback sucker or other fish species as a result of dredging actions is unlikely, but this still could occur. Particularly disturbing is the absence of any description of potential effects on important sport and forage fish species such as striped bass and threadfin shad, which in Lake Mead are pelagic for much of their life cycle and could have significant short term impacts from construction activities, and significant long term effects from system operation, as described here including effects on dispersal, seasonal movement, forage patterns and behavior. Certain sport fish species including panfish and largemouth bass are highly dependent on near-shore littoral habitats for elements of their life cycle and construction actions would be expected to have effects on available habitats for those species as indirect and direct effects as described in the text only for razorback sucker. ¶ 1 on page ES-10 suggests potentially significant effects on nutrient quality in inner Las Vegas Bay and the Las Vegas Wash interface. This area of the Boulder Basin is of tremendous importance for annual production of threadfin shad which is the primary forage source for striped bass and other sport fish species. Project effects altering this complex and dynamic nutrient input and distribution could have significant and wide-spread impacts on the Lake Mead sport fishery, but this is not mentioned here.

S4-11 ES-11 ES.3.4: This section does not identify sport angling as a component of recreation activities on Lake Mead, or include any discussion of effects to that activity as a result of any of the project alternatives. Both direct construction impacts, and indirect construction effects such as displacement, noise and disturbance, during the October to March period could have significant impacts on sport fish species and on sport angling recreation activities. The fall and early winter months represent an important period for sport angling activity, particularly in the Boulder Basin, which continues through the winter months with shore angling for salmoind species.

S4-12 2-78 Table 2.8-1: Surface Water Quality impacts as described for the Boulder Island action alternatives in this table mention the reduction of nutrients into inner Las Vegas Bay but do not address the functional impact of this reduction, which is redistribution of this nutrient loading in Boulder Basin and potentially to locations downstream of Hoover Dam as implied by the increase in TP discharge through Hoover identified for all three action alternatives. The description for the Las Vegas Bay action alternative does not identify the functional reduction in nutrient loading to areas of Las Vegas Bay upstream of the proposed discharge point, which is a significant effect for those aquatic habitats.

S4-13 2-79 Table 2.8-1: The summaries of Biological Resources impacts for all action alternatives do not address the potential effects of nutrient redistribution to Boulder Basin and Colorado River aquatic habitats (see comment above) which is a potentially significant impact on all native and nonnative fish species in Lake Mead and downstream habitats.

S4-14 2-82 and 2-83 Table 2.8-2: This table is not tied to any narrative in Section 2 of the DEIS which would provide detail or explanation of the proposed mitigation measures. Specific to Biological Resources, it is unclear what aquatic species, if any would be

### S4-10

See General Response 9.

Information regarding the existing conditions and potential impacts to the sport fishery has been added to sections 3.2, 3.4, 4.2, and 4.4.

No change to the Executive Summary is required.

### S4-11

A description of sport fishing in Lake Mead has been added to Section 3.2.3.3 of the Final EIS. The potential impacts to fish are described in Section 4.2 and the potential impacts to sport fishing, as a recreational activity, is described in Section 4.4.

The Executive Summary has been updated as necessary.

### S4-12

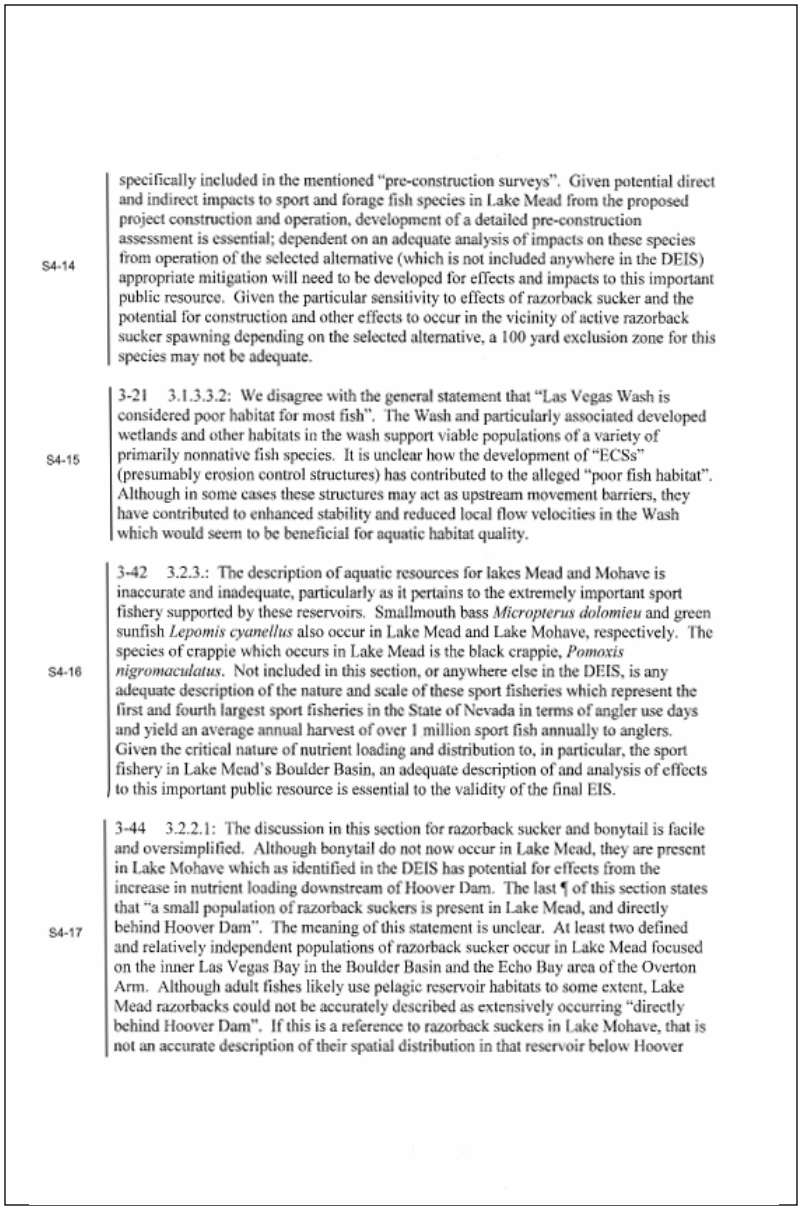
Table 2.9-1 of the Final EIS (formerly Table 2.8-1 of the Draft EIS) has been updated.

The descriptions of the pipeline alternatives have been revised to indicate that under normal operating conditions, the TP discharged to Lake Mead would not exceed 334 lbs/day on an annual average basis. Modeling indicates that there would be no change to the water quality downstream of Hoover Dam. Therefore, there would be no impact to aquatic species below Hoover Dam. The revised alternatives are described in Chapter 2 of the SCOP Final EIS, and potential impacts are described throughout Chapter 4.

The impacts to the inner Las Vegas Bay would be the same as those described for the Boulder Islands North Alternative in Section 4.2.2.

### S4-13

Table 2.9-1 of the Final EIS (formerly Table 2.8-1 of the Draft EIS) has been updated. However, the table presents only a brief summary of impacts. Additional information regarding potential impacts is presented in Section 4.2 of the Final EIS.



specifically included in the mentioned "pre-construction surveys". Given potential direct and indirect impacts to sport and forage fish species in Lake Mead from the proposed project construction and operation, development of a detailed pre-construction assessment is essential; dependent on an adequate analysis of impacts on these species from operation of the selected alternative (which is not included anywhere in the DEIS) appropriate mitigation will need to be developed for effects and impacts to this important public resource. Given the particular sensitivity to effects of razorback sucker and the potential for construction and other effects to occur in the vicinity of active razorback sucker spawning depending on the selected alternative, a 100 yard exclusion zone for this species may not be adequate.

S4-14

3-21 3.1.3.3.2: We disagree with the general statement that "Las Vegas Wash is considered poor habitat for most fish". The Wash and particularly associated developed wetlands and other habitats in the wash support viable populations of a variety of primarily nonnative fish species. It is unclear how the development of "ECSs" (presumably erosion control structures) has contributed to the alleged "poor fish habitat". Although in some cases these structures may act as upstream movement barriers, they have contributed to enhanced stability and reduced local flow velocities in the Wash which would seem to be beneficial for aquatic habitat quality.

S4-15

3-42 3.2.3.: The description of aquatic resources for lakes Mead and Mohave is inaccurate and inadequate, particularly as it pertains to the extremely important sport fishery supported by these reservoirs. Smallmouth bass *Micropterus dolomieu* and green sunfish *Lepomis cyanellus* also occur in Lake Mead and Lake Mohave, respectively. The species of crappie which occurs in Lake Mead is the black crappie, *Pomoxis nigromaculatus*. Not included in this section, or anywhere else in the DEIS, is any adequate description of the nature and scale of these sport fisheries which represent the first and fourth largest sport fisheries in the State of Nevada in terms of angler use days and yield an average annual harvest of over 1 million sport fish annually to anglers. Given the critical nature of nutrient loading and distribution to, in particular, the sport fishery in Lake Mead's Boulder Basin, an adequate description of and analysis of effects to this important public resource is essential to the validity of the final EIS.

S4-16

3-44 3.2.2.1: The discussion in this section for razorback sucker and bonytail is facile and oversimplified. Although bonytail do not now occur in Lake Mead, they are present in Lake Mohave which as identified in the DEIS has potential for effects from the increase in nutrient loading downstream of Hoover Dam. The last ¶ of this section states that "a small population of razorback suckers is present in Lake Mead, and directly behind Hoover Dam". The meaning of this statement is unclear. At least two defined and relatively independent populations of razorback sucker occur in Lake Mead focused on the inner Las Vegas Bay in the Boulder Basin and the Echo Bay area of the Overton Arm. Although adult fishes likely use pelagic reservoir habitats to some extent, Lake Mead razorbacks could not be accurately described as extensively occurring "directly behind Hoover Dam". If this is a reference to razorback suckers in Lake Mohave, that is not an accurate description of their spatial distribution in that reservoir below Hoover

S4-17

**(S4-13 continued)**

The reduction of effluent flows to the Las Vegas Wash would reduce the TP loading to the inner Las Vegas Bay. This would potentially impact fish in Boulder Basin by reducing the algae and forage fish abundance in the Las Vegas Bay. The likelihood of the fish adapting to new locations of effluent discharge, the availability and contribution of the discharge to primary production, and the time required to attain full utilization of the nutrients by fish is uncertain.

**S4-14**

The mitigation measures are described in the appropriate sections of Chapter 4. Table 2.9-2 of the Final EIS (formerly Table 2.8-2 of the Draft EIS) has been updated. However, the table presents a summary of mitigation measures. Additional information regarding the mitigation measures that would be implemented are presented in Section 4.2 of the Final EIS.

Pre-construction surveys for fish would not be conducted. Existing studies provide information regarding fish presence in the project area, and existing biological opinions do not require pre-construction fish surveys. However, should surveys be identified during the Section 7 consultation as an appropriate mitigation measure, surveys would be conducted.

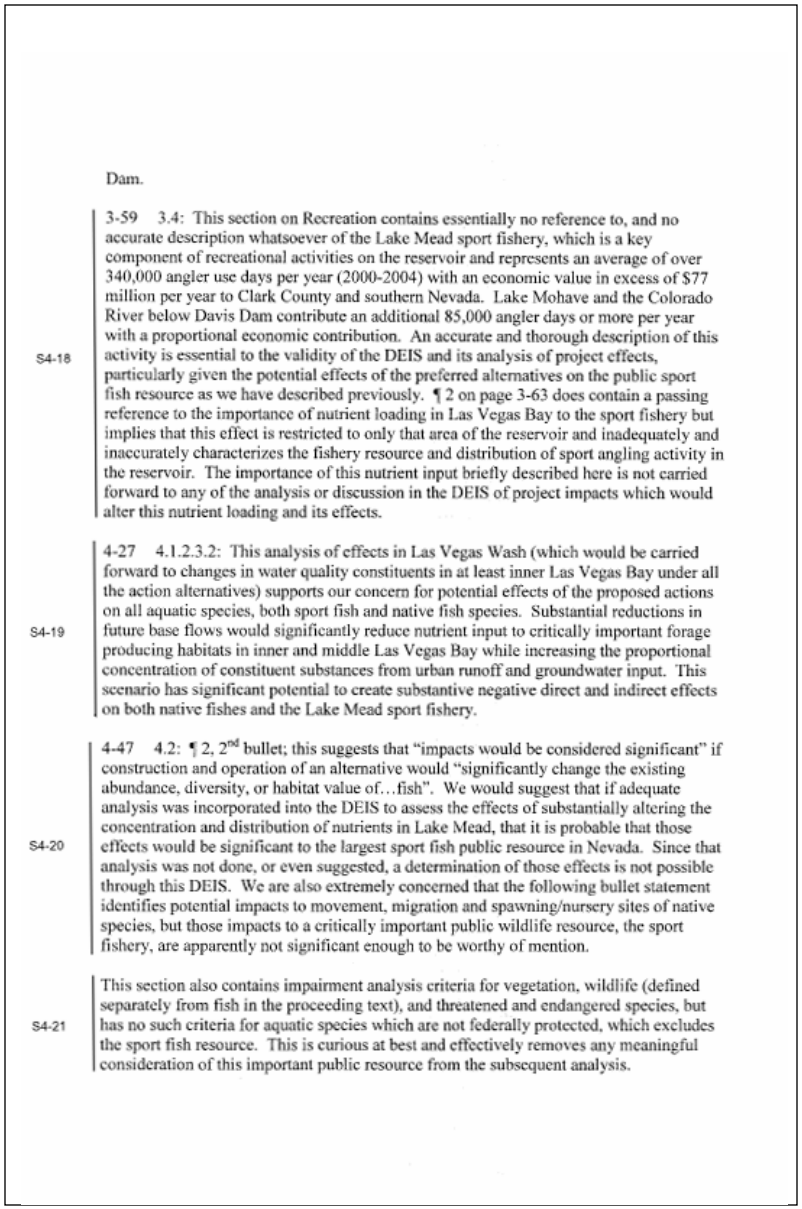
Existing biological opinions for projects in the vicinity of the proposed alternatives indicate that a 100-yard exclusion zone is adequate.

**S4-15**

The statement has been deleted. Please refer to Section 3.2.3 for descriptions of the sport fish and razorback sucker that exist in the Las Vegas Bay.

**S4-16**

A description of sport fishing in Lake Mead has been added to Section 3.2.3.3 of the Final EIS. The potential impacts to fish are described in Section 4.2 and the potential impacts to sport fishing, as a recreational activity, is described in Section 4.4.



Dam.

S4-18

3-59 3.4: This section on Recreation contains essentially no reference to, and no accurate description whatsoever of the Lake Mead sport fishery, which is a key component of recreational activities on the reservoir and represents an average of over 340,000 angler use days per year (2000-2004) with an economic value in excess of $77 million per year to Clark County and southern Nevada. Lake Mohave and the Colorado River below Davis Dam contribute an additional 85,000 angler days or more per year with a proportional economic contribution. An accurate and thorough description of this activity is essential to the validity of the DEIS and its analysis of project effects, particularly given the potential effects of the preferred alternatives on the public sport fish resource as we have described previously. ¶ 2 on page 3-63 does contain a passing reference to the importance of nutrient loading in Las Vegas Bay to the sport fishery but implies that this effect is restricted to only that area of the reservoir and inadequately and inaccurately characterizes the fishery resource and distribution of sport angling activity in the reservoir. The importance of this nutrient input briefly described here is not carried forward to any of the analysis or discussion in the DEIS of project impacts which would alter this nutrient loading and its effects.

S4-19

4-27 4.1.2.3.2: This analysis of effects in Las Vegas Wash (which would be carried forward to changes in water quality constituents in at least inner Las Vegas Bay under all the action alternatives) supports our concern for potential effects of the proposed actions on all aquatic species, both sport fish and native fish species. Substantial reductions in future base flows would significantly reduce nutrient input to critically important forage producing habitats in inner and middle Las Vegas Bay while increasing the proportional concentration of constituent substances from urban runoff and groundwater input. This scenario has significant potential to create substantive negative direct and indirect effects on both native fishes and the Lake Mead sport fishery.

S4-20

4-47 4.2: ¶ 2, 2nd bullet; this suggests that "impacts would be considered significant" if construction and operation of an alternative would "significantly change the existing abundance, diversity, or habitat value of…fish". We would suggest that if adequate analysis was incorporated into the DEIS to assess the effects of substantially altering the concentration and distribution of nutrients in Lake Mead, that it is probable that those effects would be significant to the largest sport fish public resource in Nevada. Since that analysis was not done, or even suggested, a determination of those effects is not possible through this DEIS. We are also extremely concerned that the following bullet statement identifies potential impacts to movement, migration and spawning/nursery sites of native species, but those impacts to a critically important public wildlife resource, the sport fishery, are apparently not significant enough to be worthy of mention.

S4-21

This section also contains impairment analysis criteria for vegetation, wildlife (defined separately from fish in the proceeding text), and threatened and endangered species, but has no such criteria for aquatic species which are not federally protected, which excludes the sport fish resource. This is curious at best and effectively removes any meaningful consideration of this important public resource from the subsequent analysis.

### S4-17

Corrections suggested in the comments regarding incorrect information have been incorporated into Section 3.2.3.1.

### S4-18

See response to comment S4-16.

### S4-19

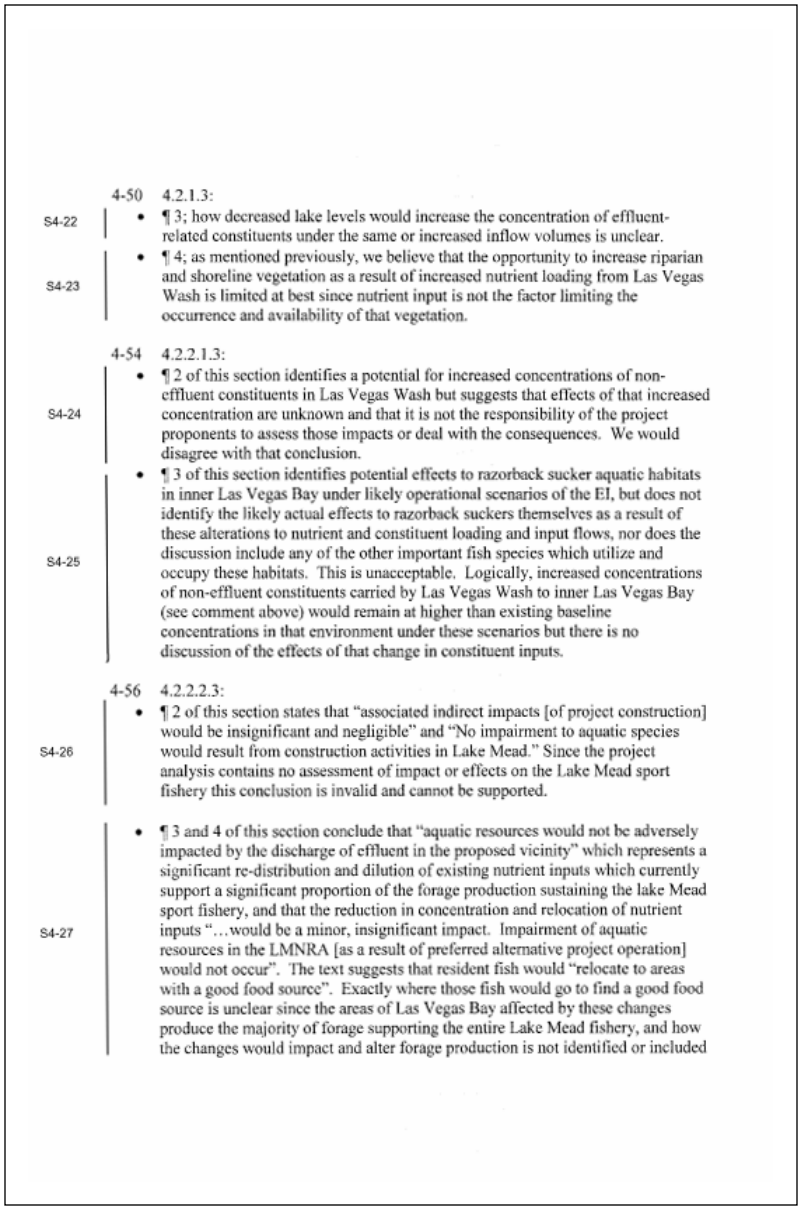
See response to comment S4-16.

### S4-20

See response to comment S4-16.

### S4-21

See response to comment S4-16.



4-50 4.2.1.3:

S4-22
- ¶ 3; how decreased lake levels would increase the concentration of effluent-related constituents under the same or increased inflow volumes is unclear.

S4-23
- ¶ 4; as mentioned previously, we believe that the opportunity to increase riparian and shoreline vegetation as a result of increased nutrient loading from Las Vegas Wash is limited at best since nutrient input is not the factor limiting the occurrence and availability of that vegetation.

4-54 4.2.2.1.3:

S4-24
- ¶ 2 of this section identifies a potential for increased concentrations of non-effluent constituents in Las Vegas Wash but suggests that effects of that increased concentration are unknown and that it is not the responsibility of the project proponents to assess those impacts or deal with the consequences. We would disagree with that conclusion.

S4-25
- ¶ 3 of this section identifies potential effects to razorback sucker aquatic habitats in inner Las Vegas Bay under likely operational scenarios of the EI, but does not identify the likely actual effects to razorback suckers themselves as a result of these alterations to nutrient and constituent loading and input flows, nor does the discussion include any of the other important fish species which utilize and occupy these habitats. This is unacceptable. Logically, increased concentrations of non-effluent constituents carried by Las Vegas Wash to inner Las Vegas Bay (see comment above) would remain at higher than existing baseline concentrations in that environment under these scenarios but there is no discussion of the effects of that change in constituent inputs.

4-56 4.2.2.2.3:

S4-26
- ¶ 2 of this section states that "associated indirect impacts [of project construction] would be insignificant and negligible" and "No impairment to aquatic species would result from construction activities in Lake Mead." Since the project analysis contains no assessment of impact or effects on the Lake Mead sport fishery this conclusion is invalid and cannot be supported.

S4-27
- ¶ 3 and 4 of this section conclude that "aquatic resources would not be adversely impacted by the discharge of effluent in the proposed vicinity" which represents a significant re-distribution and dilution of existing nutrient inputs which currently support a significant proportion of the forage production sustaining the lake Mead sport fishery, and that the reduction in concentration and relocation of nutrient inputs "…would be a minor, insignificant impact. Impairment of aquatic resources in the LMNRA [as a result of preferred alternative project operation] would not occur". The text suggests that resident fish would "relocate to areas with a good food source". Exactly where those fish would go to find a good food source is unclear since the areas of Las Vegas Bay affected by these changes produce the majority of forage supporting the entire Lake Mead fishery, and how the changes would impact and alter forage production is not identified or included

### S4-22

The text in Section 4.2.1.3 clearly states that "…the nutrient loading in conjunction with the lowering water levels in Lake Mead may create less than favorable conditions for aquatic fauna because dilution of effluent-related constituents would be reduced." The key word is "dilution". At a Lake level of 1,000 ft, less dilution of treated effluent would occur because less water would be present in the Las Vegas Bay. At low Lake levels, the Las Vegas Bay becomes an almost isolated area. See Figure 4.1-1 of the Draft and Final EIS.

### S4-23

As of February 2005, nine ECSs have been constructed throughout the Las Vegas Wash. A total of 22 ECSs are planned by SNWA for placement in the Las Vegas Wash. These structures help stabilize sections of the channel by slowing down the flow of water. Ponds are created behind the structures allowing for establishment of wetland and riparian plants. Increased effluent discharges to the Las Vegas Wash would thereby increase the size of the ponding areas and the amount of associated vegetation.

### S4-24

See General Response 11.

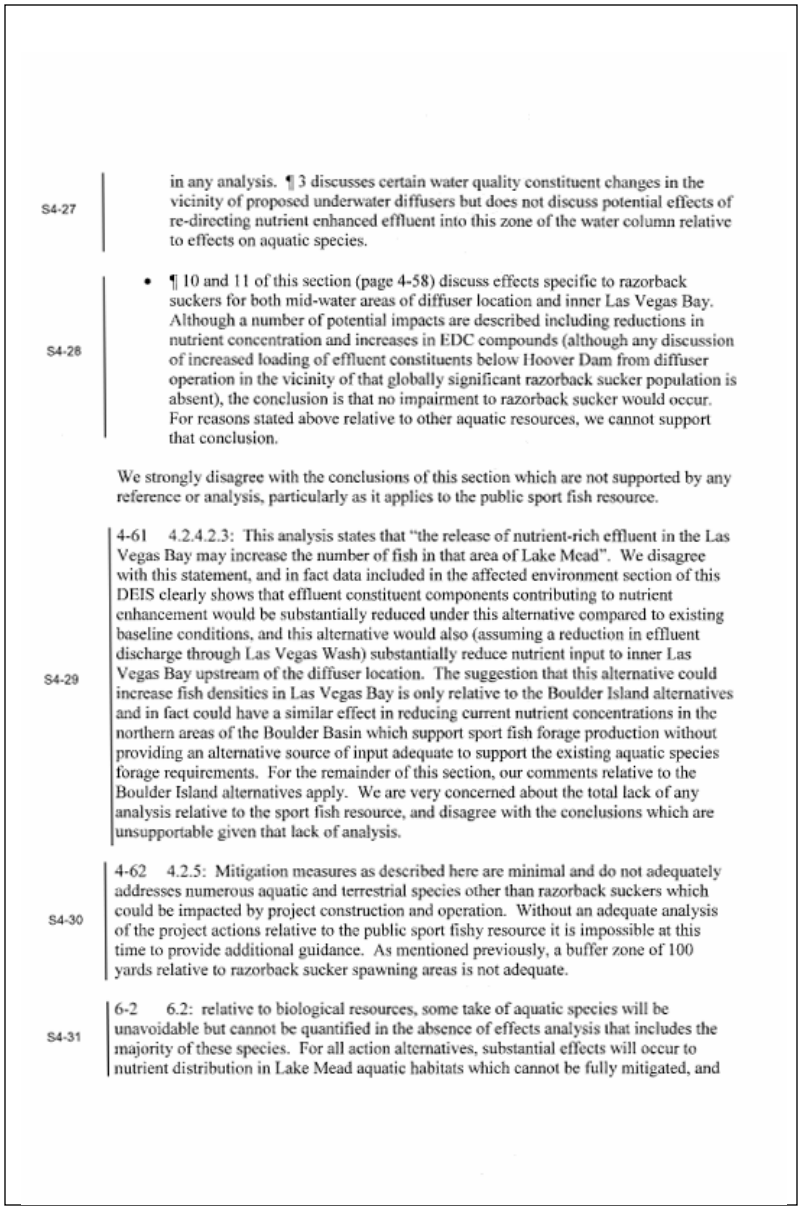
### S4-25

See General Response 11.

See General Response 9.

### S4-26

The information addressing the existing conditions and the effects of the proposed SCOP construction on fish and their habitat in Lake Mead have been inserted into the Final EIS in Section 4.2.2.2.3. The effects of these activities would be short-term, negative impacts to benthic organisms in the immediate area. The area would recolonize with organisms that move in once construction activities cease.



S4-27 in any analysis. ¶ 3 discusses certain water quality constituent changes in the vicinity of proposed underwater diffusers but does not discuss potential effects of re-directing nutrient enhanced effluent into this zone of the water column relative to effects on aquatic species.

S4-28 • ¶ 10 and 11 of this section (page 4-58) discuss effects specific to razorback suckers for both mid-water areas of diffuser location and inner Las Vegas Bay. Although a number of potential impacts are described including reductions in nutrient concentration and increases in EDC compounds (although any discussion of increased loading of effluent constituents below Hoover Dam from diffuser operation in the vicinity of that globally significant razorback sucker population is absent), the conclusion is that no impairment to razorback sucker would occur. For reasons stated above relative to other aquatic resources, we cannot support that conclusion.

We strongly disagree with the conclusions of this section which are not supported by any reference or analysis, particularly as it applies to the public sport fish resource.

S4-29 4-61 4.2.4.2.3: This analysis states that "the release of nutrient-rich effluent in the Las Vegas Bay may increase the number of fish in that area of Lake Mead". We disagree with this statement, and in fact data included in the affected environment section of this DEIS clearly shows that effluent constituent components contributing to nutrient enhancement would be substantially reduced under this alternative compared to existing baseline conditions, and this alternative would also (assuming a reduction in effluent discharge through Las Vegas Wash) substantially reduce nutrient input to inner Las Vegas Bay upstream of the diffuser location. The suggestion that this alternative could increase fish densities in Las Vegas Bay is only relative to the Boulder Island alternatives and in fact could have a similar effect in reducing current nutrient concentrations in the northern areas of the Boulder Basin which support sport fish forage production without providing an alternative source of input adequate to support the existing aquatic species forage requirements. For the remainder of this section, our comments relative to the Boulder Island alternatives apply. We are very concerned about the total lack of any analysis relative to the sport fish resource, and disagree with the conclusions which are unsupportable given that lack of analysis.

S4-30 4-62 4.2.5: Mitigation measures as described here are minimal and do not adequately addresses numerous aquatic and terrestrial species other than razorback suckers which could be impacted by project construction and operation. Without an adequate analysis of the project actions relative to the public sport fishy resource it is impossible at this time to provide additional guidance. As mentioned previously, a buffer zone of 100 yards relative to razorback sucker spawning areas is not adequate.

S4-31 6-2 6.2: relative to biological resources, some take of aquatic species will be unavoidable but cannot be quantified in the absence of effects analysis that includes the majority of these species. For all action alternatives, substantial effects will occur to nutrient distribution in Lake Mead aquatic habitats which cannot be fully mitigated, and

### S4-27

Corrections suggested in the comments regarding incorrect information have been incorporated into Section 3.2.3.1 and Appendix E.

### S4-28

See response to comment S4-27.

### S4-29

See General Response 9.

### S4-30

The information addressing the impacts of the proposed SCOP and mitigation measures to reduce impacts to aquatic species in Lake Mead have been inserted into the Final EIS in Section 4.2.

Existing biological opinions for projects in the vicinity of the proposed alternatives indicate that a 100-yard exclusion zone is adequate.

### S4-31

Text has been added to Section 6.2.

we believe that those effects could represent a substantial adverse change to existing environmental conditions.

E-1 E.1: there is no mention of any review of existing literature or reports relative to the existing, substantial sport and forage fish resource in Lake Mead or Lake Mohave, including a substantial body of peer review literature available on similar sport fisheries in large reservoir environments, other than the Allan and Roden (1978) report which is substantially out of date. No effort was made to coordinate with or contact the Nevada Department of Wildlife to obtain available current reports on the Lake Mead and Lake Mohave sport fisheries or other relevant information. This represents a significant and substantive lapse on the part of the contractor in both methodology and sourcing of information to perform an adequate environmental and biological assessment and effects analysis, since relevant information on the vast majority of aquatic species occurring within the project area was excluded from collection and analysis. While these species are not sensitive, threatened or endangered species, they are classified status species under Nevada statues and represent an important public resource potentially affected by the proposed actions.

S4-32

Thank you for the opportunity to comment on the DEIS document. If you have any questions relative to our comments please contact me at our Las Vegas office (702-486-5127 x3300).

Sincerely,
TERRY R. CRAWFORTH, DIRECTOR

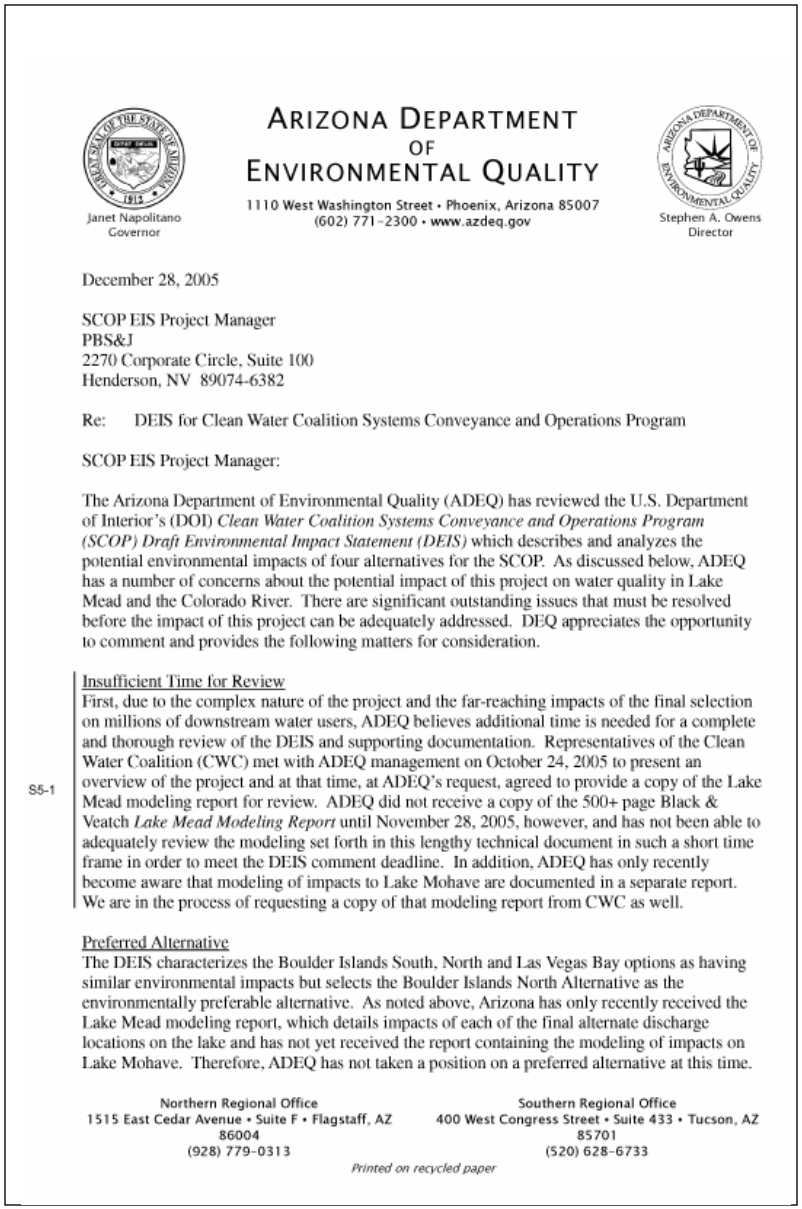
Jon C. Sjöberg
Supervising Fisheries Biologist

c: 300, 600
3315, 3600, 3700
USBR
NPS - LAME
USFWS-ES Las Vegas Field Office

**S4-32**

See response to comment S4-16.

The description of the pipeline alternatives has been revised to indicate that under normal operating conditions, the TP discharged to Lake Mead would not exceed 334 lbs/day on an annual average basis. Therefore, there would be no impact to aquatic species below Hoover Dam. The revised alternatives are described in Chapter 2 of the SCOP Final EIS, and potential impacts are described throughout Chapter 4.



ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
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Janet Napolitano
Governor

Stephen A. Owens
Director

December 28, 2005

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074-6382

Re: DEIS for Clean Water Coalition Systems Conveyance and Operations Program

SCOP EIS Project Manager:

The Arizona Department of Environmental Quality (ADEQ) has reviewed the U.S. Department of Interior's (DOI) *Clean Water Coalition Systems Conveyance and Operations Program (SCOP) Draft Environmental Impact Statement (DEIS)* which describes and analyzes the potential environmental impacts of four alternatives for the SCOP. As discussed below, ADEQ has a number of concerns about the potential impact of this project on water quality in Lake Mead and the Colorado River. There are significant outstanding issues that must be resolved before the impact of this project can be adequately addressed. DEQ appreciates the opportunity to comment and provides the following matters for consideration.

S5-1

Insufficient Time for Review

First, due to the complex nature of the project and the far-reaching impacts of the final selection on millions of downstream water users, ADEQ believes additional time is needed for a complete and thorough review of the DEIS and supporting documentation. Representatives of the Clean Water Coalition (CWC) met with ADEQ management on October 24, 2005 to present an overview of the project and at that time, at ADEQ's request, agreed to provide a copy of the Lake Mead modeling report for review. ADEQ did not receive a copy of the 500+ page Black & Veatch *Lake Mead Modeling Report* until November 28, 2005, however, and has not been able to adequately review the modeling set forth in this lengthy technical document in such a short time frame in order to meet the DEIS comment deadline. In addition, ADEQ has only recently become aware that modeling of impacts to Lake Mohave are documented in a separate report. We are in the process of requesting a copy of that modeling report from CWC as well.

Preferred Alternative

The DEIS characterizes the Boulder Islands South, North and Las Vegas Bay options as having similar environmental impacts but selects the Boulder Islands North Alternative as the environmentally preferable alternative. As noted above, Arizona has only recently received the Lake Mead modeling report, which details impacts of each of the final alternate discharge locations on the lake and has not yet received the report containing the modeling of impacts on Lake Mohave. Therefore, ADEQ has not taken a position on a preferred alternative at this time.

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1515 East Cedar Avenue • Suite F • Flagstaff, AZ 86004
(928) 779-0313

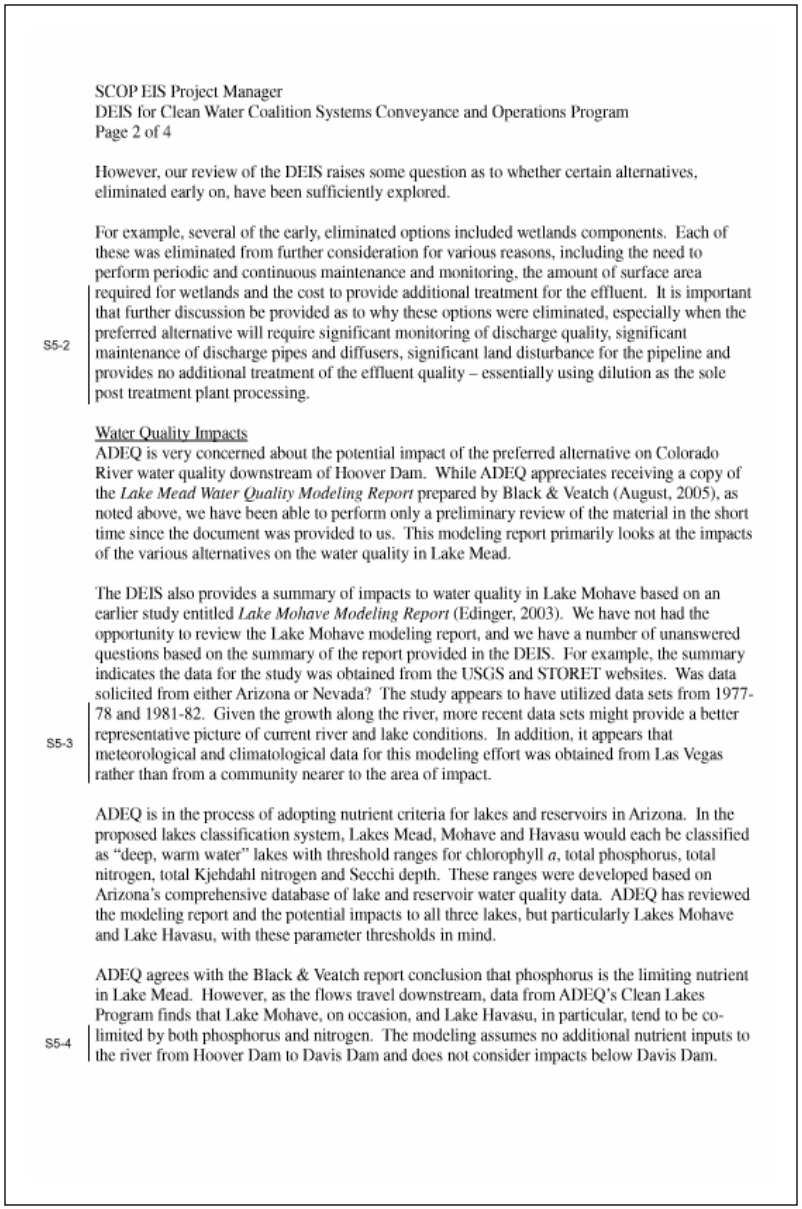
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400 West Congress Street • Suite 433 • Tucson, AZ 85701
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**Response S5** Arizona Department of Environmental Quality (State of Arizona)

**S5-1**

The Draft EIS was distributed for review between September 27 and September 30, 2005. The modeling reports were not distributed with the Draft EIS because of their size. The public comment period for the SCOP Draft EIS was informally extended 16 days and comments were accepted through January 30, 2006.



SCOP EIS Project Manager
DEIS for Clean Water Coalition Systems Conveyance and Operations Program
Page 2 of 4

However, our review of the DEIS raises some question as to whether certain alternatives, eliminated early on, have been sufficiently explored.

For example, several of the early, eliminated options included wetlands components. Each of these was eliminated from further consideration for various reasons, including the need to perform periodic and continuous maintenance and monitoring, the amount of surface area required for wetlands and the cost to provide additional treatment for the effluent. It is important that further discussion be provided as to why these options were eliminated, especially when the preferred alternative will require significant monitoring of discharge quality, significant maintenance of discharge pipes and diffusers, significant land disturbance for the pipeline and provides no additional treatment of the effluent quality – essentially using dilution as the sole post treatment plant processing.

S5-2

Water Quality Impacts

ADEQ is very concerned about the potential impact of the preferred alternative on Colorado River water quality downstream of Hoover Dam. While ADEQ appreciates receiving a copy of the *Lake Mead Water Quality Modeling Report* prepared by Black & Veatch (August, 2005), as noted above, we have been able to perform only a preliminary review of the material in the short time since the document was provided to us. This modeling report primarily looks at the impacts of the various alternatives on the water quality in Lake Mead.

The DEIS also provides a summary of impacts to water quality in Lake Mohave based on an earlier study entitled *Lake Mohave Modeling Report* (Edinger, 2003). We have not had the opportunity to review the Lake Mohave modeling report, and we have a number of unanswered questions based on the summary of the report provided in the DEIS. For example, the summary indicates the data for the study was obtained from the USGS and STORET websites. Was data solicited from either Arizona or Nevada? The study appears to have utilized data sets from 1977-78 and 1981-82. Given the growth along the river, more recent data sets might provide a better representative picture of current river and lake conditions. In addition, it appears that meteorological and climatological data for this modeling effort was obtained from Las Vegas rather than from a community nearer to the area of impact.

S5-3

ADEQ is in the process of adopting nutrient criteria for lakes and reservoirs in Arizona. In the proposed lakes classification system, Lakes Mead, Mohave and Havasu would each be classified as "deep, warm water" lakes with threshold ranges for chlorophyll *a*, total phosphorus, total nitrogen, total Kjehdahl nitrogen and Secchi depth. These ranges were developed based on Arizona's comprehensive database of lake and reservoir water quality data. ADEQ has reviewed the modeling report and the potential impacts to all three lakes, but particularly Lakes Mohave and Lake Havasu, with these parameter thresholds in mind.

ADEQ agrees with the Black & Veatch report conclusion that phosphorus is the limiting nutrient in Lake Mead. However, as the flows travel downstream, data from ADEQ's Clean Lakes Program finds that Lake Mohave, on occasion, and Lake Havasu, in particular, tend to be co-limited by both phosphorus and nitrogen. The modeling assumes no additional nutrient inputs to the river from Hoover Dam to Davis Dam and does not consider impacts below Davis Dam.

S5-4

### S5-2

The wetlands options that were eliminated included the continued discharge of highly treated effluent to the Las Vegas Wash. This does not meet the requirement for flexibility in management of effluents that is a primary component of the purpose and need for the proposed project. Text has been added to Section 2.7, where appropriate, to clarify that the option does not meet the purpose and need for the project. Although many of the reasons for elimination are similar to actions that will be needed for the alternatives carried forward, they are not the only reasons for elimination that were taken into consideration. The amount of surface area, land required, and land-use changed for the wetland options would be permanent, while the surface disturbance for the proposed alternatives would be predominantly temporary.

See General Response 3.

See General Response 8.

### S5-3

The data available from all agencies with monitoring stations was assessed. The water quality reports completed by UNLV and Reclamation from 1977 through 1982 are considered the most complete analysis for Lake Mohave that is available. This was reviewed with the Modeling Committee and deemed to be an acceptable data source.

The climatological data presented in the Draft and Final EIS represents the Lake Mohave area as well as the Lake Mead area**.** Lake Mohave used the McCarran Airport weather data coupled with the data from Sentinel Island. The Lake Mohave model, since it is two dimensional is not as sensitive to the weather as the 3-dimensional model. The Lake Mohave Model was used to gage the assimilation capacity of Lake Mohave for TP and nitrogen. This analysis is not weather sensitive.

### S5-4

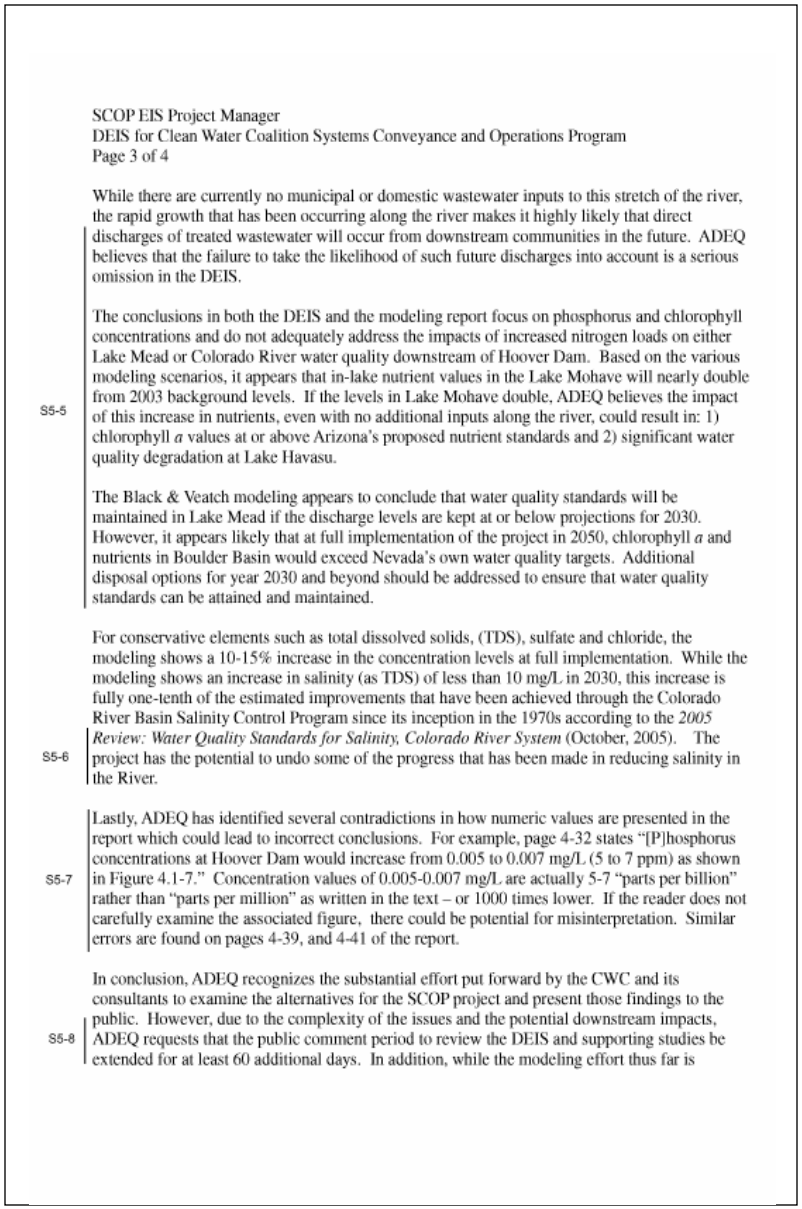
See General Response 8.

As described in Section 4.1, water quality modeling indicates that the TP loading through Hoover Dam would increase by 1 ppb if the TP discharged from the diffuser

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**(S5-4 continued)**

does not exceed 334 lbs/day on an annual average basis. Despite this increase, phosphorus concentrations below Hoover Dam would remain well below historic concentrations (the past three decades), during which no negative consequences were identified in the Colorado River below Hoover Dam, including below Davis Dam.



SCOP EIS Project Manager
DEIS for Clean Water Coalition Systems Conveyance and Operations Program
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While there are currently no municipal or domestic wastewater inputs to this stretch of the river, the rapid growth that has been occurring along the river makes it highly likely that direct discharges of treated wastewater will occur from downstream communities in the future. ADEQ believes that the failure to take the likelihood of such future discharges into account is a serious omission in the DEIS.

The conclusions in both the DEIS and the modeling report focus on phosphorus and chlorophyll concentrations and do not adequately address the impacts of increased nitrogen loads on either Lake Mead or Colorado River water quality downstream of Hoover Dam. Based on the various modeling scenarios, it appears that in-lake nutrient values in the Lake Mohave will nearly double from 2003 background levels. If the levels in Lake Mohave double, ADEQ believes the impact S5-5 of this increase in nutrients, even with no additional inputs along the river, could result in: 1) chlorophyll *a* values at or above Arizona's proposed nutrient standards and 2) significant water quality degradation at Lake Havasu.

The Black & Veatch modeling appears to conclude that water quality standards will be maintained in Lake Mead if the discharge levels are kept at or below projections for 2030. However, it appears likely that at full implementation of the project in 2050, chlorophyll *a* and nutrients in Boulder Basin would exceed Nevada's own water quality targets. Additional disposal options for year 2030 and beyond should be addressed to ensure that water quality standards can be attained and maintained.

For conservative elements such as total dissolved solids, (TDS), sulfate and chloride, the modeling shows a 10-15% increase in the concentration levels at full implementation. While the modeling shows an increase in salinity (as TDS) of less than 10 mg/L in 2030, this increase is fully one-tenth of the estimated improvements that have been achieved through the Colorado River Basin Salinity Control Program since its inception in the 1970s according to the *2005 Review: Water Quality Standards for Salinity, Colorado River System* (October, 2005). The S5-6 project has the potential to undo some of the progress that has been made in reducing salinity in the River.

Lastly, ADEQ has identified several contradictions in how numeric values are presented in the report which could lead to incorrect conclusions. For example, page 4-32 states "[P]hosphorus concentrations at Hoover Dam would increase from 0.005 to 0.007 mg/L (5 to 7 ppm) as shown S5-7 in Figure 4.1-7." Concentration values of 0.005-0.007 mg/L are actually 5-7 "parts per billion" rather than "parts per million" as written in the text – or 1000 times lower. If the reader does not carefully examine the associated figure, there could be potential for misinterpretation. Similar errors are found on pages 4-39, and 4-41 of the report.

In conclusion, ADEQ recognizes the substantial effort put forward by the CWC and its consultants to examine the alternatives for the SCOP project and present those findings to the public. However, due to the complexity of the issues and the potential downstream impacts, S5-8 ADEQ requests that the public comment period to review the DEIS and supporting studies be extended for at least 60 additional days. In addition, while the modeling effort thus far is

### S5-5

The discharge of wastewater from the Laughlin Wastewater Reclamation Facility to the lower Colorado River has been included in the cumulative impacts analysis presented in Chapter 5 of the Final EIS. However, we were unable to obtain information regarding future plans for additional wastewater discharges to the lower Colorado River from other sources. Reclamation's NEPA guidance (Reclamation 1990) states, "Future cumulative impacts should not normally be speculative, but based on known long-range plans and other plans developed by agencies, organizations, or individuals." Therefore, speculation regarding future wastewater discharges to the lower Colorado River is inappropriate.

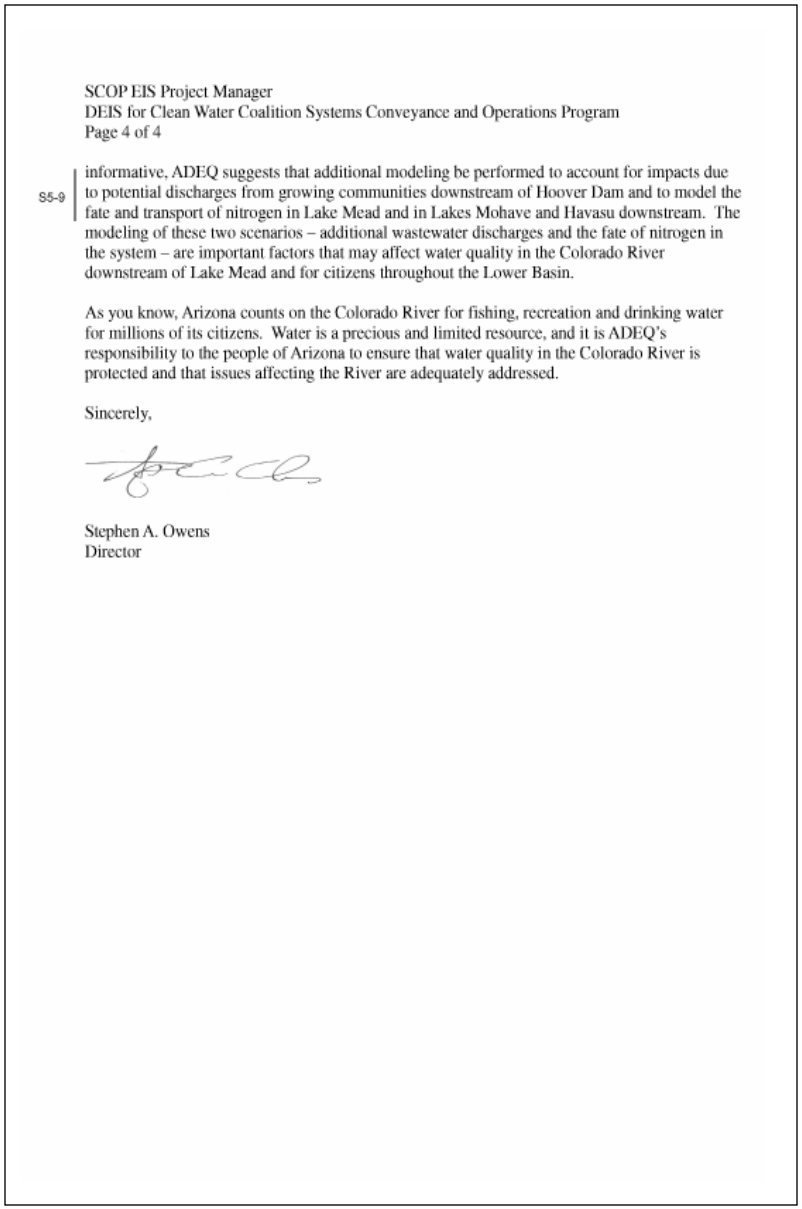
The Draft EIS provides model results of the nitrogen concentrations in Lake Mead. The annual average concentrations for Total Nitrogen, TIN, Nitrate, and Total Ammonia Nitrogen are presented in numerous tables in Chapter 4 and Appendix D of the Draft EIS. While the nitrogen concentrations increase with additional effluent loading there is not an impact on algal growth in the Lake, since the Lake is phosphorus limited, which means that growth of algae is controlled by the phosphorus concentration. In terms of meeting water quality standards, the No Action Alternative would have exceedances in the Las Vegas Bay, of the RMHQ water quality standard for TIN (95 percent of samples $\leq$ 4.5 mg/L [Table 3.1-2 of the Draft EIS]), due to the lack of sufficient dilution of the increased effluent flows entering via the Las Vegas Wash. Conversely, the modeling indicates that the Las Vegas Bay and Boulder Islands alternatives *would* meet the RMHQ TIN water quality standards. These issues are discussed in Section 4.1.5.3 of the Draft EIS and Section 6.4.2 of the Lake Mead Modeling Report, which is available upon request.

By limiting the loading through the diffuser to 334 lbs/day the nutrient values in Lake Mohave would not increase. The treatment processes would be enhanced as necessary to avoid exceeding Nevada's Water Quality Standards.

See General Response 10.

### S5-6

The ELCOM/CAEDYM modeling indicates no significant differences in the TDS (and hence salinity) concentrations passing through Hoover Dam between the baseline case and any of the alternatives. This is a result of the fact that salinity is a



SCOP EIS Project Manager
DEIS for Clean Water Coalition Systems Conveyance and Operations Program
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S5-9 informative, ADEQ suggests that additional modeling be performed to account for impacts due to potential discharges from growing communities downstream of Hoover Dam and to model the fate and transport of nitrogen in Lake Mead and in Lakes Mohave and Havasu downstream. The modeling of these two scenarios – additional wastewater discharges and the fate of nitrogen in the system – are important factors that may affect water quality in the Colorado River downstream of Lake Mead and for citizens throughout the Lower Basin.

As you know, Arizona counts on the Colorado River for fishing, recreation and drinking water for millions of its citizens. Water is a precious and limited resource, and it is ADEQ's responsibility to the people of Arizona to ensure that water quality in the Colorado River is protected and that issues affecting the River are adequately addressed.

Sincerely,

Stephen A. Owens
Director

**(S5-6 continued)**

conserved (non-decaying) substance and the amount of salinity in the system are relatively independent of the discharge point.

**S5-7**

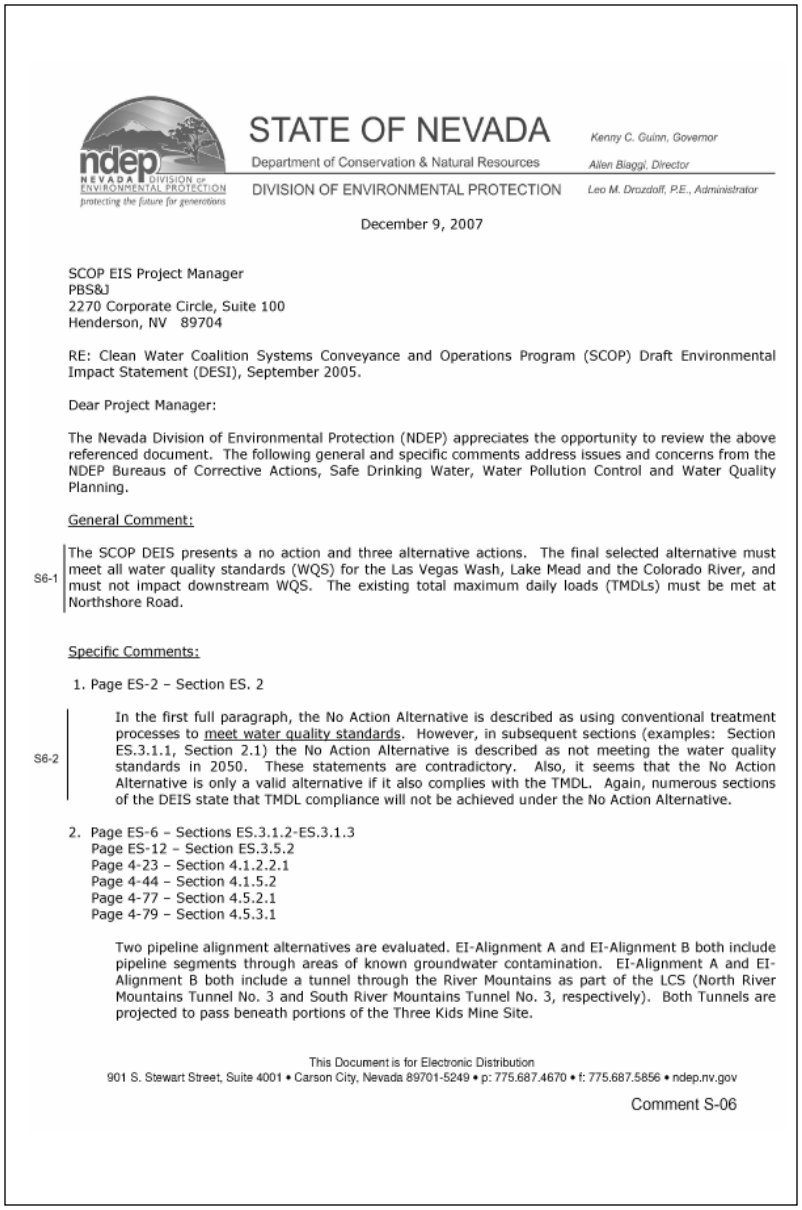
The numbers and units have been corrected throughout the Final EIS.

**S5-8**

See response to comment S5-1.

**S5-9**

See response to comment S5-3.



STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION

Kenny C. Guinn, Governor
Allen Biaggi, Director
Leo M. Drozdoff, P.E., Administrator

December 9, 2007

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89704

RE: Clean Water Coalition Systems Conveyance and Operations Program (SCOP) Draft Environmental Impact Statement (DESI), September 2005.

Dear Project Manager:

The Nevada Division of Environmental Protection (NDEP) appreciates the opportunity to review the above referenced document. The following general and specific comments address issues and concerns from the NDEP Bureaus of Corrective Actions, Safe Drinking Water, Water Pollution Control and Water Quality Planning.

General Comment:

S6-1 The SCOP DEIS presents a no action and three alternative actions. The final selected alternative must meet all water quality standards (WQS) for the Las Vegas Wash, Lake Mead and the Colorado River, and must not impact downstream WQS. The existing total maximum daily loads (TMDLs) must be met at Northshore Road.

Specific Comments:

1. Page ES-2 – Section ES. 2

S6-2 In the first full paragraph, the No Action Alternative is described as using conventional treatment processes to meet water quality standards. However, in subsequent sections (examples: Section ES.3.1.1, Section 2.1) the No Action Alternative is described as not meeting the water quality standards in 2050. These statements are contradictory. Also, it seems that the No Action Alternative is only a valid alternative if it also complies with the TMDL. Again, numerous sections of the DEIS state that TMDL compliance will not be achieved under the No Action Alternative.

2. Page ES-6 – Sections ES.3.1.2-ES.3.1.3
Page ES-12 – Section ES.3.5.2
Page 4-23 – Section 4.1.2.2.1
Page 4-44 – Section 4.1.5.2
Page 4-77 – Section 4.5.2.1
Page 4-79 – Section 4.5.3.1

Two pipeline alignment alternatives are evaluated. EI-Alignment A and EI-Alignment B both include pipeline segments through areas of known groundwater contamination. EI-Alignment A and EI-Alignment B both include a tunnel through the River Mountains as part of the LCS (North River Mountains Tunnel No. 3 and South River Mountains Tunnel No. 3, respectively). Both Tunnels are projected to pass beneath portions of the Three Kids Mine Site.

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Comment S-06

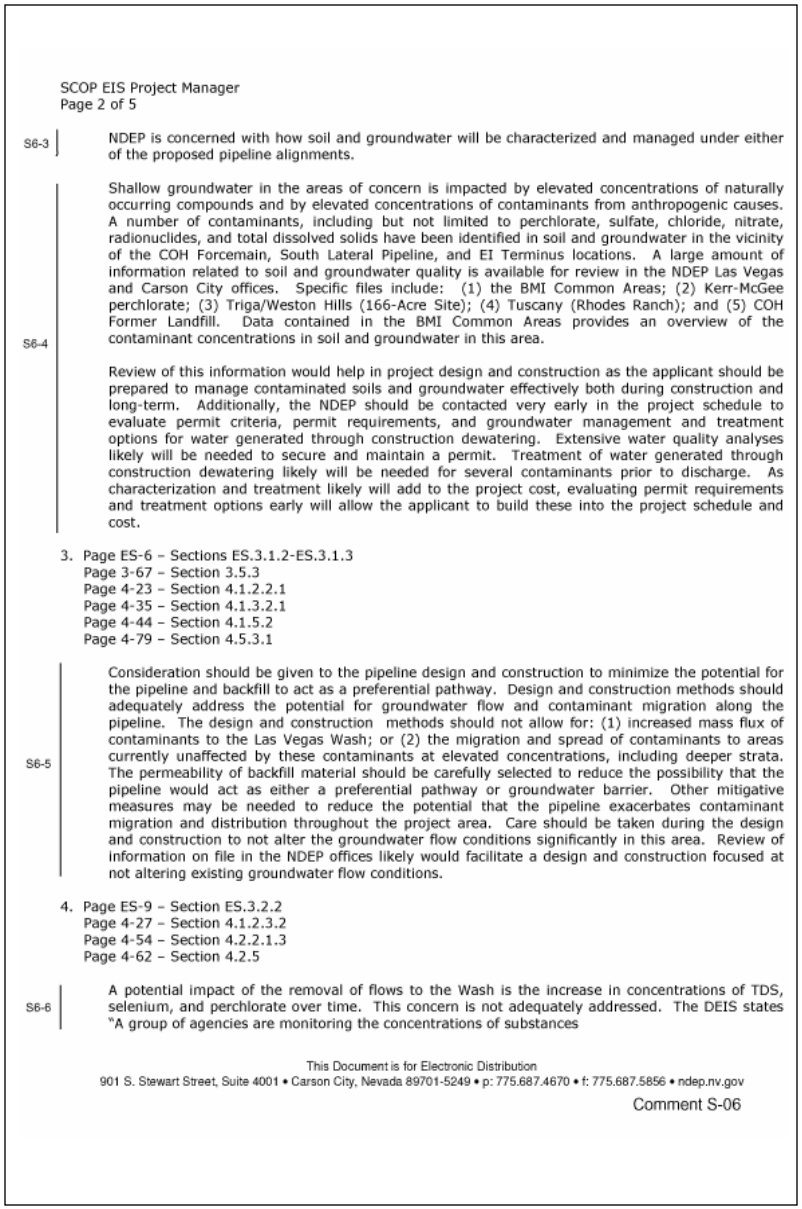
**Response S-6** Nevada Division of Environmental Protection (State of Nevada)

**S6-1**

The discharges from the three treatment plants would continue to meet water quality standards for the Las Vegas Wash, Lake Mead, Colorado River. The TMDL will continue to be met at Northshore Road.

**S6-2**

The Executive Summary has been revised.



SCOP EIS Project Manager
Page 2 of 5

S6-3 NDEP is concerned with how soil and groundwater will be characterized and managed under either of the proposed pipeline alignments.

S6-4 Shallow groundwater in the areas of concern is impacted by elevated concentrations of naturally occurring compounds and by elevated concentrations of contaminants from anthropogenic causes. A number of contaminants, including but not limited to perchlorate, sulfate, chloride, nitrate, radionuclides, and total dissolved solids have been identified in soil and groundwater in the vicinity of the COH Forcemain, South Lateral Pipeline, and EI Terminus locations. A large amount of information related to soil and groundwater quality is available for review in the NDEP Las Vegas and Carson City offices. Specific files include: (1) the BMI Common Areas; (2) Kerr-McGee perchlorate; (3) Triga/Weston Hills (166-Acre Site); (4) Tuscany (Rhodes Ranch); and (5) COH Former Landfill. Data contained in the BMI Common Areas provides an overview of the contaminant concentrations in soil and groundwater in this area.

Review of this information would help in project design and construction as the applicant should be prepared to manage contaminated soils and groundwater effectively both during construction and long-term. Additionally, the NDEP should be contacted very early in the project schedule to evaluate permit criteria, permit requirements, and groundwater management and treatment options for water generated through construction dewatering. Extensive water quality analyses likely will be needed to secure and maintain a permit. Treatment of water generated through construction dewatering likely will be needed for several contaminants prior to discharge. As characterization and treatment likely will add to the project cost, evaluating permit requirements and treatment options early will allow the applicant to build these into the project schedule and cost.

3. Page ES-6 – Sections ES.3.1.2-ES.3.1.3
Page 3-67 – Section 3.5.3
Page 4-23 – Section 4.1.2.2.1
Page 4-35 – Section 4.1.3.2.1
Page 4-44 – Section 4.1.5.2
Page 4-79 – Section 4.5.3.1

S6-5 Consideration should be given to the pipeline design and construction to minimize the potential for the pipeline and backfill to act as a preferential pathway. Design and construction methods should adequately address the potential for groundwater flow and contaminant migration along the pipeline. The design and construction methods should not allow for: (1) increased mass flux of contaminants to the Las Vegas Wash; or (2) the migration and spread of contaminants to areas currently unaffected by these contaminants at elevated concentrations, including deeper strata. The permeability of backfill material should be carefully selected to reduce the possibility that the pipeline would act as either a preferential pathway or groundwater barrier. Other mitigative measures may be needed to reduce the potential that the pipeline exacerbates contaminant migration and distribution throughout the project area. Care should be taken during the design and construction to not alter the groundwater flow conditions significantly in this area. Review of information on file in the NDEP offices likely would facilitate a design and construction focused at not altering existing groundwater flow conditions.

4. Page ES-9 – Section ES.3.2.2
Page 4-27 – Section 4.1.2.3.2
Page 4-54 – Section 4.2.2.1.3
Page 4-62 – Section 4.2.5

S6-6 A potential impact of the removal of flows to the Wash is the increase in concentrations of TDS, selenium, and perchlorate over time. This concern is not adequately addressed. The DEIS states "A group of agencies are monitoring the concentrations of substances

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Comment S-06

### S6-3

All required permits for handling potential groundwater and soil contamination will be acquired before construction. In addition, all required mitigation measures will be implemented in accordance with NDEP and EPA guidelines. Text has been added to the specified sections of the Final EIS.

The Executive Summary has been revised.

### S6-4

See response to comment S6-3.

The CWC member agencies and/or their designated contractor will contact NDEP early in the project schedule to identify permit requirements.

### S6-5

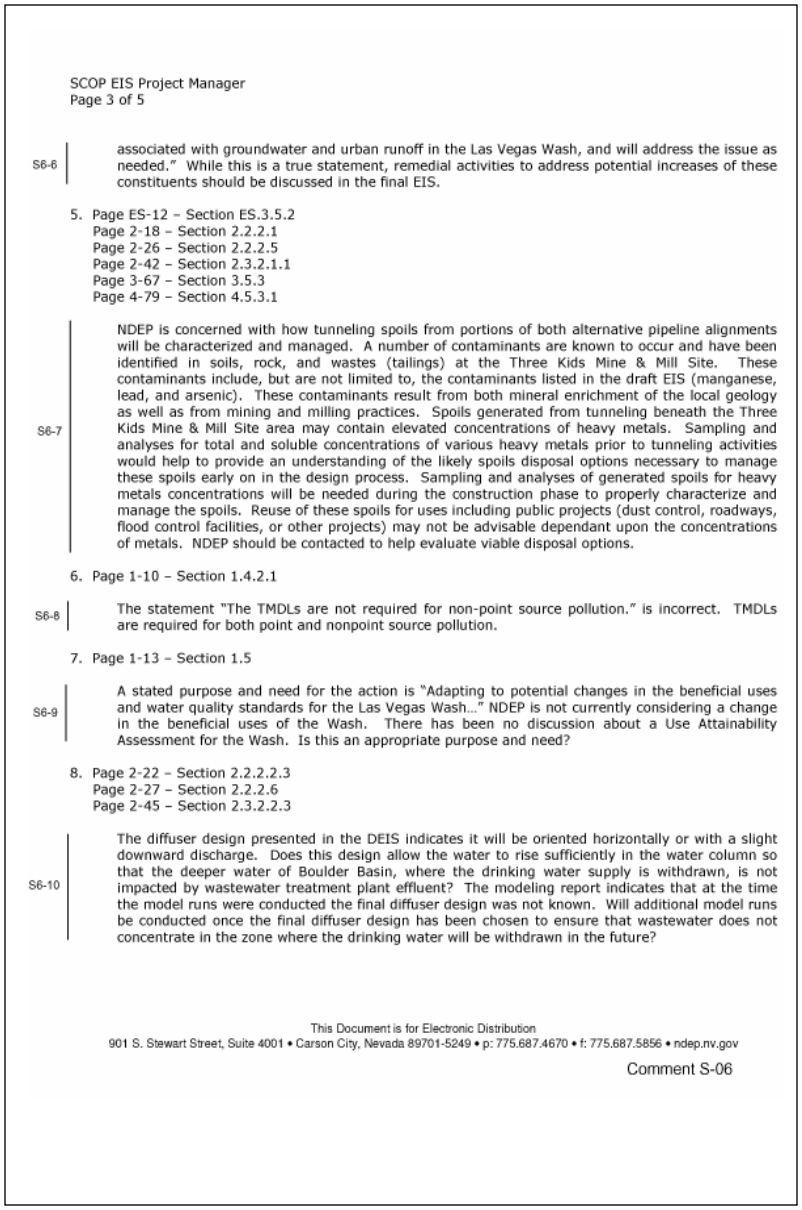
As described in Section 4.1.5.2, backfill of suitable permeability would be used to avoid the potential impact to the groundwater system. Text has been added to Section 4.1.6.2 stating that additional mitigation measures may be implemented as specified by NDEP to reduce the potential for contaminant migration.

The CWC member agencies and/or their designated design and construction contractors will contact NDEP early in the project schedule to review information and identify permit requirements.

### S6-6

See General Response 11.

See response to comment F1-10.



SCOP EIS Project Manager
Page 3 of 5

S6-6 associated with groundwater and urban runoff in the Las Vegas Wash, and will address the issue as needed." While this is a true statement, remedial activities to address potential increases of these constituents should be discussed in the final EIS.

5. Page ES-12 – Section ES.3.5.2
Page 2-18 – Section 2.2.2.1
Page 2-26 – Section 2.2.2.5
Page 2-42 – Section 2.3.2.1.1
Page 3-67 – Section 3.5.3
Page 4-79 – Section 4.5.3.1

S6-7 NDEP is concerned with how tunneling spoils from portions of both alternative pipeline alignments will be characterized and managed. A number of contaminants are known to occur and have been identified in soils, rock, and wastes (tailings) at the Three Kids Mine & Mill Site. These contaminants include, but are not limited to, the contaminants listed in the draft EIS (manganese, lead, and arsenic). These contaminants result from both mineral enrichment of the local geology as well as from mining and milling practices. Spoils generated from tunneling beneath the Three Kids Mine & Mill Site area may contain elevated concentrations of heavy metals. Sampling and analyses for total and soluble concentrations of various heavy metals prior to tunneling activities would help to provide an understanding of the likely spoils disposal options necessary to manage these spoils early on in the design process. Sampling and analyses of generated spoils for heavy metals concentrations will be needed during the construction phase to properly characterize and manage the spoils. Reuse of these spoils for uses including public projects (dust control, roadways, flood control facilities, or other projects) may not be advisable dependant upon the concentrations of metals. NDEP should be contacted to help evaluate viable disposal options.

6. Page 1-10 – Section 1.4.2.1

S6-8 The statement "The TMDLs are not required for non-point source pollution." is incorrect. TMDLs are required for both point and nonpoint source pollution.

7. Page 1-13 – Section 1.5

S6-9 A stated purpose and need for the action is "Adapting to potential changes in the beneficial uses and water quality standards for the Las Vegas Wash..." NDEP is not currently considering a change in the beneficial uses of the Wash. There has been no discussion about a Use Attainability Assessment for the Wash. Is this an appropriate purpose and need?

8. Page 2-22 – Section 2.2.2.2.3
Page 2-27 – Section 2.2.2.6
Page 2-45 – Section 2.3.2.2.3

S6-10 The diffuser design presented in the DEIS indicates it will be oriented horizontally or with a slight downward discharge. Does this design allow the water to rise sufficiently in the water column so that the deeper water of Boulder Basin, where the drinking water supply is withdrawn, is not impacted by wastewater treatment plant effluent? The modeling report indicates that at the time the model runs were conducted the final diffuser design was not known. Will additional model runs be conducted once the final diffuser design has been chosen to ensure that wastewater does not concentrate in the zone where the drinking water will be withdrawn in the future?

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Comment S-06

**S6-7**

Text has been added to Section 4.5.2.2 stating that sampling and analysis would be conducted as directed by NDEP in accordance with NDEP requirements and guidance. No change to the text is necessary for sections 4.5.3.2 and 4.5.4.2.

The Executive Summary has been updated as necessary.

**S6-8**

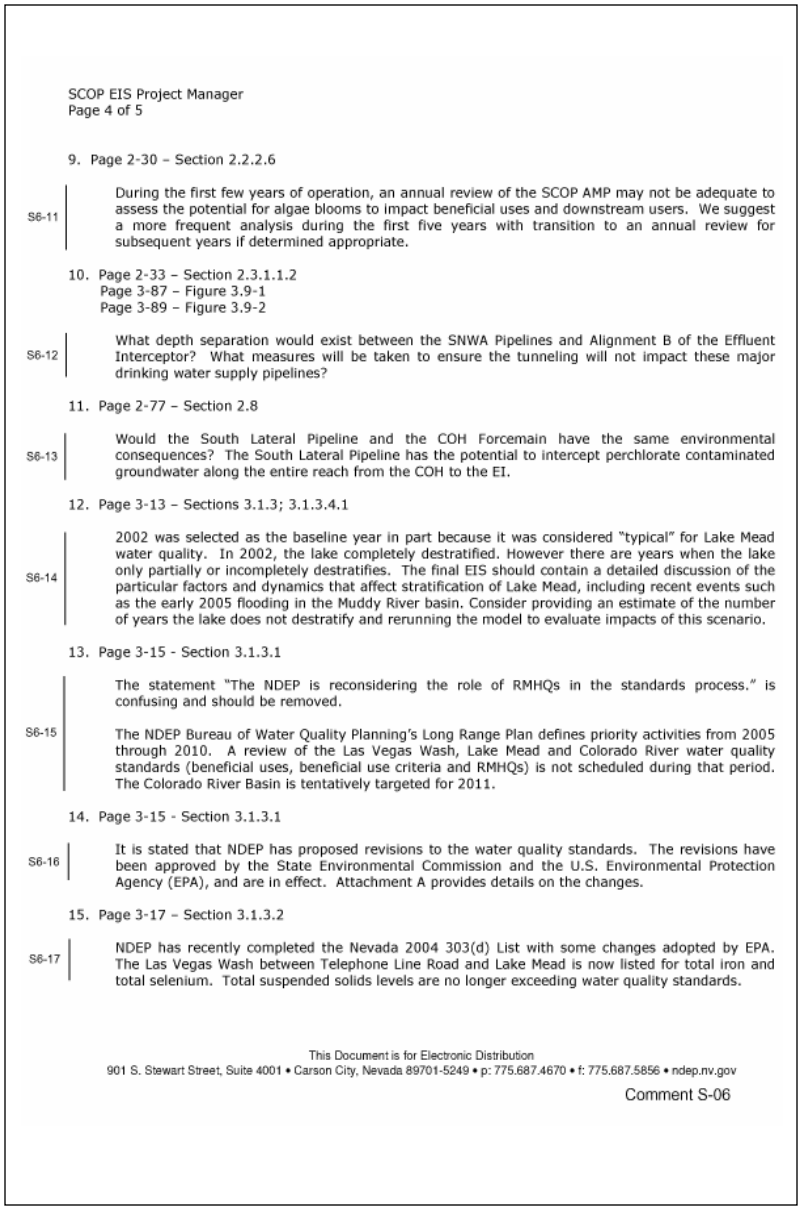
The incorrect statement has been deleted.

**S6-9**

The words "beneficial uses and water quality standards" have been deleted from the sentence.

**S6-10**

The following text has been added to Section 2.2.2.2.3 of the Final EIS. "The final configuration of the diffuser would be determined as part of final design. Current modeling indicates that the effluent discharged from the diffuser would have significant thermal buoyancy. This buoyancy would cause the effluent to rise above the elevation of the drinking water intakes. Preliminary and final design would include modeling of the diffuser operations. The modeling would consider changing Lake conditions."



SCOP EIS Project Manager
Page 4 of 5

9. Page 2-30 – Section 2.2.2.6

S6-11 During the first few years of operation, an annual review of the SCOP AMP may not be adequate to assess the potential for algae blooms to impact beneficial uses and downstream users. We suggest a more frequent analysis during the first five years with transition to an annual review for subsequent years if determined appropriate.

10. Page 2-33 – Section 2.3.1.1.2
Page 3-87 – Figure 3.9-1
Page 3-89 – Figure 3.9-2

S6-12 What depth separation would exist between the SNWA Pipelines and Alignment B of the Effluent Interceptor? What measures will be taken to ensure the tunneling will not impact these major drinking water supply pipelines?

11. Page 2-77 – Section 2.8

S6-13 Would the South Lateral Pipeline and the COH Forcemain have the same environmental consequences? The South Lateral Pipeline has the potential to intercept perchlorate contaminated groundwater along the entire reach from the COH to the EI.

12. Page 3-13 – Sections 3.1.3; 3.1.3.4.1

S6-14 2002 was selected as the baseline year in part because it was considered "typical" for Lake Mead water quality. In 2002, the lake completely destratified. However there are years when the lake only partially or incompletely destratifies. The final EIS should contain a detailed discussion of the particular factors and dynamics that affect stratification of Lake Mead, including recent events such as the early 2005 flooding in the Muddy River basin. Consider providing an estimate of the number of years the lake does not destratify and rerunning the model to evaluate impacts of this scenario.

13. Page 3-15 - Section 3.1.3.1

S6-15 The statement "The NDEP is reconsidering the role of RMHQs in the standards process." is confusing and should be removed.

The NDEP Bureau of Water Quality Planning's Long Range Plan defines priority activities from 2005 through 2010. A review of the Las Vegas Wash, Lake Mead and Colorado River water quality standards (beneficial uses, beneficial use criteria and RMHQs) is not scheduled during that period. The Colorado River Basin is tentatively targeted for 2011.

14. Page 3-15 - Section 3.1.3.1

S6-16 It is stated that NDEP has proposed revisions to the water quality standards. The revisions have been approved by the State Environmental Commission and the U.S. Environmental Protection Agency (EPA), and are in effect. Attachment A provides details on the changes.

15. Page 3-17 – Section 3.1.3.2

S6-17 NDEP has recently completed the Nevada 2004 303(d) List with some changes adopted by EPA. The Las Vegas Wash between Telephone Line Road and Lake Mead is now listed for total iron and total selenium. Total suspended solids levels are no longer exceeding water quality standards.

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901 S. Stewart Street, Suite 4001 • Carson City, Nevada 89701-5249 • p: 775.687.4670 • f: 775.687.5856 • ndep.nv.gov

Comment S-06

### S6-11

See General Response 10.

### S6-12

Text stating that the CWC would coordinate with the SNWA and other utility organizations to ensure that the Effluent Interceptor (EI) does not impact any SNWA waterlines or other utilities has been added to Chapter 2.

### S6-13

The environmental consequences for the South Lateral Pipeline will have a greater impact than the COH Forcemain because of the alignment length through a known contaminated area. The COH Forcemain is a direct line to the EI and the section is shorter in length than the South Lateral Pipeline.

### S6-14

See General Response 7.

### S6-15

The sentence has been deleted as requested.

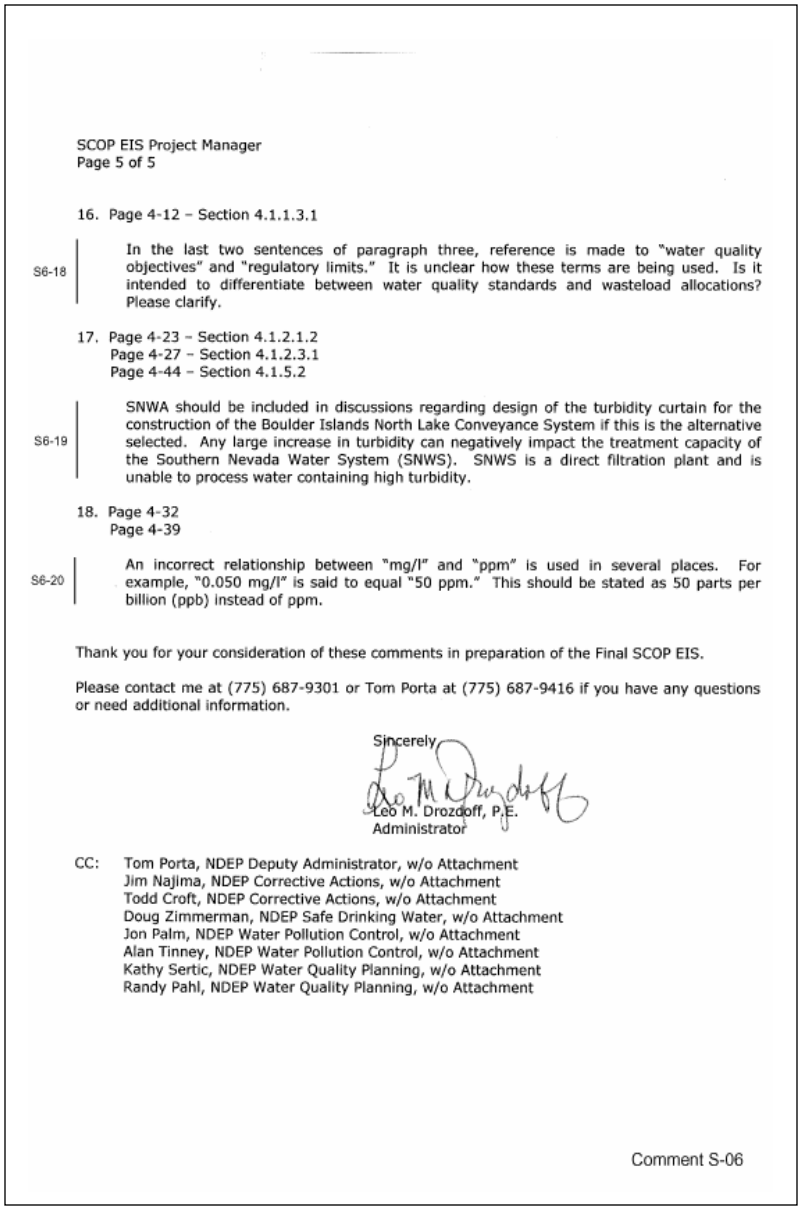
Comment noted.

### S6-16

The text in Section 3.1.3.1 has been revised as requested.

### S6-17

The text in Section 3.1.3.2 has been revised based on the Nevada 2004 303(d) List. Chapter 9 has also been revised to include the Nevada 2004 303(d) List (NDEP 2004b).



SCOP EIS Project Manager
Page 5 of 5

16. Page 4-12 – Section 4.1.1.3.1

S6-18 In the last two sentences of paragraph three, reference is made to "water quality objectives" and "regulatory limits." It is unclear how these terms are being used. Is it intended to differentiate between water quality standards and wasteload allocations? Please clarify.

17. Page 4-23 – Section 4.1.2.1.2
Page 4-27 – Section 4.1.2.3.1
Page 4-44 – Section 4.1.5.2

S6-19 SNWA should be included in discussions regarding design of the turbidity curtain for the construction of the Boulder Islands North Lake Conveyance System if this is the alternative selected. Any large increase in turbidity can negatively impact the treatment capacity of the Southern Nevada Water System (SNWS). SNWS is a direct filtration plant and is unable to process water containing high turbidity.

18. Page 4-32
Page 4-39

S6-20 An incorrect relationship between "mg/l" and "ppm" is used in several places. For example, "0.050 mg/l" is said to equal "50 ppm." This should be stated as 50 parts per billion (ppb) instead of ppm.

Thank you for your consideration of these comments in preparation of the Final SCOP EIS.

Please contact me at (775) 687-9301 or Tom Porta at (775) 687-9416 if you have any questions or need additional information.

Sincerely,

Leo M. Drozdoff, P.E.
Administrator

CC: Tom Porta, NDEP Deputy Administrator, w/o Attachment
Jim Najima, NDEP Corrective Actions, w/o Attachment
Todd Croft, NDEP Corrective Actions, w/o Attachment
Doug Zimmerman, NDEP Safe Drinking Water, w/o Attachment
Jon Palm, NDEP Water Pollution Control, w/o Attachment
Alan Tinney, NDEP Water Pollution Control, w/o Attachment
Kathy Sertic, NDEP Water Quality Planning, w/o Attachment
Randy Pahl, NDEP Water Quality Planning, w/o Attachment

Comment S-06

### S6-18

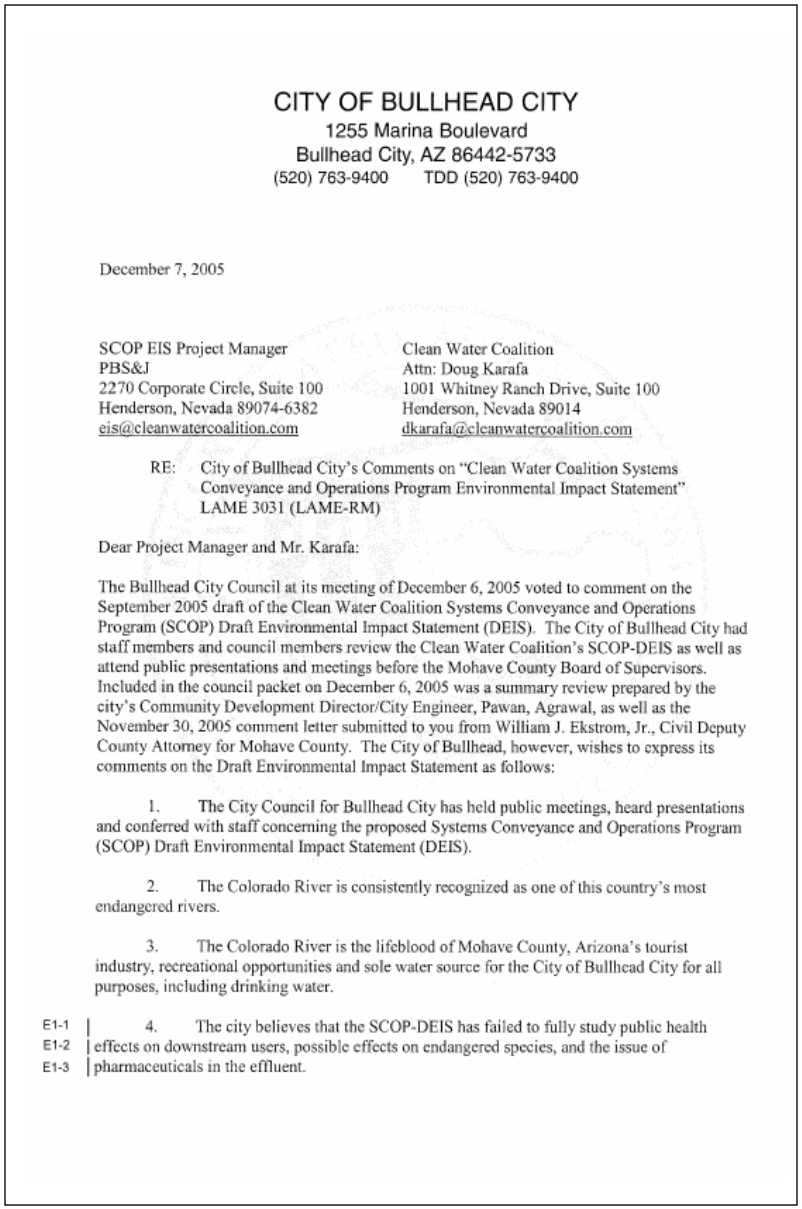
The text has been revised.

### S6-19

The following sentence has been inserted into sections 4.1.2.1.2, 4.1.2.3.1, and 4.1.6.1 of the Final EIS. "Coordination with SNWA would be implemented regarding the appropriate design and type of turbidity curtain to be used."

### S6-20

The numbers and units have been corrected throughout the Final EIS.



CITY OF BULLHEAD CITY
1255 Marina Boulevard
Bullhead City, AZ 86442-5733
(520) 763-9400 TDD (520) 763-9400

December 7, 2005

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, Nevada 89074-6382
eis@cleanwatercoalition.com

Clean Water Coalition
Attn: Doug Karafa
1001 Whitney Ranch Drive, Suite 100
Henderson, Nevada 89014
dkarafa@cleanwatercoalition.com

RE: City of Bullhead City's Comments on "Clean Water Coalition Systems Conveyance and Operations Program Environmental Impact Statement" LAME 3031 (LAME-RM)

Dear Project Manager and Mr. Karafa:

The Bullhead City Council at its meeting of December 6, 2005 voted to comment on the September 2005 draft of the Clean Water Coalition Systems Conveyance and Operations Program (SCOP) Draft Environmental Impact Statement (DEIS). The City of Bullhead City had staff members and council members review the Clean Water Coalition's SCOP-DEIS as well as attend public presentations and meetings before the Mohave County Board of Supervisors. Included in the council packet on December 6, 2005 was a summary review prepared by the city's Community Development Director/City Engineer, Pawan, Agrawal, as well as the November 30, 2005 comment letter submitted to you from William J. Ekstrom, Jr., Civil Deputy County Attorney for Mohave County. The City of Bullhead, however, wishes to express its comments on the Draft Environmental Impact Statement as follows:

1. The City Council for Bullhead City has held public meetings, heard presentations and conferred with staff concerning the proposed Systems Conveyance and Operations Program (SCOP) Draft Environmental Impact Statement (DEIS).

2. The Colorado River is consistently recognized as one of this country's most endangered rivers.

3. The Colorado River is the lifeblood of Mohave County, Arizona's tourist industry, recreational opportunities and sole water source for the City of Bullhead City for all purposes, including drinking water.

E1-1 E1-2 E1-3 4. The city believes that the SCOP-DEIS has failed to fully study public health effects on downstream users, possible effects on endangered species, and the issue of pharmaceuticals in the effluent.

## Response E1 Mayor (City of Bullhead City, AZ)

### E1-1

The impacts to downstream users are presented in Chapter 4 of the Final EIS.

### E1-2

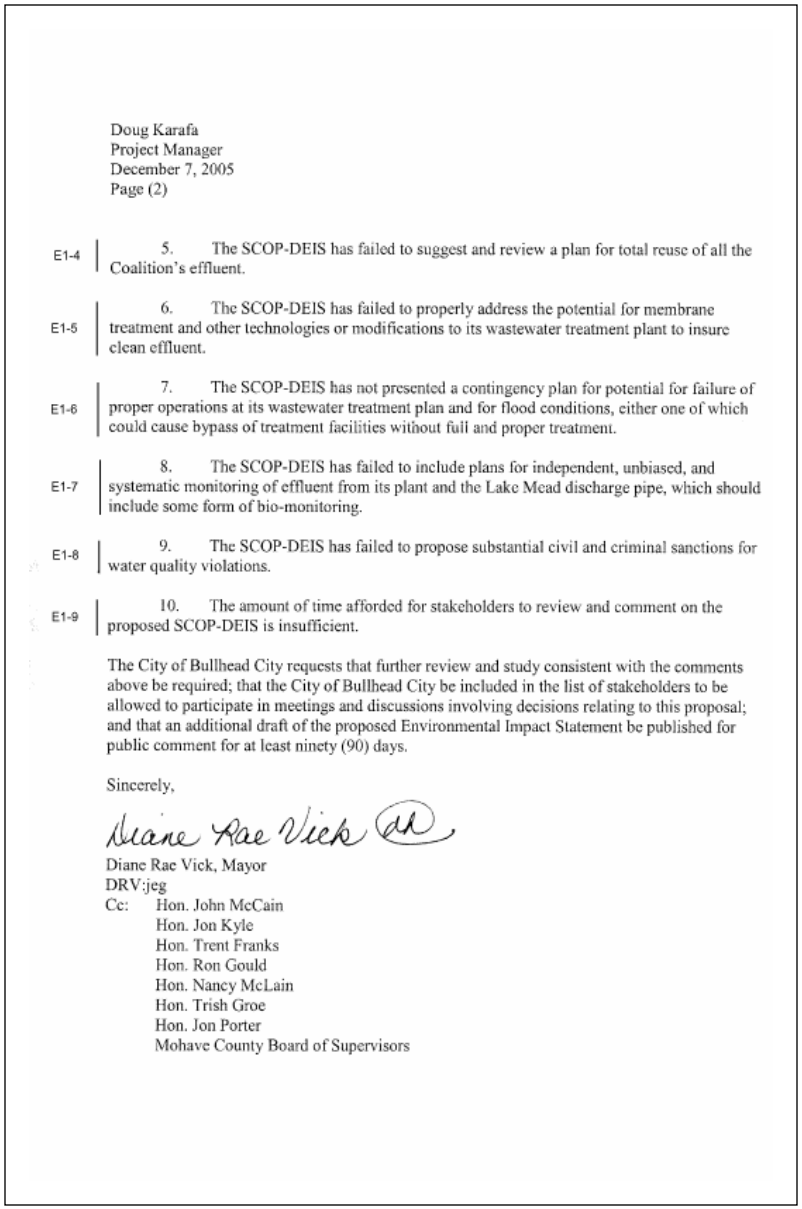
See General Response 9.

Additional analyses have been conducted, and additional information regarding endangered species has been included in sections 3.2 and 4.2 of the Final EIS.

### E1-3

See General Response 6.

The text in Section 1.4 has been revised based on the results of the literature review presented in Appendix K.



Doug Karafa
Project Manager
December 7, 2005
Page (2)

E1-4 | 5. The SCOP-DEIS has failed to suggest and review a plan for total reuse of all the Coalition's effluent.

E1-5 | 6. The SCOP-DEIS has failed to properly address the potential for membrane treatment and other technologies or modifications to its wastewater treatment plant to insure clean effluent.

E1-6 | 7. The SCOP-DEIS has not presented a contingency plan for potential for failure of proper operations at its wastewater treatment plan and for flood conditions, either one of which could cause bypass of treatment facilities without full and proper treatment.

E1-7 | 8. The SCOP-DEIS has failed to include plans for independent, unbiased, and systematic monitoring of effluent from its plant and the Lake Mead discharge pipe, which should include some form of bio-monitoring.

E1-8 | 9. The SCOP-DEIS has failed to propose substantial civil and criminal sanctions for water quality violations.

E1-9 | 10. The amount of time afforded for stakeholders to review and comment on the proposed SCOP-DEIS is insufficient.

The City of Bullhead City requests that further review and study consistent with the comments above be required; that the City of Bullhead City be included in the list of stakeholders to be allowed to participate in meetings and discussions involving decisions relating to this proposal; and that an additional draft of the proposed Environmental Impact Statement be published for public comment for at least ninety (90) days.

Sincerely,

Diane Rae Vick

Diane Rae Vick, Mayor
DRV:jeg
Cc: Hon. John McCain
Hon. Jon Kyle
Hon. Trent Franks
Hon. Ron Gould
Hon. Nancy McLain
Hon. Trish Groe
Hon. Jon Porter
Mohave County Board of Supervisors

**E1-4**

See General Response 2.

**E1-5**

See General Response 1.

**E1-6**

The SCOP facilities would be designed to allow 100 percent of the effluent flows from each plant to be discharged to the Las Vegas Wash. During emergency or maintenance, each facility may discharge to the Las Vegas Wash. However, scheduling of routine maintenance would be conducted to ensure that all three plants do not discharge 100 percent of their flows to the Las Vegas Wash at the same time. A sentence has been added to sections 2.2 and 2.2.1.6 of the Final EIS. In addition, each treatment facility is required, as part of their NPDES Discharge Permit, to have an emergency response plan. In the unlikely event that the SCOP pipeline fails, flows would be diverted directly to the Las Vegas Wash while repairs are completed. During this discharge, the effluent would be regulated by the applicable NPDES permits and WLAs, and would be required to meet all water quality requirements.

**E1-7**

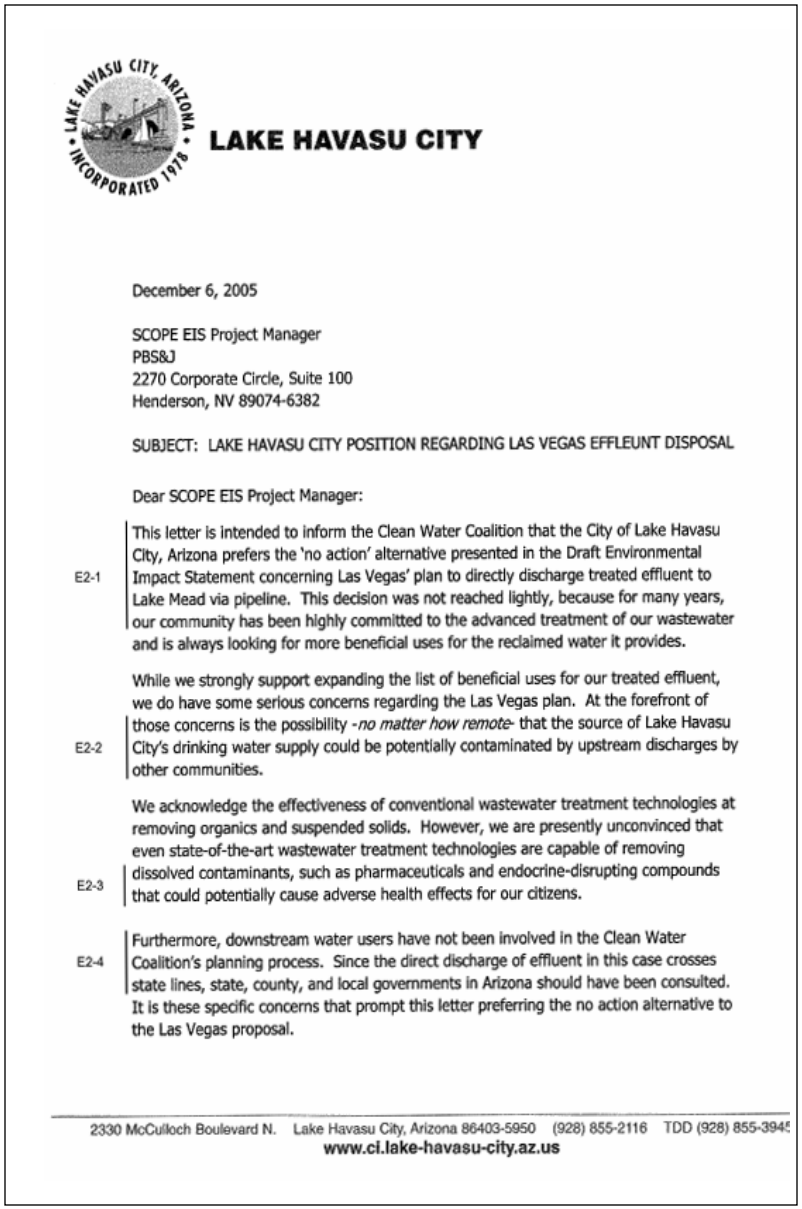
See General Response 10.

**E1-8**

The CWA and Nevada Revised Statutes (NRS) provide substantial civil and criminal penalties for discharging without a permit, or discharging in violation of a permit. The purpose of a draft EIS is not to establish penalties, but to consider environmental consequences of alternatives.

**E1-9**

Comment noted.



**LAKE HAVASU CITY**

December 6, 2005

SCOPE EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074-6382

SUBJECT: LAKE HAVASU CITY POSITION REGARDING LAS VEGAS EFFLEUNT DISPOSAL

Dear SCOPE EIS Project Manager:

E2-1 This letter is intended to inform the Clean Water Coalition that the City of Lake Havasu City, Arizona prefers the 'no action' alternative presented in the Draft Environmental Impact Statement concerning Las Vegas' plan to directly discharge treated effluent to Lake Mead via pipeline. This decision was not reached lightly, because for many years, our community has been highly committed to the advanced treatment of our wastewater and is always looking for more beneficial uses for the reclaimed water it provides.

E2-2 While we strongly support expanding the list of beneficial uses for our treated effluent, we do have some serious concerns regarding the Las Vegas plan. At the forefront of those concerns is the possibility -*no matter how remote*- that the source of Lake Havasu City's drinking water supply could be potentially contaminated by upstream discharges by other communities.

E2-3 We acknowledge the effectiveness of conventional wastewater treatment technologies at removing organics and suspended solids. However, we are presently unconvinced that even state-of-the-art wastewater treatment technologies are capable of removing dissolved contaminants, such as pharmaceuticals and endocrine-disrupting compounds that could potentially cause adverse health effects for our citizens.

E2-4 Furthermore, downstream water users have not been involved in the Clean Water Coalition's planning process. Since the direct discharge of effluent in this case crosses state lines, state, county, and local governments in Arizona should have been consulted. It is these specific concerns that prompt this letter preferring the no action alternative to the Las Vegas proposal.

2330 McCulloch Boulevard N. Lake Havasu City, Arizona 86403-5950 (928) 855-2116 TDD (928) 855-3945
www.ci.lake-havasu-city.az.us

## Response E2 Mayor (Lake Havasu City, AZ)

### E2-1

Treated wastewater from the Valley has been treated and discharged to Lake Mead via the Las Vegas Wash since 1956. Treated wastewater flows will continue to be discharged to Lake Mead, even under the No Action Alternative.

### E2-2

The wastewater treatment facilities in the Valley are some of the best in the nation--the quality of treatment is in the top 7 percent of wastewater treatment facilities in the nation.

See General Response 8.

See response to comment S5-4.

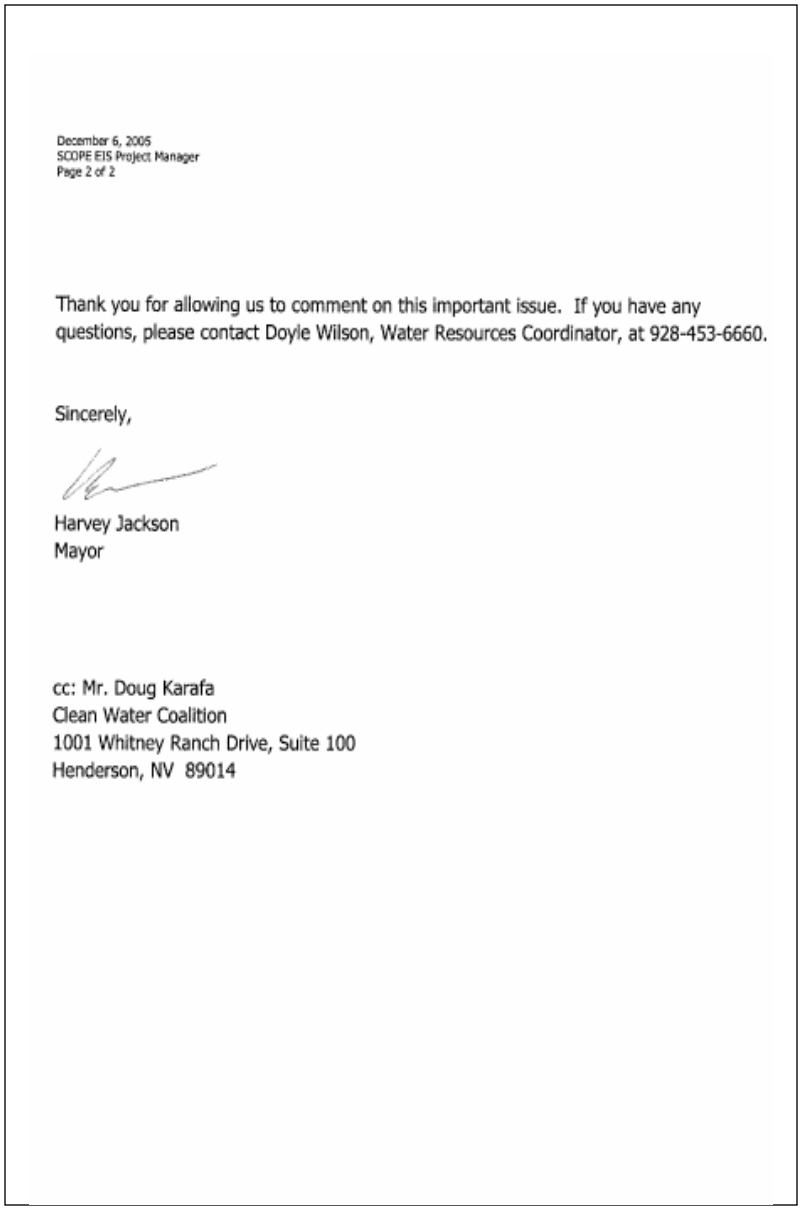
### E2-3

See General Response 6.

Wastewater treatment technologies vary in their ability to remove PPCPs and EDCs. Some of these chemicals are more resistant than others to treatment in general. While even advanced treatment processes are expected to be unable to completely remove all PPCPs and EDCs, there currently is little evidence to support the hypothesis that these chemicals, at the concentrations occurring in wastewater, have had any adverse effects on human health. See Appendix K of the Final EIS.

### E2-4

Scoping meetings were held in Nevada, Arizona, and California during August 2003. Public meetings regarding the Draft EIS were held in Nevada, Arizona, and California in October 2005. Display ads for the meetings were published in the Kingman *Miner*, Arizona *Republic* (Phoenix), *Desert Sun* (Palm Springs), San Diego *Union Tribune*, and Los Angeles *Times*. Attendance at the meetings was minimal: four people attended in Phoenix, two people attended in Tempe, two people attended in Kingman, two people attended in San Diego, and no one from the public attended in Palm Springs.



December 6, 2005
SCOPE EIS Project Manager
Page 2 of 2

Thank you for allowing us to comment on this important issue. If you have any questions, please contact Doyle Wilson, Water Resources Coordinator, at 928-453-6660.

Sincerely,

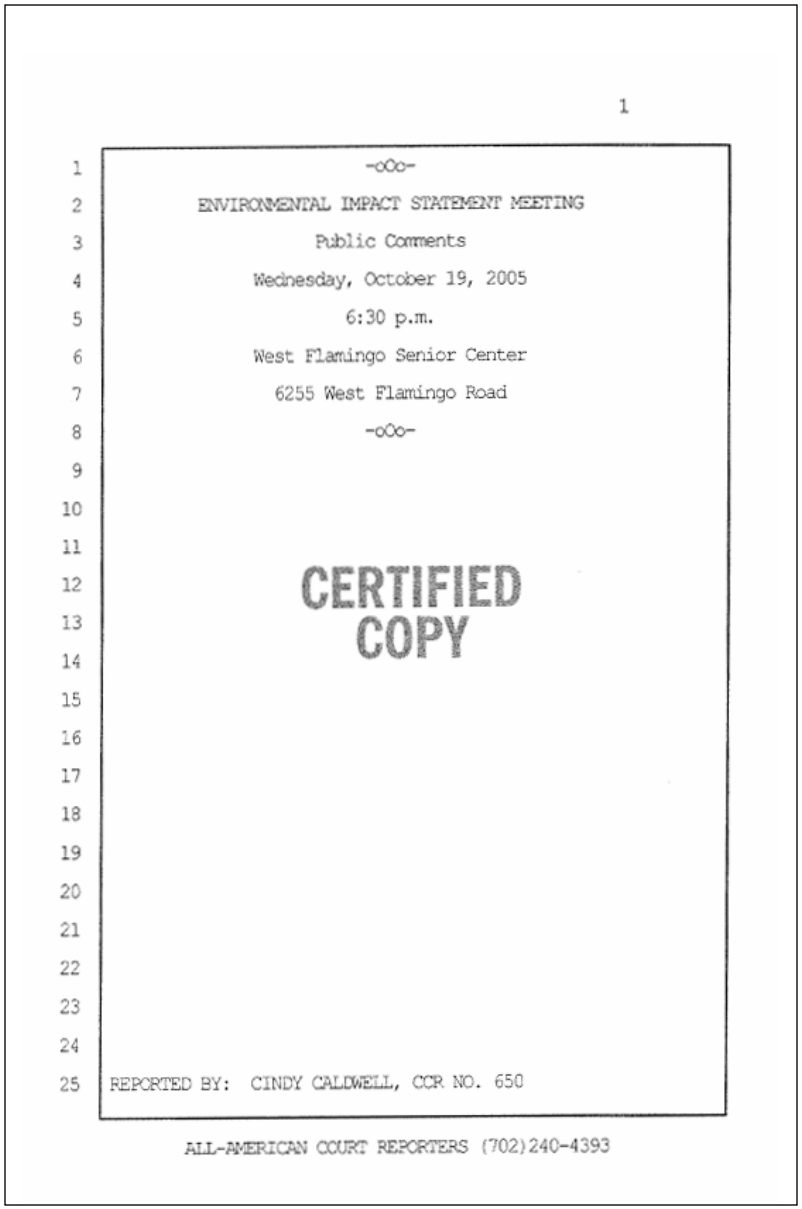
Harvey Jackson
Mayor

cc: Mr. Doug Karafa
Clean Water Coalition
1001 Whitney Ranch Drive, Suite 100
Henderson, NV 89014

**(E2-4 continued)**

Section 7.4.1 of the Draft EIS described the 2002 public scoping activities, with transcripts from these meetings provided in Appendix B. Sections 1.6.3 and 7.4.3 of the Final EIS describe the 2005 public meetings. Transcripts are included in Appendix L for meetings at which oral comments were submitted.

In addition, as stated in Section 1.2 of the Draft and Final EIS, numerous federal, state, and local agencies were invited to participate in the preparation of the SOCP EIS as cooperating agencies. The Arizona Department of Environmental Quality and Arizona Department of Water Resources were two of the agencies invited to participate.



1

-oOo-

ENVIRONMENTAL IMPACT STATEMENT MEETING

Public Comments

Wednesday, October 19, 2005

6:30 p.m.

West Flamingo Senior Center

6255 West Flamingo Road

-oOo-

CERTIFIED COPY

REPORTED BY: CINDY CALDWELL, CCR NO. 650

ALL-AMERICAN COURT REPORTERS (702)240-4393

**Response E3** Mojave County (District III), Arizona

PUBLIC STATEMENTS

MR. ERIC HAWKINS: We will turn some time over to Mr. Buster Johnson from Mohave County to make his comments.

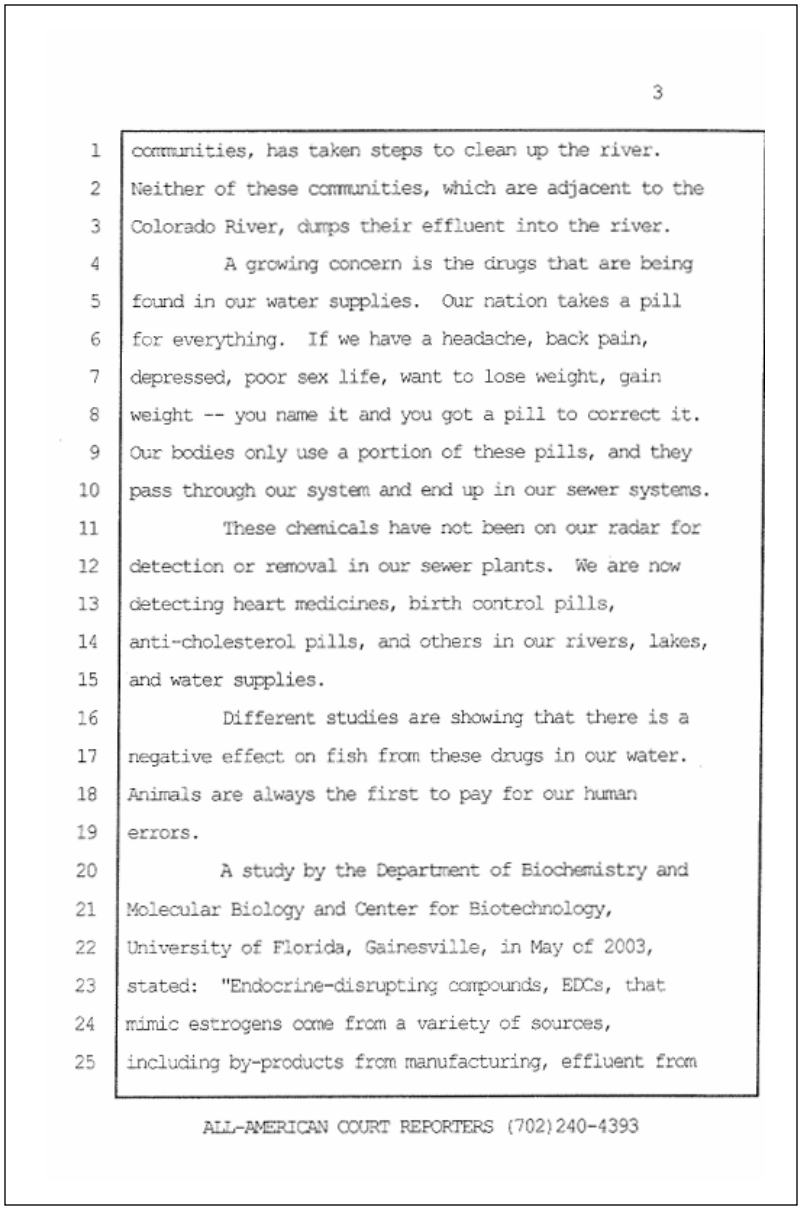
MR. BUSTER D. JOHNSON: Since you gave me all night to do this. First I want to thank you for the opportunity to address this proposal.

I am Buster Johnson, District III Supervisor, from Mohave County, Arizona. I am here tonight representing my district, not the Mohave County Board of Supervisors, as the full board has not yet taken a position on this project.

I am opposed to this project. The dumping of hundreds of millions of gallons of effluent into Lake Mead on a daily basis is, in my opinion, a reckless disregard for the millions of down river users. Our country has strived to clean up our rivers and lakes from the pollution caused by septic tanks and run offs.

Billions of dollars are being spent around the country to correct the past mistakes of discharges into rivers and lakes. Down river in Lake Havasu, the citizens are spending $500 million to install a sewer system to clean up their water and protect the Colorado River.

The City of Bullhead, along with other river





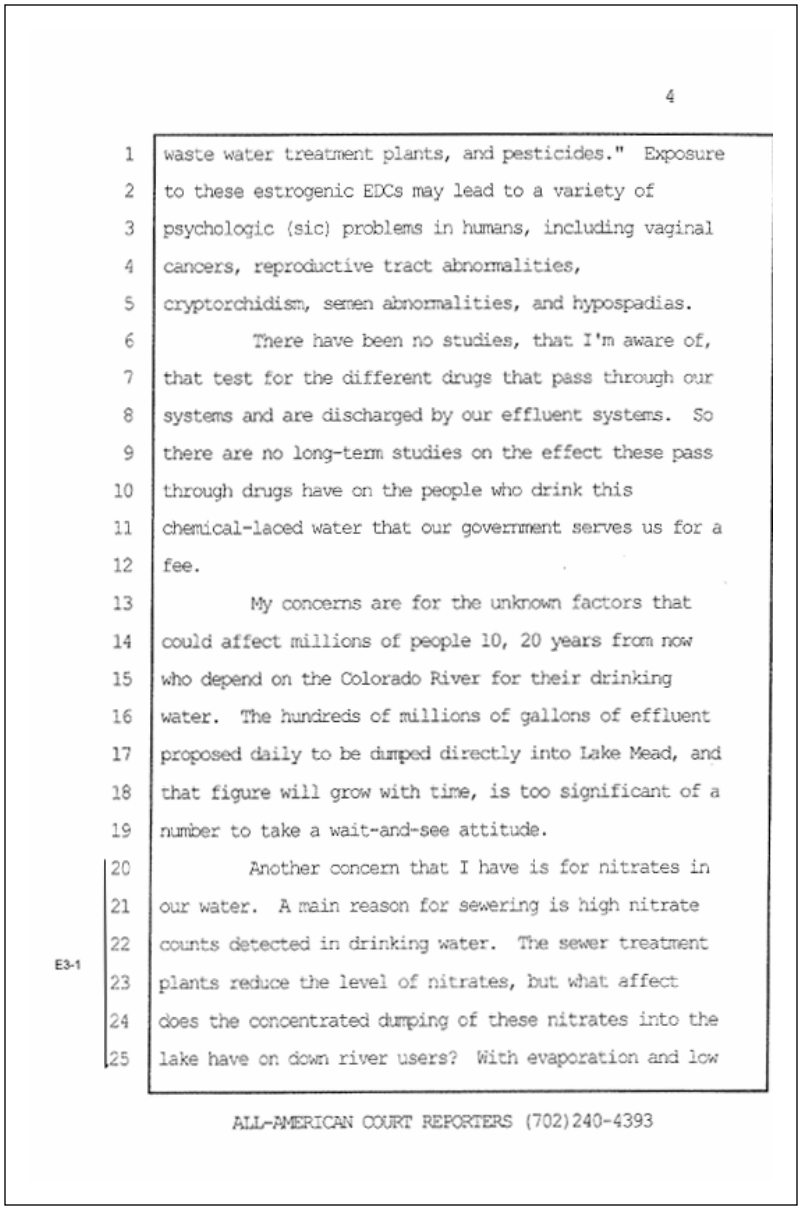
communities, has taken steps to clean up the river. Neither of these communities, which are adjacent to the Colorado River, dumps their effluent into the river.

A growing concern is the drugs that are being found in our water supplies. Our nation takes a pill for everything. If we have a headache, back pain, depressed, poor sex life, want to lose weight, gain weight -- you name it and you got a pill to correct it. Our bodies only use a portion of these pills, and they pass through our system and end up in our sewer systems.

These chemicals have not been on our radar for detection or removal in our sewer plants. We are now detecting heart medicines, birth control pills, anti-cholesterol pills, and others in our rivers, lakes, and water supplies.

Different studies are showing that there is a negative effect on fish from these drugs in our water. Animals are always the first to pay for our human errors.

A study by the Department of Biochemistry and Molecular Biology and Center for Biotechnology, University of Florida, Gainesville, in May of 2003, stated: "Endocrine-disrupting compounds, EDCs, that mimic estrogens come from a variety of sources, including by-products from manufacturing, effluent from



4

waste water treatment plants, and pesticides." Exposure to these estrogenic EDCs may lead to a variety of psychologic (sic) problems in humans, including vaginal cancers, reproductive tract abnormalities, cryptorchidism, semen abnormalities, and hypospadias.

There have been no studies, that I'm aware of, that test for the different drugs that pass through our systems and are discharged by our effluent systems. So there are no long-term studies on the effect these pass through drugs have on the people who drink this chemical-laced water that our government serves us for a fee.

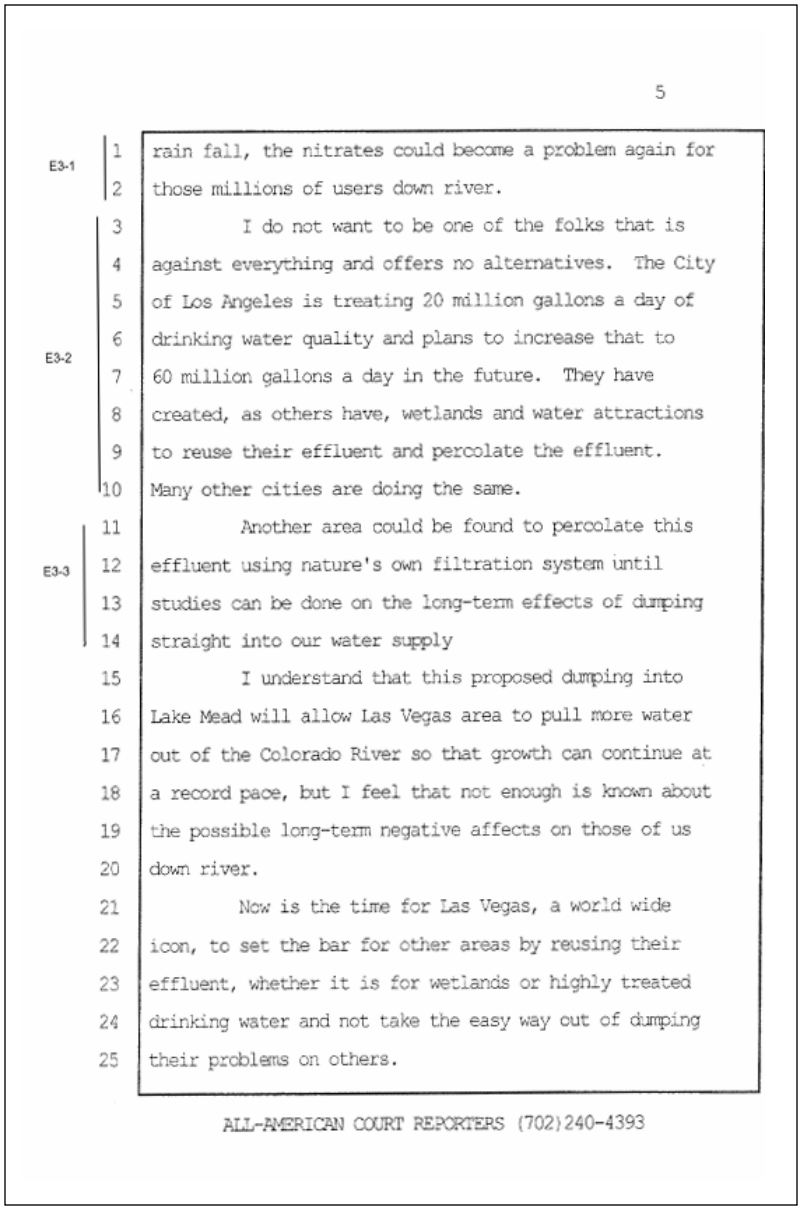
My concerns are for the unknown factors that could affect millions of people 10, 20 years from now who depend on the Colorado River for their drinking water. The hundreds of millions of gallons of effluent proposed daily to be dumped directly into Lake Mead, and that figure will grow with time, is too significant of a number to take a wait-and-see attitude.

E3-1 Another concern that I have is for nitrates in our water. A main reason for sewering is high nitrate counts detected in drinking water. The sewer treatment plants reduce the level of nitrates, but what affect does the concentrated dumping of these nitrates into the lake have on down river users? With evaporation and low

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**E3-1**

The impacts to downstream users are presented in Chapter 4 of the Final EIS.



5

rain fall, the nitrates could become a problem again for those millions of users down river.

I do not want to be one of the folks that is against everything and offers no alternatives. The City of Los Angeles is treating 20 million gallons a day of drinking water quality and plans to increase that to 60 million gallons a day in the future. They have created, as others have, wetlands and water attractions to reuse their effluent and percolate the effluent. Many other cities are doing the same.

Another area could be found to percolate this effluent using nature's own filtration system until studies can be done on the long-term effects of dumping straight into our water supply

I understand that this proposed dumping into Lake Mead will allow Las Vegas area to pull more water out of the Colorado River so that growth can continue at a record pace, but I feel that not enough is known about the possible long-term negative affects on those of us down river.

Now is the time for Las Vegas, a world wide icon, to set the bar for other areas by reusing their effluent, whether it is for wetlands or highly treated drinking water and not take the easy way out of dumping their problems on others.

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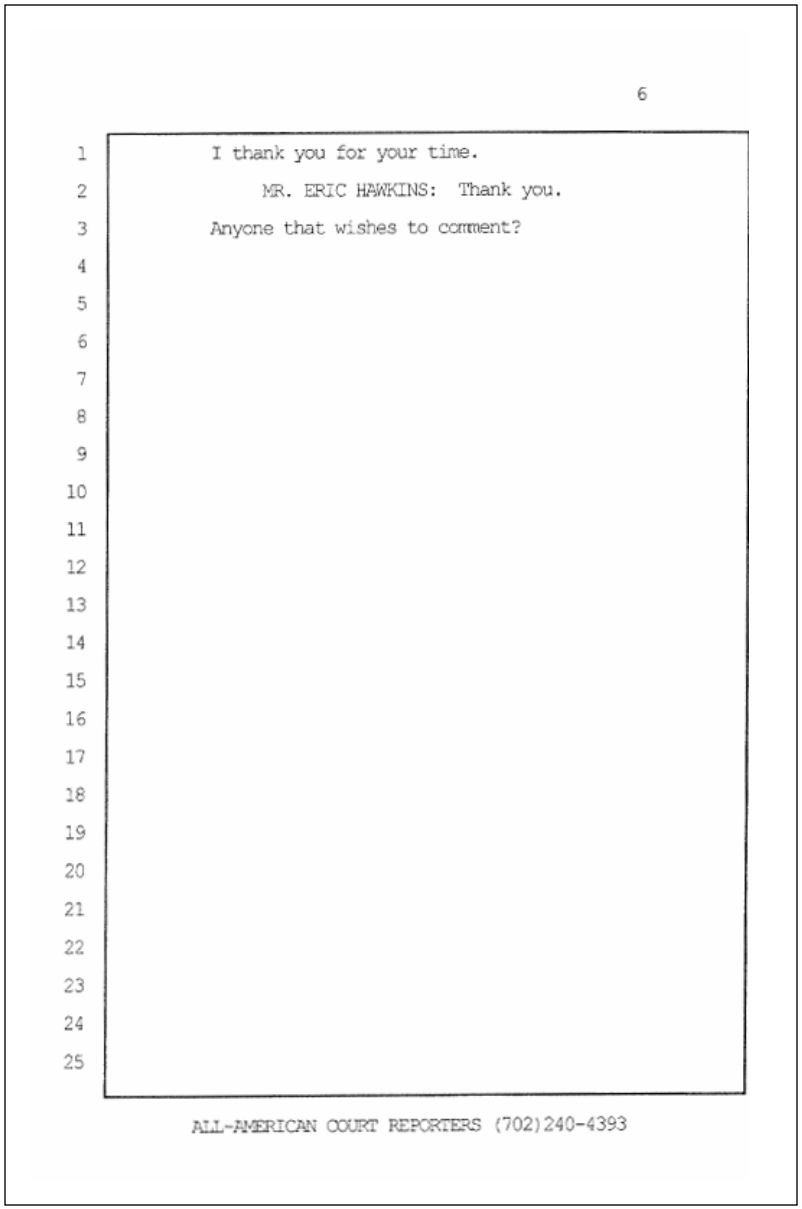
### E3-2

Treated wastewater from the Valley has been treated and discharged to Lake Mead via the Las Vegas Wash since 1956. Treated wastewater flows will continue to be discharged to Lake Mead, even under the No Action Alternative.

As indicated in the tables presented in Section 4.1, nitrate levels through Hoover Dam would increase slightly under the pipeline alternatives. However, all values are well below the Water Quality Standard of 10 mg/L.

### E3-3

See General Response 2.



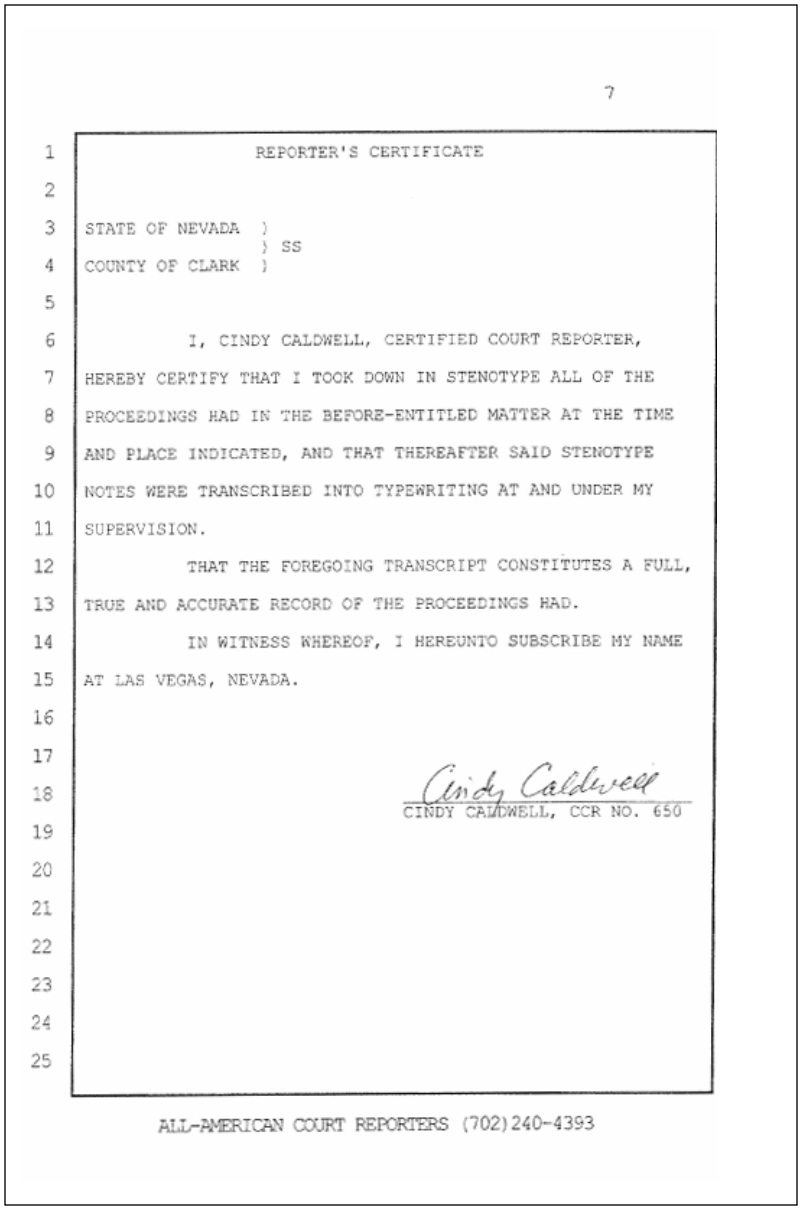
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I thank you for your time.

MR. ERIC HAWKINS: Thank you.

Anyone that wishes to comment?

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7

REPORTER'S CERTIFICATE

STATE OF NEVADA )
) SS
COUNTY OF CLARK )

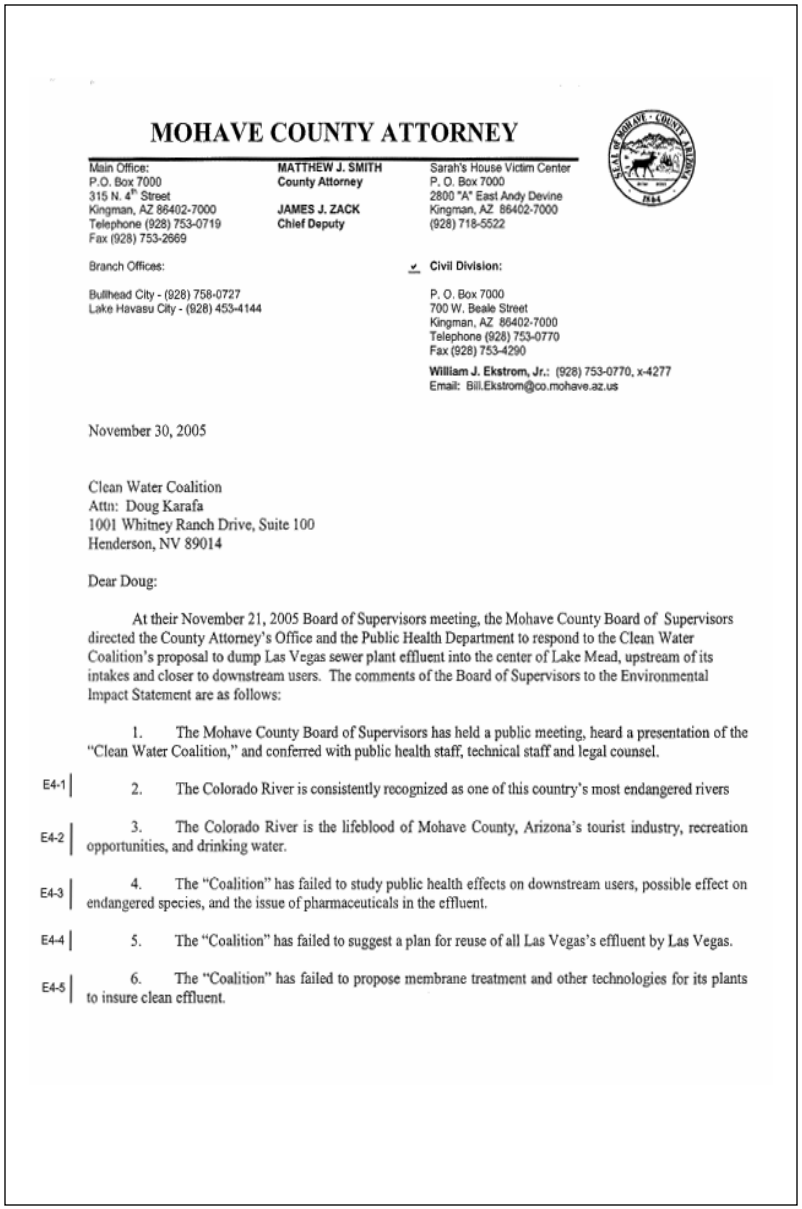
I, CINDY CALDWELL, CERTIFIED COURT REPORTER, HEREBY CERTIFY THAT I TOOK DOWN IN STENOTYPE ALL OF THE PROCEEDINGS HAD IN THE BEFORE-ENTITLED MATTER AT THE TIME AND PLACE INDICATED, AND THAT THEREAFTER SAID STENOTYPE NOTES WERE TRANSCRIBED INTO TYPEWRITING AT AND UNDER MY SUPERVISION.

THAT THE FOREGOING TRANSCRIPT CONSTITUTES A FULL, TRUE AND ACCURATE RECORD OF THE PROCEEDINGS HAD.

IN WITNESS WHEREOF, I HEREUNTO SUBSCRIBE MY NAME AT LAS VEGAS, NEVADA.

Cindy Caldwell
CINDY CALDWELL, CCR NO. 650

ALL-AMERICAN COURT REPORTERS (702)240-4393



**MOHAVE COUNTY ATTORNEY**

Main Office:
P.O. Box 7000
315 N. 4th Street
Kingman, AZ 86402-7000
Telephone (928) 753-0719
Fax (928) 753-2669

**MATTHEW J. SMITH**
**County Attorney**

**JAMES J. ZACK**
**Chief Deputy**

Sarah's House Victim Center
P. O. Box 7000
2800 "A" East Andy Devine
Kingman, AZ 86402-7000
(928) 718-5522

Branch Offices:

Bullhead City - (928) 758-0727
Lake Havasu City - (928) 453-4144

**Civil Division:**

P. O. Box 7000
700 W. Beale Street
Kingman, AZ 86402-7000
Telephone (928) 753-0770
Fax (928) 753-4290

**William J. Ekstrom, Jr.:** (928) 753-0770, x-4277
Email: Bill.Ekstrom@co.mohave.az.us

November 30, 2005

Clean Water Coalition
Attn: Doug Karafa
1001 Whitney Ranch Drive, Suite 100
Henderson, NV 89014

Dear Doug:

At their November 21, 2005 Board of Supervisors meeting, the Mohave County Board of Supervisors directed the County Attorney's Office and the Public Health Department to respond to the Clean Water Coalition's proposal to dump Las Vegas sewer plant effluent into the center of Lake Mead, upstream of its intakes and closer to downstream users. The comments of the Board of Supervisors to the Environmental Impact Statement are as follows:

1. The Mohave County Board of Supervisors has held a public meeting, heard a presentation of the "Clean Water Coalition," and conferred with public health staff, technical staff and legal counsel.

E4-1 | 2. The Colorado River is consistently recognized as one of this country's most endangered rivers

E4-2 | 3. The Colorado River is the lifeblood of Mohave County, Arizona's tourist industry, recreation opportunities, and drinking water.

E4-3 | 4. The "Coalition" has failed to study public health effects on downstream users, possible effect on endangered species, and the issue of pharmaceuticals in the effluent.

E4-4 | 5. The "Coalition" has failed to suggest a plan for reuse of all Las Vegas's effluent by Las Vegas.

E4-5 | 6. The "Coalition" has failed to propose membrane treatment and other technologies for its plants to insure clean effluent.

## Response E4 Mojave County Board of Supervisors

### E4-1

Comment noted.

### E4-2

Comment noted.

### E4-3

See General Response 6.

See General Response 9.

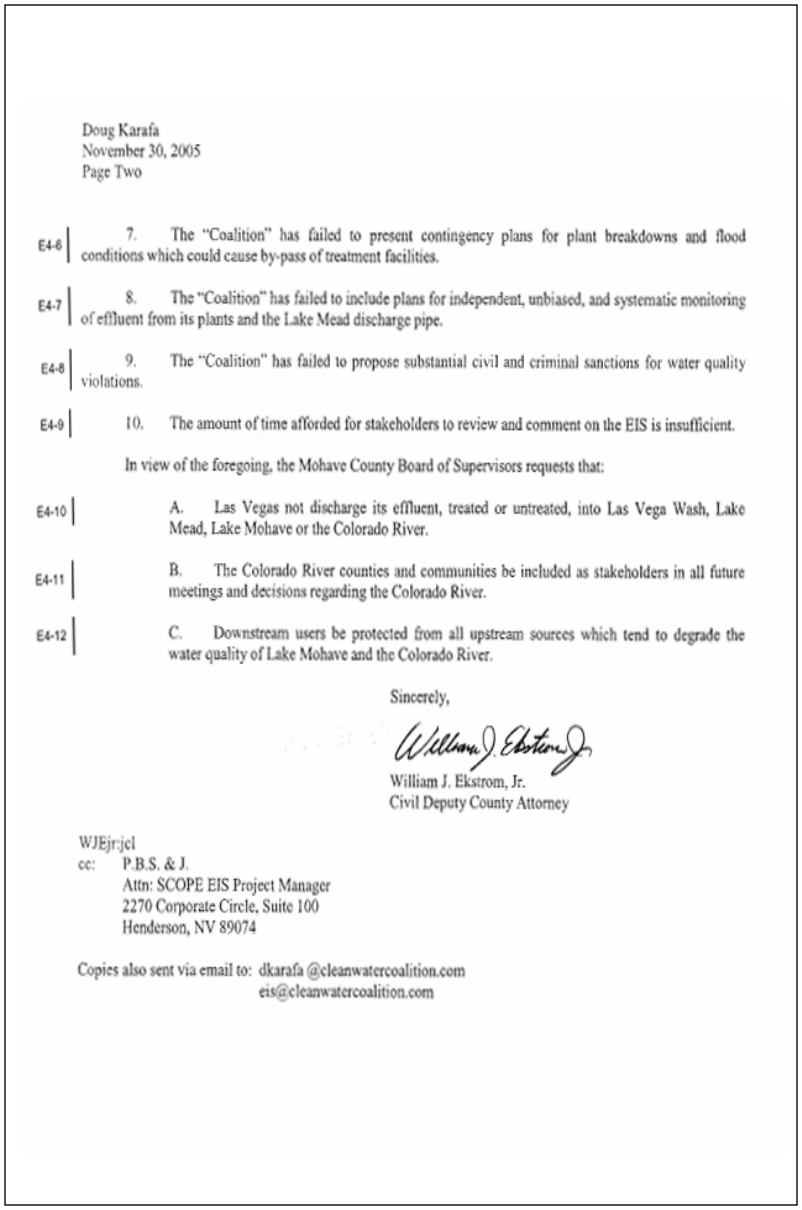
The text in Section 1.4 has been revised based on the results of the literature review presented in Appendix K.

### E4-4

See General Response 2.

### E4-5

See General Response 1.



Doug Karafa
November 30, 2005
Page Two

E4-6 | 7. The "Coalition" has failed to present contingency plans for plant breakdowns and flood conditions which could cause by-pass of treatment facilities.

E4-7 | 8. The "Coalition" has failed to include plans for independent, unbiased, and systematic monitoring of effluent from its plants and the Lake Mead discharge pipe.

E4-8 | 9. The "Coalition" has failed to propose substantial civil and criminal sanctions for water quality violations.

E4-9 | 10. The amount of time afforded for stakeholders to review and comment on the EIS is insufficient.

In view of the foregoing, the Mohave County Board of Supervisors requests that:

E4-10 | A. Las Vegas not discharge its effluent, treated or untreated, into Las Vega Wash, Lake Mead, Lake Mohave or the Colorado River.

E4-11 | B. The Colorado River counties and communities be included as stakeholders in all future meetings and decisions regarding the Colorado River.

E4-12 | C. Downstream users be protected from all upstream sources which tend to degrade the water quality of Lake Mohave and the Colorado River.

Sincerely,

William J. Ekstrom, Jr.
Civil Deputy County Attorney

WJEjr:jcl
cc: P.B.S. & J.
Attn: SCOPE EIS Project Manager
2270 Corporate Circle, Suite 100
Henderson, NV 89074

Copies also sent via email to: dkarafa @cleanwatercoalition.com
eis@cleanwatercoalition.com

### E4-6

See response to comment E1-6.

### E4-7

See General Response 10.

### E4-8

The CWA and NRS provide substantial civil and criminal penalties for discharging without a permit, or discharging in violation of a permit. The purpose of a draft EIS is not to establish penalties, but to consider environmental consequences of alternatives.

### E4-9

Comment noted.

### E4-10

See response to comment E2-1.

### E4-11

The Colorado River counties and communities will be included as stakeholders and be kept informed of SCOP progress and meetings to the extent possible given the available contact information. However, it is beyond the scope of this EIS to ensure that the Mohave County Board of Supervisors is included in "all future meetings and decisions regarding the Colorado River."

### E4-12

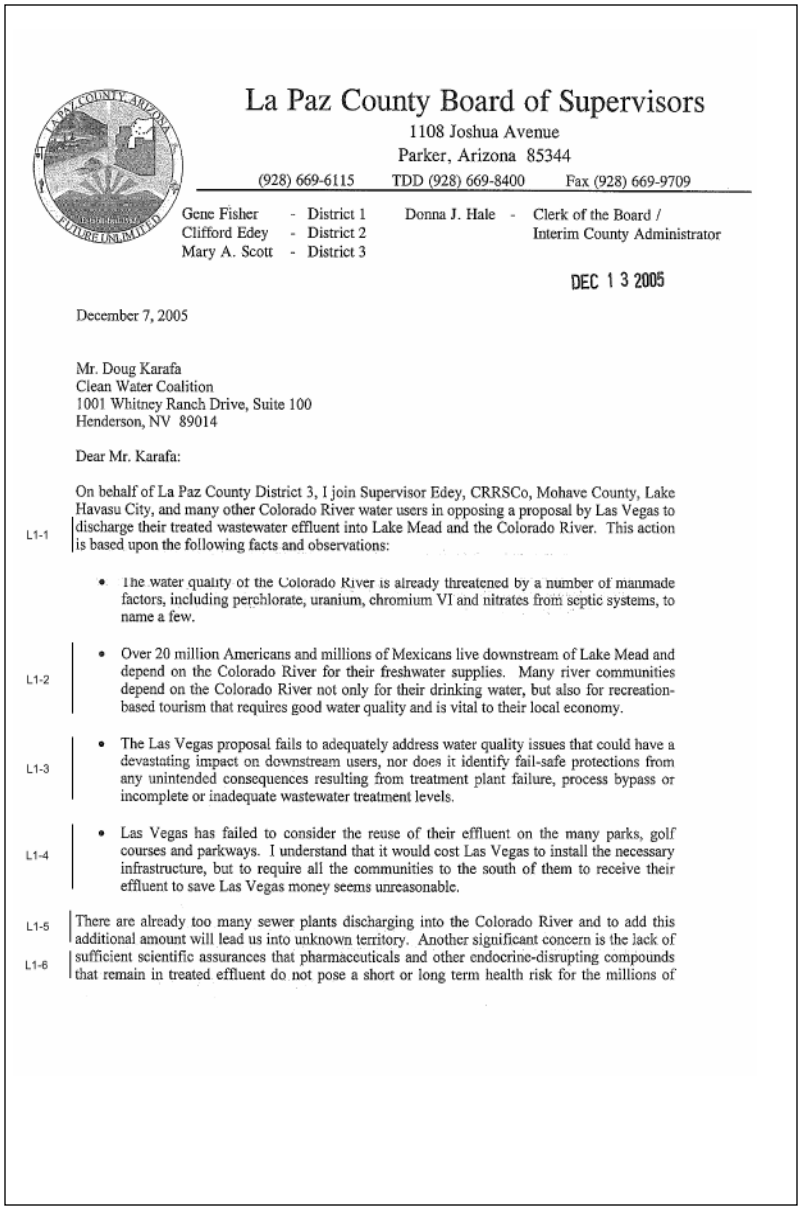
The wastewater treatment facilities in the Valley are some of the best in the nation--the quality of treatment is in the top 7 percent of wastewater treatment facilities in the nation.

The Draft EIS presents results of modeling Boulder Basin (sections 4.1.1.3.2, 4.1.2.3.3, 4.1.3.3, 4.1.4.3.3 and 4.1.5.3) and the Colorado River downstream of

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**(E4-12 continued)**

Hoover Dam, including Lake Mohave (Section 4.1). These modeling results indicate that the Boulder Islands alternatives would result in the maintenance of good downstream water quality, suitable for both municipal water supply and recreational purposes.



La Paz County Board of Supervisors
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Parker, Arizona 85344
(928) 669-6115 TDD (928) 669-8400 Fax (928) 669-9709

Gene Fisher - District 1
Clifford Edey - District 2
Mary A. Scott - District 3

Donna J. Hale - Clerk of the Board / Interim County Administrator

DEC 1 3 2005

December 7, 2005

Mr. Doug Karafa
Clean Water Coalition
1001 Whitney Ranch Drive, Suite 100
Henderson, NV 89014

Dear Mr. Karafa:

L1-1 On behalf of La Paz County District 3, I join Supervisor Edey, CRRSCo, Mohave County, Lake Havasu City, and many other Colorado River water users in opposing a proposal by Las Vegas to discharge their treated wastewater effluent into Lake Mead and the Colorado River. This action is based upon the following facts and observations:

- The water quality of the Colorado River is already threatened by a number of manmade factors, including perchlorate, uranium, chromium VI and nitrates from septic systems, to name a few.

L1-2
- Over 20 million Americans and millions of Mexicans live downstream of Lake Mead and depend on the Colorado River for their freshwater supplies. Many river communities depend on the Colorado River not only for their drinking water, but also for recreation-based tourism that requires good water quality and is vital to their local economy.

L1-3
- The Las Vegas proposal fails to adequately address water quality issues that could have a devastating impact on downstream users, nor does it identify fail-safe protections from any unintended consequences resulting from treatment plant failure, process bypass or incomplete or inadequate wastewater treatment levels.

L1-4
- Las Vegas has failed to consider the reuse of their effluent on the many parks, golf courses and parkways. I understand that it would cost Las Vegas to install the necessary infrastructure, but to require all the communities to the south of them to receive their effluent to save Las Vegas money seems unreasonable.

L1-5 There are already too many sewer plants discharging into the Colorado River and to add this additional amount will lead us into unknown territory. Another significant concern is the lack of

L1-6 sufficient scientific assurances that pharmaceuticals and other endocrine-disrupting compounds that remain in treated effluent do not pose a short or long term health risk for the millions of

## **Response L1** La Paz County Board of Supervisors

### L1-1

See response to comment E2-1.

### L1-2

See response to comment E4-12.

### L1-3

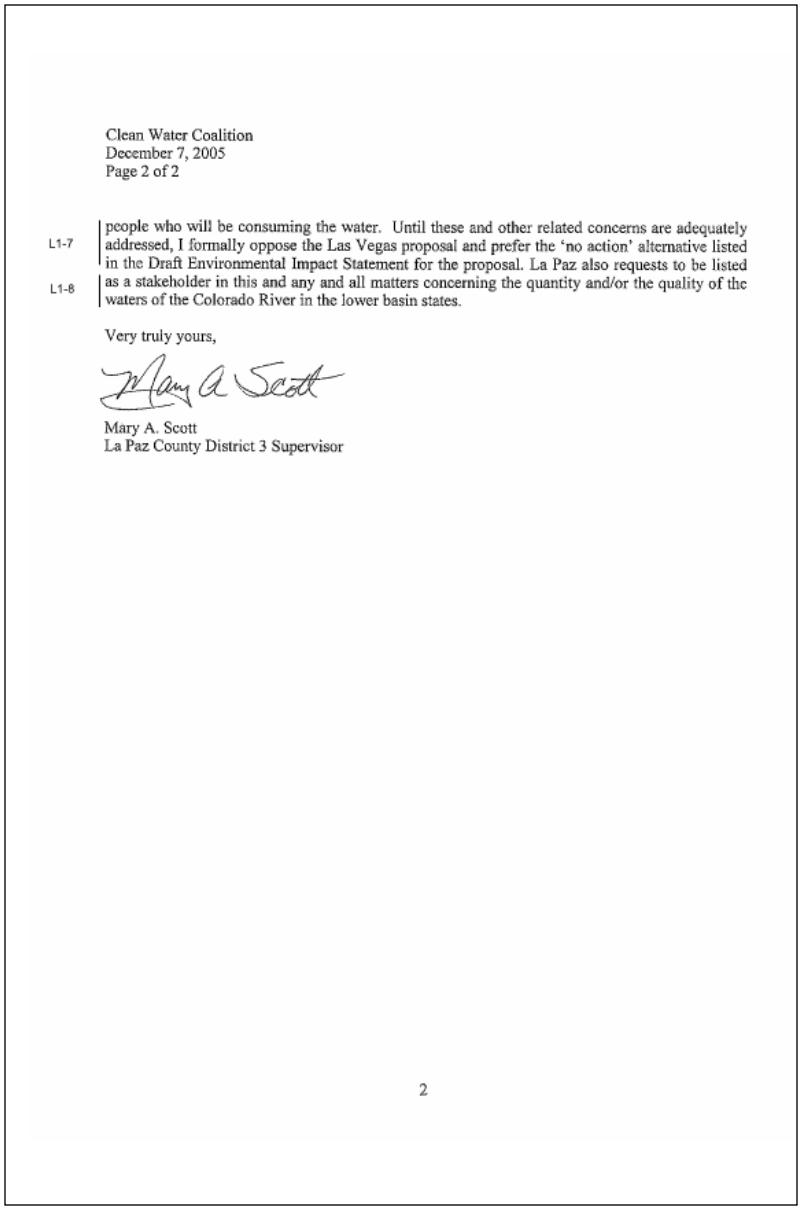
As described in Section 4.1, water quality modeling indicates that the TP loading through Hoover Dam would increase by 1 ppb if the TP discharged from the diffuser does not exceed 334 lbs/day on an annual average basis. Despite this increase, phosphorus concentrations below Hoover Dam would remain well below historic concentrations (the past three decades), during which no negative consequences were identified in the Colorado River below Hoover Dam. Potential impacts downstream of Hoover Dam are described throughout Chapter 4 of the Final EIS.

The SCOP facilities would be designed to allow 100 percent of the effluent flows from each plant to be discharged to the Las Vegas Wash. During an emergency or maintenance, each facility may discharge to the Las Vegas Wash. However, scheduling of routine maintenance would be conducted to ensure that all three plants do not discharge 100 percent of their flows to the Las Vegas Wash at the same time. A sentence has been added to sections 2.2 and 2.2.1.6 of the Final EIS. In addition, each treatment facility is required, as part of their NPDES Discharge Permit, to have an emergency response plan.

In the unlikely event that the LCS fails, flows would be diverted directly to the Las Vegas Wash while repairs are completed. During this discharge, the effluent would be regulated by the applicable NPDES permits and WLAs, and would be required to meet all water quality requirements.

### L1-4

See General Response 2.



Clean Water Coalition
December 7, 2005
Page 2 of 2

L1-7 | people who will be consuming the water. Until these and other related concerns are adequately addressed, I formally oppose the Las Vegas proposal and prefer the 'no action' alternative listed in the Draft Environmental Impact Statement for the proposal. La Paz also requests to be listed

L1-8 | as a stakeholder in this and any and all matters concerning the quantity and/or the quality of the waters of the Colorado River in the lower basin states.

Very truly yours,

Mary A. Scott
La Paz County District 3 Supervisor

2

**L1-5**

Treated wastewater from the Valley has been treated and discharged to Lake Mead via the Las Vegas Wash since 1956. Treated wastewater flows will continue to be discharged to Lake Mead, even under the No Action Alternative.

The potential impacts that may occur under the proposed alternatives are described in Chapter 4 of the Final EIS.

**L1-6**

See General Response 6.

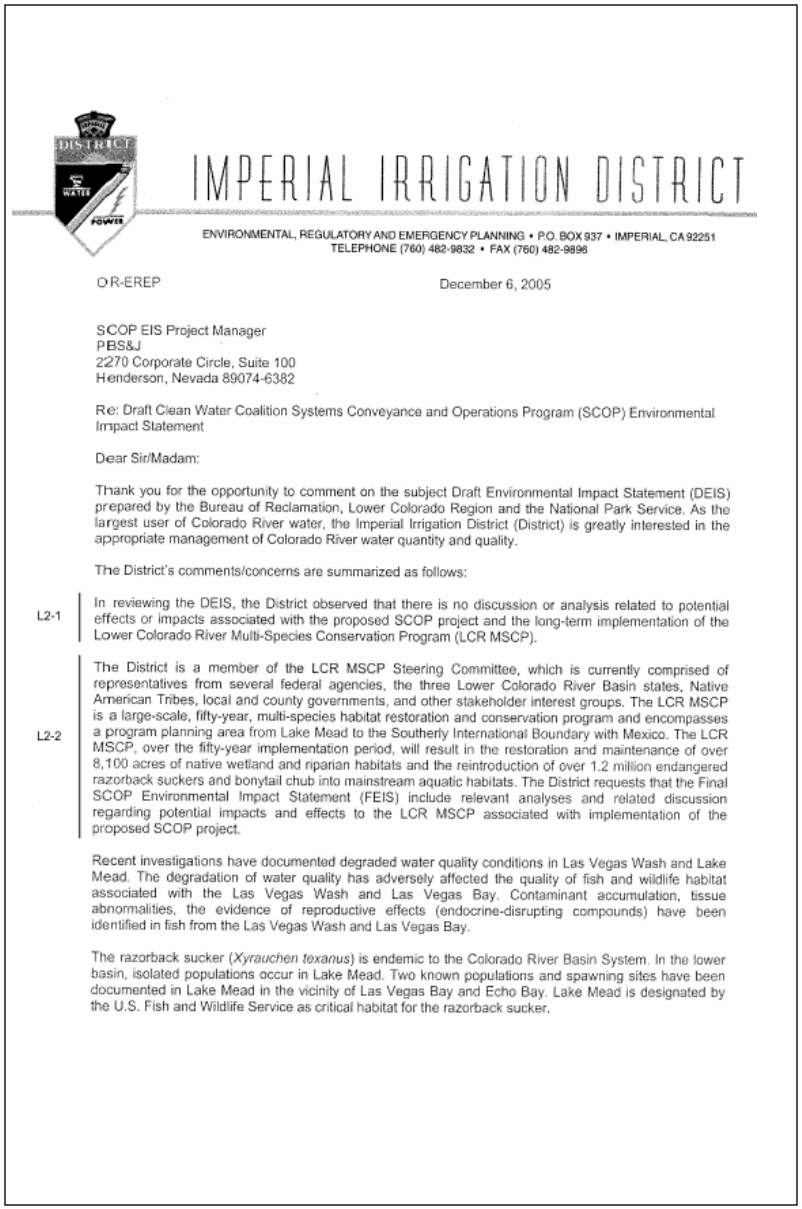
There currently is little evidence to support the hypothesis that these chemicals are causing adverse effects in humans at the levels encountered by the general population. Furthermore, treated wastewater effluent is diluted in the Lake, and water withdrawn from Lake Mead is subjected to drinking water treatment processes that can substantially remove many of these contaminants from finished drinking water.

**L1-7**

See response to comment E2-1.

**L1-8**

La Paz will be included as a stakeholder and be kept informed of SCOP progress and meetings to the extent possible given the available contact information. However, it is beyond the scope of this EIS to ensure that La Paz is included in "all matters concerning the quantity and/or quality of the waters of the Colorado River in the lower basin states."



IMPERIAL IRRIGATION DISTRICT

ENVIRONMENTAL, REGULATORY AND EMERGENCY PLANNING • P.O. BOX 937 • IMPERIAL, CA 92251
TELEPHONE (760) 482-9832 • FAX (760) 482-9896

OR-EREP

December 6, 2005

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, Nevada 89074-6382

Re: Draft Clean Water Coalition Systems Conveyance and Operations Program (SCOP) Environmental Impact Statement

Dear Sir/Madam:

Thank you for the opportunity to comment on the subject Draft Environmental Impact Statement (DEIS) prepared by the Bureau of Reclamation, Lower Colorado Region and the National Park Service. As the largest user of Colorado River water, the Imperial Irrigation District (District) is greatly interested in the appropriate management of Colorado River water quantity and quality.

The District's comments/concerns are summarized as follows:

L2-1 In reviewing the DEIS, the District observed that there is no discussion or analysis related to potential effects or impacts associated with the proposed SCOP project and the long-term implementation of the Lower Colorado River Multi-Species Conservation Program (LCR MSCP).

L2-2 The District is a member of the LCR MSCP Steering Committee, which is currently comprised of representatives from several federal agencies, the three Lower Colorado River Basin states, Native American Tribes, local and county governments, and other stakeholder interest groups. The LCR MSCP is a large-scale, fifty-year, multi-species habitat restoration and conservation program and encompasses a program planning area from Lake Mead to the Southerly International Boundary with Mexico. The LCR MSCP, over the fifty-year implementation period, will result in the restoration and maintenance of over 8,100 acres of native wetland and riparian habitats and the reintroduction of over 1.2 million endangered razorback suckers and bonytail chub into mainstream aquatic habitats. The District requests that the Final SCOP Environmental Impact Statement (FEIS) include relevant analyses and related discussion regarding potential impacts and effects to the LCR MSCP associated with implementation of the proposed SCOP project.

Recent investigations have documented degraded water quality conditions in Las Vegas Wash and Lake Mead. The degradation of water quality has adversely affected the quality of fish and wildlife habitat associated with the Las Vegas Wash and Las Vegas Bay. Contaminant accumulation, tissue abnormalities, the evidence of reproductive effects (endocrine-disrupting compounds) have been identified in fish from the Las Vegas Wash and Las Vegas Bay.

The razorback sucker (*Xyrauchen texanus*) is endemic to the Colorado River Basin System. In the lower basin, isolated populations occur in Lake Mead. Two known populations and spawning sites have been documented in Lake Mead in the vicinity of Las Vegas Bay and Echo Bay. Lake Mead is designated by the U.S. Fish and Wildlife Service as critical habitat for the razorback sucker.

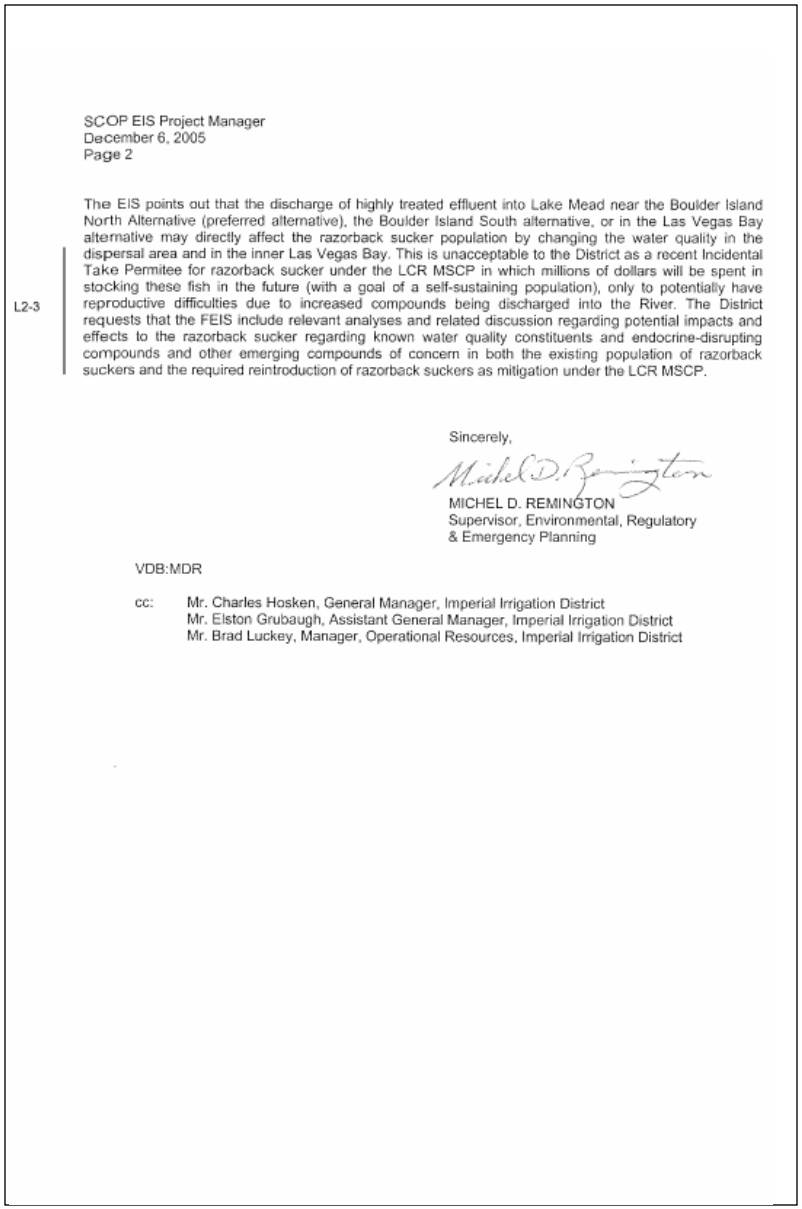
## **Response L2** Imperial Irrigation District

### L2-1

See General Response 9.

### L2-2

See General Response 9.



SCOP EIS Project Manager
December 6, 2005
Page 2

L2-3

The EIS points out that the discharge of highly treated effluent into Lake Mead near the Boulder Island North Alternative (preferred alternative), the Boulder Island South alternative, or in the Las Vegas Bay alternative may directly affect the razorback sucker population by changing the water quality in the dispersal area and in the inner Las Vegas Bay. This is unacceptable to the District as a recent Incidental Take Permitee for razorback sucker under the LCR MSCP in which millions of dollars will be spent in stocking these fish in the future (with a goal of a self-sustaining population), only to potentially have reproductive difficulties due to increased compounds being discharged into the River. The District requests that the FEIS include relevant analyses and related discussion regarding potential impacts and effects to the razorback sucker regarding known water quality constituents and endocrine-disrupting compounds and other emerging compounds of concern in both the existing population of razorback suckers and the required reintroduction of razorback suckers as mitigation under the LCR MSCP.

Sincerely,

MICHEL D. REMINGTON
Supervisor, Environmental, Regulatory
& Emergency Planning

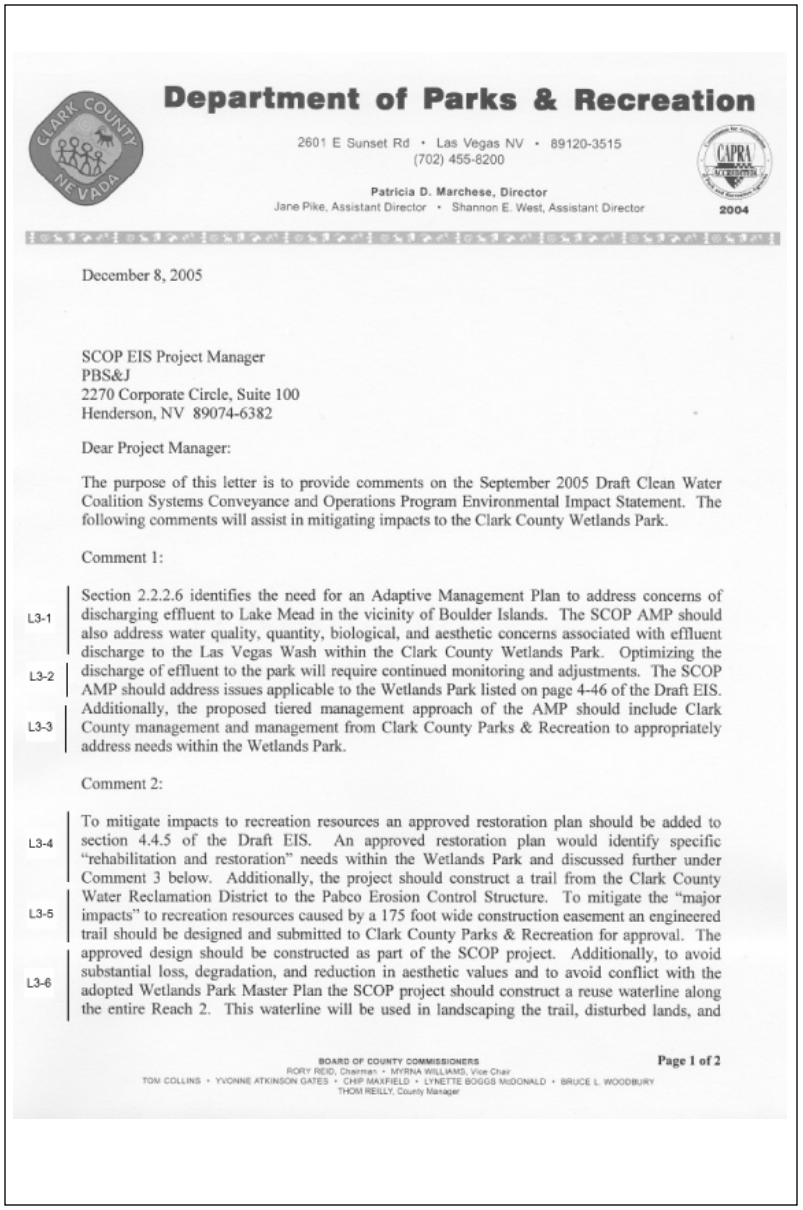
VDB:MDR

cc: Mr. Charles Hosken, General Manager, Imperial Irrigation District
Mr. Elston Grubaugh, Assistant General Manager, Imperial Irrigation District
Mr. Brad Luckey, Manager, Operational Resources, Imperial Irrigation District

**L2-3**

See General Response 6.

See General Response 9.



**Department of Parks & Recreation**

2601 E Sunset Rd • Las Vegas NV • 89120-3515
(702) 455-8200

Patricia D. Marchese, Director
Jane Pike, Assistant Director • Shannon E. West, Assistant Director

2004

December 8, 2005

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074-6382

Dear Project Manager:

The purpose of this letter is to provide comments on the September 2005 Draft Clean Water Coalition Systems Conveyance and Operations Program Environmental Impact Statement. The following comments will assist in mitigating impacts to the Clark County Wetlands Park.

Comment 1:

L3-1 Section 2.2.2.6 identifies the need for an Adaptive Management Plan to address concerns of discharging effluent to Lake Mead in the vicinity of Boulder Islands. The SCOP AMP should also address water quality, quantity, biological, and aesthetic concerns associated with effluent discharge to the Las Vegas Wash within the Clark County Wetlands Park. Optimizing the
L3-2 discharge of effluent to the park will require continued monitoring and adjustments. The SCOP AMP should address issues applicable to the Wetlands Park listed on page 4-46 of the Draft EIS.
L3-3 Additionally, the proposed tiered management approach of the AMP should include Clark County management and management from Clark County Parks & Recreation to appropriately address needs within the Wetlands Park.

Comment 2:

L3-4 To mitigate impacts to recreation resources an approved restoration plan should be added to section 4.4.5 of the Draft EIS. An approved restoration plan would identify specific "rehabilitation and restoration" needs within the Wetlands Park and discussed further under Comment 3 below. Additionally, the project should construct a trail from the Clark County
L3-5 Water Reclamation District to the Pabco Erosion Control Structure. To mitigate the "major impacts" to recreation resources caused by a 175 foot wide construction easement an engineered trail should be designed and submitted to Clark County Parks & Recreation for approval. The
L3-6 approved design should be constructed as part of the SCOP project. Additionally, to avoid substantial loss, degradation, and reduction in aesthetic values and to avoid conflict with the adopted Wetlands Park Master Plan the SCOP project should construct a reuse waterline along the entire Reach 2. This waterline will be used in landscaping the trail, disturbed lands, and

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THOM REILLY, County Manager

Page 1 of 2

## Response L3 Clark County Department of Parks and Recreation

### L3-1

See General Response 10.

See General Response 11.

### L3-2

See General Response 5.

See General Response 10.

See General Response 11.

### L3-3

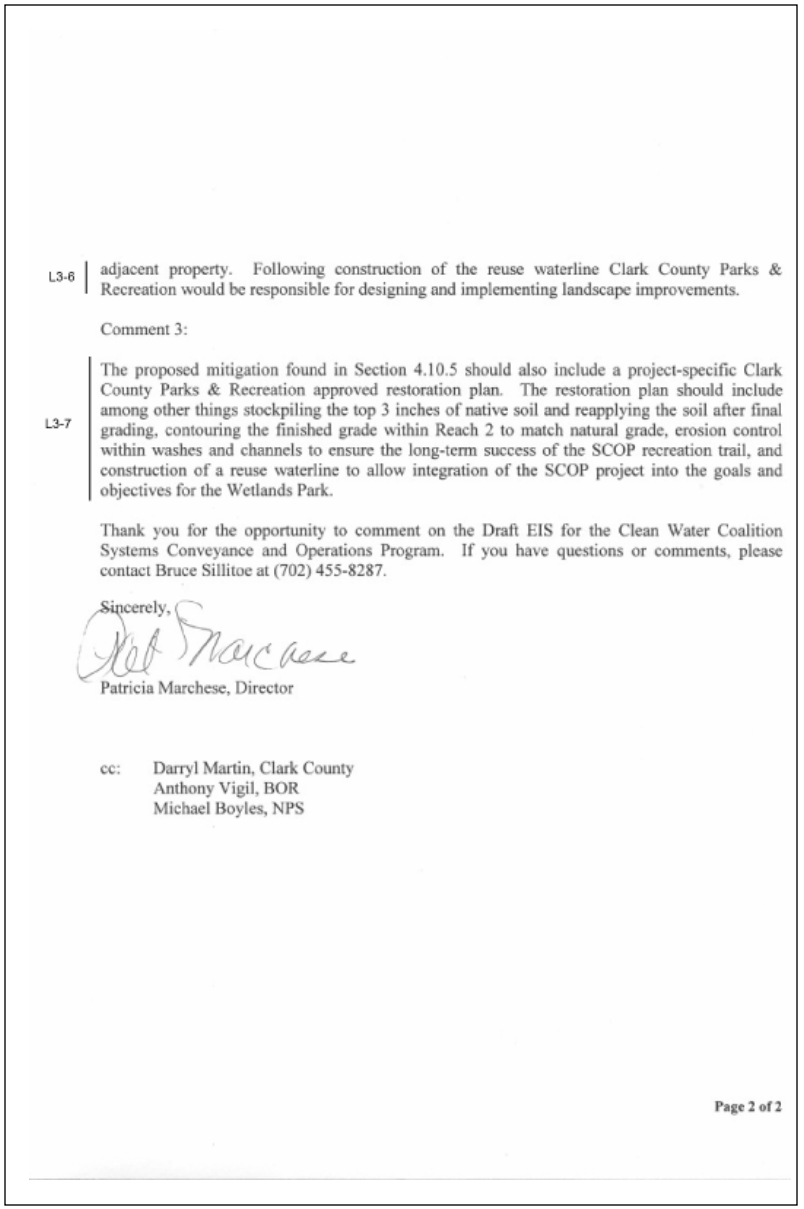
See General Response 10.

### L3-4

The details of project-specific restoration plans are not typically included in an EIS. The restoration plan details are determined once a ROD has been issued, prior to construction activities. However, the following text has been added to Section 4.4.5 of the Final EIS: "Restoration of the project site would be completed in accordance with a project-specific Reclamation- or NPS-approved restoration plan. The restoration plan may address salvage of topsoil for reseeding purposes, recontouring the natural land surface, blending colors and textures, treating weeds, and revegetating the disturbed areas. Coordination with Clark County Parks and Community Services would occur, to the extent required by Reclamation, during restoration activities within the Wetlands Park."

### L3-5

The construction of a trail from the CCWRD to the Pabco ECS is not part of the proposed project. Hollywood Boulevard is located in this area and provides adequate access to the Wetlands Park. Restoration of the project site will be completed in accordance with a project-specific Reclamation-approved restoration plan.



L3-6 | adjacent property. Following construction of the reuse waterline Clark County Parks & Recreation would be responsible for designing and implementing landscape improvements.

Comment 3:

L3-7 | The proposed mitigation found in Section 4.10.5 should also include a project-specific Clark County Parks & Recreation approved restoration plan. The restoration plan should include among other things stockpiling the top 3 inches of native soil and reapplying the soil after final grading, contouring the finished grade within Reach 2 to match natural grade, erosion control within washes and channels to ensure the long-term success of the SCOP recreation trail, and construction of a reuse waterline to allow integration of the SCOP project into the goals and objectives for the Wetlands Park.

Thank you for the opportunity to comment on the Draft EIS for the Clean Water Coalition Systems Conveyance and Operations Program. If you have questions or comments, please contact Bruce Sillitoe at (702) 455-8287.

Sincerely,

Patricia Marchese, Director

cc: Darryl Martin, Clark County
Anthony Vigil, BOR
Michael Boyles, NPS

Page 2 of 2

## L3-6

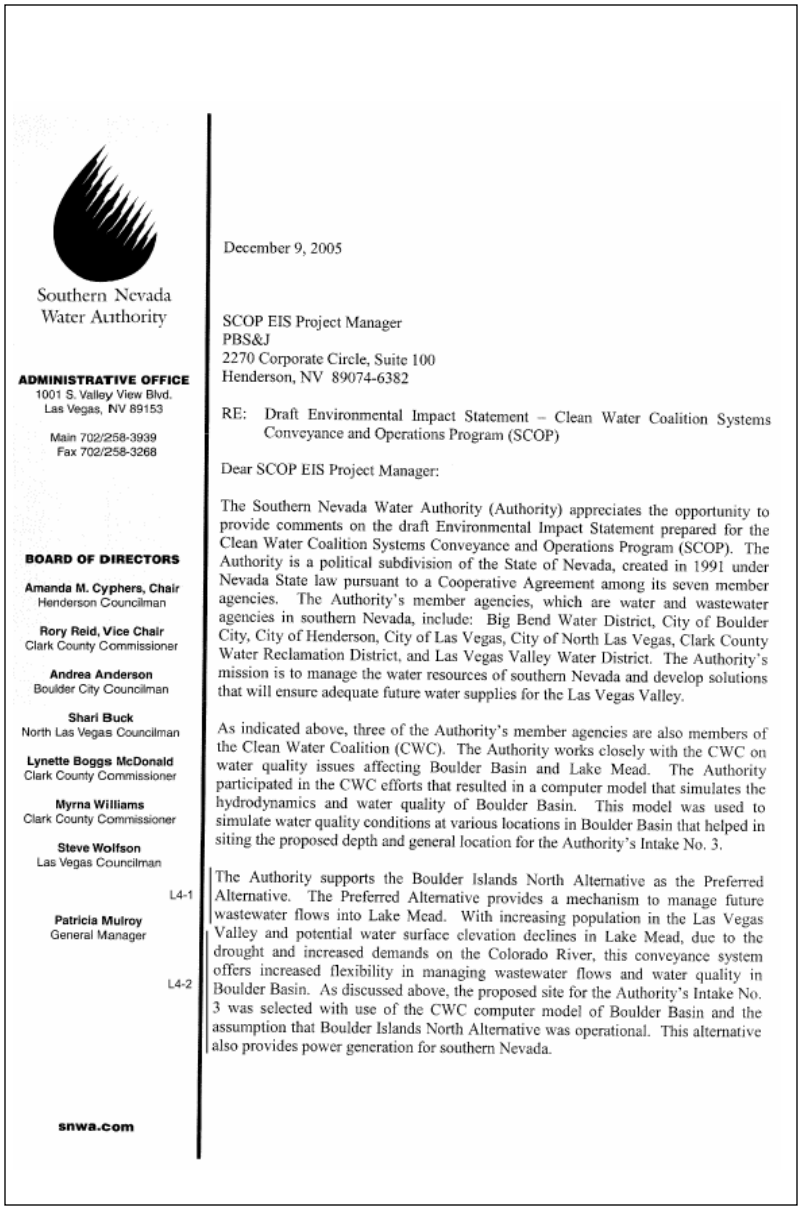
The construction of a reuse waterline for the Wetlands Park is not part of the SCOP. However, the SCOP pipeline would be designed to allow the installation of a reuse waterline for the Wetlands Park should Clark County Parks and Community Services wish to install a reuse waterline and purchase the water from the dischargers.

## L3-7

The details of project-specific restoration plans are not typically included in an EIS. The restoration plan details are determined once a ROD has been issued, prior to construction activities. However, the following text has been added to Section 4.10.6 of the Final EIS: "Restoration of the project site will be completed in accordance with a project-specific Reclamation- or NPS-approved restoration plan. The restoration plan will address salvage of topsoil for reseeding purposes, recontouring the natural land surface, blending colors and textures, treating weeds, and revegetating the disturbed areas. Coordination with Clark County Parks and Community Services would occur, to the extent required by Reclamation, during restoration activities within the Wetlands Park."

See response to comment L3-6.

A recreation trail is described in Section 2.3.1.1.2 as part of the Boulder Islands South and Las Vegas Bay alternatives. The chat trail would begin at approximately Pabco Road and continue to the working shaft for Reach 3. A recreation trail is not part of the Boulder Islands North Alternative. See response to comment L3-5.



Southern Nevada
Water Authority

**ADMINISTRATIVE OFFICE**
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December 9, 2005

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074-6382

RE: Draft Environmental Impact Statement – Clean Water Coalition Systems Conveyance and Operations Program (SCOP)

Dear SCOP EIS Project Manager:

The Southern Nevada Water Authority (Authority) appreciates the opportunity to provide comments on the draft Environmental Impact Statement prepared for the Clean Water Coalition Systems Conveyance and Operations Program (SCOP). The Authority is a political subdivision of the State of Nevada, created in 1991 under Nevada State law pursuant to a Cooperative Agreement among its seven member agencies. The Authority's member agencies, which are water and wastewater agencies in southern Nevada, include: Big Bend Water District, City of Boulder City, City of Henderson, City of Las Vegas, City of North Las Vegas, Clark County Water Reclamation District, and Las Vegas Valley Water District. The Authority's mission is to manage the water resources of southern Nevada and develop solutions that will ensure adequate future water supplies for the Las Vegas Valley.

As indicated above, three of the Authority's member agencies are also members of the Clean Water Coalition (CWC). The Authority works closely with the CWC on water quality issues affecting Boulder Basin and Lake Mead. The Authority participated in the CWC efforts that resulted in a computer model that simulates the hydrodynamics and water quality of Boulder Basin. This model was used to simulate water quality conditions at various locations in Boulder Basin that helped in siting the proposed depth and general location for the Authority's Intake No. 3.

L4-1

The Authority supports the Boulder Islands North Alternative as the Preferred Alternative. The Preferred Alternative provides a mechanism to manage future wastewater flows into Lake Mead. With increasing population in the Las Vegas Valley and potential water surface elevation declines in Lake Mead, due to the drought and increased demands on the Colorado River, this conveyance system offers increased flexibility in managing wastewater flows and water quality in Boulder Basin. As discussed above, the proposed site for the Authority's Intake No. 3 was selected with use of the CWC computer model of Boulder Basin and the assumption that Boulder Islands North Alternative was operational. This alternative also provides power generation for southern Nevada.

L4-2

## Response L4 Southern Nevada Water Authority

### L4-1

Comment noted.

### L4-2

Comment noted.

If you would like to discuss these comments further, please do not hesitate to contact me directly at (702) 258-3108.

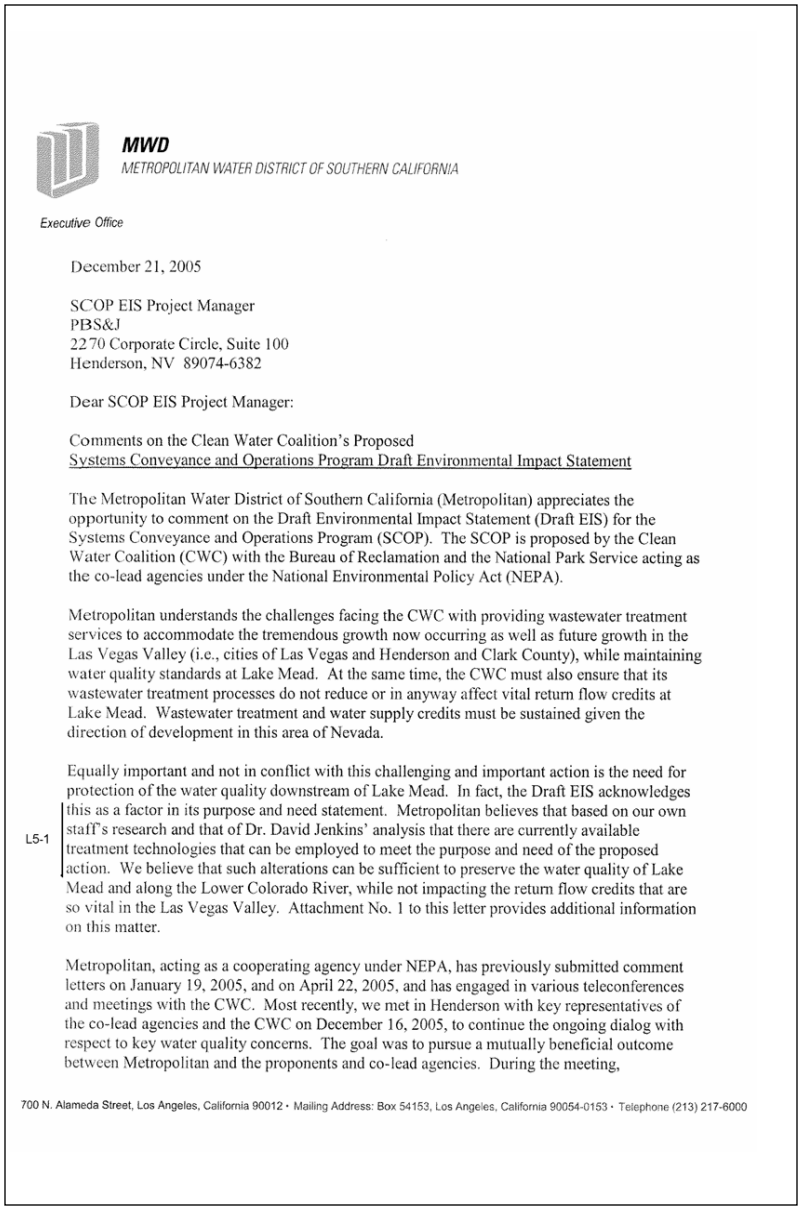
Sincerely,

Kay Brothers

Kay Brothers
Deputy General Manager
Engineering and Operations

KB/df

cc: Douglas Karafa, Project Administrator – Clean Water Coalition



**MWD**
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Executive Office

December 21, 2005

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074-6382

Dear SCOP EIS Project Manager:

Comments on the Clean Water Coalition's Proposed
Systems Conveyance and Operations Program Draft Environmental Impact Statement

The Metropolitan Water District of Southern California (Metropolitan) appreciates the opportunity to comment on the Draft Environmental Impact Statement (Draft EIS) for the Systems Conveyance and Operations Program (SCOP). The SCOP is proposed by the Clean Water Coalition (CWC) with the Bureau of Reclamation and the National Park Service acting as the co-lead agencies under the National Environmental Policy Act (NEPA).

Metropolitan understands the challenges facing the CWC with providing wastewater treatment services to accommodate the tremendous growth now occurring as well as future growth in the Las Vegas Valley (i.e., cities of Las Vegas and Henderson and Clark County), while maintaining water quality standards at Lake Mead. At the same time, the CWC must also ensure that its wastewater treatment processes do not reduce or in anyway affect vital return flow credits at Lake Mead. Wastewater treatment and water supply credits must be sustained given the direction of development in this area of Nevada.

L5-1

Equally important and not in conflict with this challenging and important action is the need for protection of the water quality downstream of Lake Mead. In fact, the Draft EIS acknowledges this as a factor in its purpose and need statement. Metropolitan believes that based on our own staff's research and that of Dr. David Jenkins' analysis that there are currently available treatment technologies that can be employed to meet the purpose and need of the proposed action. We believe that such alterations can be sufficient to preserve the water quality of Lake Mead and along the Lower Colorado River, while not impacting the return flow credits that are so vital in the Las Vegas Valley. Attachment No. 1 to this letter provides additional information on this matter.

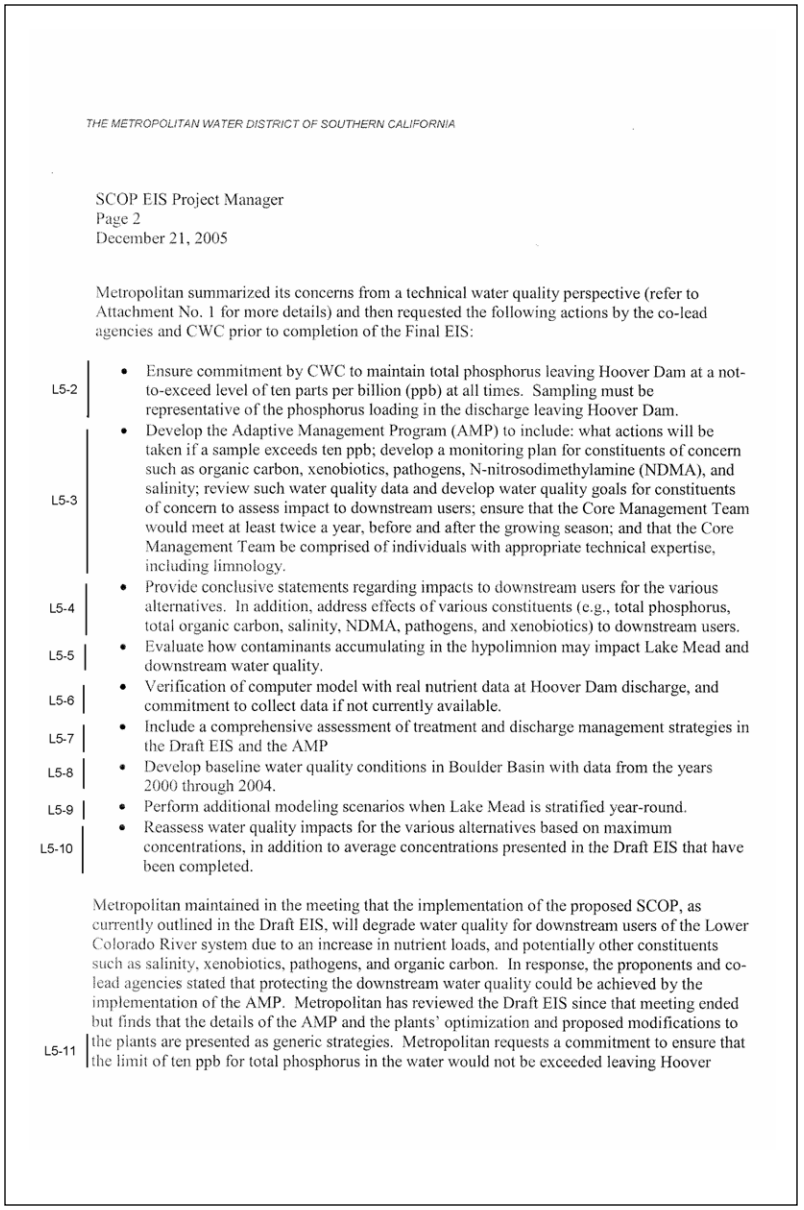
Metropolitan, acting as a cooperating agency under NEPA, has previously submitted comment letters on January 19, 2005, and on April 22, 2005, and has engaged in various teleconferences and meetings with the CWC. Most recently, we met in Henderson with key representatives of the co-lead agencies and the CWC on December 16, 2005, to continue the ongoing dialog with respect to key water quality concerns. The goal was to pursue a mutually beneficial outcome between Metropolitan and the proponents and co-lead agencies. During the meeting,

700 N. Alameda Street, Los Angeles, California 90012 · Mailing Address: Box 54153, Los Angeles, California 90054-0153 · Telephone (213) 217-6000

## Response L5 Metropolitan Water District of Southern California

### L5-1

See General Response 1.



THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

SCOP EIS Project Manager
Page 2
December 21, 2005

Metropolitan summarized its concerns from a technical water quality perspective (refer to Attachment No. 1 for more details) and then requested the following actions by the co-lead agencies and CWC prior to completion of the Final EIS:

L5-2
- Ensure commitment by CWC to maintain total phosphorus leaving Hoover Dam at a not-to-exceed level of ten parts per billion (ppb) at all times. Sampling must be representative of the phosphorus loading in the discharge leaving Hoover Dam.

L5-3
- Develop the Adaptive Management Program (AMP) to include: what actions will be taken if a sample exceeds ten ppb; develop a monitoring plan for constituents of concern such as organic carbon, xenobiotics, pathogens, N-nitrosodimethylamine (NDMA), and salinity; review such water quality data and develop water quality goals for constituents of concern to assess impact to downstream users; ensure that the Core Management Team would meet at least twice a year, before and after the growing season; and that the Core Management Team be comprised of individuals with appropriate technical expertise, including limnology.

L5-4
- Provide conclusive statements regarding impacts to downstream users for the various alternatives. In addition, address effects of various constituents (e.g., total phosphorus, total organic carbon, salinity, NDMA, pathogens, and xenobiotics) to downstream users.

L5-5
- Evaluate how contaminants accumulating in the hypolimnion may impact Lake Mead and downstream water quality.

L5-6
- Verification of computer model with real nutrient data at Hoover Dam discharge, and commitment to collect data if not currently available.

L5-7
- Include a comprehensive assessment of treatment and discharge management strategies in the Draft EIS and the AMP

L5-8
- Develop baseline water quality conditions in Boulder Basin with data from the years 2000 through 2004.

L5-9
- Perform additional modeling scenarios when Lake Mead is stratified year-round.

L5-10
- Reassess water quality impacts for the various alternatives based on maximum concentrations, in addition to average concentrations presented in the Draft EIS that have been completed.

Metropolitan maintained in the meeting that the implementation of the proposed SCOP, as currently outlined in the Draft EIS, will degrade water quality for downstream users of the Lower Colorado River system due to an increase in nutrient loads, and potentially other constituents such as salinity, xenobiotics, pathogens, and organic carbon. In response, the proponents and co-lead agencies stated that protecting the downstream water quality could be achieved by the implementation of the AMP. Metropolitan has reviewed the Draft EIS since that meeting ended but finds that the details of the AMP and the plants' optimization and proposed modifications to

L5-11 the plants are presented as generic strategies. Metropolitan requests a commitment to ensure that the limit of ten ppb for total phosphorus in the water would not be exceeded leaving Hoover

**L5-2**

See General Response 8.

**L5-3**

See General Response 8.

See General Response 10.

See General Response 4.

**L5-4**

See General Response 8.

See General Response 10.

See General Response 4.

**L5-5**

See General Response 7.

The potential impacts downstream of Hoover Dam have been added throughout Chapter 4. A separate subheading for each alternative was added to the water quality sections. The potential impacts downstream of Hoover Dam are described in the text for the other resources.

**L5-6**

As part of the preparation of the Draft EIS, the sophisticated three-dimensional ELCOM-CAEDYM computer model was compared with actual data, and was found to have adequately simulated conditions during 2000 through 2003. The model provided hour-by-hour analysis of how discharges at the modeled locations would mix into the Lake under various hydrologic and weather conditions. Because its calibration adequately simulated several years of differing conditions, it is considered sufficiently validated for use in assessing the variables modeled, including the concentration of phosphorus.

See General Response 10.

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**L5-7**

See General Response 3.

See General Response 1.

See General Response 10.

**L5-8**

The Draft EIS uses 2002 conditions for baseline comparisons. If the baseline is extended to comprise the years 2000 through 2004 then the comparisons of chlorophyll levels would be more favorable for the SCOP than those presented in the Draft EIS. This is a direct result of the large algae bloom in 2001 that would increase the average baseline chlorophyll concentrations (see Figure D.2-3 in Appendix D).

Similarly, the longer baseline increases the baseline phosphorus loads through Hoover Dam, since prior to 2002 the dischargers did not remove as much phosphorus year-round resulting in higher phosphorus loads through the dam. An analysis is presented in Appendix D, Attachment 2 in which a baseline for TP through Hoover Dam is developed based on the 1999 through 2003 period.

For constituents other than chlorophyll and phosphorus, using several years for baseline rather than the single year 2002 would not produce any significant differences in the conclusions.

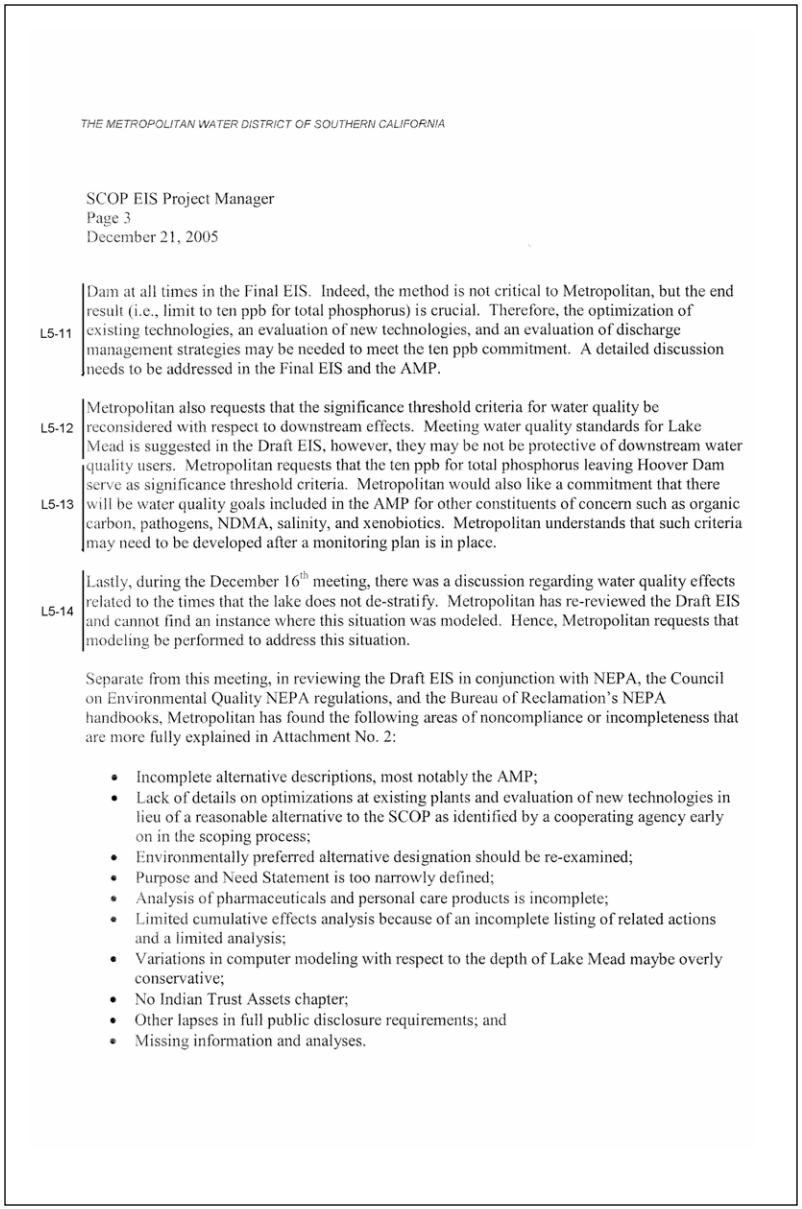
Extending the baseline back to include 10 years would result in even higher baseline values for phosphorus loads through Hoover Dam, since more phosphorus was discharged in the effluent prior to 2002.

**L5-9**

See General Response 7.

**L5-10**

The Draft EIS relies primarily on averages rather than maxima because maxima are less reliable predictors than averages, and water quality standards are generally defined in terms of annual averages. However, peak concentrations were also considered. The modeling included sophisticated equations for the growth of algae, such that any algal blooms in Lake Mead that may be the result of sudden increases



THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

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L5-11 Dam at all times in the Final EIS. Indeed, the method is not critical to Metropolitan, but the end result (i.e., limit to ten ppb for total phosphorus) is crucial. Therefore, the optimization of existing technologies, an evaluation of new technologies, and an evaluation of discharge management strategies may be needed to meet the ten ppb commitment. A detailed discussion needs to be addressed in the Final EIS and the AMP.

L5-12 Metropolitan also requests that the significance threshold criteria for water quality be reconsidered with respect to downstream effects. Meeting water quality standards for Lake Mead is suggested in the Draft EIS, however, they may be not be protective of downstream water quality users. Metropolitan requests that the ten ppb for total phosphorus leaving Hoover Dam serve as significance threshold criteria. Metropolitan would also like a commitment that there

L5-13 will be water quality goals included in the AMP for other constituents of concern such as organic carbon, pathogens, NDMA, salinity, and xenobiotics. Metropolitan understands that such criteria may need to be developed after a monitoring plan is in place.

L5-14 Lastly, during the December 16th meeting, there was a discussion regarding water quality effects related to the times that the lake does not de-stratify. Metropolitan has re-reviewed the Draft EIS and cannot find an instance where this situation was modeled. Hence, Metropolitan requests that modeling be performed to address this situation.

Separate from this meeting, in reviewing the Draft EIS in conjunction with NEPA, the Council on Environmental Quality NEPA regulations, and the Bureau of Reclamation's NEPA handbooks, Metropolitan has found the following areas of noncompliance or incompleteness that are more fully explained in Attachment No. 2:

- Incomplete alternative descriptions, most notably the AMP;
- Lack of details on optimizations at existing plants and evaluation of new technologies in lieu of a reasonable alternative to the SCOP as identified by a cooperating agency early on in the scoping process;
- Environmentally preferred alternative designation should be re-examined;
- Purpose and Need Statement is too narrowly defined;
- Analysis of pharmaceuticals and personal care products is incomplete;
- Limited cumulative effects analysis because of an incomplete listing of related actions and a limited analysis;
- Variations in computer modeling with respect to the depth of Lake Mead maybe overly conservative;
- No Indian Trust Assets chapter;
- Other lapses in full public disclosure requirements; and
- Missing information and analyses.

**(L5-10 continued)**

in nutrient levels are inherently considered in the modeling analysis. Because chlorophyll concentrations were of particular interest, and because they are regulated by water quality standards applicable both to the mean and the 95th percentile, modeling of the 95th percentile chlorophyll concentrations were conducted. These results were added to Chapter 4 and Appendix D of the EIS. Results showed that the water quality standard for mean chlorophyll was the more sensitive indicator, and the mean was therefore used in the Draft EIS. Using maxima rather than averages for other constituents would similarly not be expected to identify significant differences that do not exist for averages.

Algal blooms in Lake Mohave would not be particularly sensitive to sudden temporary increases in phosphorus concentrations through Hoover Dam, because of the significant mixing and delay before reaching the photic zone. The seasonally uniform, cold inflow from the Lake Mead hypolimnetic Hoover Dam releases (approximately 12 °C year round) transits the Canyon Reach with very little warming and enters the upper basins of Lake Mohave as an underflow through the spring, summer, and fall seasons (when algae growth in Lake Mohave may be of concern). This underflow becomes larger than the inflow from Lake Mead due to entrainment of epilimnetic water at the plunge point (J.D. Edinger Associates 2003). This entrainment directly dilutes any parcels of water that may have higher than average phosphorus concentrations. In addition, the average residence time of Cottonwood Basin (the largest and furthest downstream portion of Lake Mohave) is 64 days (J.D. Edinger Associates 2003). The time for the underflow to upwell and reach the surface in Lake Mohave would be smaller than, but of the same order as, the residence time. It would therefore take many days or weeks for any parcels of water with higher than average phosphorus concentrations to surface and reach the photic zone after entering Lake Mohave as an underflow. By this time, the higher phosphorus concentration would have been well mixed and diluted with ambient water and water entrained from the epilimnion. Thus, with respect to algal growth in Lake Mohave, the relevant phosphorus concentration leaving Hoover Dam is one that has been averaged over many days or weeks, rather than any instantaneous value. This information was added to Appendix D.

**L5-11**

See General Response 8.

See General Response 3.

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**(L5-11 continued)**

See General Response 1.

See General Response 10.

**L5-12**

The significance criteria used for water quality was re-evaluated. The significance criteria presented in Section 4.1 of the Draft and Final EIS states: "This project would have a significant impact on water resources if the project: Violates any water quality standards or waste discharge requirements…Substanially degrades water quality…" The significance criteria used did NOT specify "water quality standards for Lake Mead".

Water quality standards for the Colorado River have been established by the State of Nevada, and approved by EPA. These standards have been promulgated to protect all designated uses of the Colorado River, including water supply. They provide a good starting point, at the very least, and the Draft EIS did not preclude the use of other significance criteria. No other criterion, except the suggested phosphorus level of 10 ppb (comment L5-2), has been identified as an applicable criterion to measure effects on downstream users. The SCOP project appears to have increased interest in discharges from the Valley, and the dischargers expect to be increasing their already substantial monitoring program. If the increased interest and monitoring identifies issues in the future, they will be resolved through several ongoing processes in which the dischargers coordinate with, and are regulated by, federal, state, and local entities.

No change to the EIS is necessary.

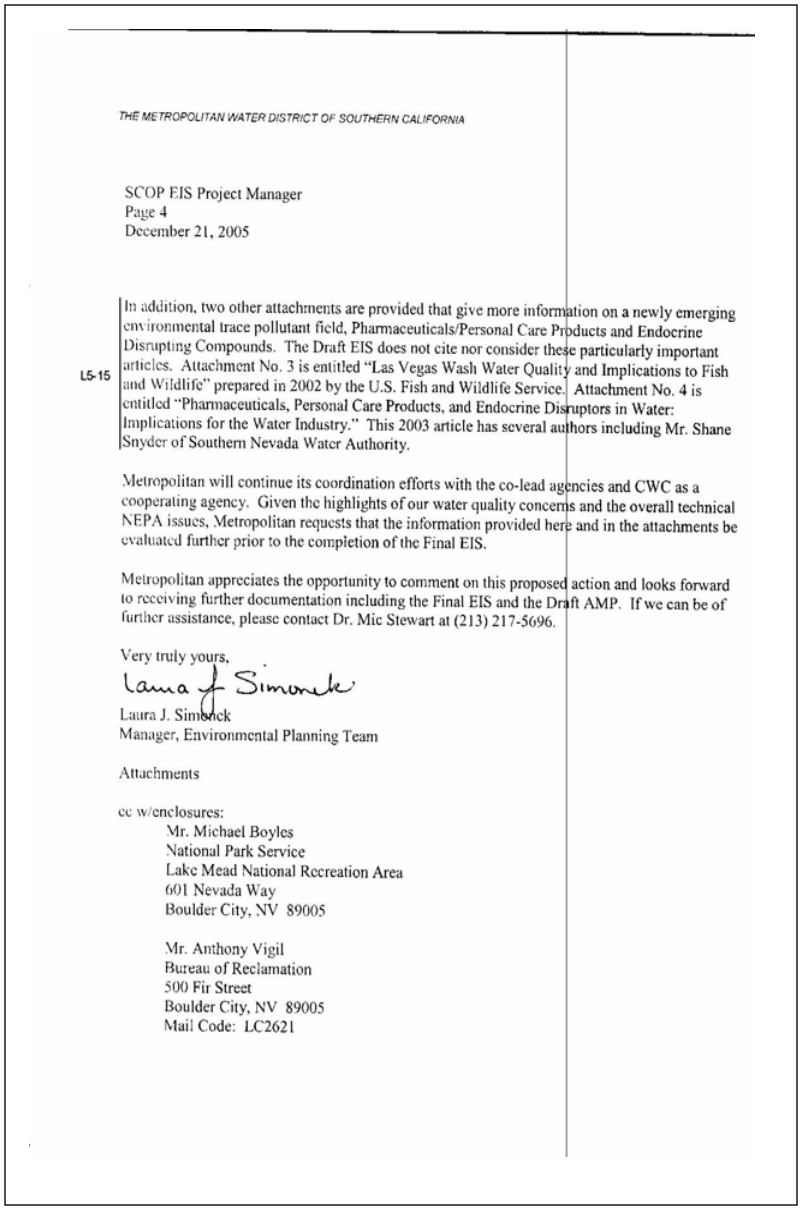
**L5-13**

See General Response 8.

See General Response 10.

**L5-14**

See General Response 7.



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L5-15 In addition, two other attachments are provided that give more information on a newly emerging environmental trace pollutant field, Pharmaceuticals/Personal Care Products and Endocrine Disrupting Compounds. The Draft EIS does not cite nor consider these particularly important articles. Attachment No. 3 is entitled "Las Vegas Wash Water Quality and Implications to Fish and Wildlife" prepared in 2002 by the U.S. Fish and Wildlife Service. Attachment No. 4 is entitled "Pharmaceuticals, Personal Care Products, and Endocrine Disruptors in Water: Implications for the Water Industry." This 2003 article has several authors including Mr. Shane Snyder of Southern Nevada Water Authority.

Metropolitan will continue its coordination efforts with the co-lead agencies and CWC as a cooperating agency. Given the highlights of our water quality concerns and the overall technical NEPA issues, Metropolitan requests that the information provided here and in the attachments be evaluated further prior to the completion of the Final EIS.

Metropolitan appreciates the opportunity to comment on this proposed action and looks forward to receiving further documentation including the Final EIS and the Draft AMP. If we can be of further assistance, please contact Dr. Mic Stewart at (213) 217-5696.

Very truly yours,

Laura J. Simonek
Manager, Environmental Planning Team

Attachments

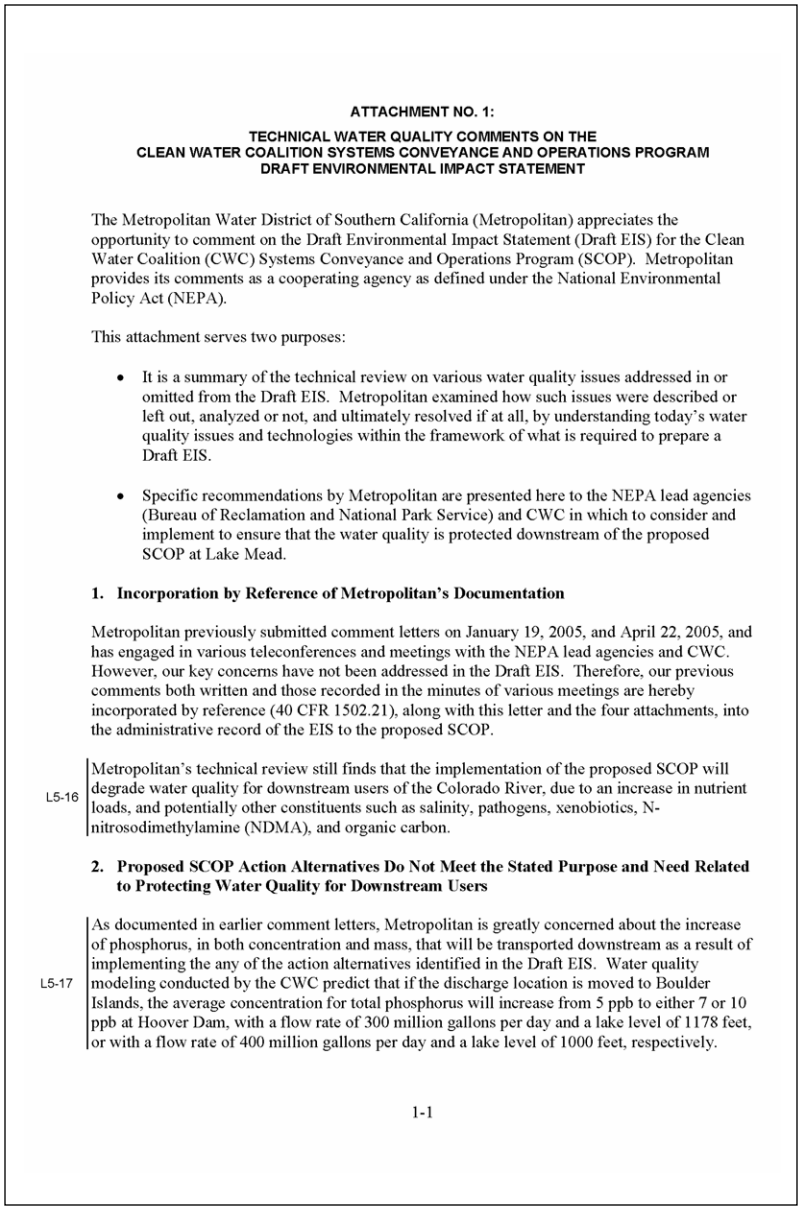
cc w/enclosures:
Mr. Michael Boyles
National Park Service
Lake Mead National Recreation Area
601 Nevada Way
Boulder City, NV 89005

Mr. Anthony Vigil
Bureau of Reclamation
500 Fir Street
Boulder City, NV 89005
Mail Code: LC2621

**L5-15**

See General Response 6.

Please refer to the revised Appendix K. These two documents have been included in a more comprehensive review of EDC and PPCP research conducted in the Boulder Basin of Lake Mead.



**ATTACHMENT NO. 1:**

**TECHNICAL WATER QUALITY COMMENTS ON THE CLEAN WATER COALITION SYSTEMS CONVEYANCE AND OPERATIONS PROGRAM DRAFT ENVIRONMENTAL IMPACT STATEMENT**

The Metropolitan Water District of Southern California (Metropolitan) appreciates the opportunity to comment on the Draft Environmental Impact Statement (Draft EIS) for the Clean Water Coalition (CWC) Systems Conveyance and Operations Program (SCOP). Metropolitan provides its comments as a cooperating agency as defined under the National Environmental Policy Act (NEPA).

This attachment serves two purposes:

- It is a summary of the technical review on various water quality issues addressed in or omitted from the Draft EIS. Metropolitan examined how such issues were described or left out, analyzed or not, and ultimately resolved if at all, by understanding today's water quality issues and technologies within the framework of what is required to prepare a Draft EIS.
- Specific recommendations by Metropolitan are presented here to the NEPA lead agencies (Bureau of Reclamation and National Park Service) and CWC in which to consider and implement to ensure that the water quality is protected downstream of the proposed SCOP at Lake Mead.

**1. Incorporation by Reference of Metropolitan's Documentation**

Metropolitan previously submitted comment letters on January 19, 2005, and April 22, 2005, and has engaged in various teleconferences and meetings with the NEPA lead agencies and CWC. However, our key concerns have not been addressed in the Draft EIS. Therefore, our previous comments both written and those recorded in the minutes of various meetings are hereby incorporated by reference (40 CFR 1502.21), along with this letter and the four attachments, into the administrative record of the EIS to the proposed SCOP.

L5-16 Metropolitan's technical review still finds that the implementation of the proposed SCOP will degrade water quality for downstream users of the Colorado River, due to an increase in nutrient loads, and potentially other constituents such as salinity, pathogens, xenobiotics, N-nitrosodimethylamine (NDMA), and organic carbon.

**2. Proposed SCOP Action Alternatives Do Not Meet the Stated Purpose and Need Related to Protecting Water Quality for Downstream Users**

L5-17 As documented in earlier comment letters, Metropolitan is greatly concerned about the increase of phosphorus, in both concentration and mass, that will be transported downstream as a result of implementing the any of the action alternatives identified in the Draft EIS. Water quality modeling conducted by the CWC predict that if the discharge location is moved to Boulder Islands, the average concentration for total phosphorus will increase from 5 ppb to either 7 or 10 ppb at Hoover Dam, with a flow rate of 300 million gallons per day and a lake level of 1178 feet, or with a flow rate of 400 million gallons per day and a lake level of 1000 feet, respectively.

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## L5-16

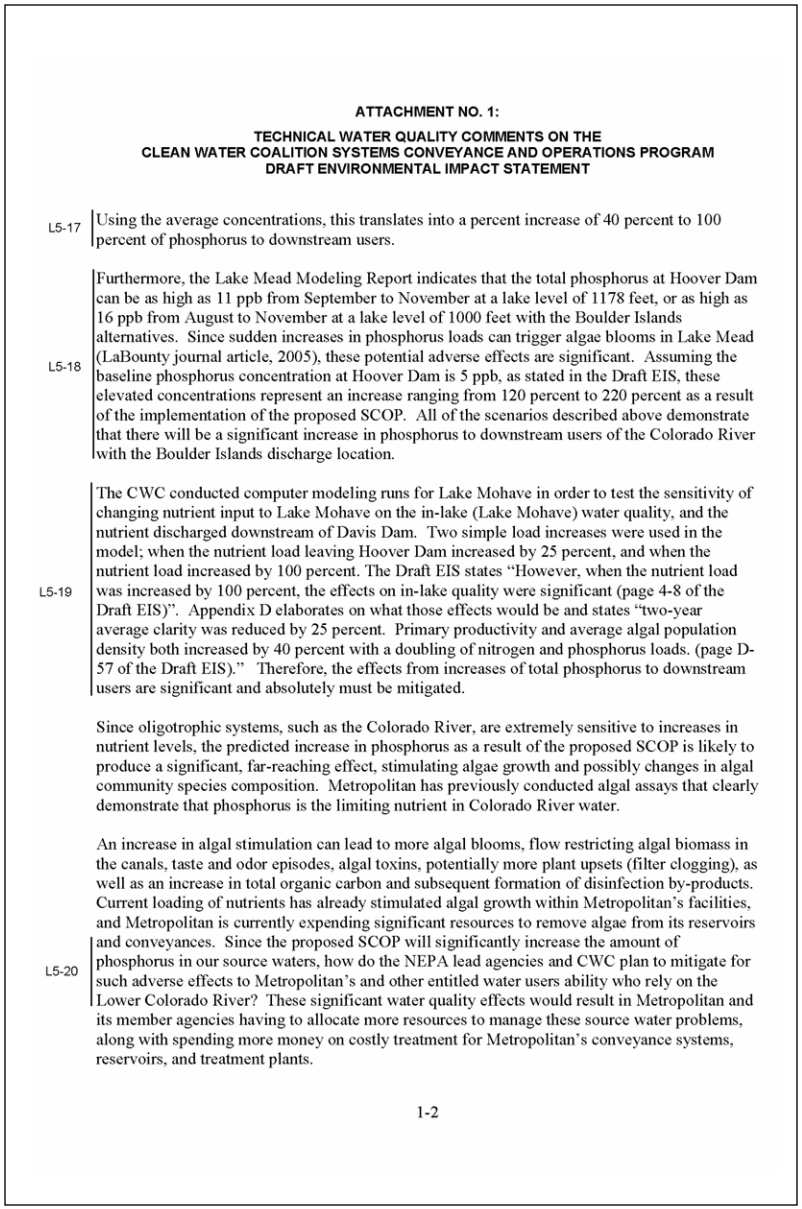
See General Response 8.

See General Response 10.

## L5-17

The commenter compares the baseline condition (2002 with initial water surface elevation of 1,178 ft) to the 2050 condition with initial water surface elevation of 1,000 ft to infer that a 100-percent increase in TP loading through Hoover Dam would occur as a result of implementing the Boulder Islands alternatives. This conclusion is inappropriate since it is based upon a comparison of results of two simulations at vastly different water surface elevations.

See General Response 8.



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L5-17 Using the average concentrations, this translates into a percent increase of 40 percent to 100 percent of phosphorus to downstream users.

L5-18 Furthermore, the Lake Mead Modeling Report indicates that the total phosphorus at Hoover Dam can be as high as 11 ppb from September to November at a lake level of 1178 feet, or as high as 16 ppb from August to November at a lake level of 1000 feet with the Boulder Islands alternatives. Since sudden increases in phosphorus loads can trigger algae blooms in Lake Mead (LaBounty journal article, 2005), these potential adverse effects are significant. Assuming the baseline phosphorus concentration at Hoover Dam is 5 ppb, as stated in the Draft EIS, these elevated concentrations represent an increase ranging from 120 percent to 220 percent as a result of the implementation of the proposed SCOP. All of the scenarios described above demonstrate that there will be a significant increase in phosphorus to downstream users of the Colorado River with the Boulder Islands discharge location.

L5-19 The CWC conducted computer modeling runs for Lake Mohave in order to test the sensitivity of changing nutrient input to Lake Mohave on the in-lake (Lake Mohave) water quality, and the nutrient discharged downstream of Davis Dam. Two simple load increases were used in the model; when the nutrient load leaving Hoover Dam increased by 25 percent, and when the nutrient load increased by 100 percent. The Draft EIS states "However, when the nutrient load was increased by 100 percent, the effects on in-lake quality were significant (page 4-8 of the Draft EIS)". Appendix D elaborates on what those effects would be and states "two-year average clarity was reduced by 25 percent. Primary productivity and average algal population density both increased by 40 percent with a doubling of nitrogen and phosphorus loads. (page D-57 of the Draft EIS)." Therefore, the effects from increases of total phosphorus to downstream users are significant and absolutely must be mitigated.

Since oligotrophic systems, such as the Colorado River, are extremely sensitive to increases in nutrient levels, the predicted increase in phosphorus as a result of the proposed SCOP is likely to produce a significant, far-reaching effect, stimulating algae growth and possibly changes in algal community species composition. Metropolitan has previously conducted algal assays that clearly demonstrate that phosphorus is the limiting nutrient in Colorado River water.

L5-20 An increase in algal stimulation can lead to more algal blooms, flow restricting algal biomass in the canals, taste and odor episodes, algal toxins, potentially more plant upsets (filter clogging), as well as an increase in total organic carbon and subsequent formation of disinfection by-products. Current loading of nutrients has already stimulated algal growth within Metropolitan's facilities, and Metropolitan is currently expending significant resources to remove algae from its reservoirs and conveyances. Since the proposed SCOP will significantly increase the amount of phosphorus in our source waters, how do the NEPA lead agencies and CWC plan to mitigate for such adverse effects to Metropolitan's and other entitled water users ability who rely on the Lower Colorado River? These significant water quality effects would result in Metropolitan and its member agencies having to allocate more resources to manage these source water problems, along with spending more money on costly treatment for Metropolitan's conveyance systems, reservoirs, and treatment plants.

1-2

## L5-18

The journal article by LaBounty and Burns (2005) in part attributes the 2001 algal bloom in Boulder Basin to increased phosphorus loads. However, they also attribute the bloom to an extended period of overflow from the Las Vegas Wash resulting in more nutrients in the epilimnion and photic zone. In contrast to the present day and No Action Alternative, the modeling indicates that the Boulder Islands alternatives would result in the majority of the effluent being inserted below the photic zone, thereby resulting in decreased algal growth. Thus, the probability of algal blooms similar to the 2001 event occurring would decrease with discharge in the vicinity of the Boulder Islands.

As a result of storms, Lake levels, and dam operations, the phosphorus concentrations through Hoover Dam would not be constant, and instantaneous values would vary from the annual average value. As such, it is not appropriate to compare an instantaneous maximum value to an annual average value. Therefore the 120-percent and 220-percent increases stated by the commenter are not accurate reflections of the change in phosphorus loading resulting from implementation of the Boulder Islands Alternative. Additionally, the stated 220-percent increase results from comparing the average of the baseline condition (2002 with initial water surface elevation of 1,178 ft) to the maximum of the 2050 condition with initial water surface elevation of 1,000 ft. It is not appropriate to compare simulation results at vastly different water surface elevations.

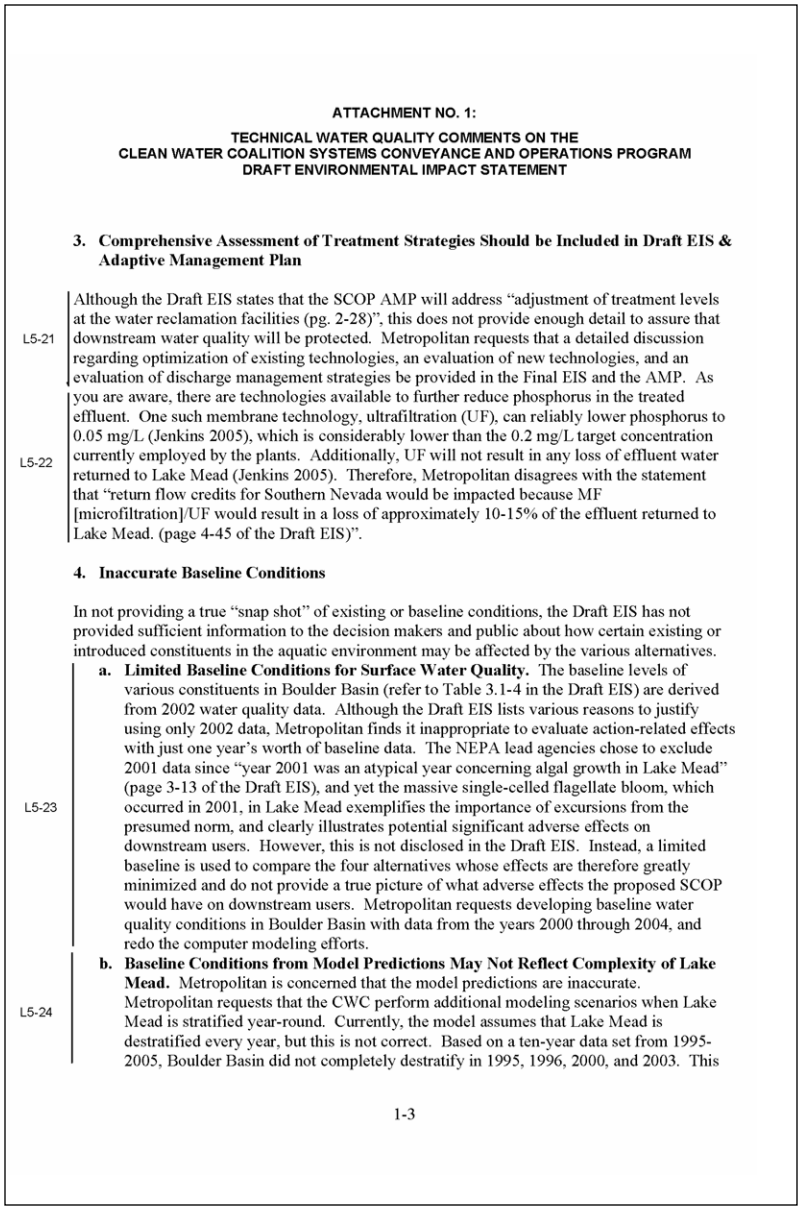
See General Response 8.

## L5-19

See General Response 8.

## L5-20

See General Response 8.



**ATTACHMENT NO. 1:**

**TECHNICAL WATER QUALITY COMMENTS ON THE CLEAN WATER COALITION SYSTEMS CONVEYANCE AND OPERATIONS PROGRAM DRAFT ENVIRONMENTAL IMPACT STATEMENT**

**3. Comprehensive Assessment of Treatment Strategies Should be Included in Draft EIS & Adaptive Management Plan**

L5-21 Although the Draft EIS states that the SCOP AMP will address "adjustment of treatment levels at the water reclamation facilities (pg. 2-28)", this does not provide enough detail to assure that downstream water quality will be protected. Metropolitan requests that a detailed discussion regarding optimization of existing technologies, an evaluation of new technologies, and an evaluation of discharge management strategies be provided in the Final EIS and the AMP. As you are aware, there are technologies available to further reduce phosphorus in the treated effluent. One such membrane technology, ultrafiltration (UF), can reliably lower phosphorus to 0.05 mg/L (Jenkins 2005), which is considerably lower than the 0.2 mg/L target concentration

L5-22 currently employed by the plants. Additionally, UF will not result in any loss of effluent water returned to Lake Mead (Jenkins 2005). Therefore, Metropolitan disagrees with the statement that "return flow credits for Southern Nevada would be impacted because MF [microfiltration]/UF would result in a loss of approximately 10-15% of the effluent returned to Lake Mead. (page 4-45 of the Draft EIS)".

**4. Inaccurate Baseline Conditions**

In not providing a true "snap shot" of existing or baseline conditions, the Draft EIS has not provided sufficient information to the decision makers and public about how certain existing or introduced constituents in the aquatic environment may be affected by the various alternatives.

L5-23 **a. Limited Baseline Conditions for Surface Water Quality.** The baseline levels of various constituents in Boulder Basin (refer to Table 3.1-4 in the Draft EIS) are derived from 2002 water quality data. Although the Draft EIS lists various reasons to justify using only 2002 data, Metropolitan finds it inappropriate to evaluate action-related effects with just one year's worth of baseline data. The NEPA lead agencies chose to exclude 2001 data since "year 2001 was an atypical year concerning algal growth in Lake Mead" (page 3-13 of the Draft EIS), and yet the massive single-celled flagellate bloom, which occurred in 2001, in Lake Mead exemplifies the importance of excursions from the presumed norm, and clearly illustrates potential significant adverse effects on downstream users. However, this is not disclosed in the Draft EIS. Instead, a limited baseline is used to compare the four alternatives whose effects are therefore greatly minimized and do not provide a true picture of what adverse effects the proposed SCOP would have on downstream users. Metropolitan requests developing baseline water quality conditions in Boulder Basin with data from the years 2000 through 2004, and redo the computer modeling efforts.

L5-24 **b. Baseline Conditions from Model Predictions May Not Reflect Complexity of Lake Mead.** Metropolitan is concerned that the model predictions are inaccurate. Metropolitan requests that the CWC perform additional modeling scenarios when Lake Mead is stratified year-round. Currently, the model assumes that Lake Mead is destratified every year, but this is not correct. Based on a ten-year data set from 1995-2005, Boulder Basin did not completely destratify in 1995, 1996, 2000, and 2003. This

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## L5-21

See General Response 3.

See General Response 1.

See General Response 10.

## L5-22

Information regarding each plant's current capabilities has been added to Section 2.1 of the Final EIS.

See General Response 8.

See General Response 1.

## L5-23

See response to comment L5-8.

## L5-24

Additional refined model runs when the Lake does not fully destratify have been performed. Results of these runs are presented in Attachment 1 of Appendix D of the Final EIS. Figures 2, 4, and 6 of Attachment 1 of Appendix D illustrate that the effluent always undergoes initial dilution (due to jet momentum), even when the Lake remains stratified in the winter. Additionally, it is apparent that more mixing and dilution of the effluent with the ambient water occurs between the Boulder Islands diffuser location and Hoover Dam.

Since the effluent is still well mixed and diluted, the incomplete destratification scenario does not directly lead to higher phosphorus (or other effluent constituent) concentrations at Hoover Dam. However, since the phosphorus concentrations at the Hoover Dam outlets depend upon the effluent insertion elevation relative to the dam outlets elevations, the incomplete destratification scenario can have an indirect and temporary impact. For example, if the weak winter thermocline is at the elevation of one of the Hoover Dam outlets, then the effluent would likely insert at that elevation and the concentrations of phosphorus (and other effluent constituents) at the dam outlet would increase. However, this impact would be temporary since the

**ATTACHMENT NO. 1:**

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represents a 40% chance that Boulder Basin will not completely destratify. (LaBounty, journal article, 2005). Therefore, it is not uncommon for Lake Mead to remain stratified. If wastewater effluent were discharged at Boulder Islands during a stratified year, the effluent would not undergo dilution by mixing, and it is likely that phosphorus concentrations at Hoover Dam would be higher than what the model currently predicts. L5-24

c. **Validity of Baseline Conditions in Boulder Basin.** Additionally, Metropolitan questions the accuracy of the predicted baseline water quality conditions in Boulder Basin (Table 3.1-4 of the Draft EIS). The baseline concentration for phosphorus at Hoover Dam Discharge as predicted by the model is shown as 5 ppb. However, monitoring data obtained from the Bureau of Reclamation at Hoover Dam shows that the average concentration, from January 2004 to July 2005, is closer to 8 ppb and widely ranges from 2 – 35 ppb. A higher phosphorus baseline concentration shifts the water classification closer to the eutrophic range, which heightens Metropolitan's concerns. Consequently, with the current modeling effort, the predicted baseline numbers may skew the results, thereby presenting an erroneous finding that the SCOP would have little to no impact to the water quality at Lake Mead or possibly to water quality downstream of the proposed action. Metropolitan strongly recommends that the model needs to be verified with real nutrient Hoover Dam discharge water quality data, and if not available, these data should be collected. With so much at stake, it is inappropriate to draw conclusions with an unverified model. L5-25

**5. Incomplete Description of Action Alternatives**

In order for an environmental analysis to be undertaken, relevant information from the alternatives must be presented in the Draft EIS that, in conjunction with the affected human environment, natural resources, socioeconomics, and other NEPA required topics, can be fairly evaluated. If information on the action descriptions is missing, then the appropriate analysis cannot be carried out.

a. **Adaptive Management Plan Needs to Actively Protect Downstream Water Quality.** One of the most important components to the action alternatives, the Adaptive Management Program (AMP), was not included in the Draft EIS. As a result, these action alternatives have incomplete descriptions that cannot be completely evaluated for certain water quality effects or statements made about minimizing potential adverse effects. In particular, it is unclear how "monitoring of water quality parameters through the SCOP AMP would ensure that an increase of effluent-related total phosphorus through Hoover Dam would not occur." (page 4-32 of the Draft EIS) The Draft EIS needs to provide a full set of details on the proposed SCOP AMP so that Metropolitan and others can provide additional comments on or confirm that such adaptive management planning would ensure water quality protection. If the AMP is truly to "ensure that an increase of effluent-related total phosphorus through Hoover Dam would not occur" (page 4-32 of the Draft EIS), then the CWC should be able to commit to total phosphorus leaving Hoover Dam to not exceed 10 ppb at all times. Metropolitan requests this commitment from the CWC to ensure that the water quality is protected for downstream users of the Lower Colorado River. In addition, sampling must be L5-26 L5-27 L5-28

1-4

## (L5-24 continued)

thermocline would eventually move away from the elevation of the dam outlets. Additionally, any increases in phosphorus concentrations through the dam would likely be compensated for by decreased concentrations at a later time, since the overall concentrations in the reservoir would decrease as more phosphorus is removed through the dam. The concentration of phosphorus through Hoover Dam depends upon the interaction of the effluent insertion depth (and thus the depth of the thermocline), the Lake water surface elevation and the elevations of the open dam outlets.

Hence, while there may be increases in the phosphorus concentrations at Hoover Dam due to incomplete destratification, these changes are temporary and would likely be partially compensated for by lower concentrations at a later time. The effluent is always well mixed and diluted before reaching the dam.

See General Response 7.

## L5-25

The predicted 2002 baseline concentration of 5 ppb for TP through Hoover Dam is consistent with the USGS data at Hoover Dam, which averages 5 ppb over the 2000 through 2003 period. The Reclamation data referenced by the commenter has significant limitations and discrepancies as discussed in Attachment 2 of Appendix D of the Final EIS. For example, in one instance a sample yielded a TP concentration of 35 ppb, while another sample taken at the same time and location and analyzed in a different laboratory yielded 4 ppb. Thus, the average value of 8 ppb and maximum value of 35 ppb for these data are not likely to be representative of the true phosphorus concentrations passing through the dam. In Attachment 2 of Appendix D it is concluded that the USGS is the most accurate data set that is available to describe the phosphorus concentration over an extended period.

In addition, Appendix D-Attachment 2 of the Final EIS describes results of a special phosphorus sampling effort that indicated phosphorus levels in Lake Mead and through the dam are likely to be even lower than those suggested by the USGS and other data. A lower phosphorus baseline concentration shifts the water classification further from the eutrophic range.

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**(L5-25 continued)**

The ELCOM/CAEDYM model has been verified through extensive comparison to all available in-lake data. Chapter 4 of the Lake Mead Modeling Report, which is available upon request, presents a detailed discussion of the model validation, including over 50 figures comparing the modeling results with measured data. Specifically, with regard to TP concentrations, the model predictions were compared with the USGS Hoover Dam data set (deemed to be the most accurate data set that is available over an extended period), as well as other data sets in the Lake.
Appendix D – Attachment 2 of the Final EIS discusses and demonstrates the validity of the model.

The accuracy of the model has been verified. An appropriate statistical analysis was also undertaken and presented in the Lake Mead Modeling Report. Therefore, the conclusions drawn from the model are scientifically justified.

**L5-26**

See General Response 10.

**L5-27**

See General Response 8.

**L5-28**

See General Response 10.

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L5-34

near Boulder Islands would not be subjected to the TMDLs…(page 2-5).". In other words, no significance threshold criteria exists for TMDL currently applicable to the Boulder Islands discharge, so relying on current water quality objectives to trigger additional treatment at the wastewater plants will not protect downstream users should one of the action alternatives be implemented.

L5-35

c. **Unclear if Project Will Comply with Future Water Quality Standards**. Using current water quality standards alone to determine the potential effects by the alternatives in the Draft EIS is not appropriate, since the Nevada Division of Environmental Protection has the ability to update or require additional standards if the discharge location is changed. Therefore, it is premature to conclude as significance threshold criteria that "water quality standards would not be exceeded" for Boulder Islands North and South Alternatives (Table 2.8-1, Summary of Environmental Impacts). Conclusions for the action alternatives where the discharge location is changed cannot be based upon current water quality standards as the significance threshold criteria.

7. **Insufficient Analysis of Effects Related to the No Action Alternative**

L5-36

a. **No Action Alternative Has Water Quality Benefits.** The Las Vegas Wash is presently removing approximately 66 percent of the reactive phosphorus (La Bounty). Therefore, moving the discharge point to Boulder Islands will bypass the natural removal mechanisms in the Las Vegas Wash and the inner Las Vegas Bay for phosphorus. The Draft EIS states, "Under the Boulder Islands North Alternative, effluent-related constituents would undergo more dilution than under existing conditions or the No Action Alternative. (page ES-6)." Dilution in Lake Mead is only of limited help to the downstream users, rather load reduction at the source is most beneficial. Given the fact that the Las Vegas Wash removes 66 percent of reactive phosphorus, Metropolitan requests clarification to how the quoted statement is beneficial to downstream users.

L5-37

b. **No Action Alternative Dismissed Without Adequate Justification.** Additionally, the Lake Mead modeling report makes statements in favor of the No Action Alternative by stating that "the phosphorus concentration through the Hoover Dam is higher for the diffuser scenarios (Boulder Islands and Las Vegas Bay) as compared to the Las Vegas Wash discharge scenario." Although the No Action Alternative may have particular challenges if the lake level drops to 1000 feet, this is no reason to disregard this alternative entirely. Please provide references and data that support the conclusion that "if the lake level falls to 1000 feet, the limits of treatment for MF/UF would be reached prior to 2030, which would result in the need to implement reverse osmosis. (page 4-45 of the Draft EIS)" This alternative does meet the purpose and need of the proposed SCOP and so should not be dismissed.

8. **Overly Limited or Incomplete Analysis of Potential Adverse Effects by Action Alternatives.**

L5-38

a. **Boulder Islands Discharge Will Lead to a Build-up of Contaminants in Hypolimnion.** Flooding of the Virgin River watershed, in December 2004 through January 2005, has resulted in a build-up of salts and organic material at the bottom of Boulder Basin (LaBounty, presentation 2005). Measured values of nutrients, bromide,

1-6

## L5-29

See General Response 8.

See General Response 10.

## L5-30

See General Response 10.

## L5-31

See General Response 8.

See General Response 4.

## L5-32

See General Response 10.

## L5-33

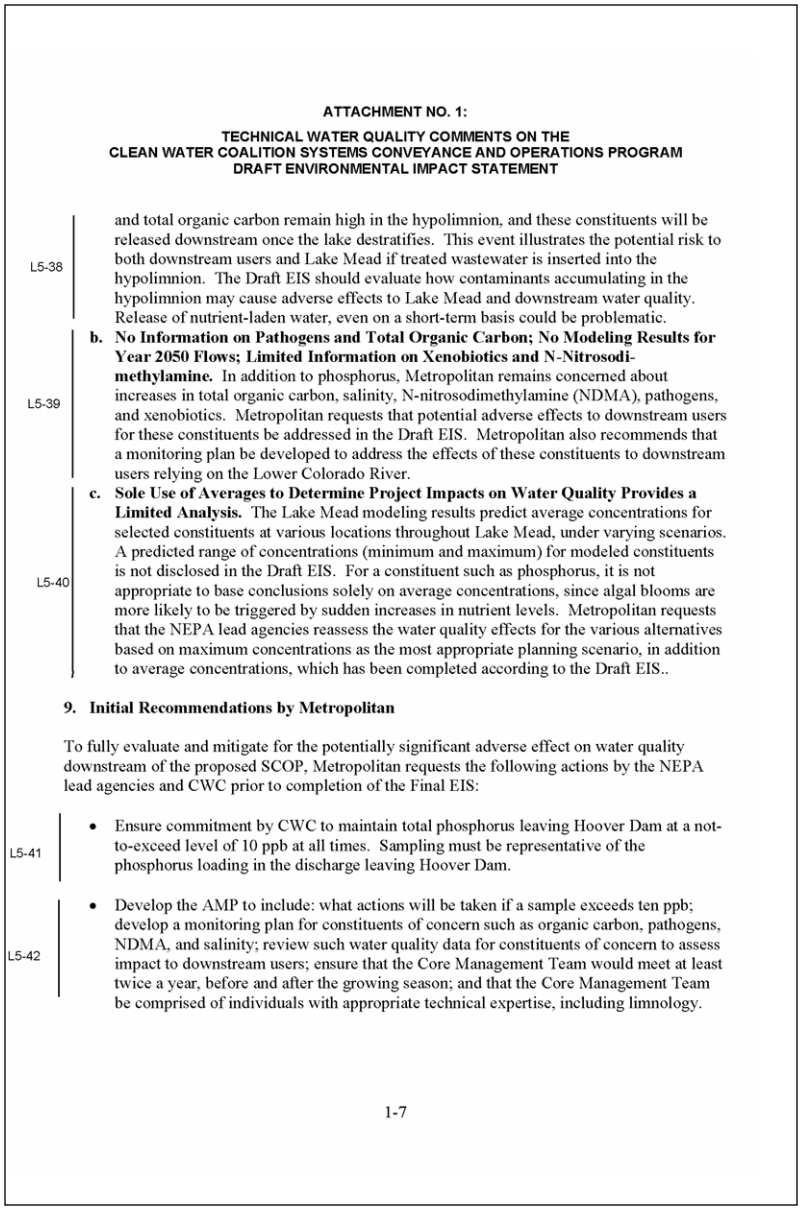
The description of the alternatives has been revised to indicate that under normal operating conditions, the TP discharged to Lake Mead would not exceed 334 lbs/day on an annual average basis. At these loads the Boulder Islands alternatives (at both water surface elevations) are predicted to result in TP loads through Hoover Dam that are comparable to the 1999 through 2003 baseline period, and lower than historical levels over an extended period of time. Phosphorus levels through Hoover Dam are expected to be similar to recent levels, and lower than historical levels. No impacts to downstream users were identified for the 1999 to 2003 conditions or historical conditions. Therefore, the impact to downstream users from the Boulder Islands alternatives would be insignificant. These model results and the impact to downstream users are fully described in Appendix D, Attachment 2 of the Final EIS.

The revised alternatives are described in Chapter 2 of the SCOP Final EIS, and potential impacts are described throughout Chapter 4.

## L5-34

See General Response 8.

See General Response 10.



**ATTACHMENT NO. 1:**

**TECHNICAL WATER QUALITY COMMENTS ON THE CLEAN WATER COALITION SYSTEMS CONVEYANCE AND OPERATIONS PROGRAM DRAFT ENVIRONMENTAL IMPACT STATEMENT**

L5-38

and total organic carbon remain high in the hypolimnion, and these constituents will be released downstream once the lake destratifies. This event illustrates the potential risk to both downstream users and Lake Mead if treated wastewater is inserted into the hypolimnion. The Draft EIS should evaluate how contaminants accumulating in the hypolimnion may cause adverse effects to Lake Mead and downstream water quality. Release of nutrient-laden water, even on a short-term basis could be problematic.

L5-39

**b. No Information on Pathogens and Total Organic Carbon; No Modeling Results for Year 2050 Flows; Limited Information on Xenobiotics and N-Nitrosodi-methylamine.** In addition to phosphorus, Metropolitan remains concerned about increases in total organic carbon, salinity, N-nitrosodimethylamine (NDMA), pathogens, and xenobiotics. Metropolitan requests that potential adverse effects to downstream users for these constituents be addressed in the Draft EIS. Metropolitan also recommends that a monitoring plan be developed to address the effects of these constituents to downstream users relying on the Lower Colorado River.

L5-40

**c. Sole Use of Averages to Determine Project Impacts on Water Quality Provides a Limited Analysis.** The Lake Mead modeling results predict average concentrations for selected constituents at various locations throughout Lake Mead, under varying scenarios. A predicted range of concentrations (minimum and maximum) for modeled constituents is not disclosed in the Draft EIS. For a constituent such as phosphorus, it is not appropriate to base conclusions solely on average concentrations, since algal blooms are more likely to be triggered by sudden increases in nutrient levels. Metropolitan requests that the NEPA lead agencies reassess the water quality effects for the various alternatives based on maximum concentrations as the most appropriate planning scenario, in addition to average concentrations, which has been completed according to the Draft EIS..

**9. Initial Recommendations by Metropolitan**

To fully evaluate and mitigate for the potentially significant adverse effect on water quality downstream of the proposed SCOP, Metropolitan requests the following actions by the NEPA lead agencies and CWC prior to completion of the Final EIS:

L5-41

- Ensure commitment by CWC to maintain total phosphorus leaving Hoover Dam at a not-to-exceed level of 10 ppb at all times. Sampling must be representative of the phosphorus loading in the discharge leaving Hoover Dam.

L5-42

- Develop the AMP to include: what actions will be taken if a sample exceeds ten ppb; develop a monitoring plan for constituents of concern such as organic carbon, pathogens, NDMA, and salinity; review such water quality data for constituents of concern to assess impact to downstream users; ensure that the Core Management Team would meet at least twice a year, before and after the growing season; and that the Core Management Team be comprised of individuals with appropriate technical expertise, including limnology.

1-7

### L5-35

Compliance with water quality standards will always need to occur, whether the standards remain the same or are changed.

### L5-36

See response to comment F1-80.

### L5-37

See General Response 1.

The NDEP does not currently have plans to address Lake levels of 1,000 ft. However, Reclamation has done some modeling that predicts conditions at 1,000 ft. In addition, as stated in Section 1.5 of the Final EIS, the 1,000-ft (305 m) Lake level is used for planning purposes in this EIS because it is the level that has been discussed by the Colorado River states to be "protected" in future drought conditions, and has most recently been agreed to in the *Seven Basin States' Preliminary Proposal Regarding the Colorado River Interim Operations*.

### L5-38

See General Response 7.

See response to comment L5-5.

### L5-39

See response to comment F1-77.

See General Response 10.

### L5-40

See response to comment L5-10.

### L5-41

See General Response 8.

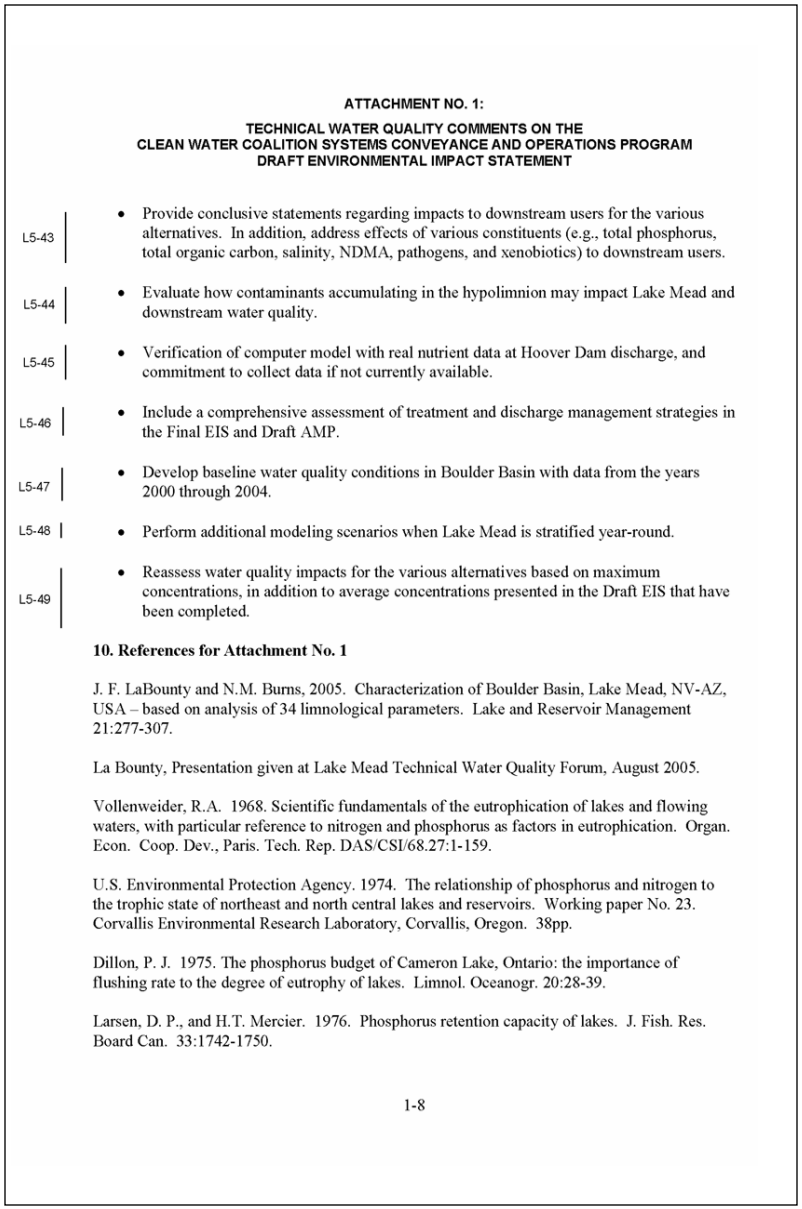
See General Response 10.

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**L5-42**

See General Response 8.

See General Response 10.



**ATTACHMENT NO. 1:**

**TECHNICAL WATER QUALITY COMMENTS ON THE CLEAN WATER COALITION SYSTEMS CONVEYANCE AND OPERATIONS PROGRAM DRAFT ENVIRONMENTAL IMPACT STATEMENT**

L5-43 • Provide conclusive statements regarding impacts to downstream users for the various alternatives. In addition, address effects of various constituents (e.g., total phosphorus, total organic carbon, salinity, NDMA, pathogens, and xenobiotics) to downstream users.

L5-44 • Evaluate how contaminants accumulating in the hypolimnion may impact Lake Mead and downstream water quality.

L5-45 • Verification of computer model with real nutrient data at Hoover Dam discharge, and commitment to collect data if not currently available.

L5-46 • Include a comprehensive assessment of treatment and discharge management strategies in the Final EIS and Draft AMP.

L5-47 • Develop baseline water quality conditions in Boulder Basin with data from the years 2000 through 2004.

L5-48 • Perform additional modeling scenarios when Lake Mead is stratified year-round.

L5-49 • Reassess water quality impacts for the various alternatives based on maximum concentrations, in addition to average concentrations presented in the Draft EIS that have been completed.

**10. References for Attachment No. 1**

J. F. LaBounty and N.M. Burns, 2005. Characterization of Boulder Basin, Lake Mead, NV-AZ, USA – based on analysis of 34 limnological parameters. Lake and Reservoir Management 21:277-307.

La Bounty, Presentation given at Lake Mead Technical Water Quality Forum, August 2005.

Vollenweider, R.A. 1968. Scientific fundamentals of the eutrophication of lakes and flowing waters, with particular reference to nitrogen and phosphorus as factors in eutrophication. Organ. Econ. Coop. Dev., Paris. Tech. Rep. DAS/CSI/68.27:1-159.

U.S. Environmental Protection Agency. 1974. The relationship of phosphorus and nitrogen to the trophic state of northeast and north central lakes and reservoirs. Working paper No. 23. Corvallis Environmental Research Laboratory, Corvallis, Oregon. 38pp.

Dillon, P. J. 1975. The phosphorus budget of Cameron Lake, Ontario: the importance of flushing rate to the degree of eutrophy of lakes. Limnol. Oceanogr. 20:28-39.

Larsen, D. P., and H.T. Mercier. 1976. Phosphorus retention capacity of lakes. J. Fish. Res. Board Can. 33:1742-1750.

1-8

## L5-43

See General Response 8.

See General Response 10.

See General Response 4.

## L5-44

See General Response 7.

## L5-45

As part of the preparation of the Draft EIS, the sophisticated three-dimensional ELCOM-CAEDYM computer model was compared with actual data, and was found to have adequately simulated conditions during 2000 through 2003. The model provided hour-by-hour analysis of how discharges at the modeled locations would mix into the lake under various hydrologic and weather conditions. Because its calibration adequately simulated several years of differing conditions, it is considered sufficiently validated for use in assessing the variables modeled, including the concentration of phosphorus.

See General Response 10.

## L5-46

See General Response 3.

See General Response 1.

See General Response 10.

## L5-47

See General Response 8.

## L5-48

See General Response 7.

**ATTACHMENT NO. 1:**

**TECHNICAL WATER QUALITY COMMENTS ON THE CLEAN WATER COALITION SYSTEMS CONVEYANCE AND OPERATIONS PROGRAM DRAFT ENVIRONMENTAL IMPACT STATEMENT**

Personal communication, Dr. David Jenkins

"Phosphorus Optimization Study", Dr. David Jenkins, prepared for the Metropolitan Water District, September 2005.

1-9

**L5-49**

See response to comment L5-10.

**ATTACHMENT NO. 2:**

**NEPA COMMENTS ON THE**
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**DRAFT ENVIRONMENTAL IMPACT STATEMENT**

The Metropolitan Water District of Southern California (Metropolitan), acting as a cooperating agency under the National Environmental Policy Act (NEPA), has participated in a number of meetings over the last couple of years with the lead agencies and the project proponents with respect to the Clean Water Coalition (CWC) Systems Conveyance and Operations Program (SCOP) and the resultant Draft Environmental Impact Statement (Draft EIS). Metropolitan concurs with the lead agencies that two options excluded from further consideration would have had significant adverse effects to downstream uses, i.e., Discharge Downstream of Hoover Dam (Subsection 2.6.8 of the Draft EIS) and Discharge Upstream of Hoover Dam in the Vicinity of Promontory Point (Subsection 2.6.9 of the Draft EIS).

Metropolitan has also reviewed the Draft Environmental Impact Statement (Draft EIS) prepared for the SCOP. Given the information provided to date, Metropolitan is still deeply concerned with the SCOP as currently proposed in terms of significant adverse water quality effects to downstream uses in the Lower Colorado River system. Specifics on recommendations that need to be taken by the lead agencies and project proponents of SCOP are presented in the letter to this attachment, along with a separate attachment dealing specifically with technical water quality issues (refer to Attachment No. 1).

In reviewing the Draft EIS in conjunction with NEPA, the Council on Environmental Quality (CEQ) NEPA regulations, the CEQ's Forty Questions on NEPA, and the Bureau of Reclamation's NEPA handbooks, Metropolitan has found the following areas of noncompliance or incompleteness that are more fully explained in this attachment:

- Incomplete alternative descriptions, most notably the adaptive management program (AMP);
- Lack of details on optimizations at existing plants and evaluation of new technologies in lieu of a reasonable alternative to the SCOP as identified by a cooperating agency early on in the scoping process;
- Environmentally preferred alternative designation should be re-examined;
- Purpose and Need Statement is too narrowly defined;
- Analysis of pharmaceuticals and personal care products is incomplete;
- Limited cumulative effects analysis because of an incomplete listing of related actions and a limited analysis;
- Variations in computer modeling with respect to the depth of Lake Mead maybe overly conservative;
- No Indian Trust Assets chapter;
- Other lapses in full public disclosure requirements; and
- Missing information and analyses.

**1. Incomplete alternatives description, most notably the AMP**

L5-50

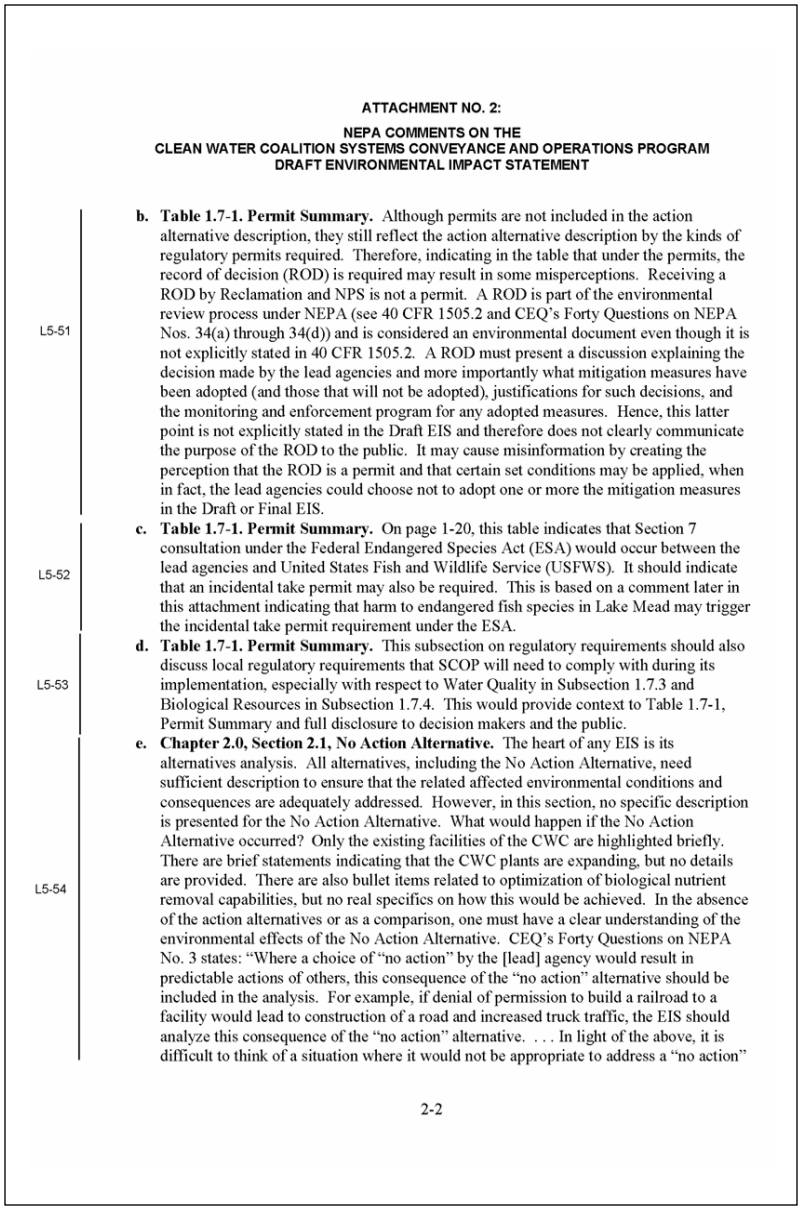
**a. Chapter 1.0, Subsection 1.7.1 (Environment Policy).** The Draft EIS lacks a complete description for the action alternatives highlighted by not including any specific details on the AMP (see further comments below for more detail).

2-1

## L5-50

Section 1.7.1 describes Environmental Policy, not the action alternatives. No change to Section 1.7.1 is necessary.

See General Response 10.



**ATTACHMENT NO. 2:**

**NEPA COMMENTS ON THE CLEAN WATER COALITION SYSTEMS CONVEYANCE AND OPERATIONS PROGRAM DRAFT ENVIRONMENTAL IMPACT STATEMENT**

L5-51

**b. Table 1.7-1. Permit Summary.** Although permits are not included in the action alternative description, they still reflect the action alternative description by the kinds of regulatory permits required. Therefore, indicating in the table that under the permits, the record of decision (ROD) is required may result in some misperceptions. Receiving a ROD by Reclamation and NPS is not a permit. A ROD is part of the environmental review process under NEPA (see 40 CFR 1505.2 and CEQ's Forty Questions on NEPA Nos. 34(a) through 34(d)) and is considered an environmental document even though it is not explicitly stated in 40 CFR 1505.2. A ROD must present a discussion explaining the decision made by the lead agencies and more importantly what mitigation measures have been adopted (and those that will not be adopted), justifications for such decisions, and the monitoring and enforcement program for any adopted measures. Hence, this latter point is not explicitly stated in the Draft EIS and therefore does not clearly communicate the purpose of the ROD to the public. It may cause misinformation by creating the perception that the ROD is a permit and that certain set conditions may be applied, when in fact, the lead agencies could choose not to adopt one or more the mitigation measures in the Draft or Final EIS.

L5-52

**c. Table 1.7-1. Permit Summary.** On page 1-20, this table indicates that Section 7 consultation under the Federal Endangered Species Act (ESA) would occur between the lead agencies and United States Fish and Wildlife Service (USFWS). It should indicate that an incidental take permit may also be required. This is based on a comment later in this attachment indicating that harm to endangered fish species in Lake Mead may trigger the incidental take permit requirement under the ESA.

L5-53

**d. Table 1.7-1. Permit Summary.** This subsection on regulatory requirements should also discuss local regulatory requirements that SCOP will need to comply with during its implementation, especially with respect to Water Quality in Subsection 1.7.3 and Biological Resources in Subsection 1.7.4. This would provide context to Table 1.7-1, Permit Summary and full disclosure to decision makers and the public.

L5-54

**e. Chapter 2.0, Section 2.1, No Action Alternative.** The heart of any EIS is its alternatives analysis. All alternatives, including the No Action Alternative, need sufficient description to ensure that the related affected environmental conditions and consequences are adequately addressed. However, in this section, no specific description is presented for the No Action Alternative. What would happen if the No Action Alternative occurred? Only the existing facilities of the CWC are highlighted briefly. There are brief statements indicating that the CWC plants are expanding, but no details are provided. There are also bullet items related to optimization of biological nutrient removal capabilities, but no real specifics on how this would be achieved. In the absence of the action alternatives or as a comparison, one must have a clear understanding of the environmental effects of the No Action Alternative. CEQ's Forty Questions on NEPA No. 3 states: "Where a choice of "no action" by the [lead] agency would result in predictable actions of others, this consequence of the "no action" alternative should be included in the analysis. For example, if denial of permission to build a railroad to a facility would lead to construction of a road and increased truck traffic, the EIS should analyze this consequence of the "no action" alternative. . . . In light of the above, it is difficult to think of a situation where it would not be appropriate to address a "no action"

2-2

## L5-51

As stated in the last sentence of Section 1.7, "Table 1.7-1 provides a summary of the permits and approvals that may be required for this project."

The title of Table 1.7-1 has been changed to "Permit/Approval Summary", and the second column has been changed to "Permit/Approval Required". In addition, a brief description of a ROD has been added to Section 1.7.1.

## L5-52

The following text was added to Table 1.7-1: "If it is determined that the project may adversely affect an endangered species, an incidental take permit may be required".

## L5-53

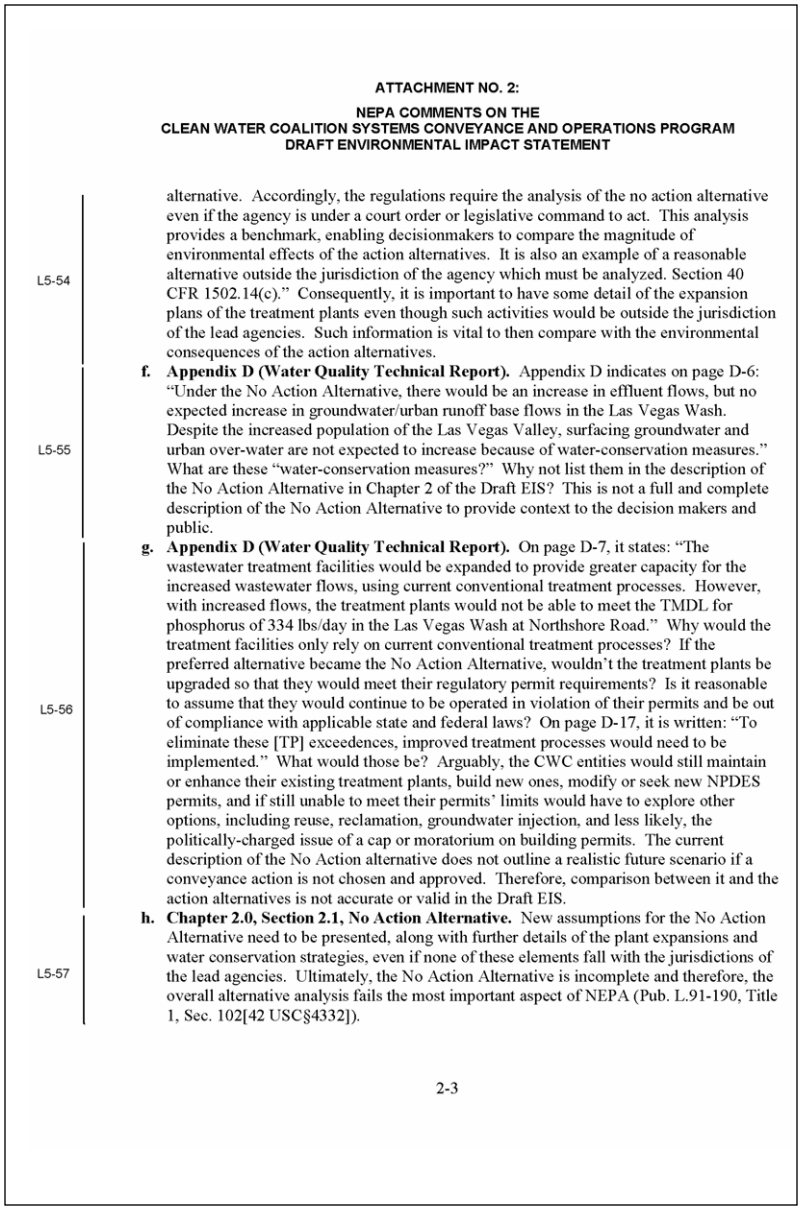
The federal, state, and local regulatory and permit requirements for the project are listed in Table 1.7-1 providing disclosure of the number and types of permits that will be needed for the proposed project. The requirements for the permits are readily available on the Internet. In compliance with 40 Code of Federal Regulations (CFR) 1500.4, Reducing Paperwork, the permits were listed in table form rather than describing the 39 permits that may be required by local entities.

Local agencies do not regulate water quality in Nevada. As stated in Section 1.4.2, the water in the Las Vegas Wash and Lake Mead must meet the water quality standards conforming to the CWA and established by the NDEP. The following sentence has been added to Section 1.7.3 for clarification: The NDEP establishes water quality standards in accordance with the CWA, and has authority over the NPDES program in Nevada.

## L5-54

Text has been added to Section 2.1 defining "existing facilities" as facilities that meet one of the following criteria:

- The facilities are physically present on the site;
- The facilities are being constructed on the site; or



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alternative. Accordingly, the regulations require the analysis of the no action alternative even if the agency is under a court order or legislative command to act. This analysis provides a benchmark, enabling decisionmakers to compare the magnitude of environmental effects of the action alternatives. It is also an example of a reasonable alternative outside the jurisdiction of the agency which must be analyzed. Section 40 CFR 1502.14(c)." Consequently, it is important to have some detail of the expansion plans of the treatment plants even though such activities would be outside the jurisdiction of the lead agencies. Such information is vital to then compare with the environmental consequences of the action alternatives.

L5-54

f. **Appendix D (Water Quality Technical Report).** Appendix D indicates on page D-6: "Under the No Action Alternative, there would be an increase in effluent flows, but no expected increase in groundwater/urban runoff base flows in the Las Vegas Wash. Despite the increased population of the Las Vegas Valley, surfacing groundwater and urban over-water are not expected to increase because of water-conservation measures." What are these "water-conservation measures?" Why not list them in the description of the No Action Alternative in Chapter 2 of the Draft EIS? This is not a full and complete description of the No Action Alternative to provide context to the decision makers and public.

L5-55

g. **Appendix D (Water Quality Technical Report).** On page D-7, it states: "The wastewater treatment facilities would be expanded to provide greater capacity for the increased wastewater flows, using current conventional treatment processes. However, with increased flows, the treatment plants would not be able to meet the TMDL for phosphorus of 334 lbs/day in the Las Vegas Wash at Northshore Road." Why would the treatment facilities only rely on current conventional treatment processes? If the preferred alternative became the No Action Alternative, wouldn't the treatment plants be upgraded so that they would meet their regulatory permit requirements? Is it reasonable to assume that they would continue to be operated in violation of their permits and be out of compliance with applicable state and federal laws? On page D-17, it is written: "To eliminate these [TP] exceedences, improved treatment processes would need to be implemented." What would those be? Arguably, the CWC entities would still maintain or enhance their existing treatment plants, build new ones, modify or seek new NPDES permits, and if still unable to meet their permits' limits would have to explore other options, including reuse, reclamation, groundwater injection, and less likely, the politically-charged issue of a cap or moratorium on building permits. The current description of the No Action alternative does not outline a realistic future scenario if a conveyance action is not chosen and approved. Therefore, comparison between it and the action alternatives is not accurate or valid in the Draft EIS.

L5-56

h. **Chapter 2.0, Section 2.1, No Action Alternative.** New assumptions for the No Action Alternative need to be presented, along with further details of the plant expansions and water conservation strategies, even if none of these elements fall with the jurisdictions of the lead agencies. Ultimately, the No Action Alternative is incomplete and therefore, the overall alternative analysis fails the most important aspect of NEPA (Pub. L.91-190, Title 1, Sec. 102[42 USC§4332]).

L5-57

2-3

## (L5-54 continued)

- The facilities are in the detailed design stage, with construction about to commence in the very near future.

Therefore, facility expansions are described under the "Existing Facilities and Processes" heading.

See General Response 3.

## L5-55

The water conservation measures being implemented by SNWA are ongoing activities that are not part of the SCOP. The goal of the water-conservation measures is to reduce the actual water use in the Valley. Although the results of conservation efforts affect the urban-runoff flows in the Las Vegas Wash, the wastewater treatment agencies are not responsible for urban runoff. Therefore, it would not be correct to include SNWA's water conservation measures in the description of the No Action Alternative. However, a list of the water conservation measures being implemented by SNWA has been added to Section 1.4.1.3. These measures will be implemented regardless of which SCOP alternative is chosen. A reference to Section 1.4.1.3 has been added to Appendix D, Section D.1.3.1.

Appendix D has been revised based on comments received regarding the Draft EIS.

## L5-56

See response to comment L5-54.

See General Response 1.

Appendix D has been revised based on comments received regarding the Draft EIS.

## L5-57

See response to comment L5-54.

See response to comment L5-56.

See response to comment L5-55.

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L5-58

**i. Chapter 2.0, Section 2.1, No Action Alternative/Appendix D.** Table 2.1-1 (Wastewater Discharge Projections) lists the forecasts of potential effluent discharge to the year 2050, from the CWC entities, both separately and combined, by annual average flow, peak month, peak day, and peak hour. A note to the table states: "The table does not account for reuse because the quantity of effluent used for reuse varies depending on the season. The SCOP system would be designed to handle the largest projected effluent flows." So, although the Executive Summary indicated that about 453 million gallons per day of effluent (at peak months) may occur by 2050, the system will actually be sized for at least 599 million gallons per day (to account for peak hour). The question is why was the modeling effort (in Appendix D—Water Quality Technical Report) geared for the annual average flow (about 300 million gallons per day in the year 2030 and almost 400 million gallons per day in the year 2050) rather than looking at a more reasonable scenario of peak month (339 million gallons per day in the year 2030 and 453 million gallons per day in the year 2050)?

L5-59

**j. Chapter 2.0, Section 2.2, Boulder Islands North Alternative, Preferred Alternative.** There is no information on the number of temporary (e.g., construction) workers or permanent workers that will be necessary to implement this action alternative. This information is relevant to several environmental resource categories including air quality, traffic, and socioeconomics. The Draft EIS needs to include this information.

L5-60

**k. Chapter 2.0, Section 2.2, Boulder Islands North Alternative, Preferred Alternative.** On page 2-5, it states the following: "The three treatment agencies would expand their facilities to handle the increasing quantities of wastewater through 2050." As mentioned in the comments on the No Action Alternative, what are the specific details for these proposed expansions? Would they be similar, more, or less than those expansions required if the No Action Alternative were implemented? There needs to be sufficient information so that the decision makers and the public can evaluate and compare the relative merits and effects of all alternatives presented in the Draft EIS (CEQ's Forty Questions on NEPA, No. 5b and 40 CFR 1502.14(b)).

L5-61

**l. Chapter 2.0, Section 2.2, Boulder Islands North Alternative, Preferred Alternative.** Clarification is needed given the discussion of design flow on page 2-15 and operation of the EI-Alignment A on page 2-17. Specifically on page 2-15 it states: "Therefore, the EI diversion structures were designed to allow a controlled discharge of 30 to 50 mgd (46 to 77 cfs) to the Las Vegas Wash. . . . One-hundred percent of the effluent flows may be discharged to the Las Vegas Wash during emergencies or maintenance of the pipeline." Then on page 2-17, the Draft EIS indicates: "The EI and the associated treatment plant connections would be designed to allow from 0 to 100 percent of the plants' flows to the Las Vegas Wash or the EI. *[Note in this sentence there are no caveats about emergencies or maintenance issues]* . . . . The CWC would manage the operation and the maintenance of the EI in coordination with the member agencies and the Management Advisory Committee. A minimum of 30 mgd (46 cfs) of treated effluent would be discharged to the Las Vegas Wash year round. Together with the 20 mgd (31 cfs) of base flow, the total amount in the Las Vegas Wash is expected to be at least 50 mgd (77 cfs). As part of the action alternatives, a SCOP Adaptive Management Plan (AMP) would be designed and implemented. The SCOP AMP. . .would include operation of the EI relating to the

2-4

## L5-58

Using the peak month effluent flows for the entire simulation period is not appropriate, since this would result in overestimation of the annual averages of effluent constituents in Lake Mead. Using the annual average effluent flow rate for the entire simulation year enables the annual average concentrations of effluent constituents to be correctly modeled. Alternatively, the varying monthly flow rates could be applied to the model, but since the difference between the peak month effluent flows and the annual average effluent flow is only about 13 percent (compare 339 mgd to 300 mgd, and 453 mgd to 400 mgd) it would have minimal impact on the model results, particularly with regard to the annual average values predicted by the model.

## L5-59

The requested information was provided in Section 4.11.2.1 of the Draft EIS.

The expected employment associated with this alternative has been moved to Section 2.2.2.4 of the Final EIS.

## L5-60

See response to comment L5-54.

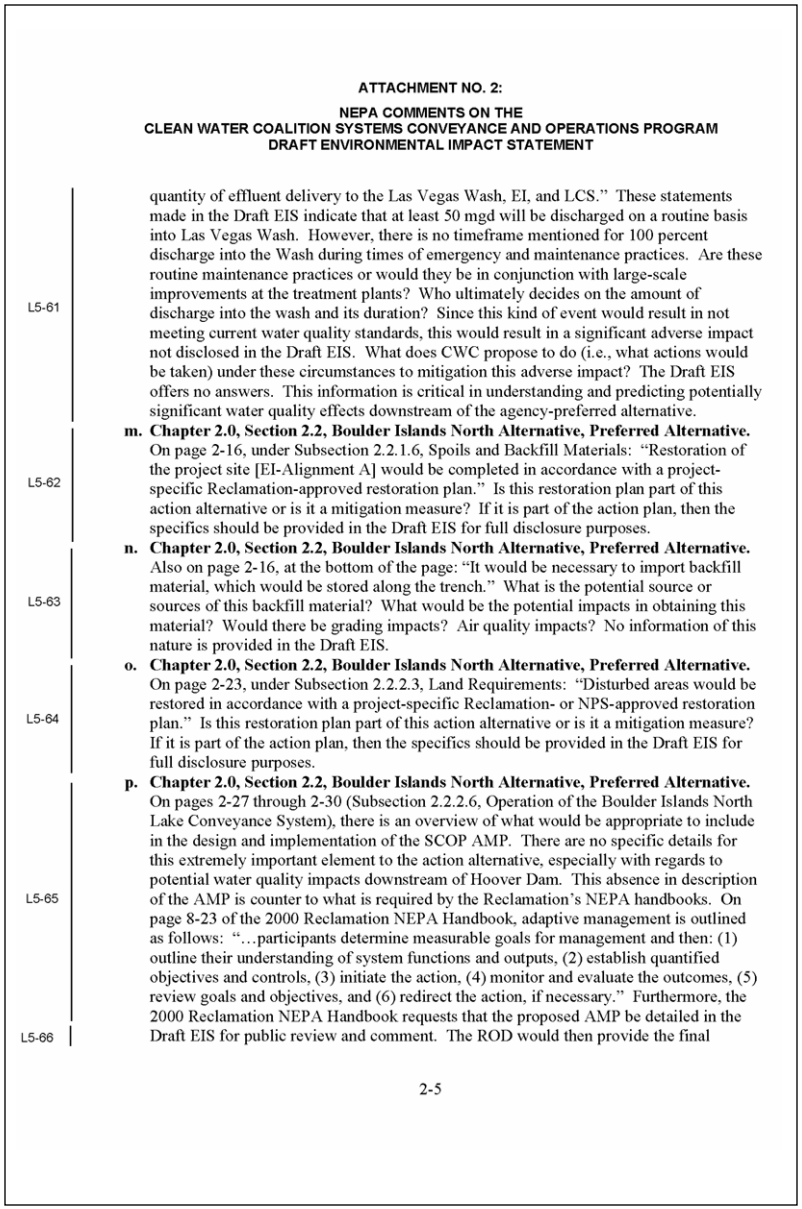
Since plant expansions and optimization are part of all the alternatives, the description in Section 2.1 applies to all alternatives.

## L5-61

The text has been revised to clarify that, "One-hundred percent of the effluent flows may be discharged to the Las Vegas Wash during emergencies or maintenance of the pipeline."

The Boulder Basin AMP CMT would coordinate with other agencies including those responsible for the Las Vegas Wash to determine any flow changes needed in the Las Vegas Wash.

Although facilities would be designed to allow as much as 100 percent of the effluent to be discharged to the Las Vegas Wash, 100-pecent discharge into the Las Vegas Wash is not expected, and would not be required for large-scale plant improvements. Discharges into the Las Vegas Wash would be made in



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quantity of effluent delivery to the Las Vegas Wash, EI, and LCS." These statements made in the Draft EIS indicate that at least 50 mgd will be discharged on a routine basis into Las Vegas Wash. However, there is no timeframe mentioned for 100 percent discharge into the Wash during times of emergency and maintenance practices. Are these routine maintenance practices or would they be in conjunction with large-scale improvements at the treatment plants? Who ultimately decides on the amount of discharge into the wash and its duration? Since this kind of event would result in not meeting current water quality standards, this would result in a significant adverse impact not disclosed in the Draft EIS. What does CWC propose to do (i.e., what actions would be taken) under these circumstances to mitigation this adverse impact? The Draft EIS offers no answers. This information is critical in understanding and predicting potentially significant water quality effects downstream of the agency-preferred alternative.

L5-61

m. **Chapter 2.0, Section 2.2, Boulder Islands North Alternative, Preferred Alternative.** On page 2-16, under Subsection 2.2.1.6, Spoils and Backfill Materials: "Restoration of the project site [EI-Alignment A] would be completed in accordance with a project-specific Reclamation-approved restoration plan." Is this restoration plan part of this action alternative or is it a mitigation measure? If it is part of the action plan, then the specifics should be provided in the Draft EIS for full disclosure purposes.

L5-62

n. **Chapter 2.0, Section 2.2, Boulder Islands North Alternative, Preferred Alternative.** Also on page 2-16, at the bottom of the page: "It would be necessary to import backfill material, which would be stored along the trench." What is the potential source or sources of this backfill material? What would be the potential impacts in obtaining this material? Would there be grading impacts? Air quality impacts? No information of this nature is provided in the Draft EIS.

L5-63

o. **Chapter 2.0, Section 2.2, Boulder Islands North Alternative, Preferred Alternative.** On page 2-23, under Subsection 2.2.2.3, Land Requirements: "Disturbed areas would be restored in accordance with a project-specific Reclamation- or NPS-approved restoration plan." Is this restoration plan part of this action alternative or is it a mitigation measure? If it is part of the action plan, then the specifics should be provided in the Draft EIS for full disclosure purposes.

L5-64

p. **Chapter 2.0, Section 2.2, Boulder Islands North Alternative, Preferred Alternative.** On pages 2-27 through 2-30 (Subsection 2.2.2.6, Operation of the Boulder Islands North Lake Conveyance System), there is an overview of what would be appropriate to include in the design and implementation of the SCOP AMP. There are no specific details for this extremely important element to the action alternative, especially with regards to potential water quality impacts downstream of Hoover Dam. This absence in description of the AMP is counter to what is required by the Reclamation's NEPA handbooks. On page 8-23 of the 2000 Reclamation NEPA Handbook, adaptive management is outlined as follows: "…participants determine measurable goals for management and then: (1) outline their understanding of system functions and outputs, (2) establish quantified objectives and controls, (3) initiate the action, (4) monitor and evaluate the outcomes, (5) review goals and objectives, and (6) redirect the action, if necessary." Furthermore, the 2000 Reclamation NEPA Handbook requests that the proposed AMP be detailed in the Draft EIS for public review and comment. The ROD would then provide the final

L5-65

L5-66

2-5

### (L5-61 continued)

compliance with permits issued by NDEP. These permits prohibit dischargers from causing violations of water quality standards. During an emergency or maintenance, each facility may discharge to the Las Vegas Wash. However, scheduling of routine maintenance would be conducted to ensure that all three plants do not discharge 100 percent of their flows to the Las Vegas Wash at the same time. A sentence has been added to sections 2.2 and 2.2.1.6 of the Final EIS. In addition, each treatment facility is required, as part of their NPDES Discharge Permit, to have an emergency response plan.

See response to comment E1-6.

The commenter incorrectly states that "Since this kind of event would result in not meeting current water quality standards…" One-hundred percent discharge of effluent flows to the Las Vegas Wash for a limited period of time would not necessarily cause exceedances of water quality standards.

### L5-62

Restoration activities are not part of the action alternatives. They are mitigation measures. Therefore, all mention of restoration plans in Chapter 2 have been deleted. The details of project-specific restoration plans are not typically included in an EIS. The restoration plan details are determined once a ROD has been issued, prior to construction activities. However, the following text has been added to sections 4.4.6 and 4.10.6 of the Final EIS: "Restoration of the project site would be completed in accordance with a project-specific Reclamation- or NPS-approved restoration plan. The restoration plan may address salvage of topsoil for reseeding purposes, recontouring the natural land surface, blending colors and textures, treating weeds, and revegetating the disturbed areas." Restoration is also described in Section 4.2.6 of the Final EIS.

### L5-63

The following text has been added to Section 2.2.1.5: "The backfill material would be obtained from a commercially available source. The procurement of this material would be part of the construction activities performed by the contractor."

Text regarding the backfill materials has been added to Section 4.7.2.1.1.

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**L5-64**

See response to comment L5-62.

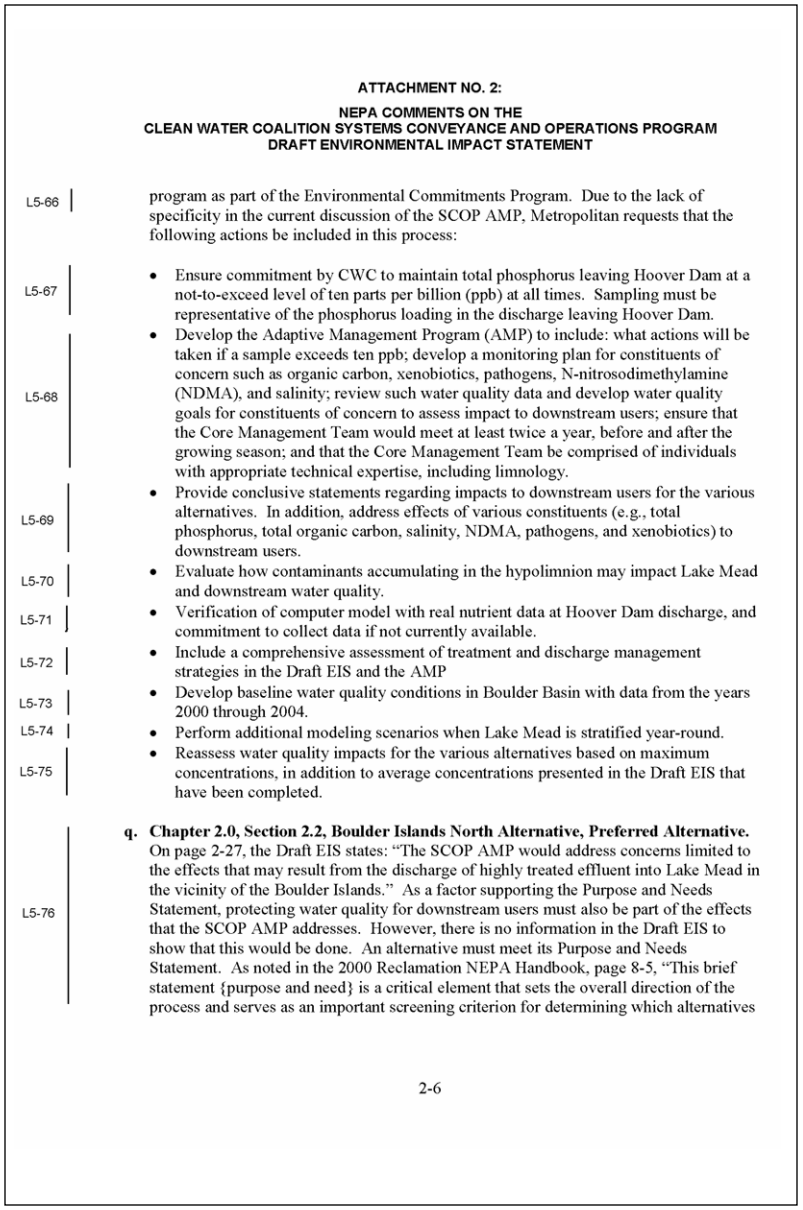
**L5-65**

The 2000 Reclamation NEPA Handbook is in draft format and as of July 2006 has not been implemented by Reclamation. Therefore, the requirements are not applicable. However, additional details of the initial Boulder Basin AMP have been included in Section 2.2.2.6 of the Final EIS.

**L5-66**

The 2000 Reclamation NEPA Handbook is in draft format and has not been implemented by Reclamation. Therefore, the requirements are not applicable.

The ROD will include a description of the environmental commitments for the SCOP.



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L5-66 program as part of the Environmental Commitments Program. Due to the lack of specificity in the current discussion of the SCOP AMP, Metropolitan requests that the following actions be included in this process:

L5-67
- Ensure commitment by CWC to maintain total phosphorus leaving Hoover Dam at a not-to-exceed level of ten parts per billion (ppb) at all times. Sampling must be representative of the phosphorus loading in the discharge leaving Hoover Dam.

L5-68
- Develop the Adaptive Management Program (AMP) to include: what actions will be taken if a sample exceeds ten ppb; develop a monitoring plan for constituents of concern such as organic carbon, xenobiotics, pathogens, N-nitrosodimethylamine (NDMA), and salinity; review such water quality data and develop water quality goals for constituents of concern to assess impact to downstream users; ensure that the Core Management Team would meet at least twice a year, before and after the growing season; and that the Core Management Team be comprised of individuals with appropriate technical expertise, including limnology.

L5-69
- Provide conclusive statements regarding impacts to downstream users for the various alternatives. In addition, address effects of various constituents (e.g., total phosphorus, total organic carbon, salinity, NDMA, pathogens, and xenobiotics) to downstream users.

L5-70
- Evaluate how contaminants accumulating in the hypolimnion may impact Lake Mead and downstream water quality.

L5-71
- Verification of computer model with real nutrient data at Hoover Dam discharge, and commitment to collect data if not currently available.

L5-72
- Include a comprehensive assessment of treatment and discharge management strategies in the Draft EIS and the AMP

L5-73
- Develop baseline water quality conditions in Boulder Basin with data from the years 2000 through 2004.

L5-74
- Perform additional modeling scenarios when Lake Mead is stratified year-round.

L5-75
- Reassess water quality impacts for the various alternatives based on maximum concentrations, in addition to average concentrations presented in the Draft EIS that have been completed.

L5-76 **q. Chapter 2.0, Section 2.2, Boulder Islands North Alternative, Preferred Alternative.** On page 2-27, the Draft EIS states: "The SCOP AMP would address concerns limited to the effects that may result from the discharge of highly treated effluent into Lake Mead in the vicinity of the Boulder Islands." As a factor supporting the Purpose and Needs Statement, protecting water quality for downstream users must also be part of the effects that the SCOP AMP addresses. However, there is no information in the Draft EIS to show that this would be done. An alternative must meet its Purpose and Needs Statement. As noted in the 2000 Reclamation NEPA Handbook, page 8-5, "This brief statement {purpose and need} is a critical element that sets the overall direction of the process and serves as an important screening criterion for determining which alternatives

2-6

**L5-67**

See General Response 8.

See General Response 10.

**L5-68**

See General Response 8.

See General Response 10.

See General Response 4.

**L5-69**

See General Response 8.

See General Response 4.

**L5-70**

See General Response 7.

**L5-71**

See response to comment L5-6.

**L5-72**

See General Response 3.

See General Response 1.

**L5-73**

See General Response 8.

**L5-74**

See General Response 7.

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L5-76 are reasonable. All reasonable alternatives examined in detail must meet the defined purpose and need."

r. **Chapter 2.0, Section 2.2, Boulder Islands North Alternative, Preferred Alternative.** On page 2-28, the Draft EIS notes: "The environmental integrity of Lake Mead is dependent not only on the characteristics of the discharged effluent, but also on other non-effluent characteristics and stressors within the Lake itself and actions implemented throughout the Lake Mead watershed and beyond. The SCOP AMP would not be designed to accommodate the impacts from these outlying characteristics and stressors, but would be designed to be compatible with the continuous monitoring and possible development of future actions designed to mitigate impacts from these outlying areas." This last statement seems to be counter to the need for protecting water quality for downstream users. L5-77

s. **Chapter 2.0, Section 2.2, Boulder Islands North Alternative, Preferred Alternative.** On page 2-30, the Draft EIS states: "The data obtained from implementing the SCOP AMP would be evaluated annually to assess whether the objectives are being met and to determine whether management actions are required." This would seem too long a timeframe in instances where exceedences occurred. There must be additional checks and balances in the AMP for more timely review rather than waiting for an entire year. Also on the same page: "The SCOP AMP would be re-evaluated every 5 years to assess whether the objectives are being met." In this dynamic environment, five years is too long for modifications to the AMP if such are needed. Metropolitan requests that the Core Management Team meet at least twice a year, before and after the growing season, and if need be, see if modification to the AMP are necessary. For further information, please see Attachment No. 1 to this letter. L5-78

t. **Chapter 2.0, Section 2.3, Boulder Islands South Alternative.** There is no information on the number of temporary (e.g., construction) workers or permanent workers that will be necessary to implement this action alternative. This information is relevant to several environmental resource categories including air quality, traffic, and socioeconomics. The Draft EIS needs to include this information. L5-79

u. **Chapter 2.0, Section 2.3, Boulder Islands South Alternative.** At the bottom of page 2-30, it states the following: "The three treatment agencies would expand their facilities to handle the increasing quantities of wastewater through 2050." As mentioned in the comments on the No Action Alternative and the Boulder Islands North Alternative, what are the specific details for these proposed expansions? Would they be similar, more, or less than those expansions required if the No Action Alternative were implemented? There needs to be sufficient information so that the decision makers and the public can evaluate and compare the relative merits and effects of all alternatives presented in the Draft EIS (CEQ's Forty Questions on NEPA, No. 5b and 40 CFR 1502.14(b)). L5-80

v. **Chapter 2.0, Section 2.3, Boulder Islands South Alternative.** On page 2-40, under Subsection 2.3.1.6, Spoils and Backfill Materials: "Restoration of the project site [EI-Alignment B] would be completed in accordance with a project-specific Reclamation-approved restoration plan." Is this restoration plan part of this action alternative or is it a mitigation measure? If it is part of the action plan, then the specifics should be provided in the Draft EIS for full disclosure purposes. L5-81

2-7

### L5-75

See response to comment L5-10.

### L5-76

The 2000 Reclamation NEPA Handbook is in draft format and has not been implemented by Reclamation.

See General Response 10.

It is agreed that, "All reasonable alternatives examined in detail must meet the defined purpose and need." However, in response to comments received from this commenter and others, the Process Improvements Alternative has been added to the Final EIS even though it does not meet a critical element of the purpose and need for the project, which is flexibility in management of effluent flows.

### L5-77

Section 2.2.2.6 of the Final EIS has been revised. The specified sentence has been deleted.

### L5-78

See General Response 10.

### L5-79

The requested information was provided in Section 4.11.3.1 of the Draft EIS.

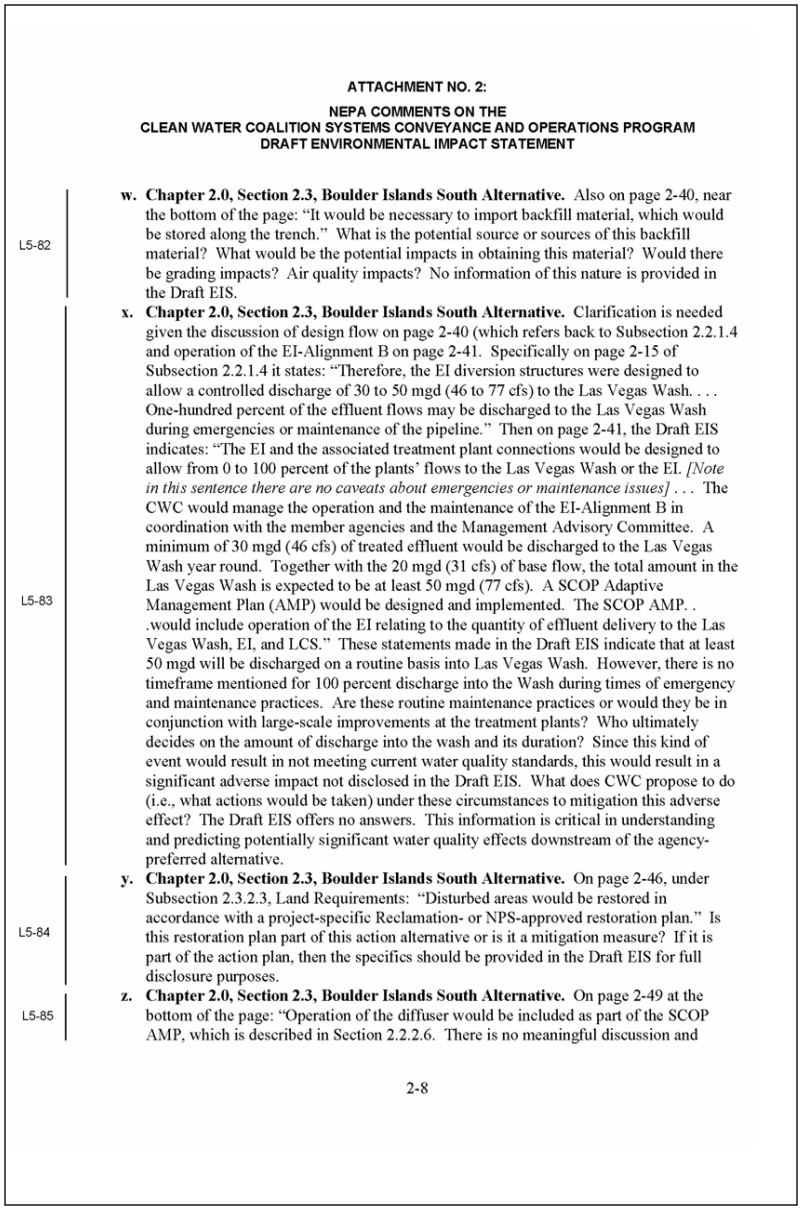
The expected employment associated with this alternative has been moved to Section 2.3.2.4 of the Final EIS.

### L5-80

See responses to comment L5-54 and L5-60.

### L5-81

See response to comment L5-62.



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L5-82

**w. Chapter 2.0, Section 2.3, Boulder Islands South Alternative.** Also on page 2-40, near the bottom of the page: "It would be necessary to import backfill material, which would be stored along the trench." What is the potential source or sources of this backfill material? What would be the potential impacts in obtaining this material? Would there be grading impacts? Air quality impacts? No information of this nature is provided in the Draft EIS.

L5-83

**x. Chapter 2.0, Section 2.3, Boulder Islands South Alternative.** Clarification is needed given the discussion of design flow on page 2-40 (which refers back to Subsection 2.2.1.4 and operation of the EI-Alignment B on page 2-41. Specifically on page 2-15 of Subsection 2.2.1.4 it states: "Therefore, the EI diversion structures were designed to allow a controlled discharge of 30 to 50 mgd (46 to 77 cfs) to the Las Vegas Wash. . . . One-hundred percent of the effluent flows may be discharged to the Las Vegas Wash during emergencies or maintenance of the pipeline." Then on page 2-41, the Draft EIS indicates: "The EI and the associated treatment plant connections would be designed to allow from 0 to 100 percent of the plants' flows to the Las Vegas Wash or the EI. *[Note in this sentence there are no caveats about emergencies or maintenance issues]* . . . The CWC would manage the operation and the maintenance of the EI-Alignment B in coordination with the member agencies and the Management Advisory Committee. A minimum of 30 mgd (46 cfs) of treated effluent would be discharged to the Las Vegas Wash year round. Together with the 20 mgd (31 cfs) of base flow, the total amount in the Las Vegas Wash is expected to be at least 50 mgd (77 cfs). A SCOP Adaptive Management Plan (AMP) would be designed and implemented. The SCOP AMP. . .would include operation of the EI relating to the quantity of effluent delivery to the Las Vegas Wash, EI, and LCS." These statements made in the Draft EIS indicate that at least 50 mgd will be discharged on a routine basis into Las Vegas Wash. However, there is no timeframe mentioned for 100 percent discharge into the Wash during times of emergency and maintenance practices. Are these routine maintenance practices or would they be in conjunction with large-scale improvements at the treatment plants? Who ultimately decides on the amount of discharge into the wash and its duration? Since this kind of event would result in not meeting current water quality standards, this would result in a significant adverse impact not disclosed in the Draft EIS. What does CWC propose to do (i.e., what actions would be taken) under these circumstances to mitigation this adverse effect? The Draft EIS offers no answers. This information is critical in understanding and predicting potentially significant water quality effects downstream of the agency-preferred alternative.

L5-84

**y. Chapter 2.0, Section 2.3, Boulder Islands South Alternative.** On page 2-46, under Subsection 2.3.2.3, Land Requirements: "Disturbed areas would be restored in accordance with a project-specific Reclamation- or NPS-approved restoration plan." Is this restoration plan part of this action alternative or is it a mitigation measure? If it is part of the action plan, then the specifics should be provided in the Draft EIS for full disclosure purposes.

L5-85

**z. Chapter 2.0, Section 2.3, Boulder Islands South Alternative.** On page 2-49 at the bottom of the page: "Operation of the diffuser would be included as part of the SCOP AMP, which is described in Section 2.2.2.6. There is no meaningful discussion and

2-8

## L5-82

The backfill material would be obtained from a commercially available source. The procurement of this material would be part of the construction activities performed by the contractor**.** Impacts to soils and air quality are described in Chapter 4.

Text regarding the backfill materials has been added to Section 4.7.3.1.

## L5-83

The text has been revised to clarify that, "One-hundred percent of the effluent flows may be discharged to the Las Vegas Wash during emergencies or maintenance of the pipeline."

See General Response 10.

See response to comment E1-6.

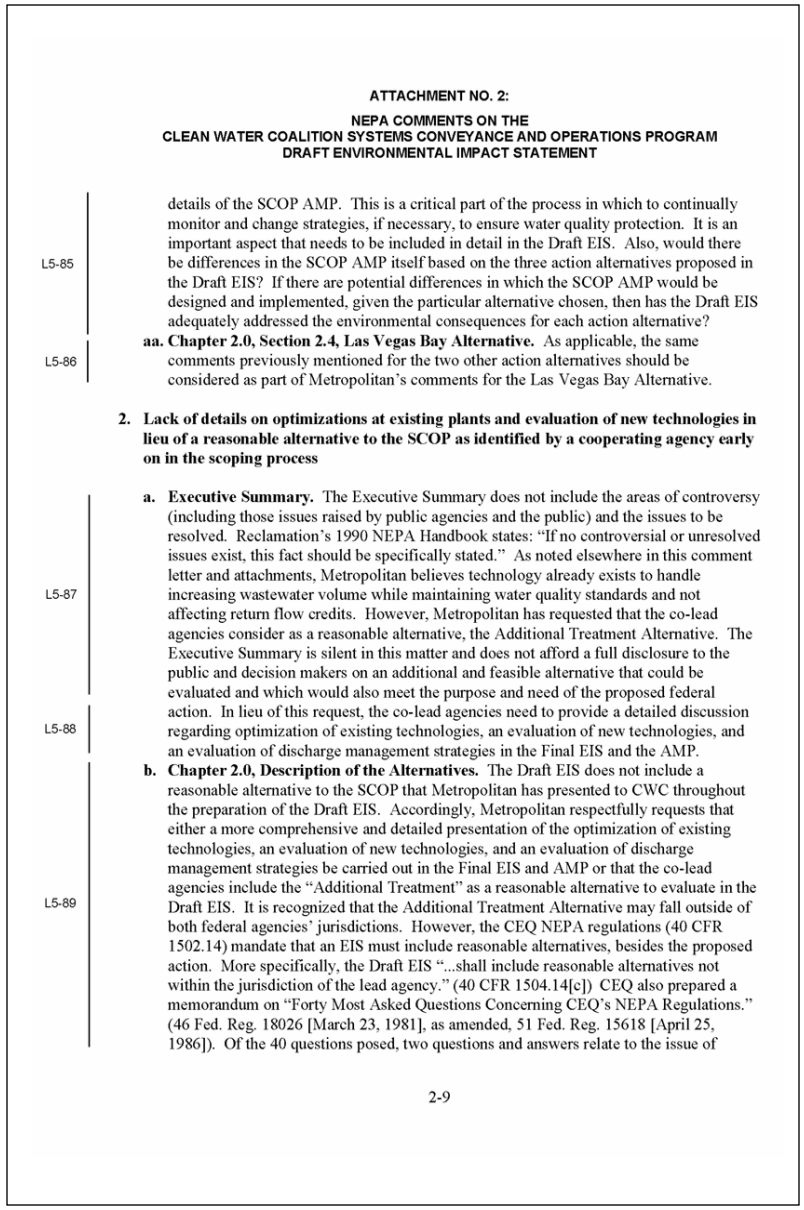
The commenter incorrectly states that "Since this kind of event would result in not meeting current water quality standards…" One-hundred percent discharge of effluent flows to the Las Vegas Wash for a limited period of time would not necessarily cause exceedances of water quality standards.

## L5-84

See response to comment L5-62.

## L5-85

See General Response 10.



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details of the SCOP AMP. This is a critical part of the process in which to continually monitor and change strategies, if necessary, to ensure water quality protection. It is an important aspect that needs to be included in detail in the Draft EIS. Also, would there be differences in the SCOP AMP itself based on the three action alternatives proposed in the Draft EIS? If there are potential differences in which the SCOP AMP would be designed and implemented, given the particular alternative chosen, then has the Draft EIS adequately addressed the environmental consequences for each action alternative? L5-85

aa. **Chapter 2.0, Section 2.4, Las Vegas Bay Alternative.** As applicable, the same comments previously mentioned for the two other action alternatives should be considered as part of Metropolitan's comments for the Las Vegas Bay Alternative. L5-86

2. **Lack of details on optimizations at existing plants and evaluation of new technologies in lieu of a reasonable alternative to the SCOP as identified by a cooperating agency early on in the scoping process**

a. **Executive Summary.** The Executive Summary does not include the areas of controversy (including those issues raised by public agencies and the public) and the issues to be resolved. Reclamation's 1990 NEPA Handbook states: "If no controversial or unresolved issues exist, this fact should be specifically stated." As noted elsewhere in this comment letter and attachments, Metropolitan believes technology already exists to handle increasing wastewater volume while maintaining water quality standards and not affecting return flow credits. However, Metropolitan has requested that the co-lead agencies consider as a reasonable alternative, the Additional Treatment Alternative. The Executive Summary is silent in this matter and does not afford a full disclosure to the public and decision makers on an additional and feasible alternative that could be evaluated and which would also meet the purpose and need of the proposed federal action. In lieu of this request, the co-lead agencies need to provide a detailed discussion regarding optimization of existing technologies, an evaluation of new technologies, and an evaluation of discharge management strategies in the Final EIS and the AMP. L5-87 L5-88

b. **Chapter 2.0, Description of the Alternatives.** The Draft EIS does not include a reasonable alternative to the SCOP that Metropolitan has presented to CWC throughout the preparation of the Draft EIS. Accordingly, Metropolitan respectfully requests that either a more comprehensive and detailed presentation of the optimization of existing technologies, an evaluation of new technologies, and an evaluation of discharge management strategies be carried out in the Final EIS and AMP or that the co-lead agencies include the "Additional Treatment" as a reasonable alternative to evaluate in the Draft EIS. It is recognized that the Additional Treatment Alternative may fall outside of both federal agencies' jurisdictions. However, the CEQ NEPA regulations (40 CFR 1502.14) mandate that an EIS must include reasonable alternatives, besides the proposed action. More specifically, the Draft EIS "...shall include reasonable alternatives not within the jurisdiction of the lead agency." (40 CFR 1504.14[c]) CEQ also prepared a memorandum on "Forty Most Asked Questions Concerning CEQ's NEPA Regulations." (46 Fed. Reg. 18026 [March 23, 1981], as amended, 51 Fed. Reg. 15618 [April 25, 1986]). Of the 40 questions posed, two questions and answers relate to the issue of L5-89

2-9

## L5-86

The responses to the comments in regards to the Las Vegas Bay Alternative would be the same as those for the other alternatives.

## L5-87

The Executive Summary has been revised to include the comments on the Draft EIS that were received most often. The complete comments and responses are presented in Appendix L of the Final EIS.

See General Response 1.

## L5-88

See General Response 1.

## L5-89

See General Response 1.

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L5-89

reasonable alternatives in conjunction with being outside the agency's jurisdiction. They are as follows:

**2a. Alternatives Outside the Capability of Applicant or Jurisdiction of Agency. If an EIS is prepared in connection with an application for a permit or other federal approval, must the EIS rigorously analyze and discuss alternatives that are outside the capability of the applicant or can it be limited to reasonable alternatives that can be carried out by the applicant?**

A. Section 1502.14 requires the EIS to examine all reasonable alternatives to the proposal. In determining the scope of alternatives to be considered, the emphasis is on what is "reasonable" rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.

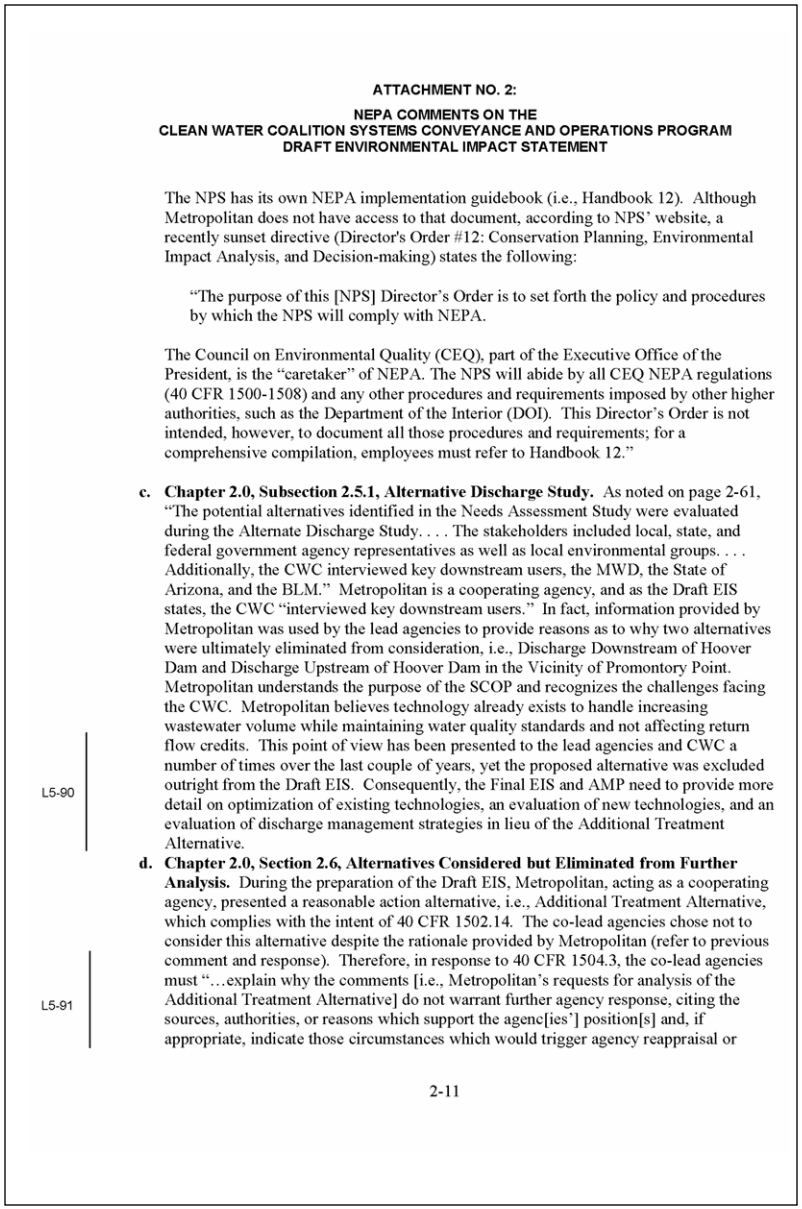
**2b. Must the EIS analyze alternatives outside the jurisdiction or capability of the agency or beyond what Congress has authorized?**

A. An alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable. A potential conflict with local or federal law does not necessarily render an alternative unreasonable, although such conflicts must be considered. Section 1506.2(d). Alternatives that are outside the scope of what Congress has approved or funded must still be evaluated in the EIS if they are reasonable, because the EIS may serve as the basis for modifying the Congressional approval or funding in light of NEPA's goals and policies. Section 1500.1(a)

The Reclamation 2000 Public Review Draft of its NEPA Handbook, also quotes from the CEQ regulations on page 8-6 of what constitutes a reasonable range of alternatives, including those not within the jurisdiction of the lead agency. The same reference to including reasonable alternatives outside of this federal agency's jurisdiction can also be found in its earlier 1990 NEPA Handbook on page 4-3. On page 8-9 of the Reclamation 2000 NEPA Handbook, it states: "The range should include alternatives based upon input from other agencies and the public." Continuing on that same page, the handbook directs the Reclamation staff as follows:

"Alternatives outside the agency's authority to implement should be considered. If such an alternative became the preferred alternative, implementation would depend on a change in authorization, a change of lead Federal agency to one with the appropriate authority, or a transfer of the project to a non-Federal entity. It could also lead to the cancellation of the project."

2-10



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The NPS has its own NEPA implementation guidebook (i.e., Handbook 12). Although Metropolitan does not have access to that document, according to NPS' website, a recently sunset directive (Director's Order #12: Conservation Planning, Environmental Impact Analysis, and Decision-making) states the following:

> "The purpose of this [NPS] Director's Order is to set forth the policy and procedures by which the NPS will comply with NEPA.
>
> The Council on Environmental Quality (CEQ), part of the Executive Office of the President, is the "caretaker" of NEPA. The NPS will abide by all CEQ NEPA regulations (40 CFR 1500-1508) and any other procedures and requirements imposed by other higher authorities, such as the Department of the Interior (DOI). This Director's Order is not intended, however, to document all those procedures and requirements; for a comprehensive compilation, employees must refer to Handbook 12."

**c. Chapter 2.0, Subsection 2.5.1, Alternative Discharge Study.** As noted on page 2-61, "The potential alternatives identified in the Needs Assessment Study were evaluated during the Alternate Discharge Study. . . . The stakeholders included local, state, and federal government agency representatives as well as local environmental groups. . . . Additionally, the CWC interviewed key downstream users, the MWD, the State of Arizona, and the BLM." Metropolitan is a cooperating agency, and as the Draft EIS states, the CWC "interviewed key downstream users." In fact, information provided by Metropolitan was used by the lead agencies to provide reasons as to why two alternatives were ultimately eliminated from consideration, i.e., Discharge Downstream of Hoover Dam and Discharge Upstream of Hoover Dam in the Vicinity of Promontory Point. Metropolitan understands the purpose of the SCOP and recognizes the challenges facing the CWC. Metropolitan believes technology already exists to handle increasing wastewater volume while maintaining water quality standards and not affecting return flow credits. This point of view has been presented to the lead agencies and CWC a number of times over the last couple of years, yet the proposed alternative was excluded outright from the Draft EIS. Consequently, the Final EIS and AMP need to provide more detail on optimization of existing technologies, an evaluation of new technologies, and an evaluation of discharge management strategies in lieu of the Additional Treatment Alternative.

L5-90

**d. Chapter 2.0, Section 2.6, Alternatives Considered but Eliminated from Further Analysis.** During the preparation of the Draft EIS, Metropolitan, acting as a cooperating agency, presented a reasonable action alternative, i.e., Additional Treatment Alternative, which complies with the intent of 40 CFR 1502.14. The co-lead agencies chose not to consider this alternative despite the rationale provided by Metropolitan (refer to previous comment and response). Therefore, in response to 40 CFR 1504.3, the co-lead agencies must "…explain why the comments [i.e., Metropolitan's requests for analysis of the Additional Treatment Alternative] do not warrant further agency response, citing the sources, authorities, or reasons which support the agenc[ies'] position[s] and, if appropriate, indicate those circumstances which would trigger agency reappraisal or

L5-91

2-11

## L5-90

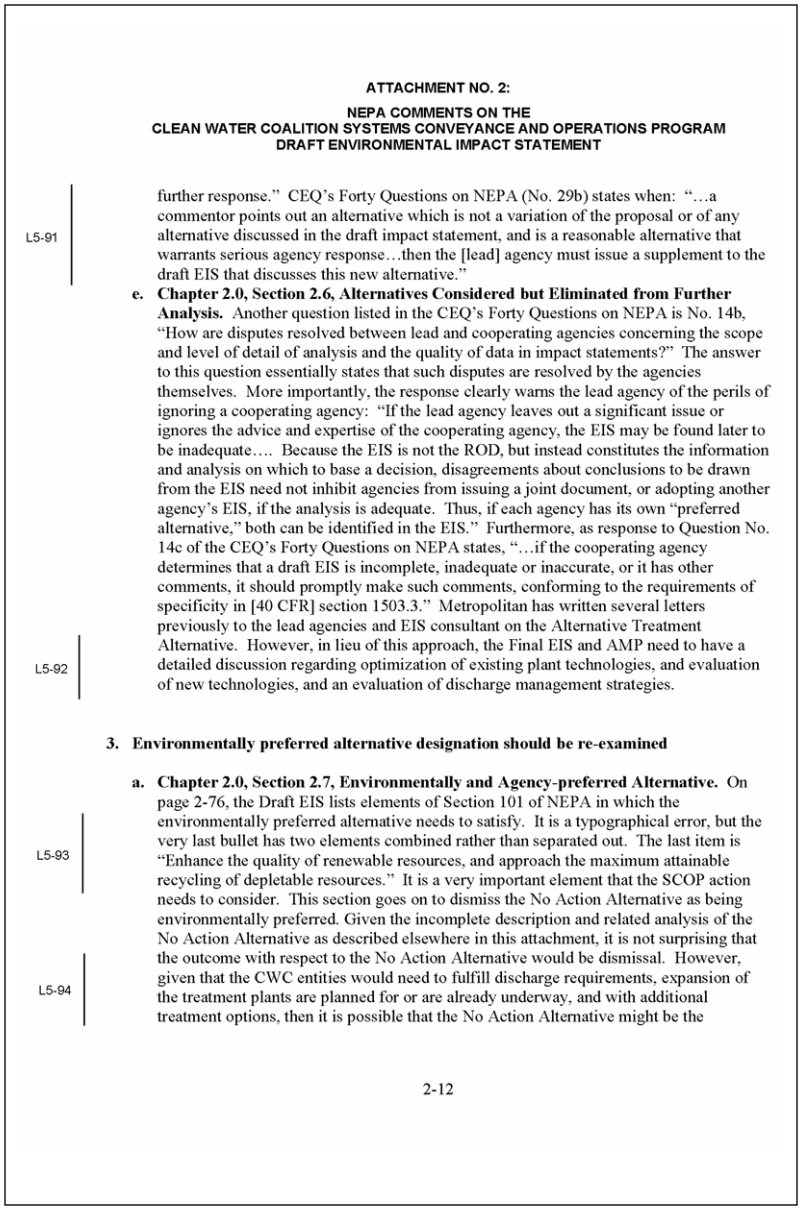
See General Response 1.

See General Response 3.

See General Response 10.

## L5-91

A Process Improvements Alternative has been added to the analyses presented in the SCOP Final EIS. This alternative is a variation of the previous No Action Alternative, and incorporates evaluations of treatment technologies previously considered. As part of this process, the most modern technology and best available science used to evaluate environmental effects has been considered. The Final EIS responds to all comments, which have not raised significant new issues or required a wholly new alternative that is not a variation of a previously considered alternative. A supplemental EIS is not considered necessary. The additional alternative is described in Section 2.5 of the SCOP Final EIS, and potential impacts are described throughout Chapter 4.



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L5-91

further response." CEQ's Forty Questions on NEPA (No. 29b) states when: "…a commentor points out an alternative which is not a variation of the proposal or of any alternative discussed in the draft impact statement, and is a reasonable alternative that warrants serious agency response…then the [lead] agency must issue a supplement to the draft EIS that discusses this new alternative."

e. **Chapter 2.0, Section 2.6, Alternatives Considered but Eliminated from Further Analysis.** Another question listed in the CEQ's Forty Questions on NEPA is No. 14b, "How are disputes resolved between lead and cooperating agencies concerning the scope and level of detail of analysis and the quality of data in impact statements?" The answer to this question essentially states that such disputes are resolved by the agencies themselves. More importantly, the response clearly warns the lead agency of the perils of ignoring a cooperating agency: "If the lead agency leaves out a significant issue or ignores the advice and expertise of the cooperating agency, the EIS may be found later to be inadequate…. Because the EIS is not the ROD, but instead constitutes the information and analysis on which to base a decision, disagreements about conclusions to be drawn from the EIS need not inhibit agencies from issuing a joint document, or adopting another agency's EIS, if the analysis is adequate. Thus, if each agency has its own "preferred alternative," both can be identified in the EIS." Furthermore, as response to Question No. 14c of the CEQ's Forty Questions on NEPA states, "…if the cooperating agency determines that a draft EIS is incomplete, inadequate or inaccurate, or it has other comments, it should promptly make such comments, conforming to the requirements of specificity in [40 CFR] section 1503.3." Metropolitan has written several letters previously to the lead agencies and EIS consultant on the Alternative Treatment Alternative. However, in lieu of this approach, the Final EIS and AMP need to have a detailed discussion regarding optimization of existing plant technologies, and evaluation of new technologies, and an evaluation of discharge management strategies.

L5-92

3. **Environmentally preferred alternative designation should be re-examined**

a. **Chapter 2.0, Section 2.7, Environmentally and Agency-preferred Alternative.** On page 2-76, the Draft EIS lists elements of Section 101 of NEPA in which the environmentally preferred alternative needs to satisfy. It is a typographical error, but the very last bullet has two elements combined rather than separated out. The last item is "Enhance the quality of renewable resources, and approach the maximum attainable recycling of depletable resources." It is a very important element that the SCOP action needs to consider. This section goes on to dismiss the No Action Alternative as being environmentally preferred. Given the incomplete description and related analysis of the No Action Alternative as described elsewhere in this attachment, it is not surprising that the outcome with respect to the No Action Alternative would be dismissal. However, given that the CWC entities would need to fulfill discharge requirements, expansion of the treatment plants are planned for or are already underway, and with additional treatment options, then it is possible that the No Action Alternative might be the

L5-93

L5-94

2-12

## L5-92

See General Response 1.

See General Response 3.

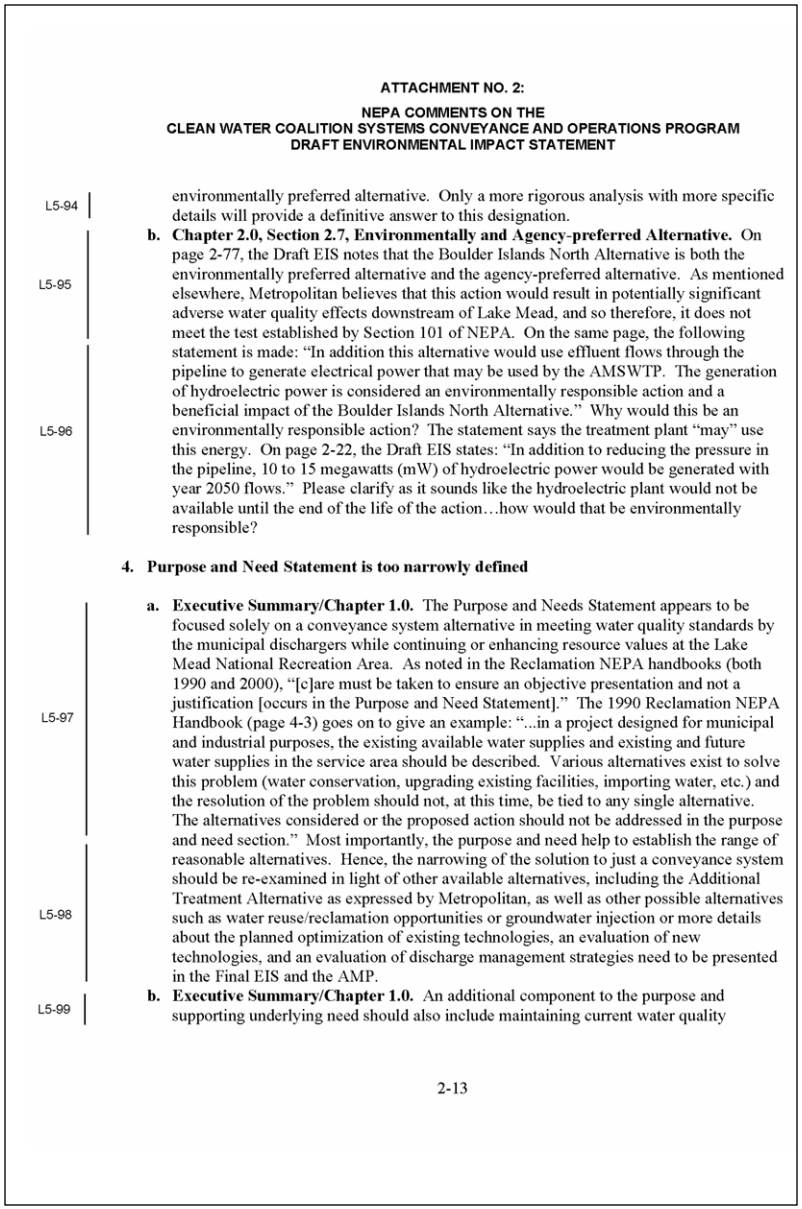
## L5-93

The text has been revised as requested in Section 2.8 (formerly 2.7) of the Final EIS.

## L5-94

See response to comment L5-54.

See General Response 1.



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L5-94 environmentally preferred alternative. Only a more rigorous analysis with more specific details will provide a definitive answer to this designation.

b. **Chapter 2.0, Section 2.7, Environmentally and Agency-preferred Alternative.** On page 2-77, the Draft EIS notes that the Boulder Islands North Alternative is both the environmentally preferred alternative and the agency-preferred alternative. As mentioned elsewhere, Metropolitan believes that this action would result in potentially significant adverse water quality effects downstream of Lake Mead, and so therefore, it does not meet the test established by Section 101 of NEPA. On the same page, the following statement is made: "In addition this alternative would use effluent flows through the pipeline to generate electrical power that may be used by the AMSWTP. The generation of hydroelectric power is considered an environmentally responsible action and a beneficial impact of the Boulder Islands North Alternative." Why would this be an environmentally responsible action? The statement says the treatment plant "may" use this energy. On page 2-22, the Draft EIS states: "In addition to reducing the pressure in the pipeline, 10 to 15 megawatts (mW) of hydroelectric power would be generated with year 2050 flows." Please clarify as it sounds like the hydroelectric plant would not be available until the end of the life of the action…how would that be environmentally responsible?

L5-95

L5-96

4. **Purpose and Need Statement is too narrowly defined**

a. **Executive Summary/Chapter 1.0.** The Purpose and Needs Statement appears to be focused solely on a conveyance system alternative in meeting water quality standards by the municipal dischargers while continuing or enhancing resource values at the Lake Mead National Recreation Area. As noted in the Reclamation NEPA handbooks (both 1990 and 2000), "[c]are must be taken to ensure an objective presentation and not a justification [occurs in the Purpose and Need Statement]." The 1990 Reclamation NEPA Handbook (page 4-3) goes on to give an example: "...in a project designed for municipal and industrial purposes, the existing available water supplies and existing and future water supplies in the service area should be described. Various alternatives exist to solve this problem (water conservation, upgrading existing facilities, importing water, etc.) and the resolution of the problem should not, at this time, be tied to any single alternative. The alternatives considered or the proposed action should not be addressed in the purpose and need section." Most importantly, the purpose and need help to establish the range of reasonable alternatives. Hence, the narrowing of the solution to just a conveyance system should be re-examined in light of other available alternatives, including the Additional Treatment Alternative as expressed by Metropolitan, as well as other possible alternatives such as water reuse/reclamation opportunities or groundwater injection or more details about the planned optimization of existing technologies, an evaluation of new technologies, and an evaluation of discharge management strategies need to be presented in the Final EIS and the AMP.

L5-97

L5-98

b. **Executive Summary/Chapter 1.0.** An additional component to the purpose and supporting underlying need should also include maintaining current water quality

L5-99

2-13

## L5-95

See General Response 8.

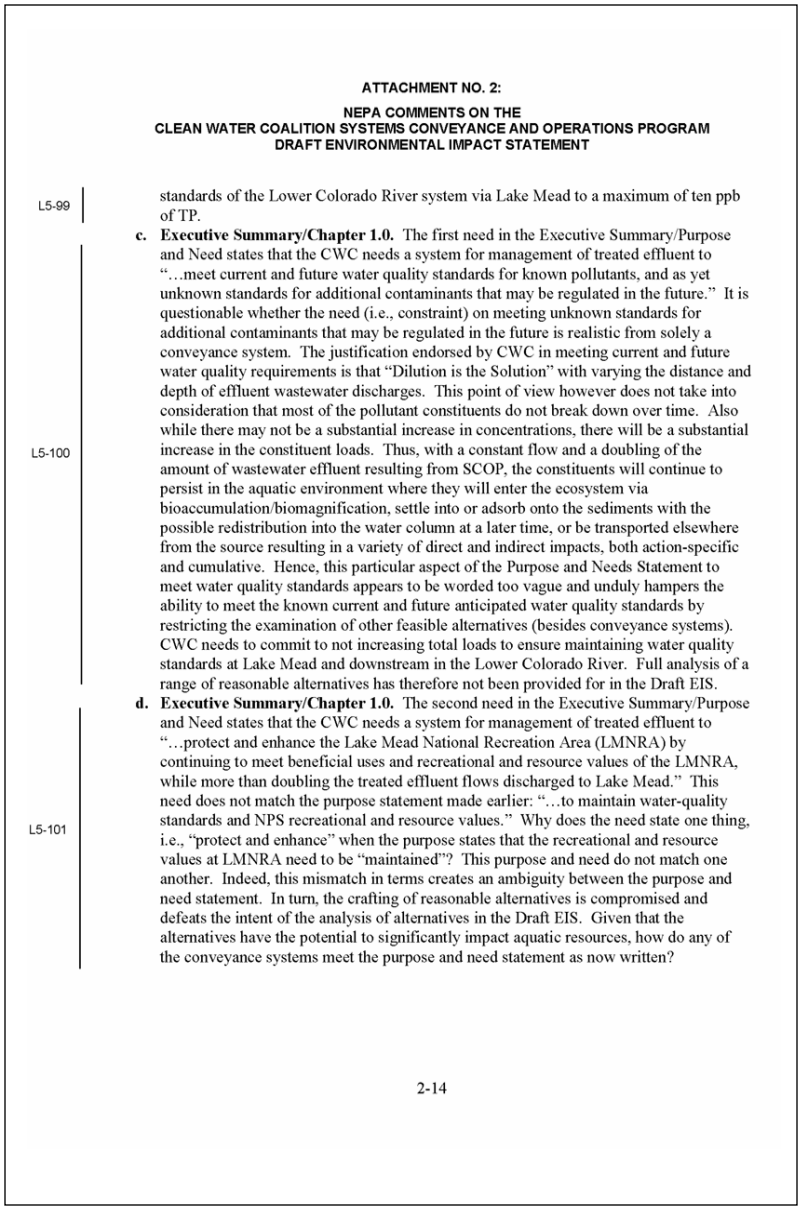
The comment asserts that the Preferred Alternative "would result in potentially significant adverse water quality effects downstream of Lake Mead." There is no accompanying data or explanation to support this statement. In response, additional research was conducted and consideration given to information on water quality in the Colorado River downstream of Hoover Dam and on possible effects on downstream users. The principal concern raised elsewhere by the commenter is that phosphorus levels may increase. But data collected by the USGS show that recent phosphorus levels downstream of Hoover Dam are at their lowest in at least three decades. These conclusions are consistent with the studies performed by UNLV, under contract to Reclamation in the early 1980s. The UNLV studies found phosphorus levels much higher historically than they were in recent years. Lower levels of phosphorus in the Colorado River are consistent with successful efforts by CWC members since the 1970s to decrease phosphorus discharges.

Any future increase in phosphorus would be minor, compared to baseline conditions, and phosphorus levels in the Colorado River would remain well under historic levels, which themselves were low enough so that chlorophyll levels were low and no problems were identified. The commenter has not identified phosphorus or chlorophyll as substances of concern in its evaluation of water quality in the Colorado River (MWD 2001). For these reasons, the available information does not support a conclusion that the project would produce potentially significant impacts downstream.

## L5-96

The word "may" has been changed to "would" in Section 2.8 (formerly 2.7) of the Final EIS.

The text in Section 2.2.2.2.1 has been revised for clarification purposes as requested. Hydroelectric power would be generated before 2050. The plant would reduce the use of electricity from other sources, which may burn fossil fuels and generate air emissions, and would thereby be environmentally beneficial.



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standards of the Lower Colorado River system via Lake Mead to a maximum of ten ppb of TP.

c. **Executive Summary/Chapter 1.0.** The first need in the Executive Summary/Purpose and Need states that the CWC needs a system for management of treated effluent to "…meet current and future water quality standards for known pollutants, and as yet unknown standards for additional contaminants that may be regulated in the future." It is questionable whether the need (i.e., constraint) on meeting unknown standards for additional contaminants that may be regulated in the future is realistic from solely a conveyance system. The justification endorsed by CWC in meeting current and future water quality requirements is that "Dilution is the Solution" with varying the distance and depth of effluent wastewater discharges. This point of view however does not take into consideration that most of the pollutant constituents do not break down over time. Also while there may not be a substantial increase in concentrations, there will be a substantial

L5-100

increase in the constituent loads. Thus, with a constant flow and a doubling of the amount of wastewater effluent resulting from SCOP, the constituents will continue to persist in the aquatic environment where they will enter the ecosystem via bioaccumulation/biomagnification, settle into or adsorb onto the sediments with the possible redistribution into the water column at a later time, or be transported elsewhere from the source resulting in a variety of direct and indirect impacts, both action-specific and cumulative. Hence, this particular aspect of the Purpose and Needs Statement to meet water quality standards appears to be worded too vague and unduly hampers the ability to meet the known current and future anticipated water quality standards by restricting the examination of other feasible alternatives (besides conveyance systems). CWC needs to commit to not increasing total loads to ensure maintaining water quality standards at Lake Mead and downstream in the Lower Colorado River. Full analysis of a range of reasonable alternatives has therefore not been provided for in the Draft EIS.

d. **Executive Summary/Chapter 1.0.** The second need in the Executive Summary/Purpose and Need states that the CWC needs a system for management of treated effluent to "…protect and enhance the Lake Mead National Recreation Area (LMNRA) by continuing to meet beneficial uses and recreational and resource values of the LMNRA, while more than doubling the treated effluent flows discharged to Lake Mead." This need does not match the purpose statement made earlier: "…to maintain water-quality

L5-101

standards and NPS recreational and resource values." Why does the need state one thing, i.e., "protect and enhance" when the purpose states that the recreational and resource values at LMNRA need to be "maintained"? This purpose and need do not match one another. Indeed, this mismatch in terms creates an ambiguity between the purpose and need statement. In turn, the crafting of reasonable alternatives is compromised and defeats the intent of the analysis of alternatives in the Draft EIS. Given that the alternatives have the potential to significantly impact aquatic resources, how do any of the conveyance systems meet the purpose and need statement as now written?

2-14

## L5-97

Although Section 1.5 of the Draft EIS clearly stated that the CWC needs a system that provides maximum flexibility for management of treated effluent, many of the commenters did not recognize that the primary need for the project is to provide maximum flexibility for management of effluent flows. This flexible management of effluent flows then allows the other needs, listed in bulleted format, to be met. The text in Section 1.5 has been revised in the Final EIS to more clearly represent the project's true need, which is to provide maximum flexibility for management of effluent flows.

## L5-98

See General Response 1.

See General Response 2.

See General Response 3.

## L5-99

See General Response 8.

## L5-100

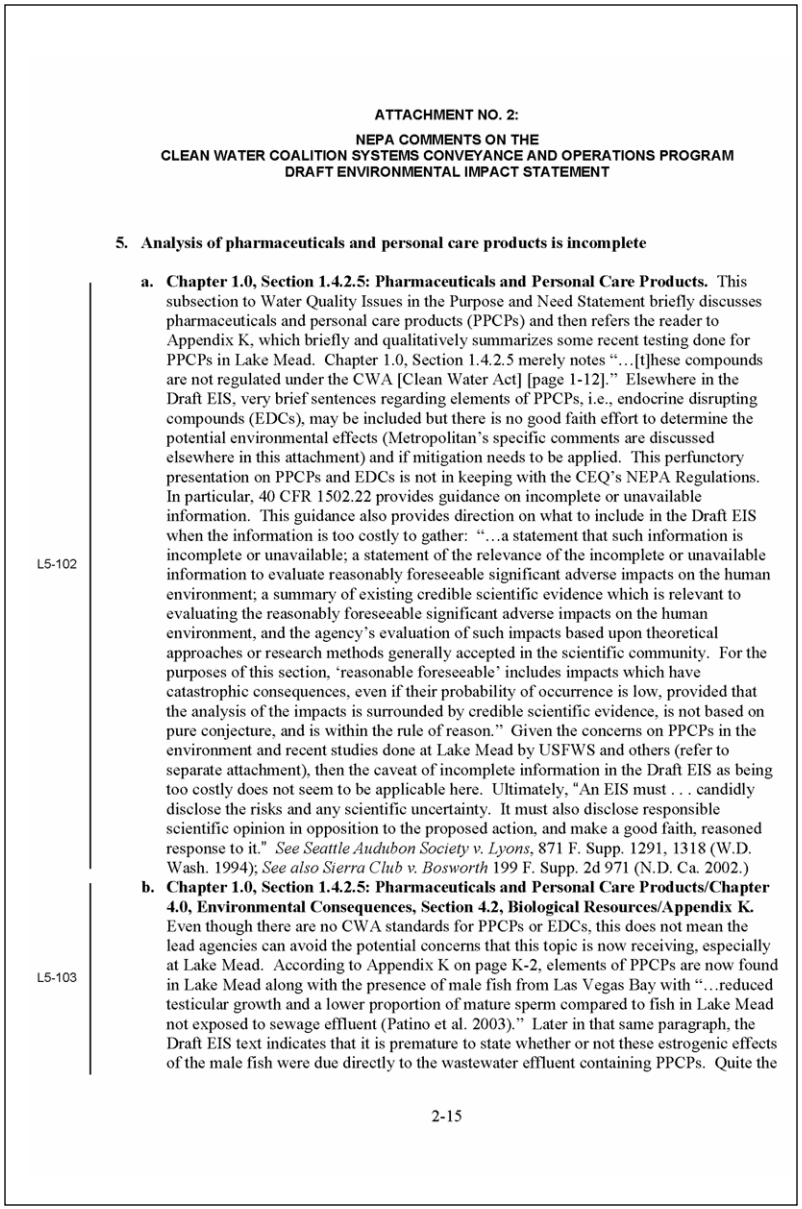
The commenter consistently deletes the word "flexible" from the purpose and need for this project. "The CWC needs a system that provides maximum flexibility for management of treated effluent to:…"

The commenter incorrectly states that "…a doubling of the amount of wastewater effluent resulting from the SCOP…" The increase in wastewater is not the result of the SCOP. Increased wastewater flows are the result of growth in the Valley.

See General Response 1.

See General Response 8.

If a bioaccumulative parameter is determined to exceed future water quality standards, NDEP would take appropriate action. The CWC will comply with any future NDEP action.



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**5. Analysis of pharmaceuticals and personal care products is incomplete**

**a. Chapter 1.0, Section 1.4.2.5: Pharmaceuticals and Personal Care Products.** This subsection to Water Quality Issues in the Purpose and Need Statement briefly discusses pharmaceuticals and personal care products (PPCPs) and then refers the reader to Appendix K, which briefly and qualitatively summarizes some recent testing done for PPCPs in Lake Mead. Chapter 1.0, Section 1.4.2.5 merely notes "…[t]hese compounds are not regulated under the CWA [Clean Water Act] [page 1-12]." Elsewhere in the Draft EIS, very brief sentences regarding elements of PPCPs, i.e., endocrine disrupting compounds (EDCs), may be included but there is no good faith effort to determine the potential environmental effects (Metropolitan's specific comments are discussed elsewhere in this attachment) and if mitigation needs to be applied. This perfunctory presentation on PPCPs and EDCs is not in keeping with the CEQ's NEPA Regulations. In particular, 40 CFR 1502.22 provides guidance on incomplete or unavailable information. This guidance also provides direction on what to include in the Draft EIS when the information is too costly to gather: "…a statement that such information is incomplete or unavailable; a statement of the relevance of the incomplete or unavailable information to evaluate reasonably foreseeable significant adverse impacts on the human environment; a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, 'reasonable foreseeable' includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is surrounded by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason." Given the concerns on PPCPs in the environment and recent studies done at Lake Mead by USFWS and others (refer to separate attachment), then the caveat of incomplete information in the Draft EIS as being too costly does not seem to be applicable here. Ultimately, "An EIS must . . . candidly disclose the risks and any scientific uncertainty. It must also disclose responsible scientific opinion in opposition to the proposed action, and make a good faith, reasoned response to it." *See Seattle Audubon Society v. Lyons*, 871 F. Supp. 1291, 1318 (W.D. Wash. 1994); *See also Sierra Club v. Bosworth* 199 F. Supp. 2d 971 (N.D. Ca. 2002.)

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**b. Chapter 1.0, Section 1.4.2.5: Pharmaceuticals and Personal Care Products/Chapter 4.0, Environmental Consequences, Section 4.2, Biological Resources/Appendix K.** Even though there are no CWA standards for PPCPs or EDCs, this does not mean the lead agencies can avoid the potential concerns that this topic is now receiving, especially at Lake Mead. According to Appendix K on page K-2, elements of PPCPs are now found in Lake Mead along with the presence of male fish from Las Vegas Bay with "…reduced testicular growth and a lower proportion of mature sperm compared to fish in Lake Mead not exposed to sewage effluent (Patino et al. 2003)." Later in that same paragraph, the Draft EIS text indicates that it is premature to state whether or not these estrogenic effects of the male fish were due directly to the wastewater effluent containing PPCPs. Quite the

L5-103

2-15

## (L5-100 continued)

The comment suggests that the stated need for flexibility in meeting unknown future requirements is worded too vaguely. No suggestion is provided regarding how to be more specific about this need, and none is apparent. The comment also suggests that "most of the pollutant constituents do not break down" and that water quality can be maintained only if loading is not increased. No support is provided for the assertion that most constituents do not break down, and all available evidence is to the contrary. Most of the substances in municipal wastewater are organic compounds built up by organisms from carbon dioxide and water, and most return either to carbon dioxide and water or provide food

for living organisms, including fish. Lake Mead, like other bodies of water, naturally assimilates modest wastewater discharges. Mixing enhances the assimilation, and tends to prevent localized effects.

## L5-101

The inconsistency in the text has been corrected in both the Executive Summary and Section 1.5.

## L5-102

See General Response 6.

Please refer to the revised Appendix K for a more comprehensive review of past and ongoing EDC and PPCP research conducted in the Boulder Basin of Lake Mead and a summary of the state-of-the-science related to these chemicals in general. The text in Section 1.4 has been revised based on the results of the literature review presented in Appendix K.

## L5-103

See General Response 6.

See General Response 9.

See response to comment F1-1.

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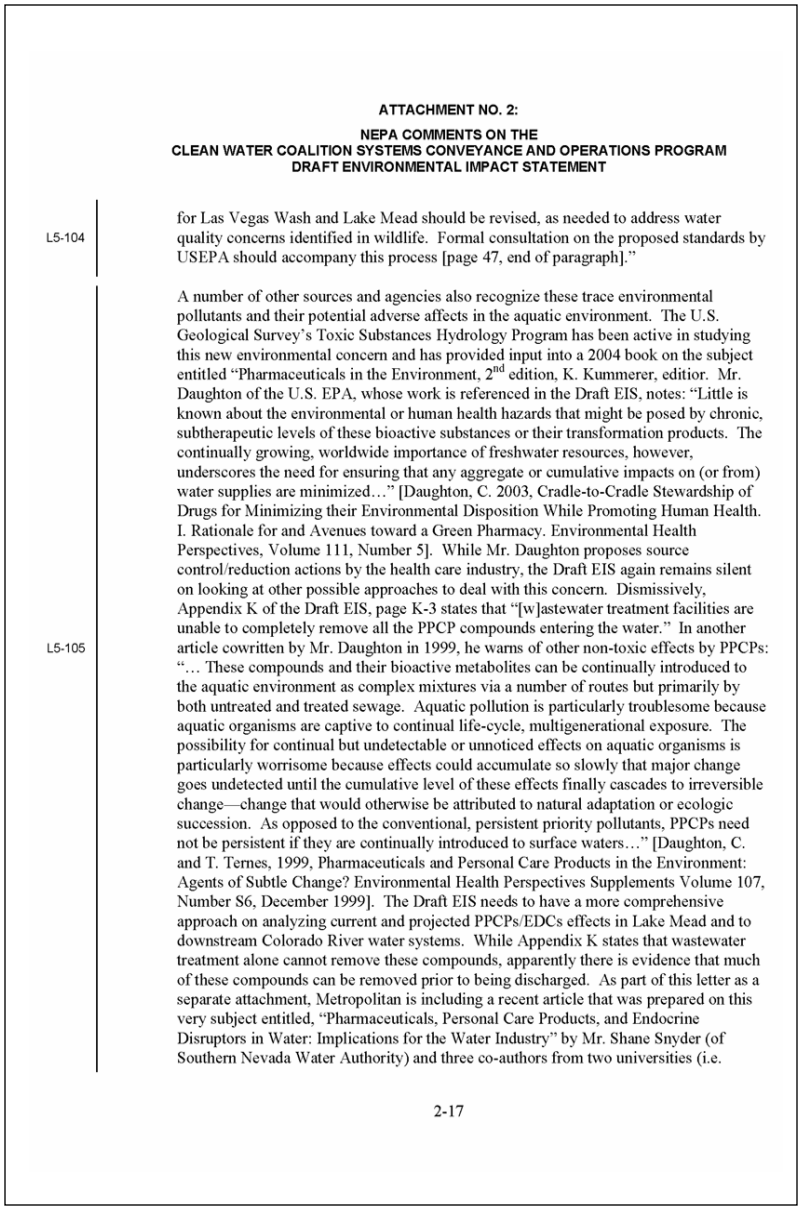
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contrary, it is too premature for the Draft EIS to dismiss this potentially significant environmental effect. While detection of the PCCPs in the Las Vegas Wash and Las Vegas Bay was done by using non-conventional, analytical instruments (i.e., radioimmunoassay), that, in and of itself, does not relieve the lead agencies from examining further such effects to the aquatic environment and to sensitive biological resources. Appendix K indicates that studies centered on at least three target species: common carp, largemouth bass, and the endangered razorback sucker. Appendix K does not indicate which male fish species demonstrated estrogenic effects. Did the studies reveal that the endangered razorback sucker or other sensitive biological resources are being affected in this manner? Does the CWC have take authorization for such impacts? The Draft EIS is silent in this matter; however, a real concern exists, since the alternatives proposed will double the amount of wastewater now entering into Lake Mead (i.e., from about 150 to 300 mgd). The Draft EIS does not discuss a recent study done by U.S. Fish and Wildlife Service entitled "Las Vegas Wash Water Quality and Implications to Fish and Wildlife" (November 2002; full report is enclosed as an attachment to this letter). Certain excerpted sentences from that report indicate the seriousness of this issue and are repeated here as follows: "Endocrine disrupting chemicals in wastewater flows and associated affects to wildlife are yet another water quality issue in Las Vegas Wash and Las Vegas Bay [page 45, second full paragraph]." "The Service maintains that there is overwhelming evidence that EDC's are present in wastewater that comprises over 90 percent of Las Vegas Wash base flows, that scientific studies have demonstrated a relationship between certain constituents in wastewater and adverse effects to trust resources in the area, and that the best approach to assess population level effects is to conduct a cooperative reproductive endpoint study on fish exposed to wastewater [page 45, second full paragraph]." "At present, discharging above or below Hoover Dam appears to be favored by the CWC, raising concerns about potential impacts to razorback suckers occurring downstream of Hoover Dam including Lake Mohave…. If a discharge above or below Hoover Dam is chosen as the preferred alternative, and wastewater flows are diverted in increasing volumes, EDCs and abnormal hormones in fish will likely occur in the Colorado River downstream, as has already been documented in largemouth bass, common carp, and razorback sucker from Las Vegas Wash and Bay. Reproductive impacts at the population level are uncertain, however, any loss in reproductive ability for an endangered fish could jeopardize recovery efforts [page 46, middle of page]." "Water quality standards for Las Vegas Wash and Lake Mead were last revised in 1998 and are overdue. Existing conditions in Las Vegas Wash and Las Vegas Bay seem to indicate that due to increasing wastewater flows (point and non-point), past water quality standards may have been inadequate to preserve the chemical and biological integrity of water [page 46, end of page]." "The results of our investigation concur with previous studies and indicate conditions in Las Vegas Wash and Bay that are not conducive to healthy populations of fish and wildlife, including an endangered fish and possibly two endangered bird species. These conditions appear to constitute take as defined under the ESA and may approach the definition of adverse modification of critical habitat [page 47, middle of paragraph]." "We believe this report, supported by Bevans et al. (1998 and 1996), constitutes evidence of adverse effects to listed species. Water quality standards

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for Las Vegas Wash and Lake Mead should be revised, as needed to address water quality concerns identified in wildlife. Formal consultation on the proposed standards by USEPA should accompany this process [page 47, end of paragraph]."

L5-105

A number of other sources and agencies also recognize these trace environmental pollutants and their potential adverse affects in the aquatic environment. The U.S. Geological Survey's Toxic Substances Hydrology Program has been active in studying this new environmental concern and has provided input into a 2004 book on the subject entitled "Pharmaceuticals in the Environment, 2nd edition, K. Kummerer, editior. Mr. Daughton of the U.S. EPA, whose work is referenced in the Draft EIS, notes: "Little is known about the environmental or human health hazards that might be posed by chronic, subtherapeutic levels of these bioactive substances or their transformation products. The continually growing, worldwide importance of freshwater resources, however, underscores the need for ensuring that any aggregate or cumulative impacts on (or from) water supplies are minimized…" [Daughton, C. 2003, Cradle-to-Cradle Stewardship of Drugs for Minimizing their Environmental Disposition While Promoting Human Health. I. Rationale for and Avenues toward a Green Pharmacy. Environmental Health Perspectives, Volume 111, Number 5]. While Mr. Daughton proposes source control/reduction actions by the health care industry, the Draft EIS again remains silent on looking at other possible approaches to deal with this concern. Dismissively, Appendix K of the Draft EIS, page K-3 states that "[w]astewater treatment facilities are unable to completely remove all the PPCP compounds entering the water." In another article cowritten by Mr. Daughton in 1999, he warns of other non-toxic effects by PPCPs: "… These compounds and their bioactive metabolites can be continually introduced to the aquatic environment as complex mixtures via a number of routes but primarily by both untreated and treated sewage. Aquatic pollution is particularly troublesome because aquatic organisms are captive to continual life-cycle, multigenerational exposure. The possibility for continual but undetectable or unnoticed effects on aquatic organisms is particularly worrisome because effects could accumulate so slowly that major change goes undetected until the cumulative level of these effects finally cascades to irreversible change—change that would otherwise be attributed to natural adaptation or ecologic succession. As opposed to the conventional, persistent priority pollutants, PPCPs need not be persistent if they are continually introduced to surface waters…" [Daughton, C. and T. Ternes, 1999, Pharmaceuticals and Personal Care Products in the Environment: Agents of Subtle Change? Environmental Health Perspectives Supplements Volume 107, Number S6, December 1999]. The Draft EIS needs to have a more comprehensive approach on analyzing current and projected PPCPs/EDCs effects in Lake Mead and to downstream Colorado River water systems. While Appendix K states that wastewater treatment alone cannot remove these compounds, apparently there is evidence that much of these compounds can be removed prior to being discharged. As part of this letter as a separate attachment, Metropolitan is including a recent article that was prepared on this very subject entitled, "Pharmaceuticals, Personal Care Products, and Endocrine Disruptors in Water: Implications for the Water Industry" by Mr. Shane Snyder (of Southern Nevada Water Authority) and three co-authors from two universities (i.e.

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## L5-104

See General Response 6.

See General Response 9.

The literature reviewed during preparation of Appendix K includes the references mentioned by the commenter. However, the conclusions presented in Appendix K, which was prepared by Intertox personnel including Erin Snyder (Ph.D., Environmental Toxicology-Zoology) are not completely consistent with the commenters conclusions. The commenters credentials are unknown.

See response to comment F1-1.

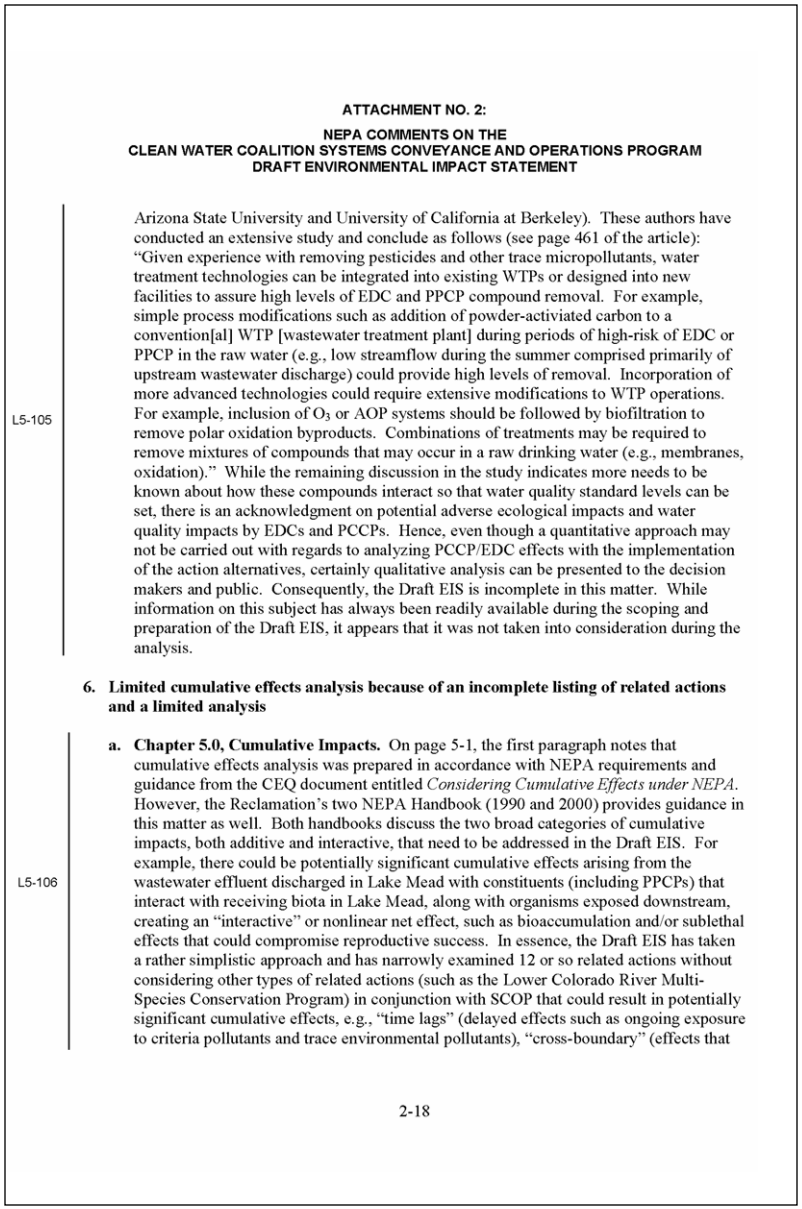
## L5-105

See General Response 6.

Section 3.0 of Appendix K describes the studies and conclusions regarding the potential impacts of EDCs to fish. Additionally, Section 4.2 of the Final EIS has been revised to include the information presented in Appendix K.

The text in Section 1.4 has been revised based on the results of the literature review presented in Appendix K.

The comment quotes expressions of concern about potential effects of pharmaceuticals in the environment, but no information about the potential effects of the project on the environment of Lake Mead and the Colorado River. In comparison, Appendix K provides a scientific evaluation of available scientific evidence as relevant to Lake Mead and the Colorado River. In its official survey of water quality in the Colorado River, MWD does not identify EDCs or PPCPs as being significant concerns. "Pathogens, coliforms, methyl tert-butyl ether (MTBE), and perchlorate were identified as the key constituents of concern . . . ." (MWD 2001). Endocrine disrupting chemicals and PPCPs appear not to have been mentioned in the executive summary of the *Colorado River Watershed Sanitary Survey – 2000 Update* (MWD 2001), although they are discussed elsewhere in the report.



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Arizona State University and University of California at Berkeley). These authors have conducted an extensive study and conclude as follows (see page 461 of the article): "Given experience with removing pesticides and other trace micropollutants, water treatment technologies can be integrated into existing WTPs or designed into new facilities to assure high levels of EDC and PPCP compound removal. For example, simple process modifications such as addition of powder-activiated carbon to a convention[al] WTP [wastewater treatment plant] during periods of high-risk of EDC or PPCP in the raw water (e.g., low streamflow during the summer comprised primarily of upstream wastewater discharge) could provide high levels of removal. Incorporation of more advanced technologies could require extensive modifications to WTP operations. For example, inclusion of $O_3$ or AOP systems should be followed by biofiltration to remove polar oxidation byproducts. Combinations of treatments may be required to remove mixtures of compounds that may occur in a raw drinking water (e.g., membranes, oxidation)." While the remaining discussion in the study indicates more needs to be known about how these compounds interact so that water quality standard levels can be set, there is an acknowledgment on potential adverse ecological impacts and water quality impacts by EDCs and PCCPs. Hence, even though a quantitative approach may not be carried out with regards to analyzing PCCP/EDC effects with the implementation of the action alternatives, certainly qualitative analysis can be presented to the decision makers and public. Consequently, the Draft EIS is incomplete in this matter. While information on this subject has always been readily available during the scoping and preparation of the Draft EIS, it appears that it was not taken into consideration during the analysis.

**6. Limited cumulative effects analysis because of an incomplete listing of related actions and a limited analysis**

L5-106

**a. Chapter 5.0, Cumulative Impacts.** On page 5-1, the first paragraph notes that cumulative effects analysis was prepared in accordance with NEPA requirements and guidance from the CEQ document entitled *Considering Cumulative Effects under NEPA*. However, the Reclamation's two NEPA Handbook (1990 and 2000) provides guidance in this matter as well. Both handbooks discuss the two broad categories of cumulative impacts, both additive and interactive, that need to be addressed in the Draft EIS. For example, there could be potentially significant cumulative effects arising from the wastewater effluent discharged in Lake Mead with constituents (including PPCPs) that interact with receiving biota in Lake Mead, along with organisms exposed downstream, creating an "interactive" or nonlinear net effect, such as bioaccumulation and/or sublethal effects that could compromise reproductive success. In essence, the Draft EIS has taken a rather simplistic approach and has narrowly examined 12 or so related actions without considering other types of related actions (such as the Lower Colorado River Multi-Species Conservation Program) in conjunction with SCOP that could result in potentially significant cumulative effects, e.g., "time lags" (delayed effects such as ongoing exposure to criteria pollutants and trace environmental pollutants), "cross-boundary" (effects that

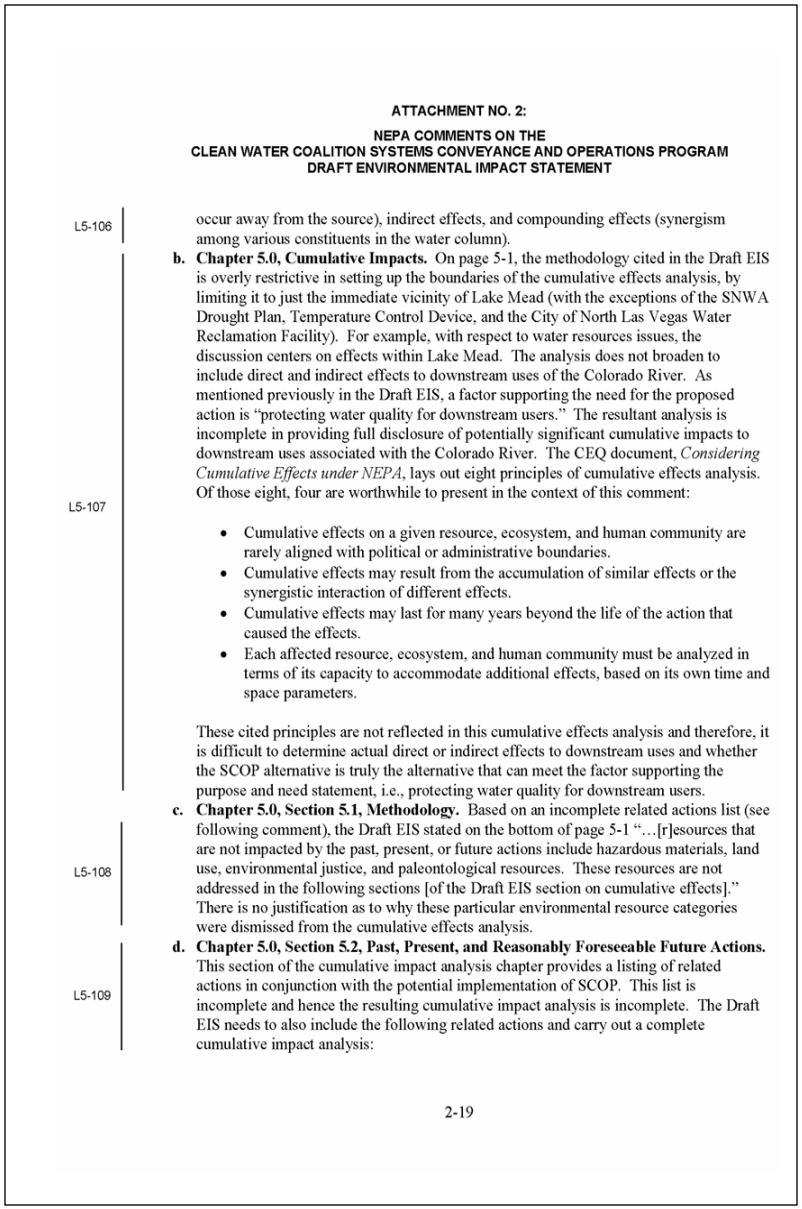
2-18

## L5-106

See General Response 9.

The 2000 Reclamation NEPA Handbook is in draft format and has not been implemented by Reclamation. Therefore, the requirements are not applicable. However, the 1990 Reclamation NEPA Handbook was consulted.

The cumulative impacts analysis has been revised. As stated in General Response 6, some uncertainty exists regarding the effects of EDCs and PPCPs on fish. Therefore, it is uncertain whether bioaccumulation occurs in aquatic species, or whether long-term exposure impacts reproductive success.



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occur away from the source), indirect effects, and compounding effects (synergism among various constituents in the water column).

**b. Chapter 5.0, Cumulative Impacts.** On page 5-1, the methodology cited in the Draft EIS is overly restrictive in setting up the boundaries of the cumulative effects analysis, by limiting it to just the immediate vicinity of Lake Mead (with the exceptions of the SNWA Drought Plan, Temperature Control Device, and the City of North Las Vegas Water Reclamation Facility). For example, with respect to water resources issues, the discussion centers on effects within Lake Mead. The analysis does not broaden to include direct and indirect effects to downstream uses of the Colorado River. As mentioned previously in the Draft EIS, a factor supporting the need for the proposed action is "protecting water quality for downstream users." The resultant analysis is incomplete in providing full disclosure of potentially significant cumulative impacts to downstream uses associated with the Colorado River. The CEQ document, *Considering Cumulative Effects under NEPA*, lays out eight principles of cumulative effects analysis. Of those eight, four are worthwhile to present in the context of this comment:

L5-107

- Cumulative effects on a given resource, ecosystem, and human community are rarely aligned with political or administrative boundaries.
- Cumulative effects may result from the accumulation of similar effects or the synergistic interaction of different effects.
- Cumulative effects may last for many years beyond the life of the action that caused the effects.
- Each affected resource, ecosystem, and human community must be analyzed in terms of its capacity to accommodate additional effects, based on its own time and space parameters.

These cited principles are not reflected in this cumulative effects analysis and therefore, it is difficult to determine actual direct or indirect effects to downstream uses and whether the SCOP alternative is truly the alternative that can meet the factor supporting the purpose and need statement, i.e., protecting water quality for downstream users.

**c. Chapter 5.0, Section 5.1, Methodology.** Based on an incomplete related actions list (see following comment), the Draft EIS stated on the bottom of page 5-1 "…[r]esources that are not impacted by the past, present, or future actions include hazardous materials, land use, environmental justice, and paleontological resources. These resources are not addressed in the following sections [of the Draft EIS section on cumulative effects]." There is no justification as to why these particular environmental resource categories were dismissed from the cumulative effects analysis.

L5-108

**d. Chapter 5.0, Section 5.2, Past, Present, and Reasonably Foreseeable Future Actions.** This section of the cumulative impact analysis chapter provides a listing of related actions in conjunction with the potential implementation of SCOP. This list is incomplete and hence the resulting cumulative impact analysis is incomplete. The Draft EIS needs to also include the following related actions and carry out a complete cumulative impact analysis:

L5-109

2-19

## L5-107

The boundaries for the cumulative impacts analysis have been extended to include actions occurring downstream of Hoover Dam that have the potential to result in cumulative impacts. The actions added include the wastewater discharges from the Laughlin Wastewater Treatment Plant and the LCR MSCP. The analysis presented in the Final EIS addresses potential impacts to downstream users. Direct and indirect impacts are presented in Chapter 4. Cumulative impacts are presented in Chapter 5.

The concepts presented in the CEQ document, *Considering Cumulative Effects under NEPA*, were used to conduct the analysis presented in the Final EIS. It is unclear what the commenter is requesting in this part of their comment. As stated above, the boundaries for cumulative impacts analysis have been extended to cross over political and administrative boundaries. The uncertainties regarding the impacts of effluent-related constituents on fish are clearly stated. The potential cumulative impacts, if there were any identified, to environmental resources and humans are clearly presented by resource in Chapter 5.

## L5-108

The text has been revised in Chapter 5 of the Final EIS to describe the potential cumulative impacts of the resources mentioned.

## L5-109

Information regarding the potential cumulative impacts downstream of Hoover Dam has been added to the Final EIS. As stated in Chapter 5.0, the CEQ document *Considering Cumulative Effects under NEPA* was used as the primary guidance for the Cumulative Impacts analyses.

Potential direct and indirect impacts to downstream users from the SCOP alternatives are described throughout Chapter 4. Separate sections describing the potential water quality impacts to downstream users from each alternative are provided in Section 4.1. The potential impacts to downstream users for resources other than water quality are presented within the text for each resource and alternative.

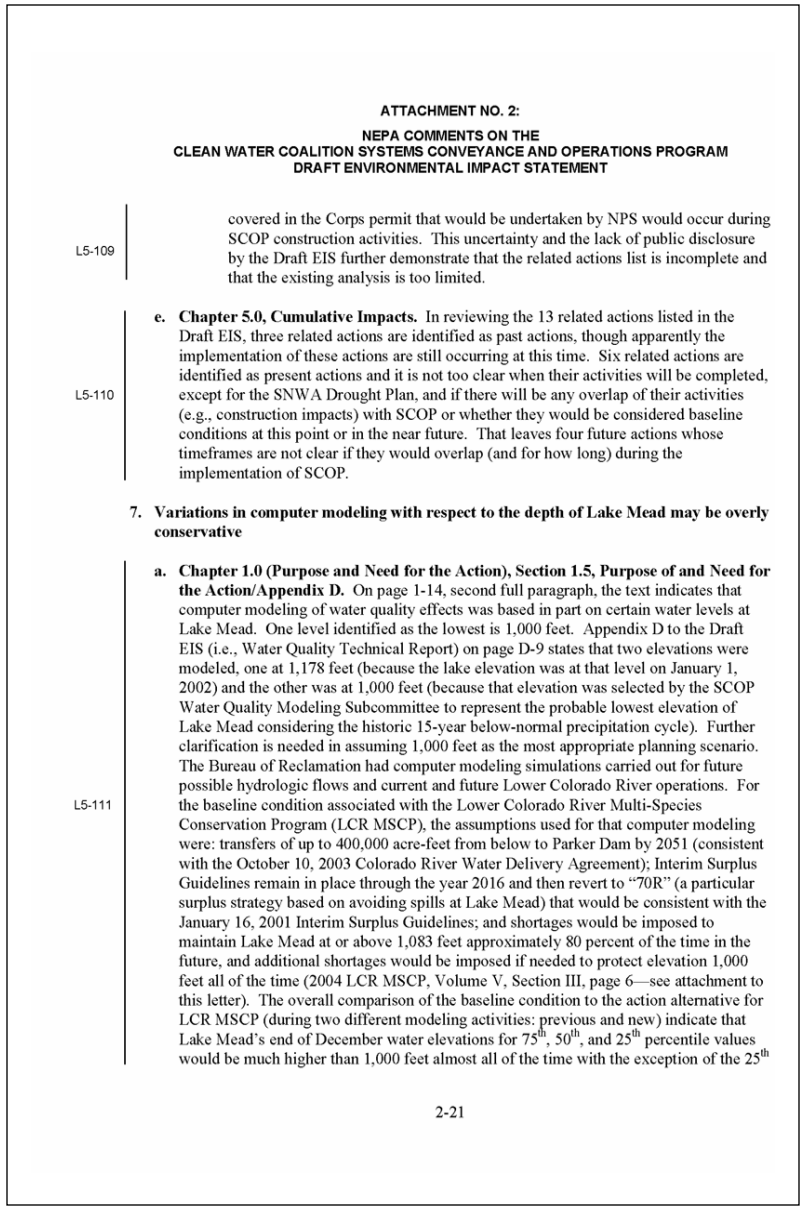
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- U.S. Department of the Interior, Bureau of Reclamation: Development of Lower Basin Shortage Guidelines and Coordinated Management Strategies for Lake Powell and Lake Mead under Low Reservoir Conditions. This proposed action would provide shortage guidelines for the Lower Basin (circumstances under which less than 7.5 million acre-feet would be delivered annually to the Lower Division States (Arizona, California, and Nevada). In addition, this action also proposes to provide coordinated management strategies for the operations of Lake Powell and Lake Mead under low reservoir conditions. According to Reclamation's own public scoping meeting presentations (entitled "Reclamation Managing Water in the West" and found at http://www.usbr.gov/lc/region/g4000/strategies/novpresentation.pdf) the public scoping period was September 30 through November 30, 2005. However, previous to that time, there was public consultation between June 15 and August 30, 2005. Hence, it is quite reasonable to include this proposed action in with other related actions associated with SCOP. The presentation on this particular proposed action also indicates a tentative EIS schedule: December 2006 for the DEIS review period, October 2007 for the FEIS review period, with December 2007 culminating in the record of decision. This is a viable action as the Secretary of Interior directed Reclamation in May 2005 to resolve such shortages with the Lower Basin States.
- U.S. Department of the Interior, Bureau of Reclamation and U.S. Fish and Wildlife Service, The Metropolitan Water District of Southern California: Lower Colorado River Multi-Species Conservation Program Final Programmatic Environmental Impact Statement/Environmental Impact Report. Metropolitan certified this document on February 8, 2005. The Lower Colorado River Multi-Species Program is a joint federal, non-federal program designed to provide incidental take coverage for endangered species and provide a comprehensive plan for restoration of sensitive habitat along the Lower Colorado River from Lake Mead to the Southerly International Boundary with Mexico. It too should be included in the list of related actions that could be cumulatively considerable with the proposed action.
- U.S. National Park Service: Categorically Excluded Activities on Lake Mead and Lake Mohave (U.S. Army Corps of Engineers' Regional General Permit Number GP-63). This permit became effective on October 1, 2004, and will expire October 1, 2009. It allows NPS to have a number of activities carried out at Lake Mead that are presumably categorically excluded from NEPA. These activities may include routine maintenance activities, replacement in kind of minor structures and facilities, etc. There is also a reference on page 3 of the permit regarding possible actions should extended drought conditions persist with simultaneous decreases to Lake Mead's water elevation. Such activities would include repair and extend launch ramps, reconfigure breakwaters or construct new breakwaters, etc. Given the proposed construction aspects of the SCOP, it is not clear whether or not the various unidentified but categorically excluded activities

L5-109

2-20



**ATTACHMENT NO. 2:**

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L5-109

covered in the Corps permit that would be undertaken by NPS would occur during SCOP construction activities. This uncertainty and the lack of public disclosure by the Draft EIS further demonstrate that the related actions list is incomplete and that the existing analysis is too limited.

L5-110

e. **Chapter 5.0, Cumulative Impacts.** In reviewing the 13 related actions listed in the Draft EIS, three related actions are identified as past actions, though apparently the implementation of these actions are still occurring at this time. Six related actions are identified as present actions and it is not too clear when their activities will be completed, except for the SNWA Drought Plan, and if there will be any overlap of their activities (e.g., construction impacts) with SCOP or whether they would be considered baseline conditions at this point or in the near future. That leaves four future actions whose timeframes are not clear if they would overlap (and for how long) during the implementation of SCOP.

7. **Variations in computer modeling with respect to the depth of Lake Mead may be overly conservative**

L5-111

a. **Chapter 1.0 (Purpose and Need for the Action), Section 1.5, Purpose of and Need for the Action/Appendix D.** On page 1-14, second full paragraph, the text indicates that computer modeling of water quality effects was based in part on certain water levels at Lake Mead. One level identified as the lowest is 1,000 feet. Appendix D to the Draft EIS (i.e., Water Quality Technical Report) on page D-9 states that two elevations were modeled, one at 1,178 feet (because the lake elevation was at that level on January 1, 2002) and the other was at 1,000 feet (because that elevation was selected by the SCOP Water Quality Modeling Subcommittee to represent the probable lowest elevation of Lake Mead considering the historic 15-year below-normal precipitation cycle). Further clarification is needed in assuming 1,000 feet as the most appropriate planning scenario. The Bureau of Reclamation had computer modeling simulations carried out for future possible hydrologic flows and current and future Lower Colorado River operations. For the baseline condition associated with the Lower Colorado River Multi-Species Conservation Program (LCR MSCP), the assumptions used for that computer modeling were: transfers of up to 400,000 acre-feet from below to Parker Dam by 2051 (consistent with the October 10, 2003 Colorado River Water Delivery Agreement); Interim Surplus Guidelines remain in place through the year 2016 and then revert to "70R" (a particular surplus strategy based on avoiding spills at Lake Mead) that would be consistent with the January 16, 2001 Interim Surplus Guidelines; and shortages would be imposed to maintain Lake Mead at or above 1,083 feet approximately 80 percent of the time in the future, and additional shortages would be imposed if needed to protect elevation 1,000 feet all of the time (2004 LCR MSCP, Volume V, Section III, page 6—see attachment to this letter). The overall comparison of the baseline condition to the action alternative for LCR MSCP (during two different modeling activities: previous and new) indicate that Lake Mead's end of December water elevations for 75$^{th}$, 50$^{th}$, and 25$^{th}$ percentile values would be much higher than 1,000 feet almost all of the time with the exception of the 25$^{th}$

2-21

## L5-110

Definitions for "past, present, and reasonably foreseeable" actions have been added to Chapter 5 of the Final EIS.

Clarification of the timelines for the various projects has been added to Sections 5.2.1, 5.2.2, and 5.2.3 of the Final EIS.

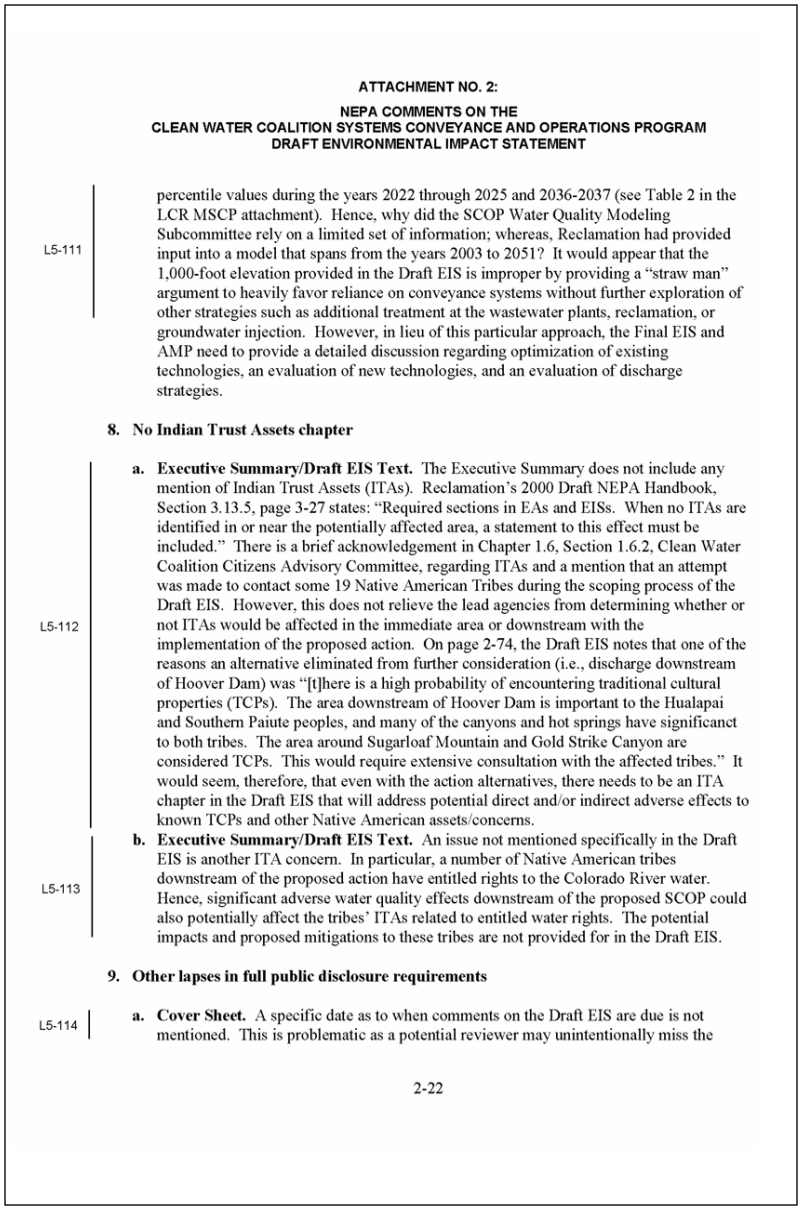
## L5-111

The Lake level of 1,000 ft was provided to the CWC by Reclamation and recommended as the design criteria for this EIS. The Modeling Committee and the CWC complied with the Reclamation recommendation. The most recent discussions concerning the management of Lake Powell and Lake Mead also indicate the appropriateness of evaluations at the 1,000-ft level. In addition, Reclamation has done some modeling that predicts conditions at 1,000 ft. As stated in Section 1.5 of the Final EIS, the 1,000-ft (305-m) Lake level is used for planning purposes in this EIS because it is the level that has been discussed by the Colorado River states to be "protected" in future drought conditions, and has most recently been agreed to in the *Seven Basin States' Preliminary Proposal Regarding the Colorado River Interim Operations*.

Modeling was done beginning at a Lake elevation of 1,178 ft because that was the elevation at the beginning of the baseline year, and because this level is close to the maximum Lake level of about 1,220 ft above sea level. Some modeling was also performed for elevations at 1,100 ft. In this way, the range of possibilities was modeled and considered when evaluating alternatives.

See General Response 1.

See General Response 3.



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L5-111

percentile values during the years 2022 through 2025 and 2036-2037 (see Table 2 in the LCR MSCP attachment). Hence, why did the SCOP Water Quality Modeling Subcommittee rely on a limited set of information; whereas, Reclamation had provided input into a model that spans from the years 2003 to 2051? It would appear that the 1,000-foot elevation provided in the Draft EIS is improper by providing a "straw man" argument to heavily favor reliance on conveyance systems without further exploration of other strategies such as additional treatment at the wastewater plants, reclamation, or groundwater injection. However, in lieu of this particular approach, the Final EIS and AMP need to provide a detailed discussion regarding optimization of existing technologies, an evaluation of new technologies, and an evaluation of discharge strategies.

**8. No Indian Trust Assets chapter**

L5-112

**a. Executive Summary/Draft EIS Text.** The Executive Summary does not include any mention of Indian Trust Assets (ITAs). Reclamation's 2000 Draft NEPA Handbook, Section 3.13.5, page 3-27 states: "Required sections in EAs and EISs. When no ITAs are identified in or near the potentially affected area, a statement to this effect must be included." There is a brief acknowledgement in Chapter 1.6, Section 1.6.2, Clean Water Coalition Citizens Advisory Committee, regarding ITAs and a mention that an attempt was made to contact some 19 Native American Tribes during the scoping process of the Draft EIS. However, this does not relieve the lead agencies from determining whether or not ITAs would be affected in the immediate area or downstream with the implementation of the proposed action. On page 2-74, the Draft EIS notes that one of the reasons an alternative eliminated from further consideration (i.e., discharge downstream of Hoover Dam) was "[t]here is a high probability of encountering traditional cultural properties (TCPs). The area downstream of Hoover Dam is important to the Hualapai and Southern Paiute peoples, and many of the canyons and hot springs have significanct to both tribes. The area around Sugarloaf Mountain and Gold Strike Canyon are considered TCPs. This would require extensive consultation with the affected tribes." It would seem, therefore, that even with the action alternatives, there needs to be an ITA chapter in the Draft EIS that will address potential direct and/or indirect adverse effects to known TCPs and other Native American assets/concerns.

L5-113

**b. Executive Summary/Draft EIS Text.** An issue not mentioned specifically in the Draft EIS is another ITA concern. In particular, a number of Native American tribes downstream of the proposed action have entitled rights to the Colorado River water. Hence, significant adverse water quality effects downstream of the proposed SCOP could also potentially affect the tribes' ITAs related to entitled water rights. The potential impacts and proposed mitigations to these tribes are not provided for in the Draft EIS.

**9. Other lapses in full public disclosure requirements**

L5-114

**a. Cover Sheet.** A specific date as to when comments on the Draft EIS are due is not mentioned. This is problematic as a potential reviewer may unintentionally miss the

2-22

## L5-112

The 2000 Reclamation NEPA Handbook is in draft format and has not been implemented by Reclamation.

A discussion of Indian Trust Assets was included in Section 1.6 of the Draft EIS. In response to this comment, the discussion has been assigned its own section, Section 1.6.3, a discussion of Indian Trust Assets (Section 3.12.3) has been added to the Environmental Justice section in Chapter 3 of the Final EIS, and the appropriate statements have been added to the Environmental Justice sections in Chapter 4 of the Final EIS.

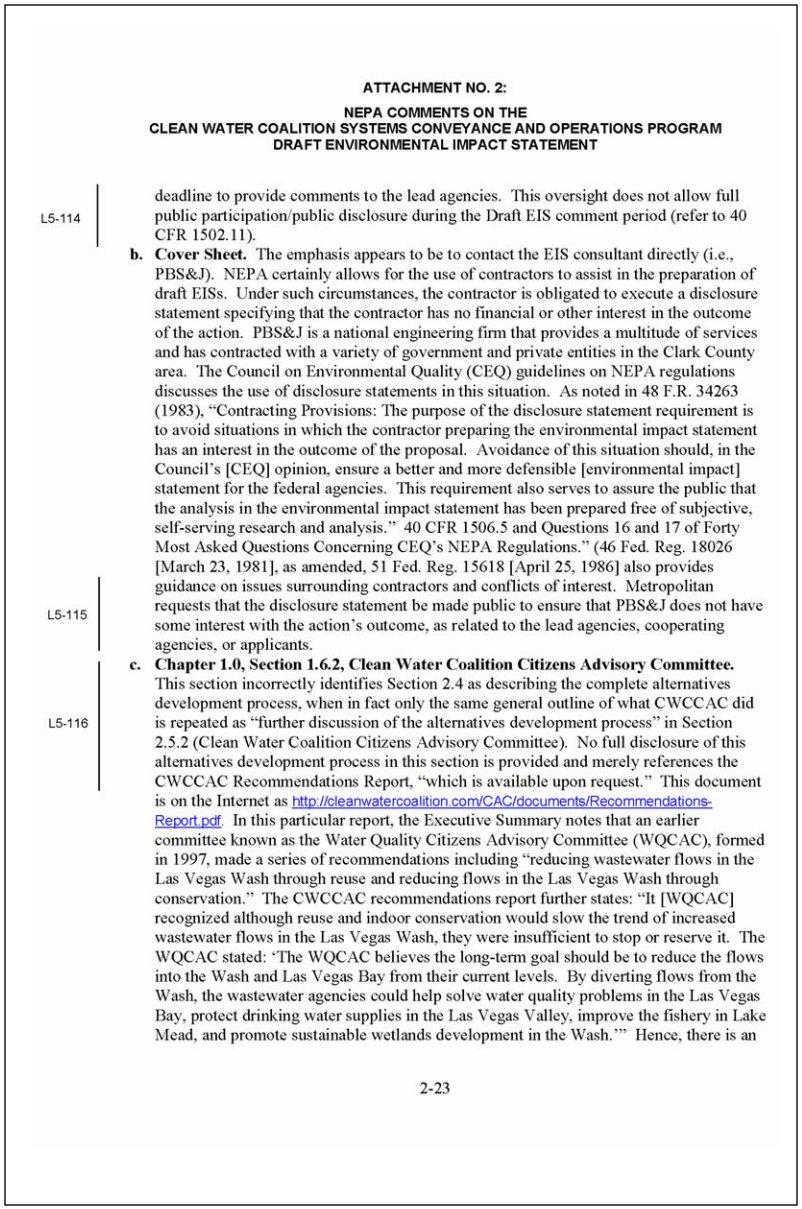
## L5-113

Text describing the water rights of the five tribes along the lower Colorado River has been added to Section 3.12 of the Final EIS. The potential impacts are addressed in Section 4.12 of the Final EIS.

The Executive Summary has been revised.

## L5-114

Although the due date for comments was not included in the Cover Sheet, the Dear Reader letter that was bound just inside the cover of the Draft EIS states "Written comments regarding the Draft EIS must be received via email or postmarked no later than 60 days after the EPA's publication of the Notice of Availability in the Federal Register." Additionally, the Dear Reader letter provides phone numbers and the Cover Sheet provides addresses to be used for inquiries or to request additional information.



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deadline to provide comments to the lead agencies. This oversight does not allow full public participation/public disclosure during the Draft EIS comment period (refer to 40 CFR 1502.11).

**b. Cover Sheet.** The emphasis appears to be to contact the EIS consultant directly (i.e., PBS&J). NEPA certainly allows for the use of contractors to assist in the preparation of draft EISs. Under such circumstances, the contractor is obligated to execute a disclosure statement specifying that the contractor has no financial or other interest in the outcome of the action. PBS&J is a national engineering firm that provides a multitude of services and has contracted with a variety of government and private entities in the Clark County area. The Council on Environmental Quality (CEQ) guidelines on NEPA regulations discusses the use of disclosure statements in this situation. As noted in 48 F.R. 34263 (1983), "Contracting Provisions: The purpose of the disclosure statement requirement is to avoid situations in which the contractor preparing the environmental impact statement has an interest in the outcome of the proposal. Avoidance of this situation should, in the Council's [CEQ] opinion, ensure a better and more defensible [environmental impact] statement for the federal agencies. This requirement also serves to assure the public that the analysis in the environmental impact statement has been prepared free of subjective, self-serving research and analysis." 40 CFR 1506.5 and Questions 16 and 17 of Forty Most Asked Questions Concerning CEQ's NEPA Regulations." (46 Fed. Reg. 18026 [March 23, 1981], as amended, 51 Fed. Reg. 15618 [April 25, 1986] also provides guidance on issues surrounding contractors and conflicts of interest. Metropolitan requests that the disclosure statement be made public to ensure that PBS&J does not have some interest with the action's outcome, as related to the lead agencies, cooperating agencies, or applicants.

L5-115

**c. Chapter 1.0, Section 1.6.2, Clean Water Coalition Citizens Advisory Committee.** This section incorrectly identifies Section 2.4 as describing the complete alternatives development process, when in fact only the same general outline of what CWCCAC did is repeated as "further discussion of the alternatives development process" in Section 2.5.2 (Clean Water Coalition Citizens Advisory Committee). No full disclosure of this alternatives development process in this section is provided and merely references the CWCCAC Recommendations Report, "which is available upon request." This document is on the Internet as http://cleanwatercoalition.com/CAC/documents/Recommendations-Report.pdf. In this particular report, the Executive Summary notes that an earlier committee known as the Water Quality Citizens Advisory Committee (WQCAC), formed in 1997, made a series of recommendations including "reducing wastewater flows in the Las Vegas Wash through reuse and reducing flows in the Las Vegas Wash through conservation." The CWCCAC recommendations report further states: "It [WQCAC] recognized although reuse and indoor conservation would slow the trend of increased wastewater flows in the Las Vegas Wash, they were insufficient to stop or reserve it. The WQCAC stated: 'The WQCAC believes the long-term goal should be to reduce the flows into the Wash and Las Vegas Bay from their current levels. By diverting flows from the Wash, the wastewater agencies could help solve water quality problems in the Las Vegas Bay, protect drinking water supplies in the Las Vegas Valley, improve the fishery in Lake Mead, and promote sustainable wetlands development in the Wash.'" Hence, there is an

L5-116

2-23

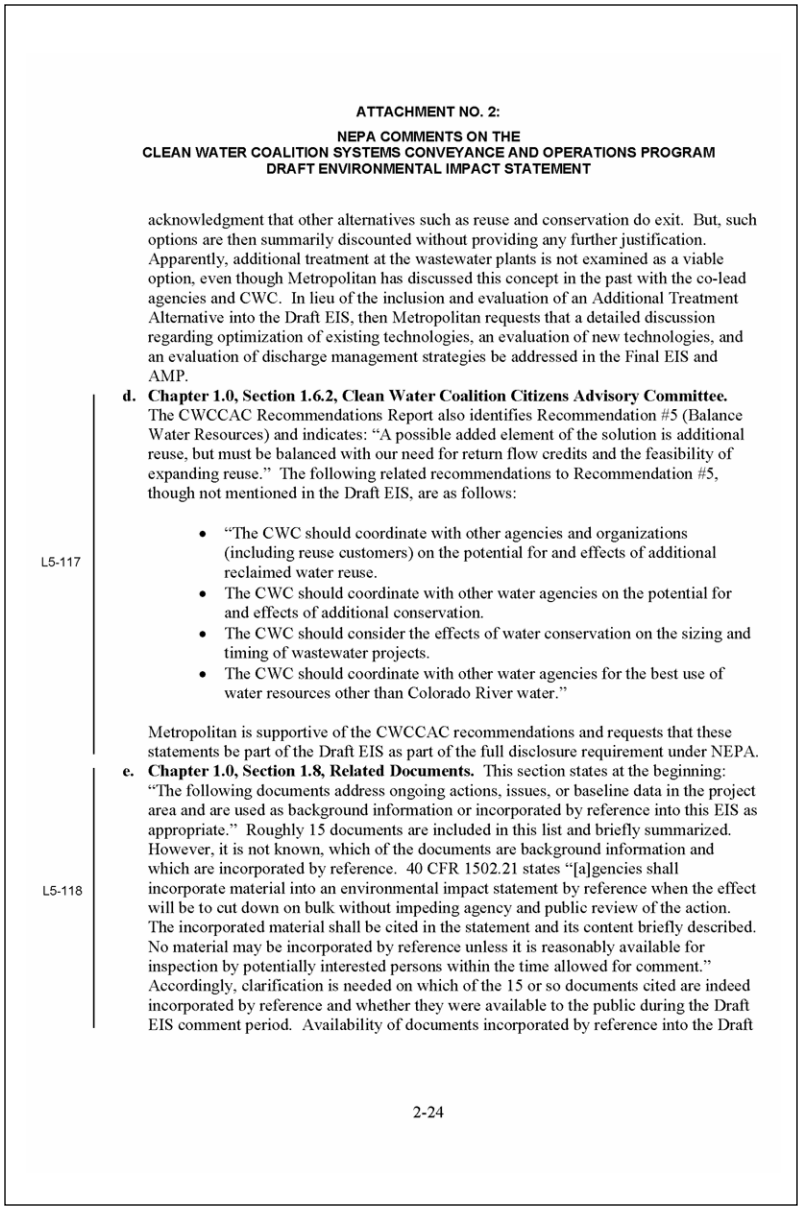
## L5-115

The disclosure statement is included in Appendix N of the Final EIS.

## L5-116

The reference to the wrong section has been corrected. The correct section is 2.5 in the Draft EIS and 2.6 in the Final EIS.

As described in Section 2.5 of the Draft EIS and Section 2.6 of the Final EIS, the alternatives for this project were developed over many years beginning in 1994. Table 2.6-1 of the Final EIS (Table 2.5-1 of the Draft EIS) presents the chronology of the recommendations throughout alternatives development. The CWC Citizens Advisory Committee (CWCCAC) involvement and recommendations report was only one phase of the alternatives development.



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acknowledgment that other alternatives such as reuse and conservation do exit. But, such options are then summarily discounted without providing any further justification. Apparently, additional treatment at the wastewater plants is not examined as a viable option, even though Metropolitan has discussed this concept in the past with the co-lead agencies and CWC. In lieu of the inclusion and evaluation of an Additional Treatment Alternative into the Draft EIS, then Metropolitan requests that a detailed discussion regarding optimization of existing technologies, an evaluation of new technologies, and an evaluation of discharge management strategies be addressed in the Final EIS and AMP.

**d. Chapter 1.0, Section 1.6.2, Clean Water Coalition Citizens Advisory Committee.** The CWCCAC Recommendations Report also identifies Recommendation #5 (Balance Water Resources) and indicates: "A possible added element of the solution is additional reuse, but must be balanced with our need for return flow credits and the feasibility of expanding reuse." The following related recommendations to Recommendation #5, though not mentioned in the Draft EIS, are as follows:

L5-117

- "The CWC should coordinate with other agencies and organizations (including reuse customers) on the potential for and effects of additional reclaimed water reuse.
- The CWC should coordinate with other water agencies on the potential for and effects of additional conservation.
- The CWC should consider the effects of water conservation on the sizing and timing of wastewater projects.
- The CWC should coordinate with other water agencies for the best use of water resources other than Colorado River water."

Metropolitan is supportive of the CWCCAC recommendations and requests that these statements be part of the Draft EIS as part of the full disclosure requirement under NEPA.

**e. Chapter 1.0, Section 1.8, Related Documents.** This section states at the beginning: "The following documents address ongoing actions, issues, or baseline data in the project area and are used as background information or incorporated by reference into this EIS as appropriate." Roughly 15 documents are included in this list and briefly summarized. However, it is not known, which of the documents are background information and which are incorporated by reference. 40 CFR 1502.21 states "[a]gencies shall incorporate material into an environmental impact statement by reference when the effect will be to cut down on bulk without impeding agency and public review of the action. The incorporated material shall be cited in the statement and its content briefly described. No material may be incorporated by reference unless it is reasonably available for inspection by potentially interested persons within the time allowed for comment." Accordingly, clarification is needed on which of the 15 or so documents cited are indeed incorporated by reference and whether they were available to the public during the Draft EIS comment period. Availability of documents incorporated by reference into the Draft

L5-118

2-24

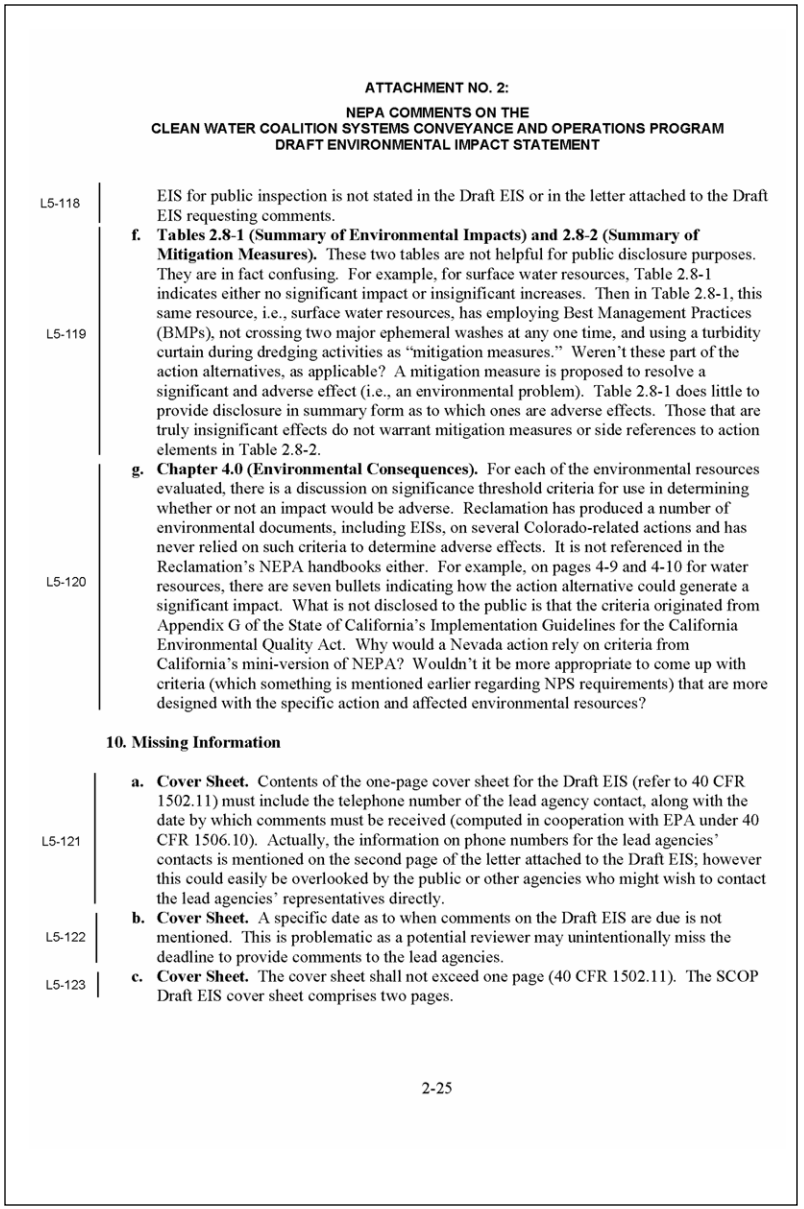
## L5-117

None of the specific CWCCAC recommendations are discussed in Section 1.6.2 of the Draft EIS. This section simply describes the CWCCAC's role in formulating potential solutions and making recommendations to the CWC. A reference to Section 2.6, Alternatives Development, of the Final EIS, is included in Section 1.6.2.

The CWCCAC recommendations have been added to Section 2.6 of the Final EIS as requested. In addition, Section 2.6 of the Final EIS states that the CWCCAC Recommendations Report is available upon request.

## L5-118

As stated in CEQ's Forty Questions on NEPA No. 25b, regarding documents incorporated by reference, "These must be made available, either by citing the literature, furnishing copies to central locations, or sending copies directly to commenters upon request." Information and text incorporated by reference is cited throughout the Draft and Final EISs, and a complete reference list is provided in Chapter 9 of the Draft and Final EIS. The documents listed and briefly described in Section 1.8 are available to the public. In addition, the Dear Reader letter provides phone numbers and the Cover Sheet provides addresses to be used for inquiries or to request additional information.



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L5-118 EIS for public inspection is not stated in the Draft EIS or in the letter attached to the Draft EIS requesting comments.

f. **Tables 2.8-1 (Summary of Environmental Impacts) and 2.8-2 (Summary of Mitigation Measures).** These two tables are not helpful for public disclosure purposes. They are in fact confusing. For example, for surface water resources, Table 2.8-1 indicates either no significant impact or insignificant increases. Then in Table 2.8-1, this same resource, i.e., surface water resources, has employing Best Management Practices (BMPs), not crossing two major ephemeral washes at any one time, and using a turbidity curtain during dredging activities as "mitigation measures." Weren't these part of the action alternatives, as applicable? A mitigation measure is proposed to resolve a significant and adverse effect (i.e., an environmental problem). Table 2.8-1 does little to provide disclosure in summary form as to which ones are adverse effects. Those that are truly insignificant effects do not warrant mitigation measures or side references to action elements in Table 2.8-2. L5-119

g. **Chapter 4.0 (Environmental Consequences).** For each of the environmental resources evaluated, there is a discussion on significance threshold criteria for use in determining whether or not an impact would be adverse. Reclamation has produced a number of environmental documents, including EISs, on several Colorado-related actions and has never relied on such criteria to determine adverse effects. It is not referenced in the Reclamation's NEPA handbooks either. For example, on pages 4-9 and 4-10 for water resources, there are seven bullets indicating how the action alternative could generate a significant impact. What is not disclosed to the public is that the criteria originated from Appendix G of the State of California's Implementation Guidelines for the California Environmental Quality Act. Why would a Nevada action rely on criteria from California's mini-version of NEPA? Wouldn't it be more appropriate to come up with criteria (which something is mentioned earlier regarding NPS requirements) that are more designed with the specific action and affected environmental resources? L5-120

**10. Missing Information**

a. **Cover Sheet.** Contents of the one-page cover sheet for the Draft EIS (refer to 40 CFR 1502.11) must include the telephone number of the lead agency contact, along with the date by which comments must be received (computed in cooperation with EPA under 40 CFR 1506.10). Actually, the information on phone numbers for the lead agencies' contacts is mentioned on the second page of the letter attached to the Draft EIS; however this could easily be overlooked by the public or other agencies who might wish to contact the lead agencies' representatives directly. L5-121

b. **Cover Sheet.** A specific date as to when comments on the Draft EIS are due is not mentioned. This is problematic as a potential reviewer may unintentionally miss the deadline to provide comments to the lead agencies. L5-122

c. **Cover Sheet.** The cover sheet shall not exceed one page (40 CFR 1502.11). The SCOP Draft EIS cover sheet comprises two pages. L5-123

2-25

## L5-119

Table 2.9-1 (formerly Table 2.8-1) has been revised for clarity.

## L5-120

The use of significance criteria is a widely accepted approach to determining whether impacts would be considered significant or insignificant. The statement that a number of EISs have been prepared that do not rely on such criteria does not negate the value and effectiveness of using significance criteria. The general process to determine significance criteria is described in Section 4.0 of the Draft and Final EIS. It is important to note that criteria vary among resources, and thresholds were established for each resource of concern to determine the context, intensity, and duration of impacts.

The significance criteria used for water quality was re-evaluated in response to this comment. The significance criteria used for water resources did indeed originate from Appendix G of the State of California's Implementation Guidelines for the California Environmental Quality Act. The criteria are relevant to the proposed project. A citation has been added to Section 4.1 of the Final EIS.

## L5-121

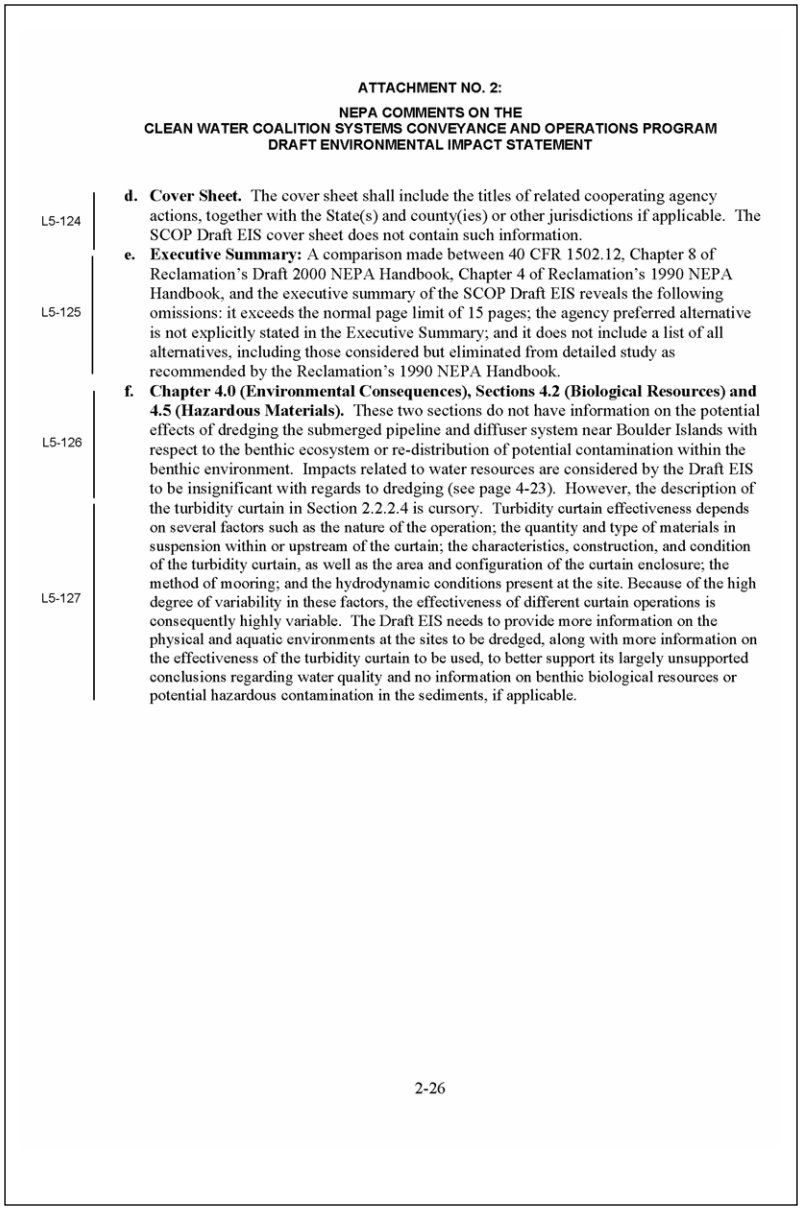
Although the due date for comments was not included in the Cover Sheet, the Dear Reader letter that was bound just inside the cover of the Draft EIS states "Written comments regarding the DEIS must be received via email or postmarked no later than 60 days after the EPA's publication of the Notice of Availability in the Federal Register." Additionally, the Dear Reader letter provides phone numbers and the Cover Sheet provides addresses to be used for inquiries or to request additional information. The Cover Sheet for the Final EIS has been revised as suggested.

## L5-122

Although the official closing date for public comments was December 7, 2006, comments regarding the Draft EIS were accepted through January 30, 2006.

## L5-123

Comment noted. The Final EIS Cover Sheet does not exceed one page.



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L5-124

**d. Cover Sheet.** The cover sheet shall include the titles of related cooperating agency actions, together with the State(s) and county(ies) or other jurisdictions if applicable. The SCOP Draft EIS cover sheet does not contain such information.

L5-125

**e. Executive Summary:** A comparison made between 40 CFR 1502.12, Chapter 8 of Reclamation's Draft 2000 NEPA Handbook, Chapter 4 of Reclamation's 1990 NEPA Handbook, and the executive summary of the SCOP Draft EIS reveals the following omissions: it exceeds the normal page limit of 15 pages; the agency preferred alternative is not explicitly stated in the Executive Summary; and it does not include a list of all alternatives, including those considered but eliminated from detailed study as recommended by the Reclamation's 1990 NEPA Handbook.

L5-126

**f. Chapter 4.0 (Environmental Consequences), Sections 4.2 (Biological Resources) and 4.5 (Hazardous Materials).** These two sections do not have information on the potential effects of dredging the submerged pipeline and diffuser system near Boulder Islands with respect to the benthic ecosystem or re-distribution of potential contamination within the benthic environment. Impacts related to water resources are considered by the Draft EIS to be insignificant with regards to dredging (see page 4-23). However, the description of the turbidity curtain in Section 2.2.2.4 is cursory. Turbidity curtain effectiveness depends on several factors such as the nature of the operation; the quantity and type of materials in suspension within or upstream of the curtain; the characteristics, construction, and condition of the turbidity curtain, as well as the area and configuration of the curtain enclosure; the method of mooring; and the hydrodynamic conditions present at the site. Because of the high degree of variability in these factors, the effectiveness of different curtain operations is consequently highly variable. The Draft EIS needs to provide more information on the physical and aquatic environments at the sites to be dredged, along with more information on the effectiveness of the turbidity curtain to be used, to better support its largely unsupported conclusions regarding water quality and no information on benthic biological resources or potential hazardous contamination in the sediments, if applicable.

L5-127

2-26

## L5-124

It is unclear what information the commenter wants to be inserted. The commenter does not state what "related cooperating agency actions" are being referenced.

## L5-125

The Executive Summary has been revised to include the recommended information. The Council on Environmental Quality (CEQ) regulation 40 CFR 1502.12 states "The summary will normally not exceed 15 pages." That statement may be interpreted to mean that there are instances in which the summary would be longer than 15 pages. The SCOP EIS is presenting information on a complicated project that requires complex analyses of potential impacts. The Draft EIS was more than 750 pages and the Final EIS is more than 850 pages. Therefore, a summary that is more than the "normal" 15 pages may be warranted.

It is important to note that there are two Lead Agencies for the SCOP EIS. Therefore, the EIS may not strictly adhere to the "guidance" provided in Reclamation's 1990 NEPA Handbook or the NPS NEPA Guidance.

The 2000 Reclamation NEPA Handbook is in draft format and as of July 2006 has not been implemented by Reclamation. Therefore, the requirements are not applicable. However, additional details of the initial Boulder Basin AMP have been included in Section 2.2.2.6 of the Final EIS.

## L5-126

The information addressing the existing conditions and the effects of the proposed SCOP construction on fish and their habitat in Lake Mead has been added to the Final EIS in Section 2.2.2.3. The effects of these activities would be short-term, negative impacts to benthic organisms in the immediate area. The area would recolonize with organisms that move in once construction activities cease. Text has also been added to Section 4.5.2.

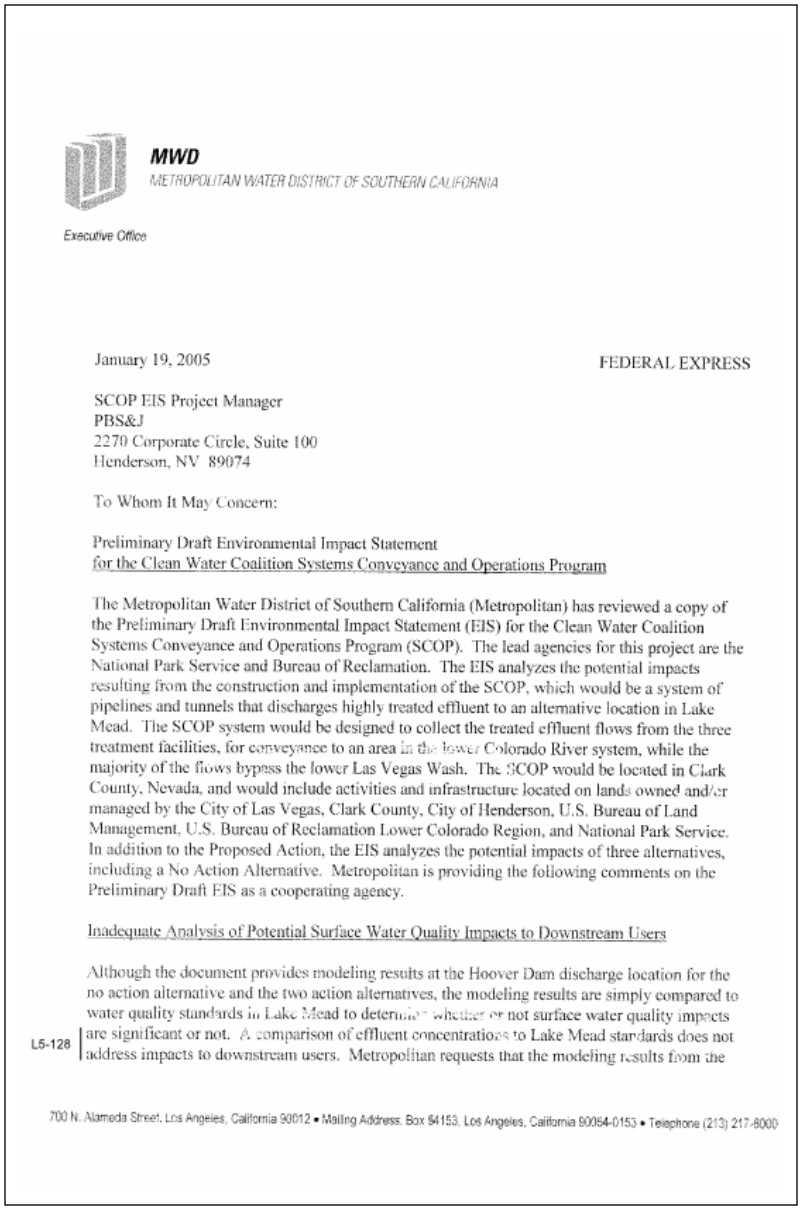
The permit process for dredging, required and administered by EPA and USACE, is explained in Section 4.1.2.1.2. Additional measures to limit sediment dispersal would be required per NDEP "Working in Waterways" Permit. Minimization measures (turbidity curtain) are explained in Section 2.2.2.4.

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**L5-127**

See response to comment F1-35.

The type of turbidity curtain to be used during dredging activities would be selected in coordination with the CWC, SNWA, NPS, and other agencies to ensure that the curtain performs as needed. It is premature to provide details regarding the turbidity curtain in the Final EIS. The first sentence of this response paragraph has been added to Section 2.2.2.4 of the Final EIS.



**MWD**
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Executive Office

January 19, 2005 FEDERAL EXPRESS

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074

To Whom It May Concern:

Preliminary Draft Environmental Impact Statement
for the Clean Water Coalition Systems Conveyance and Operations Program

The Metropolitan Water District of Southern California (Metropolitan) has reviewed a copy of the Preliminary Draft Environmental Impact Statement (EIS) for the Clean Water Coalition Systems Conveyance and Operations Program (SCOP). The lead agencies for this project are the National Park Service and Bureau of Reclamation. The EIS analyzes the potential impacts resulting from the construction and implementation of the SCOP, which would be a system of pipelines and tunnels that discharges highly treated effluent to an alternative location in Lake Mead. The SCOP system would be designed to collect the treated effluent flows from the three treatment facilities, for conveyance to an area in the lower Colorado River system, while the majority of the flows bypass the lower Las Vegas Wash. The SCOP would be located in Clark County, Nevada, and would include activities and infrastructure located on lands owned and/or managed by the City of Las Vegas, Clark County, City of Henderson, U.S. Bureau of Land Management, U.S. Bureau of Reclamation Lower Colorado Region, and National Park Service. In addition to the Proposed Action, the EIS analyzes the potential impacts of three alternatives, including a No Action Alternative. Metropolitan is providing the following comments on the Preliminary Draft EIS as a cooperating agency.

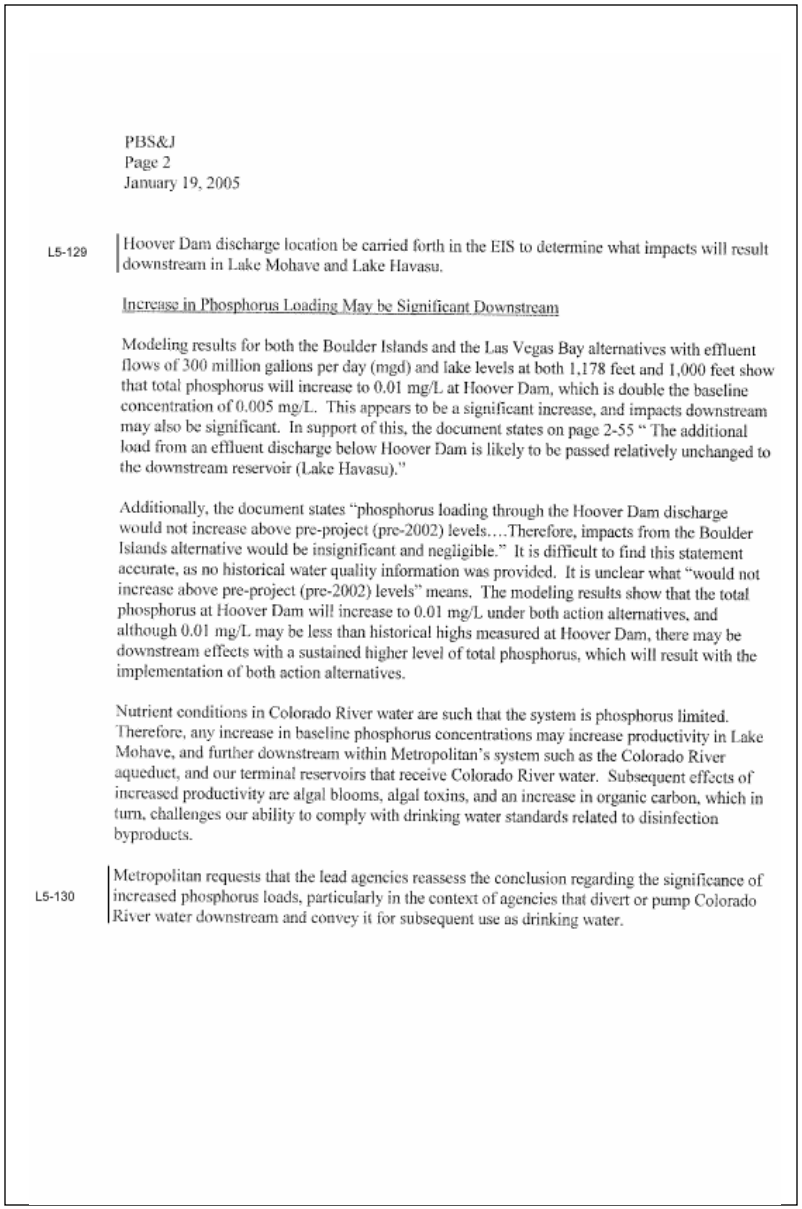
Inadequate Analysis of Potential Surface Water Quality Impacts to Downstream Users

L5-128 Although the document provides modeling results at the Hoover Dam discharge location for the no action alternative and the two action alternatives, the modeling results are simply compared to water quality standards in Lake Mead to determine whether or not surface water quality impacts are significant or not. A comparison of effluent concentrations to Lake Mead standards does not address impacts to downstream users. Metropolitan requests that the modeling results from the

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**L5-128**

See General Response 8.



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L5-129 Hoover Dam discharge location be carried forth in the EIS to determine what impacts will result downstream in Lake Mohave and Lake Havasu.

Increase in Phosphorus Loading May be Significant Downstream

Modeling results for both the Boulder Islands and the Las Vegas Bay alternatives with effluent flows of 300 million gallons per day (mgd) and lake levels at both 1,178 feet and 1,000 feet show that total phosphorus will increase to 0.01 mg/L at Hoover Dam, which is double the baseline concentration of 0.005 mg/L. This appears to be a significant increase, and impacts downstream may also be significant. In support of this, the document states on page 2-55 " The additional load from an effluent discharge below Hoover Dam is likely to be passed relatively unchanged to the downstream reservoir (Lake Havasu)."

Additionally, the document states "phosphorus loading through the Hoover Dam discharge would not increase above pre-project (pre-2002) levels….Therefore, impacts from the Boulder Islands alternative would be insignificant and negligible." It is difficult to find this statement accurate, as no historical water quality information was provided. It is unclear what "would not increase above pre-project (pre-2002) levels" means. The modeling results show that the total phosphorus at Hoover Dam will increase to 0.01 mg/L under both action alternatives, and although 0.01 mg/L may be less than historical highs measured at Hoover Dam, there may be downstream effects with a sustained higher level of total phosphorus, which will result with the implementation of both action alternatives.

Nutrient conditions in Colorado River water are such that the system is phosphorus limited. Therefore, any increase in baseline phosphorus concentrations may increase productivity in Lake Mohave, and further downstream within Metropolitan's system such as the Colorado River aqueduct, and our terminal reservoirs that receive Colorado River water. Subsequent effects of increased productivity are algal blooms, algal toxins, and an increase in organic carbon, which in turn, challenges our ability to comply with drinking water standards related to disinfection byproducts.

L5-130 Metropolitan requests that the lead agencies reassess the conclusion regarding the significance of increased phosphorus loads, particularly in the context of agencies that divert or pump Colorado River water downstream and convey it for subsequent use as drinking water.

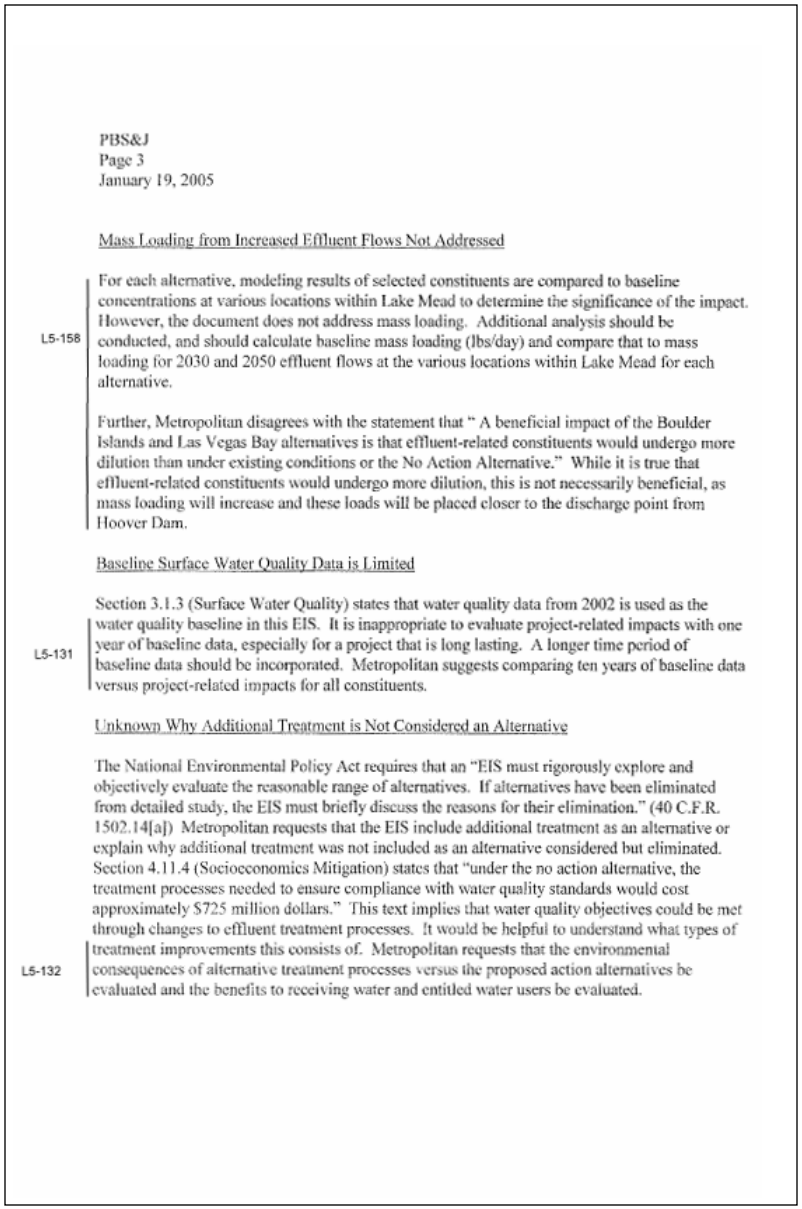
### L5-129

See General Response 8.

### L5-130

See General Response 8.

Water quality monitoring in Boulder Basin and just downstream of Hoover Dam would be conducted as part of the initial Boulder Basin AMP as described in Section 2.2.2.6.



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Mass Loading from Increased Effluent Flows Not Addressed

L5-158 For each alternative, modeling results of selected constituents are compared to baseline concentrations at various locations within Lake Mead to determine the significance of the impact. However, the document does not address mass loading. Additional analysis should be conducted, and should calculate baseline mass loading (lbs/day) and compare that to mass loading for 2030 and 2050 effluent flows at the various locations within Lake Mead for each alternative.

Further, Metropolitan disagrees with the statement that " A beneficial impact of the Boulder Islands and Las Vegas Bay alternatives is that effluent-related constituents would undergo more dilution than under existing conditions or the No Action Alternative." While it is true that effluent-related constituents would undergo more dilution, this is not necessarily beneficial, as mass loading will increase and these loads will be placed closer to the discharge point from Hoover Dam.

Baseline Surface Water Quality Data is Limited

L5-131 Section 3.1.3 (Surface Water Quality) states that water quality data from 2002 is used as the water quality baseline in this EIS. It is inappropriate to evaluate project-related impacts with one year of baseline data, especially for a project that is long lasting. A longer time period of baseline data should be incorporated. Metropolitan suggests comparing ten years of baseline data versus project-related impacts for all constituents.

Unknown Why Additional Treatment is Not Considered an Alternative

The National Environmental Policy Act requires that an "EIS must rigorously explore and objectively evaluate the reasonable range of alternatives. If alternatives have been eliminated from detailed study, the EIS must briefly discuss the reasons for their elimination." (40 C.F.R. 1502.14[a]) Metropolitan requests that the EIS include additional treatment as an alternative or explain why additional treatment was not included as an alternative considered but eliminated. Section 4.11.4 (Socioeconomics Mitigation) states that "under the no action alternative, the treatment processes needed to ensure compliance with water quality standards would cost approximately $725 million dollars." This text implies that water quality objectives could be met through changes to effluent treatment processes. It would be helpful to understand what types of

L5-132 treatment improvements this consists of. Metropolitan requests that the environmental consequences of alternative treatment processes versus the proposed action alternatives be evaluated and the benefits to receiving water and entitled water users be evaluated.

### L5-158

The description of the pipeline alternatives has been revised to indicate that under normal operating conditions, the TP discharged to Lake Mead would not exceed 334 lbs/day on an annual average basis. Therefore, there would be no impact to aquatic species below Hoover Dam. The revised alternatives are described in Chapter 2 of the SCOP Final EIS, and potential impacts are described throughout Chapter 4.

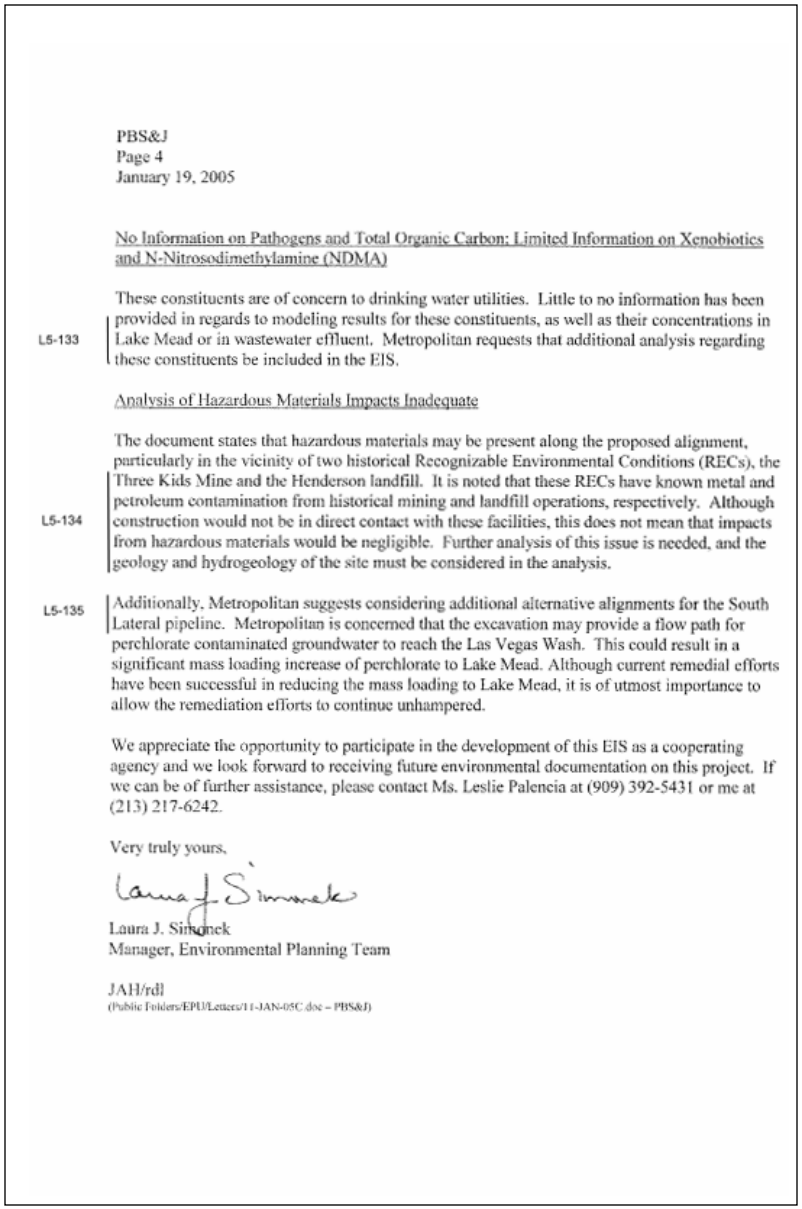
Table D.0-2 of the Draft EIS presents the mass loading at discharge and intake locations in Lake Mead.

### L5-131

See General Response 8.

### L5-132

See General Response 1.



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No Information on Pathogens and Total Organic Carbon; Limited Information on Xenobiotics and N-Nitrosodimethylamine (NDMA)

L5-133 These constituents are of concern to drinking water utilities. Little to no information has been provided in regards to modeling results for these constituents, as well as their concentrations in Lake Mead or in wastewater effluent. Metropolitan requests that additional analysis regarding these constituents be included in the EIS.

Analysis of Hazardous Materials Impacts Inadequate

L5-134 The document states that hazardous materials may be present along the proposed alignment, particularly in the vicinity of two historical Recognizable Environmental Conditions (RECs), the Three Kids Mine and the Henderson landfill. It is noted that these RECs have known metal and petroleum contamination from historical mining and landfill operations, respectively. Although construction would not be in direct contact with these facilities, this does not mean that impacts from hazardous materials would be negligible. Further analysis of this issue is needed, and the geology and hydrogeology of the site must be considered in the analysis.

L5-135 Additionally, Metropolitan suggests considering additional alternative alignments for the South Lateral pipeline. Metropolitan is concerned that the excavation may provide a flow path for perchlorate contaminated groundwater to reach the Las Vegas Wash. This could result in a significant mass loading increase of perchlorate to Lake Mead. Although current remedial efforts have been successful in reducing the mass loading to Lake Mead, it is of utmost importance to allow the remediation efforts to continue unhampered.

We appreciate the opportunity to participate in the development of this EIS as a cooperating agency and we look forward to receiving future environmental documentation on this project. If we can be of further assistance, please contact Ms. Leslie Palencia at (909) 392-5431 or me at (213) 217-6242.

Very truly yours,

Laura J. Simonek
Manager, Environmental Planning Team

JAH/rdl
(Public Folders/EPU/Letters/11-JAN-05C.doc – PBS&J)

### L5-133

See General Response 4.

Total organic carbon was not modeled as a part of the EIS. Since the preferred alternative is expected to result in less algae production in Boulder Basin, this would also result in a lesser amount of TOC generation.

### L5-134

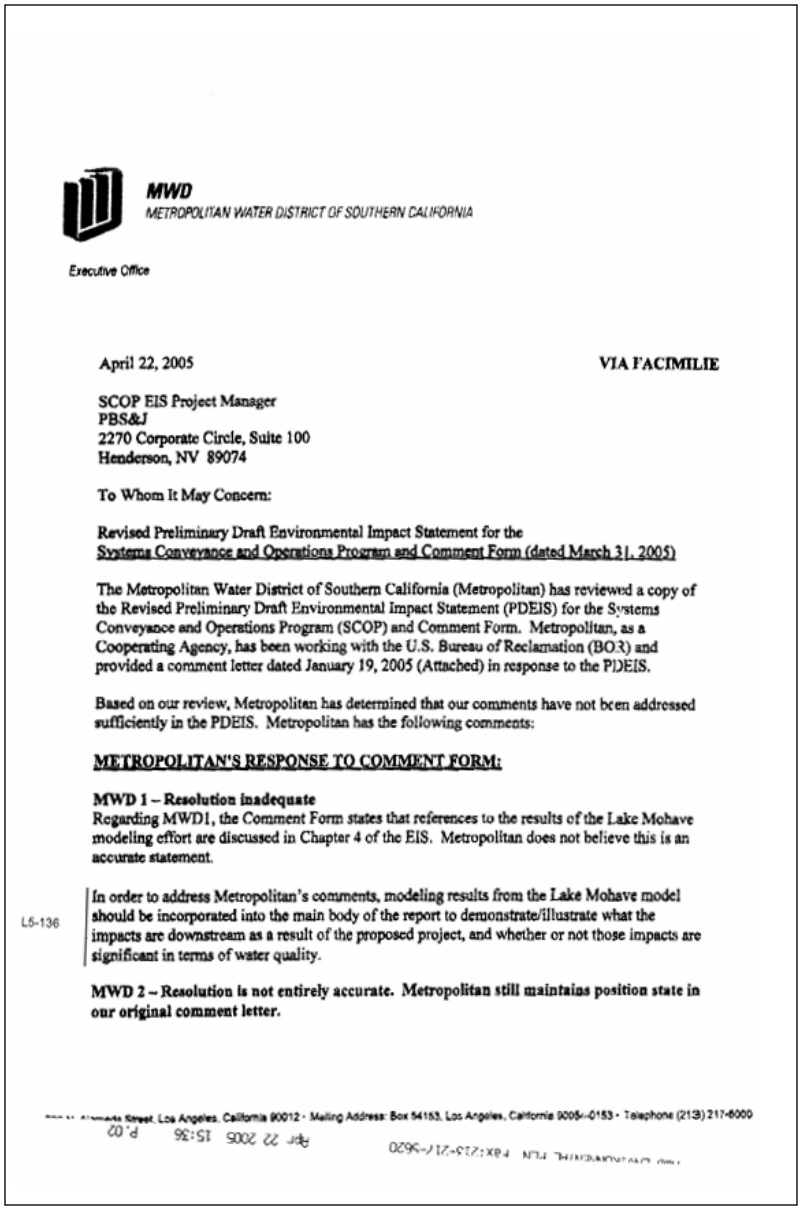
See response to comment F1-36.

Text has been added to Section 4.5.2.1 of the Final EIS.

### L5-135

This comment refers to an earlier version of the EIS (Preliminary Draft EIS). The text has been rewritten since the comment was submitted. The COH Forcemain, which is a segment of EI-Alignment A is an alternative to the South Lateral Pipeline.

Section 4.1.2.2.1 of the Draft EIS and Final EIS indicates that the construction of the pipeline may inadvertently form permeable pathways along which groundwater may flow. Mitigation for this impact is presented in Section 4.1.5.2 of the Draft EIS and Section 4.1.6.2 of the Final EIS. Mitigation requires that backfill material of suitable permeability be used to avoid creating groundwater pathways.



MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Executive Office

April 22, 2005 VIA FACIMILIE

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074

To Whom It May Concern:

Revised Preliminary Draft Environmental Impact Statement for the
Systems Conveyance and Operations Program and Comment Form (dated March 31, 2005)

The Metropolitan Water District of Southern California (Metropolitan) has reviewed a copy of the Revised Preliminary Draft Environmental Impact Statement (PDEIS) for the Systems Conveyance and Operations Program (SCOP) and Comment Form. Metropolitan, as a Cooperating Agency, has been working with the U.S. Bureau of Reclamation (BOR) and provided a comment letter dated January 19, 2005 (Attached) in response to the PDEIS.

Based on our review, Metropolitan has determined that our comments have not been addressed sufficiently in the PDEIS. Metropolitan has the following comments:

METROPOLITAN'S RESPONSE TO COMMENT FORM:

**MWD 1 – Resolution inadequate**
Regarding MWD1, the Comment Form states that references to the results of the Lake Mohave modeling effort are discussed in Chapter 4 of the EIS. Metropolitan does not believe this is an accurate statement.

L5-136 In order to address Metropolitan's comments, modeling results from the Lake Mohave model should be incorporated into the main body of the report to demonstrate/illustrate what the impacts are downstream as a result of the proposed project, and whether or not those impacts are significant in terms of water quality.

**MWD 2 – Resolution is not entirely accurate. Metropolitan still maintains position state in our original comment letter.**

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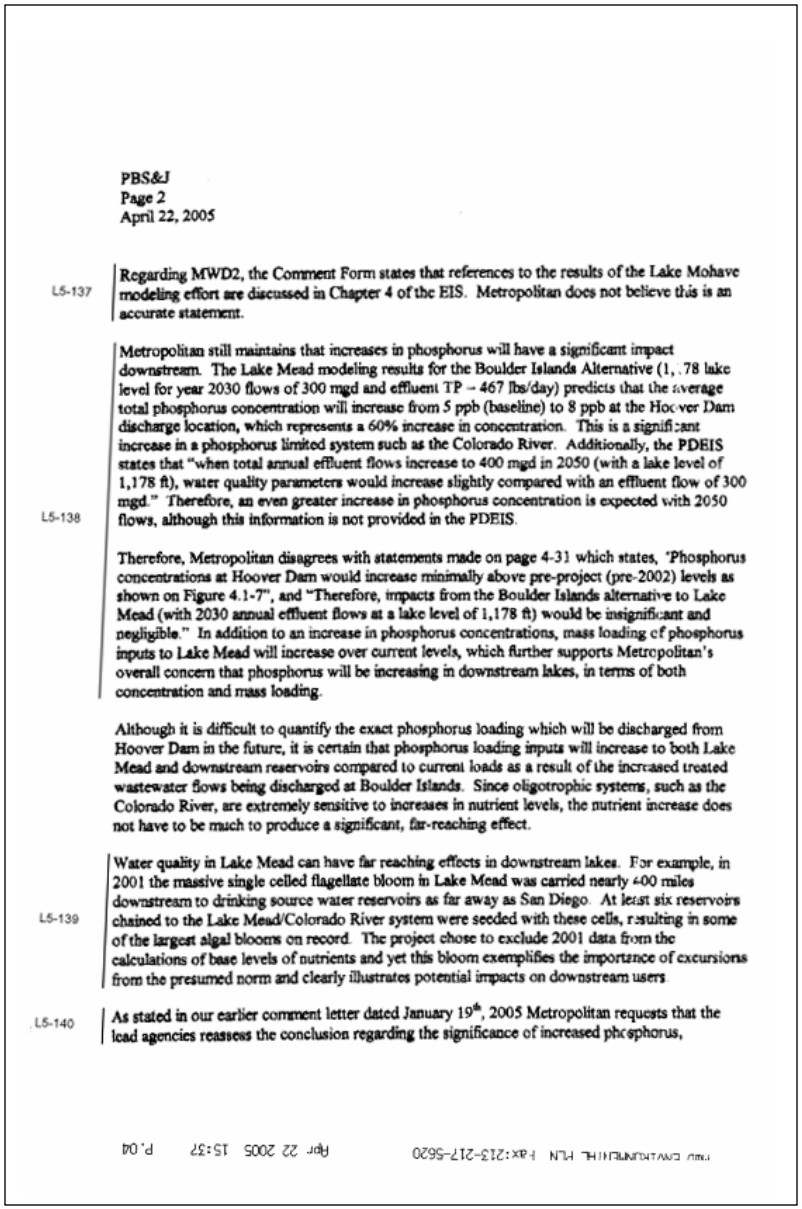
Apr 22 2005 15:36 P.02

FAX:213-217-5620

## L5-136

This comment refers to an earlier version of the EIS (Preliminary Draft EIS). The text has been rewritten since the comment was submitted. The Lake Mohave Report is described in Section 4.1 and Appendix D of the Draft and Final EIS.

The description of the pipeline alternatives has been revised to indicate that under normal operating conditions, the TP discharged to Lake Mead would not exceed 334 lbs/day on an annual average basis. Therefore, there would be no impact to aquatic species below Hoover Dam. The revised alternatives are described in Chapter 2 of the SCOP Final EIS, and potential impacts are described throughout Chapter 4.



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L5-137 Regarding MWD2, the Comment Form states that references to the results of the Lake Mohave modeling effort are discussed in Chapter 4 of the EIS. Metropolitan does not believe this is an accurate statement.

L5-138 Metropolitan still maintains that increases in phosphorus will have a significant impact downstream. The Lake Mead modeling results for the Boulder Islands Alternative (1, .78 lake level for year 2030 flows of 300 mgd and effluent TP → 467 lbs/day) predicts that the average total phosphorus concentration will increase from 5 ppb (baseline) to 8 ppb at the Hoover Dam discharge location, which represents a 60% increase in concentration. This is a significant increase in a phosphorus limited system such as the Colorado River. Additionally, the PDEIS states that "when total annual effluent flows increase to 400 mgd in 2050 (with a lake level of 1,178 ft), water quality parameters would increase slightly compared with an effluent flow of 300 mgd." Therefore, an even greater increase in phosphorus concentration is expected with 2050 flows, although this information is not provided in the PDEIS.

Therefore, Metropolitan disagrees with statements made on page 4-31 which states, "Phosphorus concentrations at Hoover Dam would increase minimally above pre-project (pre-2002) levels as shown on Figure 4.1-7", and "Therefore, impacts from the Boulder Islands alternative to Lake Mead (with 2030 annual effluent flows at a lake level of 1,178 ft) would be insignificant and negligible." In addition to an increase in phosphorus concentrations, mass loading of phosphorus inputs to Lake Mead will increase over current levels, which further supports Metropolitan's overall concern that phosphorus will be increasing in downstream lakes, in terms of both concentration and mass loading.

Although it is difficult to quantify the exact phosphorus loading which will be discharged from Hoover Dam in the future, it is certain that phosphorus loading inputs will increase to both Lake Mead and downstream reservoirs compared to current loads as a result of the increased treated wastewater flows being discharged at Boulder Islands. Since oligotrophic systems, such as the Colorado River, are extremely sensitive to increases in nutrient levels, the nutrient increase does not have to be much to produce a significant, far-reaching effect.

L5-139 Water quality in Lake Mead can have far reaching effects in downstream lakes. For example, in 2001 the massive single celled flagellate bloom in Lake Mead was carried nearly 400 miles downstream to drinking source water reservoirs as far away as San Diego. At least six reservoirs chained to the Lake Mead/Colorado River system were seeded with these cells, resulting in some of the largest algal blooms on record. The project chose to exclude 2001 data from the calculations of base levels of nutrients and yet this bloom exemplifies the importance of excursions from the presumed norm and clearly illustrates potential impacts on downstream users.

L5-140 As stated in our earlier comment letter dated January 19th, 2005 Metropolitan requests that the lead agencies reassess the conclusion regarding the significance of increased phosphorus,

Apr 22 2005 15:37 P.04 Fax:213-217-5620

### L5-137

This comment refers to an earlier version of the EIS (Preliminary Draft EIS). The text has been rewritten since the comment was submitted. The Lake Mohave Report is described in Section 4.1 and Appendix D of the Draft and Final EIS. In addition, potential impacts to downstream users and aquatic resources are described in Section 4.1, 4.2, and 4.12 of the Final EIS.

### L5-138

See General Response 8.

Water quality monitoring in Boulder Basin and just downstream of Hoover Dam would be conducted as part of the initial Boulder Basin AMP as described in Section 2.2.2.6.

See response to comment L5-34.

### L5-139

LaBounty and Burns (2005) largely attribute the 2001 algal bloom to an extended period of overflow from the Las Vegas Wash resulting in more nutrients in the epilimnion and photic zone. The modeling results indicate that there would be less nutrients in the photic zone with the Boulder Islands alternatives in place, since the majority of the effluent would be inserted below the photic zone. This is in contrast to both the present day situation and the No Action Alternative. Indeed, the modeling shows that the Boulder Islands alternatives would result in decreased algal growth, thereby reducing the chance of such blooms impacting downstream users.

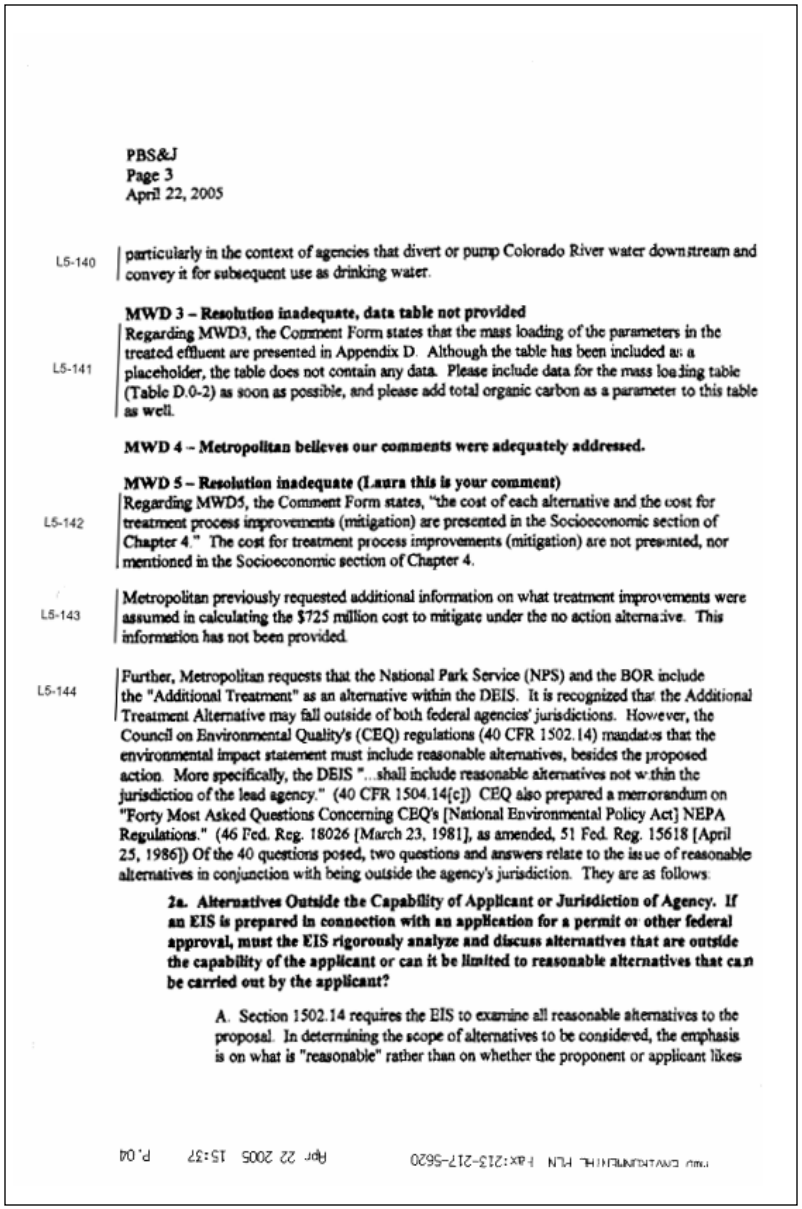
See response to comment L5-23 regarding the exclusion of 2001 data from the calculations of the baseline concentrations.

### L5-140

See General Response 8.

See General Response 10.

See response to comment L5-34.



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L5-140 particularly in the context of agencies that divert or pump Colorado River water downstream and convey it for subsequent use as drinking water.

**MWD 3 – Resolution inadequate, data table not provided**

L5-141 Regarding MWD3, the Comment Form states that the mass loading of the parameters in the treated effluent are presented in Appendix D. Although the table has been included as a placeholder, the table does not contain any data. Please include data for the mass loading table (Table D.0-2) as soon as possible, and please add total organic carbon as a parameter to this table as well.

**MWD 4 – Metropolitan believes our comments were adequately addressed.**

**MWD 5 – Resolution inadequate (Laura this is your comment)**

L5-142 Regarding MWD5, the Comment Form states, "the cost of each alternative and the cost for treatment process improvements (mitigation) are presented in the Socioeconomic section of Chapter 4." The cost for treatment process improvements (mitigation) are not presented, nor mentioned in the Socioeconomic section of Chapter 4.

L5-143 Metropolitan previously requested additional information on what treatment improvements were assumed in calculating the $725 million cost to mitigate under the no action alternative. This information has not been provided.

L5-144 Further, Metropolitan requests that the National Park Service (NPS) and the BOR include the "Additional Treatment" as an alternative within the DEIS. It is recognized that the Additional Treatment Alternative may fall outside of both federal agencies' jurisdictions. However, the Council on Environmental Quality's (CEQ) regulations (40 CFR 1502.14) mandates that the environmental impact statement must include reasonable alternatives, besides the proposed action. More specifically, the DEIS "...shall include reasonable alternatives not within the jurisdiction of the lead agency." (40 CFR 1504.14[c]) CEQ also prepared a memorandum on "Forty Most Asked Questions Concerning CEQ's [National Environmental Policy Act] NEPA Regulations." (46 Fed. Reg. 18026 [March 23, 1981], as amended, 51 Fed. Reg. 15618 [April 25, 1986]) Of the 40 questions posed, two questions and answers relate to the issue of reasonable alternatives in conjunction with being outside the agency's jurisdiction. They are as follows:

**2a. Alternatives Outside the Capability of Applicant or Jurisdiction of Agency. If an EIS is prepared in connection with an application for a permit or other federal approval, must the EIS rigorously analyze and discuss alternatives that are outside the capability of the applicant or can it be limited to reasonable alternatives that can be carried out by the applicant?**

A. Section 1502.14 requires the EIS to examine all reasonable alternatives to the proposal. In determining the scope of alternatives to be considered, the emphasis is on what is "reasonable" rather than on whether the proponent or applicant likes

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## L5-141

This comment refers to an earlier version of the EIS (Preliminary Draft EIS). The requested data was included prior to releasing the Draft EIS for public comment. Table D.0-2 of the Draft EIS contains mass loading data.

## L5-142

The cost of each alternative is described in Chapter 2 and Section 4.11 of the Final EIS.

## L5-143

This comment refers to an earlier version of the EIS (Preliminary Draft EIS). However, a Process Improvements Alternative has been added to the analyses presented in the SCOP Final EIS. This alternative is a variation of the previous No Action Alternative, and incorporates evaluations of treatment technologies previously considered. Cost information is provided in Chapter 2 of the Final EIS and the results of the socioeconomic impacts analyses are presented in Section 4.11 of the Final EIS.

## L5-144

See General Response 1.

or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.

**2b. Must the EIS analyze alternatives outside the jurisdiction or capability of the agency or beyond what Congress has authorized?**

A. An alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable. A potential conflict with local or federal law does not necessarily render an alternative unreasonable, although such conflicts must be considered. Section 1506.2(d). Alternatives that are outside the scope of what Congress has approved or funded must still be evaluated in the EIS if they are reasonable, because the EIS may serve as the basis for modifying the Congressional approval or funding in light of NEPA's goals and policies. Section 1500.1(a)

The BOR 2000 Public Review Draft of its NEPA Handbook, also quotes from the CEQ regulations on page 8-6 of what constitutes a reasonable range of alternatives, including those not within the jurisdiction of the lead agency. The same reference to including reasonable alternatives outside of this federal agency's jurisdiction can also be found in its earlier 1990 NEPA Handbook on page 4-3.

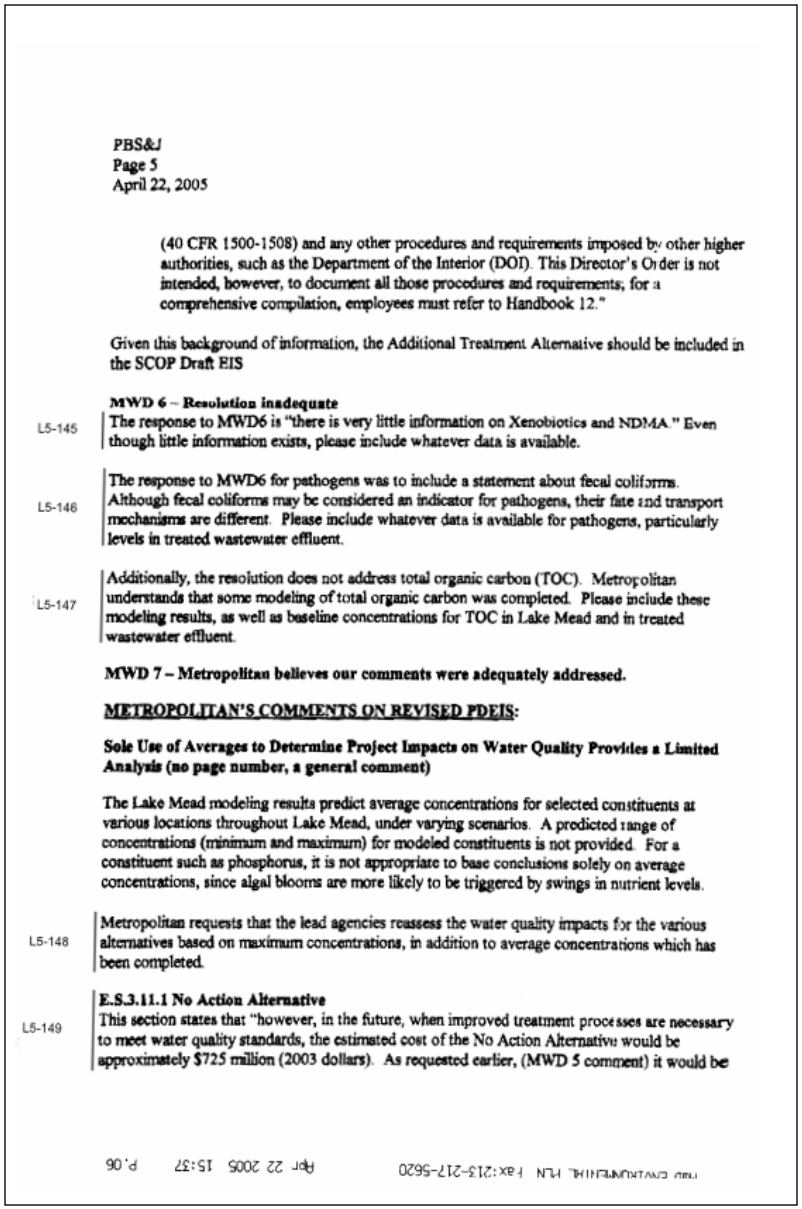
On page 8-9 of the BOR 2000 NEPA Handbook, it states: "The range should include alternatives based upon input from other agencies and the public." Continuing on that same page, the handbook directs the BOR staff as follows:

"Alternatives outside the agency's authority to implement should be considered. If such an alternative became the preferred alternative, implementation would depend on a change in authorization, a change of lead Federal agency to one with the appropriate authority, or a transfer of the project to a non-Federal entity. It could also lead to the cancellation of the project."

The NPS has its own NEPA implementation guidebook (i.e., Handbook 12). Although Metropolitan does not have access to that document, according to NPS' website, a recently sunset directive (Director's Order #12: Conservation Planning, Environmental Impact Analysis, and Decision-making) states the following:

"The purpose of this [NPS] Director's Order is to set forth the policy and procedures by which the NPS will comply with NEPA.

The Council on Environmental Quality (CEQ), part of the Executive Office of the President, is the "caretaker" of NEPA. The NPS will abide by all CEQ NEPA regulations



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(40 CFR 1500-1508) and any other procedures and requirements imposed by other higher authorities, such as the Department of the Interior (DOI). This Director's Order is not intended, however, to document all those procedures and requirements; for a comprehensive compilation, employees must refer to Handbook 12."

Given this background of information, the Additional Treatment Alternative should be included in the SCOP Draft EIS

**MWD 6 – Resolution inadequate**

L5-145 The response to MWD6 is "there is very little information on Xenobiotics and NDMA." Even though little information exists, please include whatever data is available.

L5-146 The response to MWD6 for pathogens was to include a statement about fecal coliforms. Although fecal coliforms may be considered an indicator for pathogens, their fate and transport mechanisms are different. Please include whatever data is available for pathogens, particularly levels in treated wastewater effluent.

L5-147 Additionally, the resolution does not address total organic carbon (TOC). Metropolitan understands that some modeling of total organic carbon was completed. Please include these modeling results, as well as baseline concentrations for TOC in Lake Mead and in treated wastewater effluent.

**MWD 7 – Metropolitan believes our comments were adequately addressed.**

**METROPOLITAN'S COMMENTS ON REVISED PDEIS:**

**Sole Use of Averages to Determine Project Impacts on Water Quality Provides a Limited Analysis (no page number, a general comment)**

The Lake Mead modeling results predict average concentrations for selected constituents at various locations throughout Lake Mead, under varying scenarios. A predicted range of concentrations (minimum and maximum) for modeled constituents is not provided. For a constituent such as phosphorus, it is not appropriate to base conclusions solely on average concentrations, since algal blooms are more likely to be triggered by swings in nutrient levels.

L5-148 Metropolitan requests that the lead agencies reassess the water quality impacts for the various alternatives based on maximum concentrations, in addition to average concentrations which has been completed.

**E.S.3.11.1 No Action Alternative**

L5-149 This section states that "however, in the future, when improved treatment processes are necessary to meet water quality standards, the estimated cost of the No Action Alternative would be approximately $725 million (2003 dollars). As requested earlier, (MWD 5 comment) it would be

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## L5-145

See General Response 4.

## L5-146

Pathogens are currently regulated through the use of indicator FC and E. coli bacteria. Because existing discharges are given exceptionally high levels of treatment, bacterial concentrations are well under those required by permits, and well under those levels established to protect water quality in Lake Mead and the Colorado River.

## L5-147

Data analysis indicates a direct correlation between algae production and TOC. The preferred alternative lowers algae production; therefore TOC would not increase as a result of implementation of the preferred alternative**.** However, TOC was not modeled. It was not simulated in Lake Mead because the model does not include a variable specifically for TOC and, thus, it cannot be modeled directly.

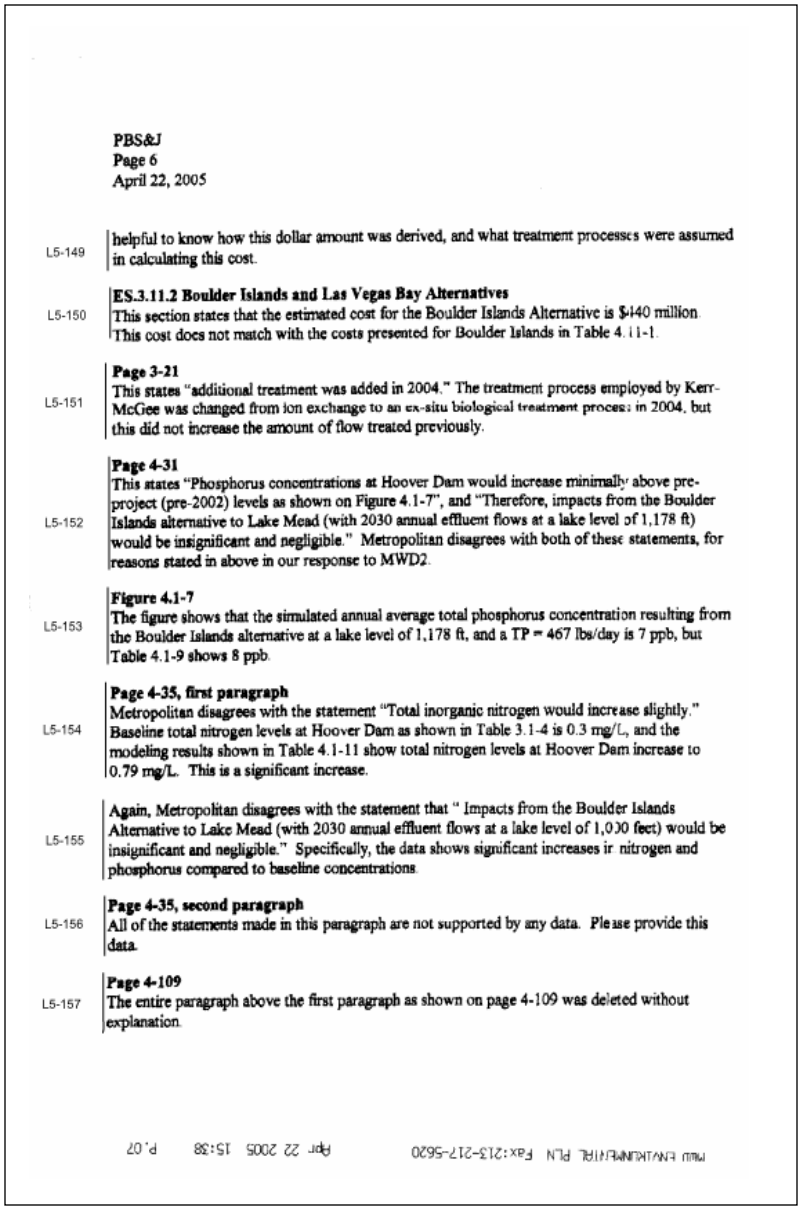
This information was added to Section 4.1.

## L5-148

See response to comment L5-10.

## L5-149

See response to comment L5-143.



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L5-149 helpful to know how this dollar amount was derived, and what treatment processes were assumed in calculating this cost.

L5-150 **ES.3.11.2 Boulder Islands and Las Vegas Bay Alternatives**
This section states that the estimated cost for the Boulder Islands Alternative is $140 million. This cost does not match with the costs presented for Boulder Islands in Table 4.11-1.

L5-151 **Page 3-21**
This states "additional treatment was added in 2004." The treatment process employed by Kerr-McGee was changed from ion exchange to an ex-situ biological treatment process in 2004, but this did not increase the amount of flow treated previously.

L5-152 **Page 4-31**
This states "Phosphorus concentrations at Hoover Dam would increase minimally above pre-project (pre-2002) levels as shown on Figure 4.1-7", and "Therefore, impacts from the Boulder Islands alternative to Lake Mead (with 2030 annual effluent flows at a lake level of 1,178 ft) would be insignificant and negligible." Metropolitan disagrees with both of these statements, for reasons stated in above in our response to MWD2.

L5-153 **Figure 4.1-7**
The figure shows that the simulated annual average total phosphorus concentration resulting from the Boulder Islands alternative at a lake level of 1,178 ft, and a TP = 467 lbs/day is 7 ppb, but Table 4.1-9 shows 8 ppb.

L5-154 **Page 4-35, first paragraph**
Metropolitan disagrees with the statement "Total inorganic nitrogen would increase slightly." Baseline total nitrogen levels at Hoover Dam as shown in Table 3.1-4 is 0.3 mg/L, and the modeling results shown in Table 4.1-11 show total nitrogen levels at Hoover Dam increase to 0.79 mg/L. This is a significant increase.

L5-155 Again, Metropolitan disagrees with the statement that " Impacts from the Boulder Islands Alternative to Lake Mead (with 2030 annual effluent flows at a lake level of 1,000 feet) would be insignificant and negligible." Specifically, the data shows significant increases in nitrogen and phosphorus compared to baseline concentrations.

L5-156 **Page 4-35, second paragraph**
All of the statements made in this paragraph are not supported by any data. Please provide this data.

L5-157 **Page 4-109**
The entire paragraph above the first paragraph as shown on page 4-109 was deleted without explanation.

MWD ENVIRONMENTAL PLN Fax:213-217-5620 Apr 22 2005 15:38 P.07

### L5-150

This comment refers to an earlier version of the EIS (Preliminary Draft EIS). The inconsistency was corrected prior to publication of the Draft EIS.

### L5-151

This comment refers to an earlier version of the EIS (Preliminary Draft EIS). The text has been rewritten since the comment was submitted.

### L5-152

See General Response 8.

See General Response 10.

### L5-153

This comment refers to an earlier version of the EIS (Preliminary Draft EIS). The text has been rewritten and the tables/figures have been revised since the comment was submitted.

### L5-154

See response to comment L5-153.

### L5-155

See response to comment L5-153.

### L5-156

This comment refers to an earlier version of the EIS (Preliminary Draft EIS). The text has been rewritten since the comment was submitted.

### L5-157

See response to comment L5-156. An explanation of every revision to a Preliminary Draft document is not required.

Metropolitan believes that there are various issues that still need to be addressed in the document. We, therefore, request that our comments be incorporated into the DEIS. We appreciate the opportunity to participate in the development of this EIS as a cooperating agency and we look forward to receiving future environmental documentation on this project. If we can be of further assistance, please contact Ms. Leslie Palencia at (909) 392-5431 or me at (213) 217-6242.

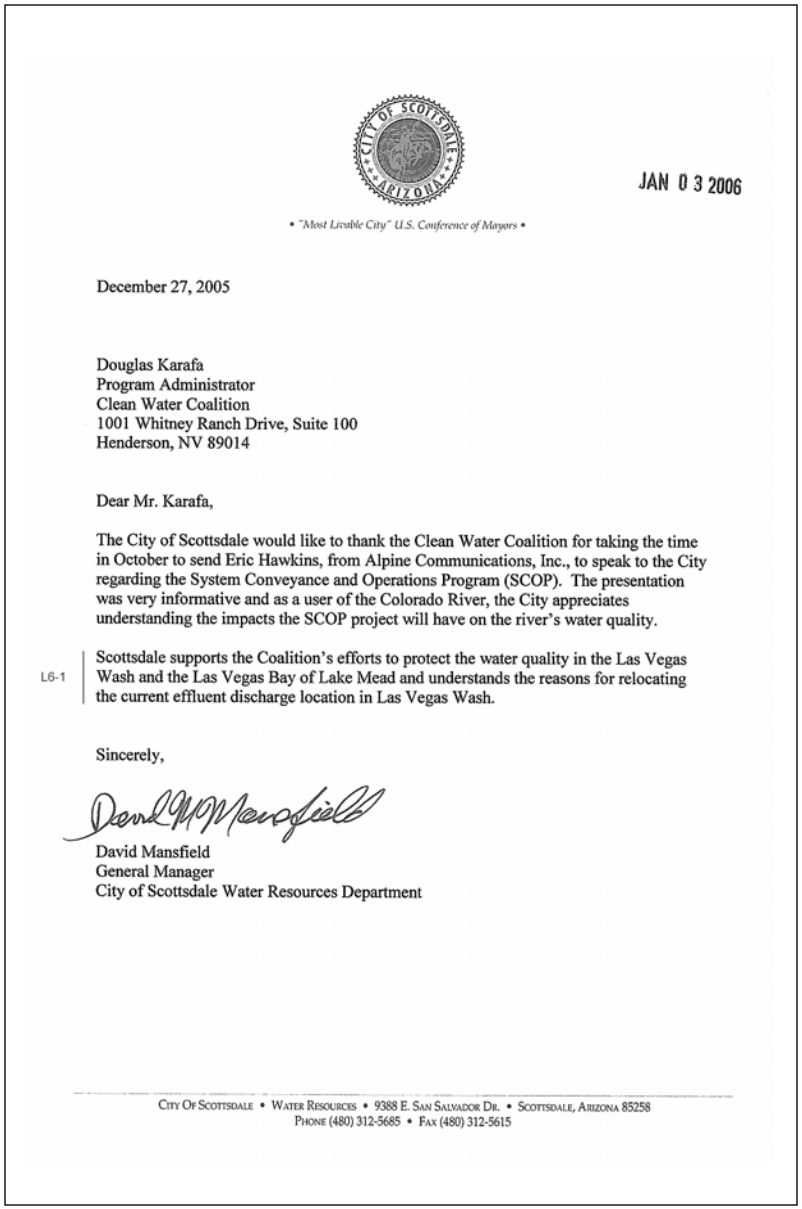
Very truly yours,

Laura J. Simonek

Laura J. Simonek
Manager, Environmental Planning Team

LJM/rdl
(Public Folders/EPU/Letters/21-APR-05A.doc - PBS&J)

MWD ENVIRONMENTAL PLN Fax:213-217-5620 Apr 22 2005 15:38 P.08



JAN 0 3 2006

• "Most Livable City" U.S. Conference of Mayors •

December 27, 2005

Douglas Karafa
Program Administrator
Clean Water Coalition
1001 Whitney Ranch Drive, Suite 100
Henderson, NV 89014

Dear Mr. Karafa,

The City of Scottsdale would like to thank the Clean Water Coalition for taking the time in October to send Eric Hawkins, from Alpine Communications, Inc., to speak to the City regarding the System Conveyance and Operations Program (SCOP). The presentation was very informative and as a user of the Colorado River, the City appreciates understanding the impacts the SCOP project will have on the river's water quality.

L6-1 Scottsdale supports the Coalition's efforts to protect the water quality in the Las Vegas Wash and the Las Vegas Bay of Lake Mead and understands the reasons for relocating the current effluent discharge location in Las Vegas Wash.

Sincerely,

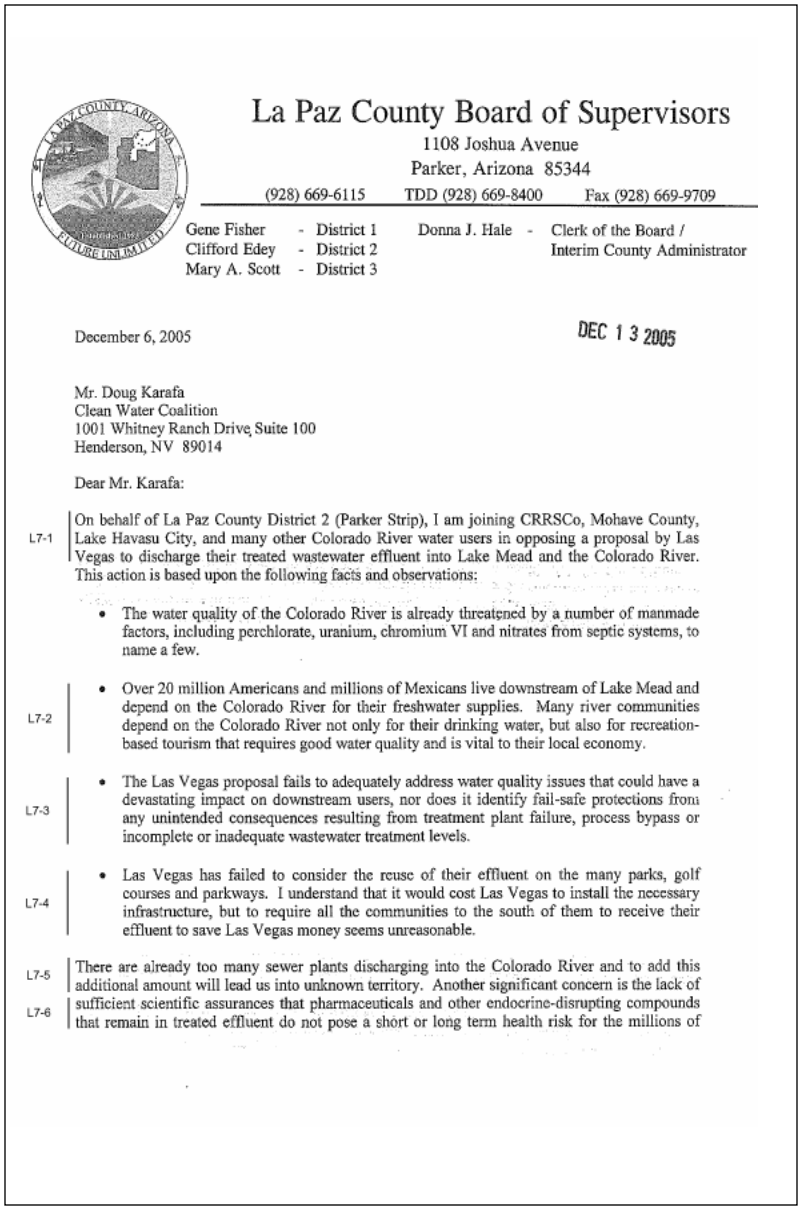
David Mansfield
General Manager
City of Scottsdale Water Resources Department

CITY OF SCOTTSDALE • WATER RESOURCES • 9388 E. SAN SALVADOR DR. • SCOTTSDALE, ARIZONA 85258
PHONE (480) 312-5685 • FAX (480) 312-5615

**Response L6** City of Scottsdale Water Resources Department

**L6-1**

Comment noted.



La Paz County Board of Supervisors
1108 Joshua Avenue
Parker, Arizona 85344
(928) 669-6115 TDD (928) 669-8400 Fax (928) 669-9709

Gene Fisher - District 1
Clifford Edey - District 2
Mary A. Scott - District 3

Donna J. Hale - Clerk of the Board / Interim County Administrator

December 6, 2005

DEC 1 3 2005

Mr. Doug Karafa
Clean Water Coalition
1001 Whitney Ranch Drive, Suite 100
Henderson, NV 89014

Dear Mr. Karafa:

L7-1 On behalf of La Paz County District 2 (Parker Strip), I am joining CRRSCo, Mohave County, Lake Havasu City, and many other Colorado River water users in opposing a proposal by Las Vegas to discharge their treated wastewater effluent into Lake Mead and the Colorado River. This action is based upon the following facts and observations:

- The water quality of the Colorado River is already threatened by a number of manmade factors, including perchlorate, uranium, chromium VI and nitrates from septic systems, to name a few.

L7-2
- Over 20 million Americans and millions of Mexicans live downstream of Lake Mead and depend on the Colorado River for their freshwater supplies. Many river communities depend on the Colorado River not only for their drinking water, but also for recreation-based tourism that requires good water quality and is vital to their local economy.

L7-3
- The Las Vegas proposal fails to adequately address water quality issues that could have a devastating impact on downstream users, nor does it identify fail-safe protections from any unintended consequences resulting from treatment plant failure, process bypass or incomplete or inadequate wastewater treatment levels.

L7-4
- Las Vegas has failed to consider the reuse of their effluent on the many parks, golf courses and parkways. I understand that it would cost Las Vegas to install the necessary infrastructure, but to require all the communities to the south of them to receive their effluent to save Las Vegas money seems unreasonable.

L7-5 There are already too many sewer plants discharging into the Colorado River and to add this additional amount will lead us into unknown territory. Another significant concern is the lack of
L7-6 sufficient scientific assurances that pharmaceuticals and other endocrine-disrupting compounds that remain in treated effluent do not pose a short or long term health risk for the millions of

## Response L7 La Paz County Board of Supervisors

### L7-1

See response to comment L1-1.

### L7-2

See response to comment L1-2.

### L7-3

See response to comment L1-3.

### L7-4

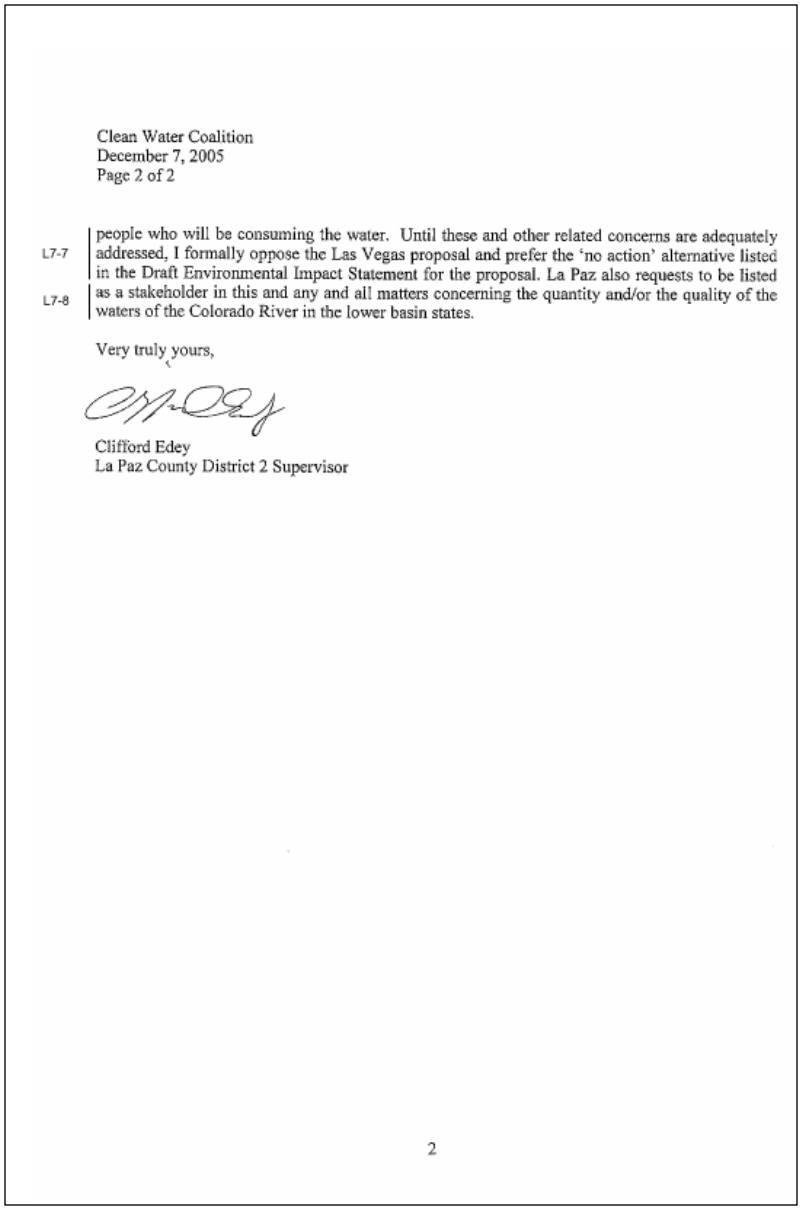
See response to comment L1-4.

### L7-5

See response to comment L1-5.

### L7-6

See response to comment L1-6.



Clean Water Coalition
December 7, 2005
Page 2 of 2

L7-7 | people who will be consuming the water. Until these and other related concerns are adequately addressed, I formally oppose the Las Vegas proposal and prefer the 'no action' alternative listed in the Draft Environmental Impact Statement for the proposal. La Paz also requests to be listed

L7-8 | as a stakeholder in this and any and all matters concerning the quantity and/or the quality of the waters of the Colorado River in the lower basin states.

Very truly yours,

Clifford Edey
La Paz County District 2 Supervisor

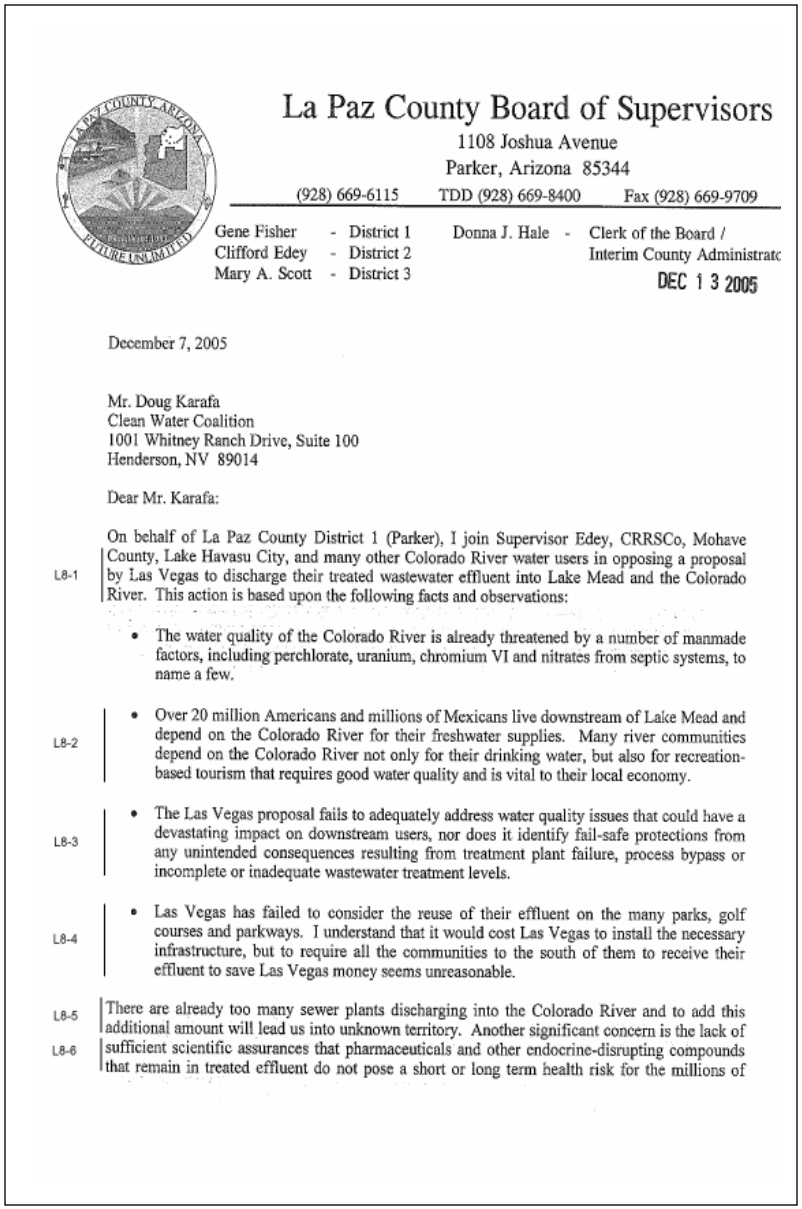
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**L7-7**

See response to comment L1-7.

**L7-8**

See response to comment L1-8.



La Paz County Board of Supervisors
1108 Joshua Avenue
Parker, Arizona 85344
(928) 669-6115 TDD (928) 669-8400 Fax (928) 669-9709

Gene Fisher - District 1
Clifford Edey - District 2
Mary A. Scott - District 3
Donna J. Hale - Clerk of the Board / Interim County Administrato

DEC 13 2005

December 7, 2005

Mr. Doug Karafa
Clean Water Coalition
1001 Whitney Ranch Drive, Suite 100
Henderson, NV 89014

Dear Mr. Karafa:

L8-1 On behalf of La Paz County District 1 (Parker), I join Supervisor Edey, CRRSCo, Mohave County, Lake Havasu City, and many other Colorado River water users in opposing a proposal by Las Vegas to discharge their treated wastewater effluent into Lake Mead and the Colorado River. This action is based upon the following facts and observations:

- The water quality of the Colorado River is already threatened by a number of manmade factors, including perchlorate, uranium, chromium VI and nitrates from septic systems, to name a few.

L8-2
- Over 20 million Americans and millions of Mexicans live downstream of Lake Mead and depend on the Colorado River for their freshwater supplies. Many river communities depend on the Colorado River not only for their drinking water, but also for recreation-based tourism that requires good water quality and is vital to their local economy.

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L8-4
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L8-5 There are already too many sewer plants discharging into the Colorado River and to add this additional amount will lead us into unknown territory. Another significant concern is the lack of
L8-6 sufficient scientific assurances that pharmaceuticals and other endocrine-disrupting compounds that remain in treated effluent do not pose a short or long term health risk for the millions of

## Response L8 La Paz County Board of Supervisors

### L8-1

See response to comment L1-1.

### L8-2

See response to comment L1-2.

### L8-3

See response to comment L1-3.

### L8-4

See response to comment L1-4.

### L8-5

See response to comment L1-5.

### L8-6

See response to comment L1-6.

Clean Water Coalition
December 7, 2005
Page 2 of 2

L8-7 people who will be consuming the water. Until these and other related concerns are adequately addressed, I formally oppose the Las Vegas proposal and prefer the 'no action' alternative listed in the Draft Environmental Impact Statement for the proposal. La Paz also requests to be listed
L8-8 as a stakeholder in this and any and all matters concerning the quantity and/or the quality of the waters of the Colorado River in the lower basin states.

Very truly yours,

Gene Fisher
La Paz County District 1 Supervisor/Chairman

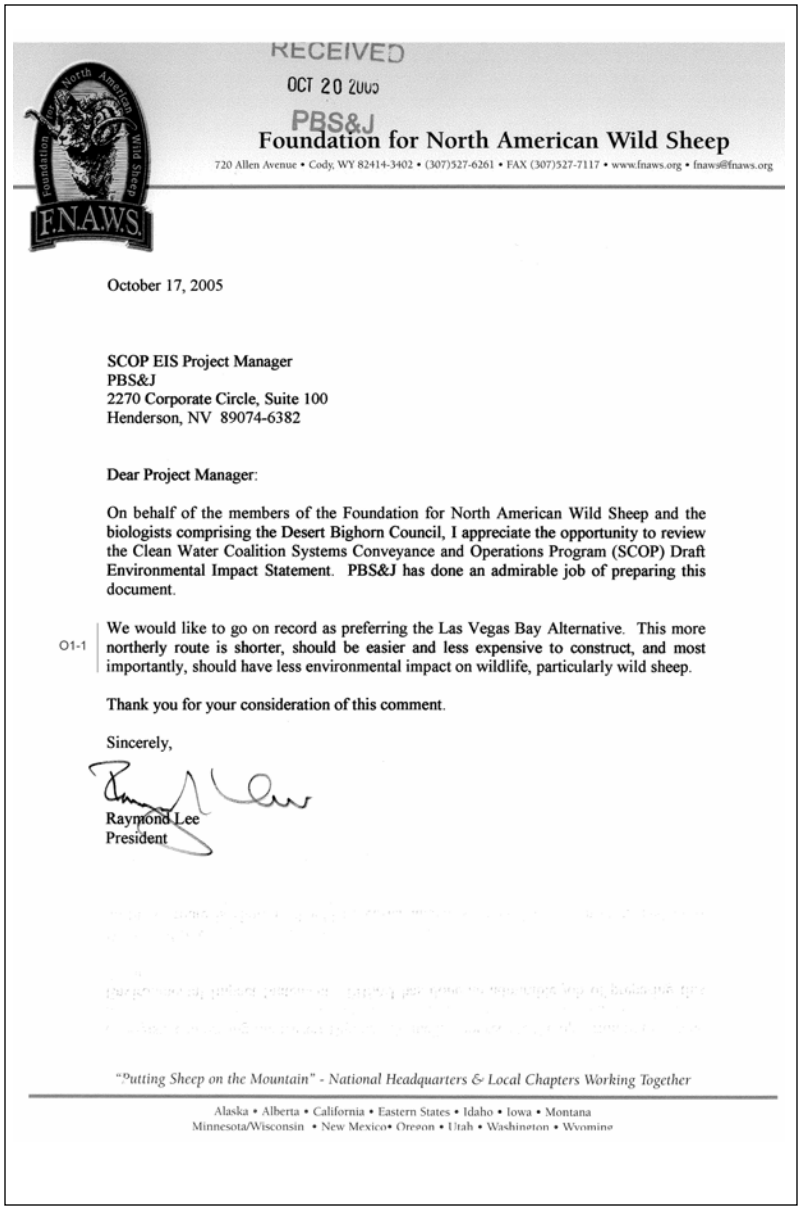
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**L8-7**

See response to comment L1-7.

**L8-8**

See response to comment L1-8.



RECEIVED
OCT 20 2005
PBS&J

Foundation for North American Wild Sheep
720 Allen Avenue • Cody, WY 82414-3402 • (307)527-6261 • FAX (307)527-7117 • www.fnaws.org • fnaws@fnaws.org

October 17, 2005

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074-6382

Dear Project Manager:

On behalf of the members of the Foundation for North American Wild Sheep and the biologists comprising the Desert Bighorn Council, I appreciate the opportunity to review the Clean Water Coalition Systems Conveyance and Operations Program (SCOP) Draft Environmental Impact Statement. PBS&J has done an admirable job of preparing this document.

O1-1 We would like to go on record as preferring the Las Vegas Bay Alternative. This more northerly route is shorter, should be easier and less expensive to construct, and most importantly, should have less environmental impact on wildlife, particularly wild sheep.

Thank you for your consideration of this comment.

Sincerely,

Raymond Lee
President

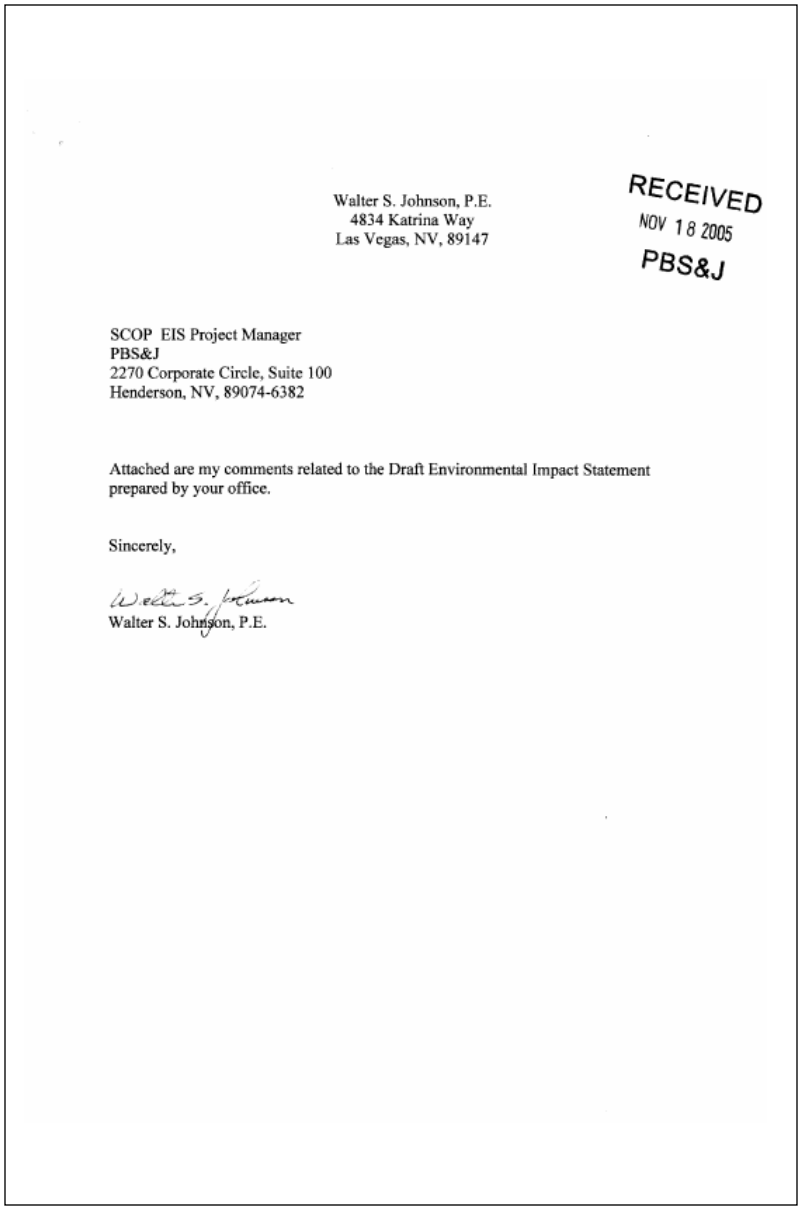
*"Putting Sheep on the Mountain" - National Headquarters & Local Chapters Working Together*

Alaska • Alberta • California • Eastern States • Idaho • Iowa • Montana
Minnesota/Wisconsin • New Mexico • Oregon • Utah • Washington • Wyoming

**Response O1** Foundation of North American Wild Sheep

**O1-1**

See response to comment S4-7.



Walter S. Johnson, P.E.
4834 Katrina Way
Las Vegas, NV, 89147

RECEIVED
NOV 18 2005
PBS&J

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV, 89074-6382

Attached are my comments related to the Draft Environmental Impact Statement prepared by your office.

Sincerely,

Walter S. Johnson

Walter S. Johnson, P.E.

**Response O2** Citizens Advisory Committee

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV, 89074-6382

17 November, 2005

I have reviewed this Draft Environmental Impact Statement, (DEIS), and, as a CWC Citizens Advisory Committee member who is greatly interested in the most appropriate management of water resources in Las Vegas Valley, I would like to submit the following comments. There is no question that a great amount of effort and resources were utilized in the preparation of this DEIS. Those that prepared this DEIS deserve high praise.

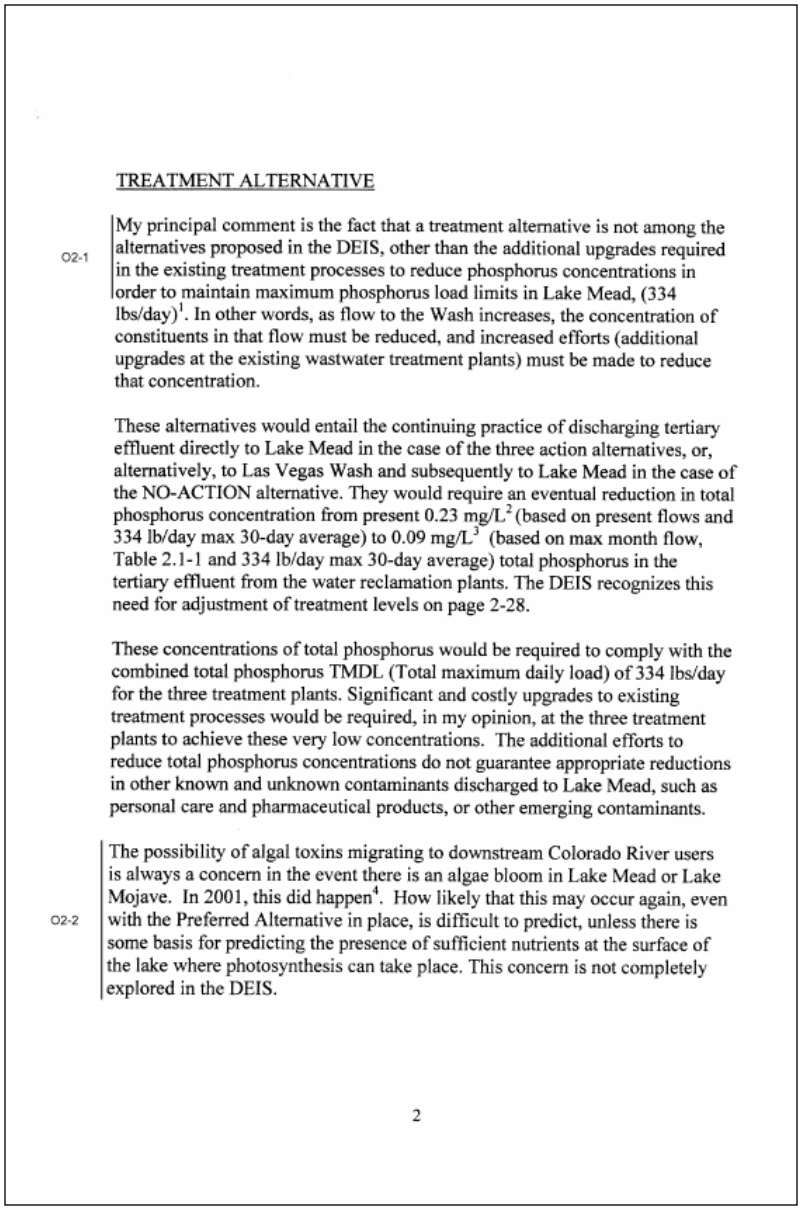
It may be of interest to the reader that my knowledge and background for these comments are based on the following:

1. 40 years experience in design, construction, and operation of wastewater and water systems,
2. Presently retired after 9 years with Clark County Water Reclamation District, responsible for all processes within the treatment plant,
3. Registered civil engineer in Nevada and California
4. Certified wastewater treatment plant operator, Gr. V,(highest level) in Nevada and California

OVERVIEW OF DRAFT ENVIRONMENTAL IMPACT STATEMENT

The DEIS provides a description of four alternatives proposed by the CWC and further discusses the impacts (advantages and disadvantages) of these four alternatives. One of the alternatives is a "NO ACTION ALTERNATIVE" and the other three are "ACTION ALTERNATIVES", namely, the construction and subsequent operation of pipelines, tunnels and diffusers at three different locations. All four alternatives would involve continuing the discharge of tertiary effluent ultimately to Lake Mead. The discharge of tertiary effluent to Lake Mead, quite obviously, required a study of mixing patterns in Lake Mead in order to address concerns of contaminants entering the intake structures for the potable water supply of Las Vegas Valley. A modelling of mixing regimes in Lake Mead was undertaken to address these concerns.

1



TREATMENT ALTERNATIVE

O2-1 My principal comment is the fact that a treatment alternative is not among the alternatives proposed in the DEIS, other than the additional upgrades required in the existing treatment processes to reduce phosphorus concentrations in order to maintain maximum phosphorus load limits in Lake Mead, (334 lbs/day)[1]. In other words, as flow to the Wash increases, the concentration of constituents in that flow must be reduced, and increased efforts (additional upgrades at the existing wastwater treatment plants) must be made to reduce that concentration.

These alternatives would entail the continuing practice of discharging tertiary effluent directly to Lake Mead in the case of the three action alternatives, or, alternatively, to Las Vegas Wash and subsequently to Lake Mead in the case of the NO-ACTION alternative. They would require an eventual reduction in total phosphorus concentration from present 0.23 mg/L[2] (based on present flows and 334 lb/day max 30-day average) to 0.09 mg/L[3] (based on max month flow, Table 2.1-1 and 334 lb/day max 30-day average) total phosphorus in the tertiary effluent from the water reclamation plants. The DEIS recognizes this need for adjustment of treatment levels on page 2-28.

These concentrations of total phosphorus would be required to comply with the combined total phosphorus TMDL (Total maximum daily load) of 334 lbs/day for the three treatment plants. Significant and costly upgrades to existing treatment processes would be required, in my opinion, at the three treatment plants to achieve these very low concentrations. The additional efforts to reduce total phosphorus concentrations do not guarantee appropriate reductions in other known and unknown contaminants discharged to Lake Mead, such as personal care and pharmaceutical products, or other emerging contaminants.

O2-2 The possibility of algal toxins migrating to downstream Colorado River users is always a concern in the event there is an algae bloom in Lake Mead or Lake Mojave. In 2001, this did happen[4]. How likely that this may occur again, even with the Preferred Alternative in place, is difficult to predict, unless there is some basis for predicting the presence of sufficient nutrients at the surface of the lake where photosynthesis can take place. This concern is not completely explored in the DEIS.

2

### O2-1

See General Response 1.

See General Response 8.

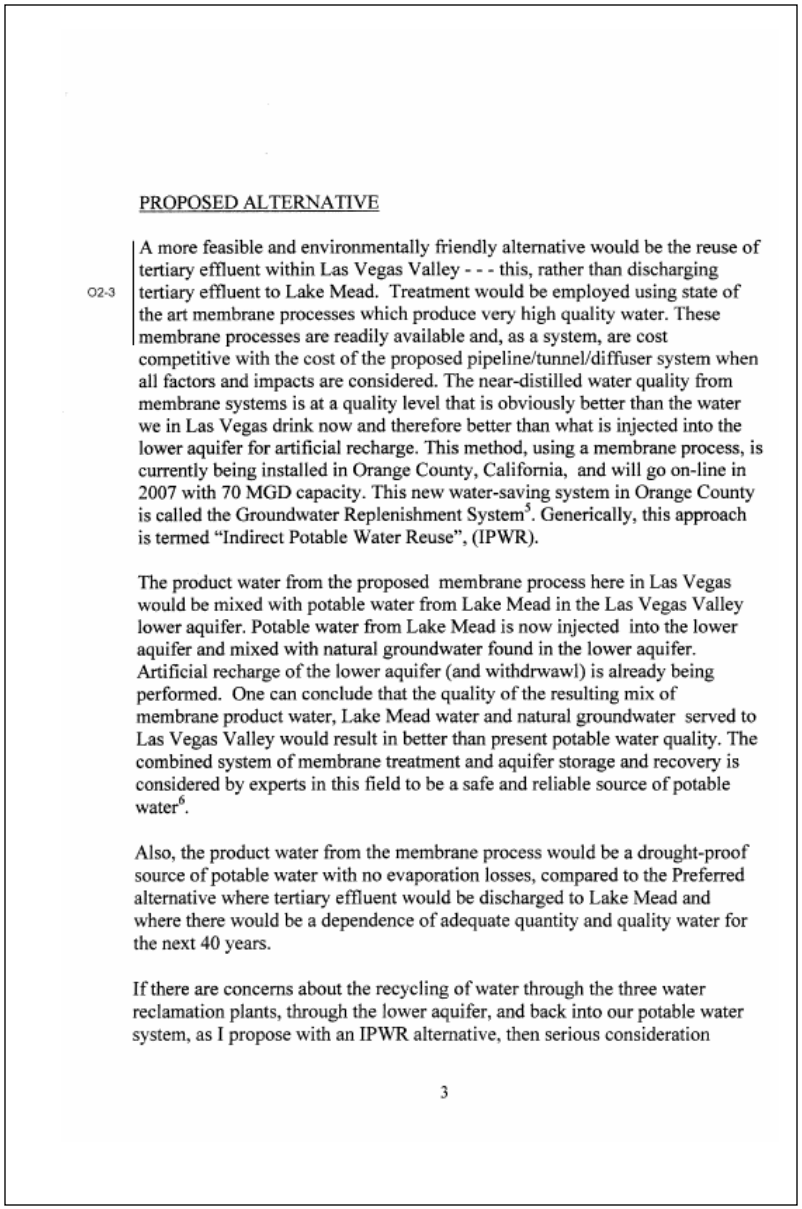
### O2-2

The ELCOM/CAEDYM modeling conducted as part of the EIS inserted the effluent from diffusers at the elevation of the thermocline. This was based upon preliminary EPA PLUMES computations that indicated the warm effluent would rise through the cooler hypolimnion. This modeling indicates that the preferred alternative would result in less algal production than the "No Action Alternative" (see, for example, Figures 4.1-3 and 4.1-5 in the Draft EIS), therefore the probability of algal toxins migrating downstream would be lower than if no action is taken.

Additionally, more refined simulations that directly coupled the EPA PLUMES algorithms into the ELCOM/CAEDYM model were performed. These simulations more accurately model the insertion elevation of the effluent, and the resulting concentrations of nutrients in the photic zone. These more refined simulations indicated deeper effluent insertion levels than the original modeling, and as such, lower nutrient concentrations in the photic zone and decreased algal growth. Thus, the more refined modeling indicates an even lower probability of algal toxins migrating downstream.

Algal blooms originating in Lake Mohave would only be impacted by the nutrients passing through Hoover Dam. This is addressed in Attachment 2 of Appendix D of the Final EIS. It illustrates the phosphorus loads through the dam for the Boulder Islands alternatives are predicted to be comparable to levels in the recent past and less than historical levels over an extended time period.

The titles of figures 4.1-3 and 4.1-5 of the Final EIS have been revised to include "Growing Season Average" for clarity.



PROPOSED ALTERNATIVE

O2-3 A more feasible and environmentally friendly alternative would be the reuse of tertiary effluent within Las Vegas Valley - - - this, rather than discharging tertiary effluent to Lake Mead. Treatment would be employed using state of the art membrane processes which produce very high quality water. These membrane processes are readily available and, as a system, are cost competitive with the cost of the proposed pipeline/tunnel/diffuser system when all factors and impacts are considered. The near-distilled water quality from membrane systems is at a quality level that is obviously better than the water we in Las Vegas drink now and therefore better than what is injected into the lower aquifer for artificial recharge. This method, using a membrane process, is currently being installed in Orange County, California, and will go on-line in 2007 with 70 MGD capacity. This new water-saving system in Orange County is called the Groundwater Replenishment System[5]. Generically, this approach is termed "Indirect Potable Water Reuse", (IPWR).

The product water from the proposed membrane process here in Las Vegas would be mixed with potable water from Lake Mead in the Las Vegas Valley lower aquifer. Potable water from Lake Mead is now injected into the lower aquifer and mixed with natural groundwater found in the lower aquifer. Artificial recharge of the lower aquifer (and withdrwawl) is already being performed. One can conclude that the quality of the resulting mix of membrane product water, Lake Mead water and natural groundwater served to Las Vegas Valley would result in better than present potable water quality. The combined system of membrane treatment and aquifer storage and recovery is considered by experts in this field to be a safe and reliable source of potable water[6].

Also, the product water from the membrane process would be a drought-proof source of potable water with no evaporation losses, compared to the Preferred alternative where tertiary effluent would be discharged to Lake Mead and where there would be a dependence of adequate quantity and quality water for the next 40 years.

If there are concerns about the recycling of water through the three water reclamation plants, through the lower aquifer, and back into our potable water system, as I propose with an IPWR alternative, then serious consideration

3

**O2-3**

See General Response 2.

See General Response 1.

should be given to halting the Groundwater Replenishment project in Orange County and in other locations that are using this method. The Groundwater Replenishment System in Orange County is designed with the very same purpose and same technology as proposed here. Public perception has been successfully addressed at Orange County with a very comprehensive public education program.

Similar systems can also be found in Scottsdale, Arizona, El Paso, Texas, West Basin MWD, (Los Angeles), and various other places in Florida and Texas. All are implementing potable water reuse with aquifer storage and withdrawal, (ASR).

This type of water reuse is becoming more feasible, especially in the southwest USA ,where arid conditions prevail and the demands for potable water start to outstrip supply due to increased populations in these locations.

COSTS

O2-4 Costs for the four alternatives are briefly mentioned in the DEIS on pages ES-16 and 2-81. Total estimated costs are given but there are no breakdowns of costs for the reader who would be interested in further details.

Cost for the Boulder Islands North alternative (the preferred alternative) has been compared to a cost that I have calculated for a water reuse alternative here in Las Vegas Valley. The total annual costs for both alternatives have been calculated and appear to be very close to each other when considering all the major factors and impacts on Las Vegas Valley and on downstream Colorado River water users. Present worth and capital recovery factors using 6% interest and 40 year life were used to arrive at total annual costs. Total annual costs are derived from a summation of annualized capital cost and annual O&M cost. Preceding the cost evaluation, a comprehensive water mass balance and salt (total dissolved solids) mass balance were performed for Las Vegas Valley and for Lake Mead. Details of these water and salt mass balances can be made available to anyone wishing to see them. Also, the cost breakdowns are available.

The following are the major considerations for the cost comparison between the reuse alternative and the Preferred Alternative:

4

**O2-4**

Additional cost information for each alternative has been added to Chapter 2 of the Final EIS.

1. Decrease in pumping and treating costs at AMS Water treatment plant due to decrease in demand for Lake Mead water, with reuse alternative. Pumping costs are significantly higher when lake levels are low.

2. Adjustment of capital costs for the membrane treatment system by applying present worth factors for delayed staged construction. Contrary to this, the Preferred Alternative must install ultimate size conduit and equipment initially with immediate total capital outlay.

3. With the reuse alternative, there is a decrease in user costs for Las Vegas Valley and Colorado River water users (Calif., Ariz., and Mexico) due to significant lower salinity damages to plumbing, appliances, industrial and agricultural uses. Data is based on reports from Dept. of Interior, Bureau of Reclamation Technology Center, Denver, Colorado. Also, data is based on CASS (Central Arizona Salinity Study) report.

4. Improvements in membrane technology with significant cost reductions in capital and O&M costs for newer membrane systems have been made in the past 5 to 10 years.

5. Recent implementation of energy recovery systems are now available for membrane systems that recover 12 to 14% of pumping energy.

6. Significantly lower pressure and higher flux rates are commonplace with low salinity feedwater to membranes such as possible with tertiary effluent from Las Vegas Valley treatment plants (1200 to 1400 mg/L).

7. Recent improvements in membrane manufacture have made it possible to extend membrane life from 4 year life to 7 year life.

8. Lower unit capital costs and unit O&M costs for installation of systems larger than 25 MGD capacity are possible due to economy of scale.

In addition to the items above which were used in the cost comparison, the following cost savings are also possible by implementing the reuse alternative. They are more difficult to justify and were not used in the cost comparison but are worthy of mention at this point.

5

These are based on money saved by delay of construction of the third intake structure in Lake Mead and on money saved by delay of construction of the Northern Counties imported water project. The following are calculations of these savings:

Third intake structure at $600 M. Use 6% interest and 4 year delay.

$$\$600\ M \times ((1.06)^4 - 1) = \$157\ M$$

Northern Imported Water Project at $2000 M. Use 6% and 3 years

$$\$2000\ M \times ((1.06)^3 - 1) = \$382\ M$$

Total $539 M

It appears that approximately $540 M (minimum) could be saved by delaying these projects with implementation of the reuse alternative. These savings were not included in the cost comparison outlined above that resulted in same cost for reuse alternative and the pipeline/tunnel/diffuser alternative.

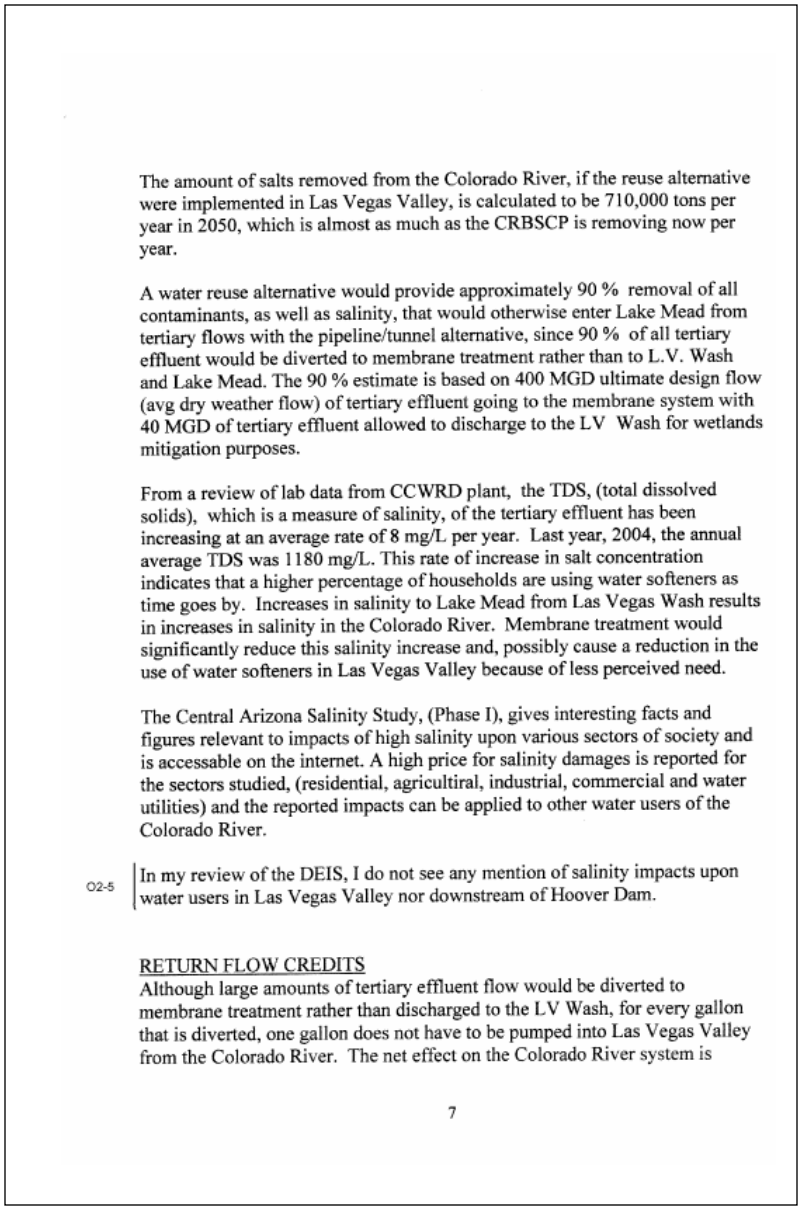
SALINITY CONSIDERATIONS

The relative salinity impacts, in reference to Item #3 above, were based on water mass balances of Las Vegas Valley and Lake Mead, and on salt mass balances of Las Vegas Valley and Lake Mead for various years. It can be shown that the salinity difference between the pipeline/tunnel/diffuser alternative and the water reuse (membrane) alternative below Hoover Dam is between 40 and 50 mg/L in the design year of 2050, depending on certain assumptions related to in and out flows at Lake Mead and TDS concentrations in my calculations.

The Colorado River Basin Salinity Control Program, (CRBSCP), studies performed by Dept. of Interior, Technical Center in Denver, Colorado with participation of Dept. of Agriculture and Bureau of Land Management, and accessed on the internet, show that:

1) The amount of salts removed from the Colorado River, with salinity removal projects applied mainly to farmlands, has been calculated to be 770,000 tons for the year 2000.
2) The damage due to salinity to downstream users ("coastal Southern California") amounts to $95M/year for every100 mg/L over 500 mg/l salinity in the Colorado River. This figure was used in the cost comparison. (Does not include Ariz., Mex., and inland Southern Calif.).

6



The amount of salts removed from the Colorado River, if the reuse alternative were implemented in Las Vegas Valley, is calculated to be 710,000 tons per year in 2050, which is almost as much as the CRBSCP is removing now per year.

A water reuse alternative would provide approximately 90 % removal of all contaminants, as well as salinity, that would otherwise enter Lake Mead from tertiary flows with the pipeline/tunnel alternative, since 90 % of all tertiary effluent would be diverted to membrane treatment rather than to L.V. Wash and Lake Mead. The 90 % estimate is based on 400 MGD ultimate design flow (avg dry weather flow) of tertiary effluent going to the membrane system with 40 MGD of tertiary effluent allowed to discharge to the LV Wash for wetlands mitigation purposes.

From a review of lab data from CCWRD plant, the TDS, (total dissolved solids), which is a measure of salinity, of the tertiary effluent has been increasing at an average rate of 8 mg/L per year. Last year, 2004, the annual average TDS was 1180 mg/L. This rate of increase in salt concentration indicates that a higher percentage of households are using water softeners as time goes by. Increases in salinity to Lake Mead from Las Vegas Wash results in increases in salinity in the Colorado River. Membrane treatment would significantly reduce this salinity increase and, possibly cause a reduction in the use of water softeners in Las Vegas Valley because of less perceived need.

The Central Arizona Salinity Study, (Phase I), gives interesting facts and figures relevant to impacts of high salinity upon various sectors of society and is accessable on the internet. A high price for salinity damages is reported for the sectors studied, (residential, agricultiral, industrial, commercial and water utilities) and the reported impacts can be applied to other water users of the Colorado River.

O2-5 In my review of the DEIS, I do not see any mention of salinity impacts upon water users in Las Vegas Valley nor downstream of Hoover Dam.

RETURN FLOW CREDITS

Although large amounts of tertiary effluent flow would be diverted to membrane treatment rather than discharged to the LV Wash, for every gallon that is diverted, one gallon does not have to be pumped into Las Vegas Valley from the Colorado River. The net effect on the Colorado River system is

7

**O2-5**

The Draft EIS presented modeling results that showed insignificant impacts of each of the Alternatives on the TDS concentrations within Lake Mead and the Hoover Dam outlet. Salinity is closely represented by TDS, so that it can be concluded that none of the alternatives would have significant impacts on salinity for water users in the Valley and downstream of Hoover Dam.

quantitatively zero. The net effect, qualitatively as explained above, is a significant benefit to Lake Mead and the river.

The loss of brine flow from the membrane system, using a three stage system, is 2 % of the feed to the membranes. If feedwater flow is 100 MGD, then, the brine flow is 2 MGD. For those that would be concerned about a loss of water out of the total system, consider that, with the tunnel alternative, a loss due to evaporation of tertiary effluent in Lake Mead and the river can be estimated to be approximately the same amount as the brine loss. Therefore, the net loss of water out of the total system is approximately zero. Admittedly, evaporation losses are not calculated in the return flow credit formula. However, this does not mean that evaporation losses do not occur.

DESTRATIFICATION IN LAKE MEAD

O2-6

It is my understanding that destratification in the winter does not completely happen in Lake Mead about 40 % of the time. From my perspective, this means that any contaminants discharged to the hypolimnion would continue to exist there during these times of extended stratification periods and possibly reach the water intake in Lake Mead until destratification occurs with consequent mixing and dilution. Information addressing this issue is not discussed in the DEIS.

SUMMARY

This DEIS discusses many aspects of the alternatives offered by the CWC. However, serious omission is made relevant to a separate treatment alternative and related impacts. An alternative that includes membrane treatment of tertiary effluent and subsequent recycling into the potable water system of Las Vegas Valley via aquifer storage and recovery, as discussed above, is not mentioned. It is a very viable alternative, in my opinion. I suspect that the possibility of using membrane treatment was initially explored but was discarded due to issues discussed above, such as, 1) cost, 2)brine disposal, 3) fear of public perception, and 4) possible decreased return flow credits. However, these issues have positive sides, as discussed above, and, balanced with the following facts, are outweighed in my opinion.

1) A major amount of contaminants that would be discharged to Lake Mead and downstream Colorado River with implementation of the

8

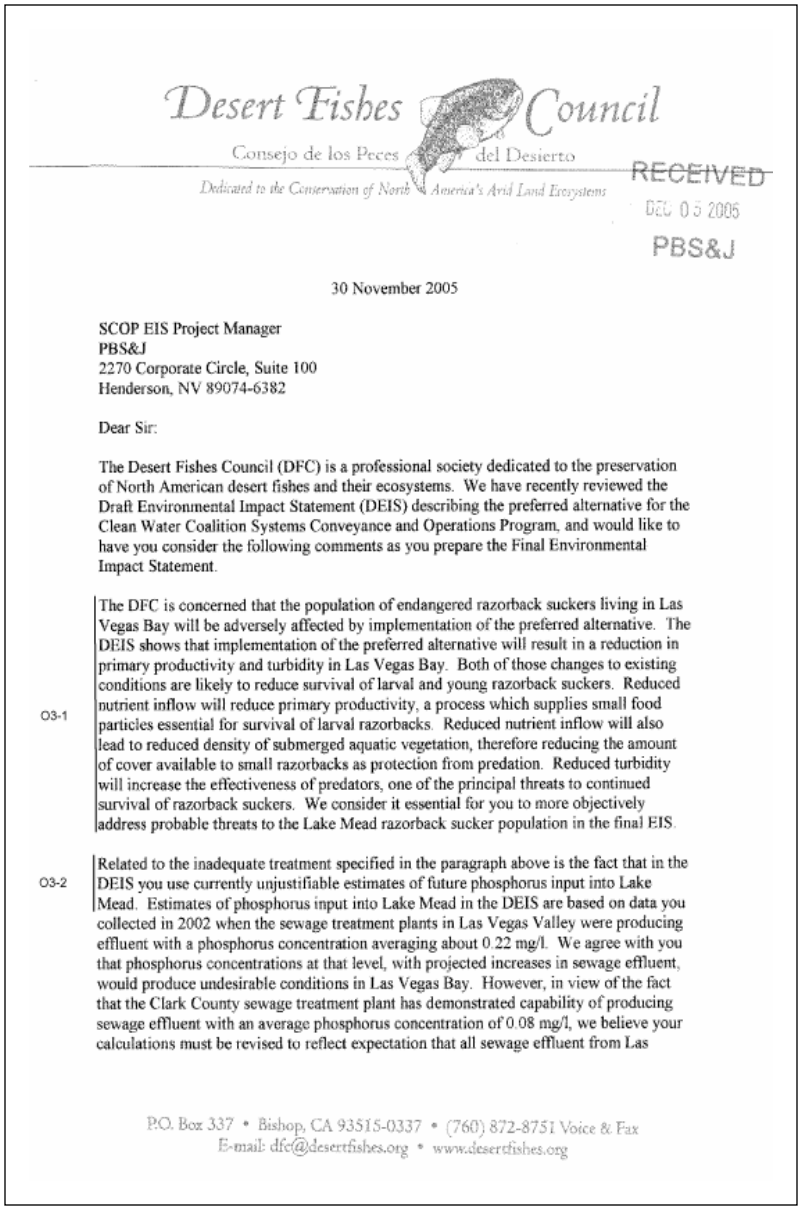
**O2-6**

See General Response 7.

pipeline/tunnel/diffuser alternative would be avoided with the membrane treatment alternative.

2) Possibilities of contamination of water entering the SNWA intake structures would be avoided with the membrane treatment alternative.
3) Contaminants, including high salinity levels and other contaminants not removed by the three existing water reclamation plants with their existing processes that would eventually migrate to downstream water users, would be avoided.
4) Membrane treatment would provide Las Vegas Valley with a safe, reliable, drought-proof source of potable water, as testified by other similar systems in the arid Southwest. An excellent example is the Orange County project.
5) The total overall annual cost of the membrane system alternative is estimated to be equal to or less than the pipeline/tunnel/diffuser alternative. Details of the economic comparison can be provided.
6) The availability of potable water to Las Vegas Valley would not decrease because the diversion of water to membrane treatment replaces the amount of water pumped from Lake Mead.
7) Although brine disposal is more difficult at inland locations, such as Las Vegas, compared to ocean-side locations, brine disposal can be handled by conventional evaporation pond technology but would require large land area for the scope of this project. However, the combination of large number of sunny days, high temperatures, and the fact that current research is underway investigating improved brine disposal systems, (WERF projects, 2005) including enhanced solar ponds, crystallization, solar gradient ponds, and other methods, will no doubt provide new technologies for more efficient inland brine disposal. Also, it is quite likely that UNLV could become a center for this subject.
8) Positive public perception must be gained to be successful for implementation of a potable water reuse system. This can be achieved through an aggressive public education program, similar to the successful program at Orange County.
9) Proponents of potable water reuse include:
    a. American Water Works Association
    b. Water Environment Federation
    c. Watereuse Association

9



Desert Fishes Council

Consejo de los Peces del Desierto

Dedicated to the Conservation of North America's Arid Land Ecosystems

RECEIVED
DEC 05 2005
PBS&J

30 November 2005

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074-6382

Dear Sir:

The Desert Fishes Council (DFC) is a professional society dedicated to the preservation of North American desert fishes and their ecosystems. We have recently reviewed the Draft Environmental Impact Statement (DEIS) describing the preferred alternative for the Clean Water Coalition Systems Conveyance and Operations Program, and would like to have you consider the following comments as you prepare the Final Environmental Impact Statement.

O3-1 The DFC is concerned that the population of endangered razorback suckers living in Las Vegas Bay will be adversely affected by implementation of the preferred alternative. The DEIS shows that implementation of the preferred alternative will result in a reduction in primary productivity and turbidity in Las Vegas Bay. Both of those changes to existing conditions are likely to reduce survival of larval and young razorback suckers. Reduced nutrient inflow will reduce primary productivity, a process which supplies small food particles essential for survival of larval razorbacks. Reduced nutrient inflow will also lead to reduced density of submerged aquatic vegetation, therefore reducing the amount of cover available to small razorbacks as protection from predation. Reduced turbidity will increase the effectiveness of predators, one of the principal threats to continued survival of razorback suckers. We consider it essential for you to more objectively address probable threats to the Lake Mead razorback sucker population in the final EIS.

O3-2 Related to the inadequate treatment specified in the paragraph above is the fact that in the DEIS you use currently unjustifiable estimates of future phosphorus input into Lake Mead. Estimates of phosphorus input into Lake Mead in the DEIS are based on data you collected in 2002 when the sewage treatment plants in Las Vegas Valley were producing effluent with a phosphorus concentration averaging about 0.22 mg/l. We agree with you that phosphorus concentrations at that level, with projected increases in sewage effluent, would produce undesirable conditions in Las Vegas Bay. However, in view of the fact that the Clark County sewage treatment plant has demonstrated capability of producing sewage effluent with an average phosphorus concentration of 0.08 mg/l, we believe your calculations must be revised to reflect expectation that all sewage effluent from Las

P.O. Box 337 • Bishop, CA 93515-0337 • (760) 872-8751 Voice & Fax
E-mail: dfc@desertfishes.org • www.desertfishes.org

## Response O3 Desert Fishes Council

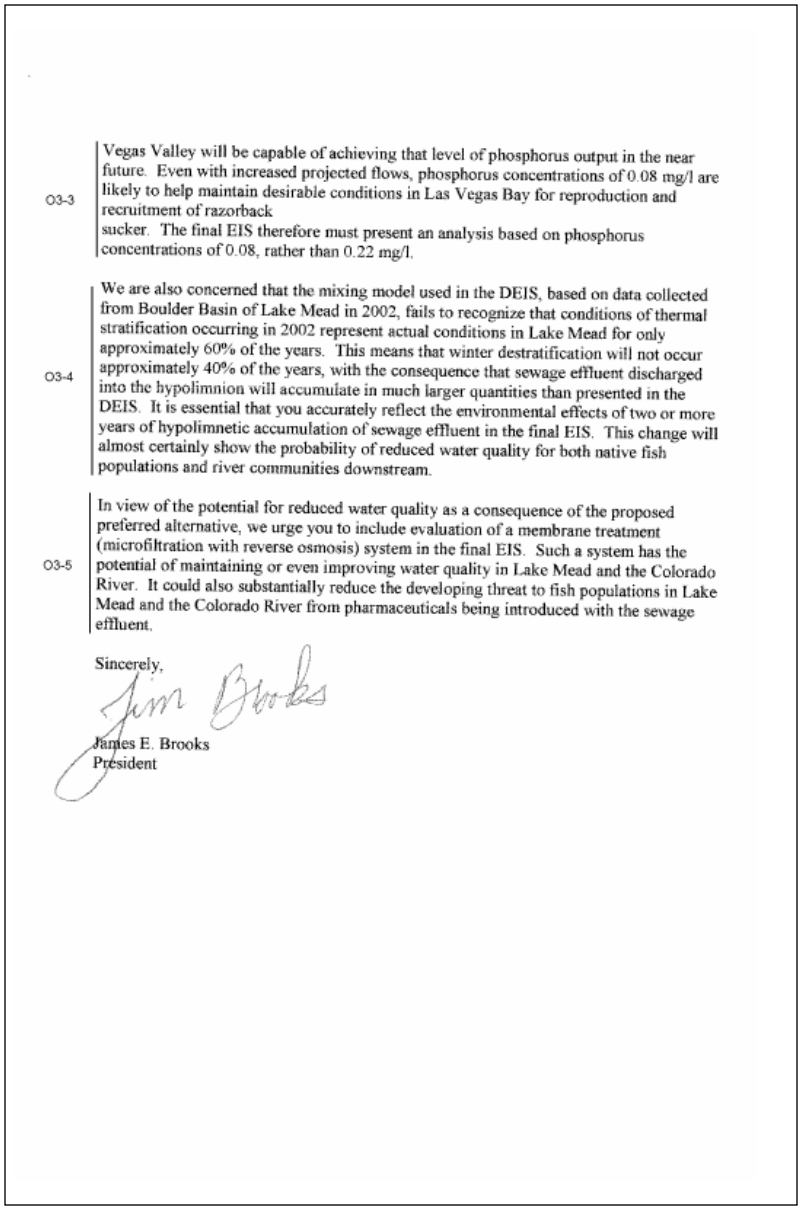
### O3-1

See General Response 9.

### O3-2

See response to comment F1-2.

See General Response 8.



O3-3 Vegas Valley will be capable of achieving that level of phosphorus output in the near future. Even with increased projected flows, phosphorus concentrations of 0.08 mg/l are likely to help maintain desirable conditions in Las Vegas Bay for reproduction and recruitment of razorback sucker. The final EIS therefore must present an analysis based on phosphorus concentrations of 0.08, rather than 0.22 mg/l.

O3-4 We are also concerned that the mixing model used in the DEIS, based on data collected from Boulder Basin of Lake Mead in 2002, fails to recognize that conditions of thermal stratification occurring in 2002 represent actual conditions in Lake Mead for only approximately 60% of the years. This means that winter destratification will not occur approximately 40% of the years, with the consequence that sewage effluent discharged into the hypolimnion will accumulate in much larger quantities than presented in the DEIS. It is essential that you accurately reflect the environmental effects of two or more years of hypolimnetic accumulation of sewage effluent in the final EIS. This change will almost certainly show the probability of reduced water quality for both native fish populations and river communities downstream.

O3-5 In view of the potential for reduced water quality as a consequence of the proposed preferred alternative, we urge you to include evaluation of a membrane treatment (microfiltration with reverse osmosis) system in the final EIS. Such a system has the potential of maintaining or even improving water quality in Lake Mead and the Colorado River. It could also substantially reduce the developing threat to fish populations in Lake Mead and the Colorado River from pharmaceuticals being introduced with the sewage effluent.

Sincerely,

Jim Brooks

James E. Brooks
President

**O3-3**

See response to comment O3-2.

See General Response 9.

**O3-4**

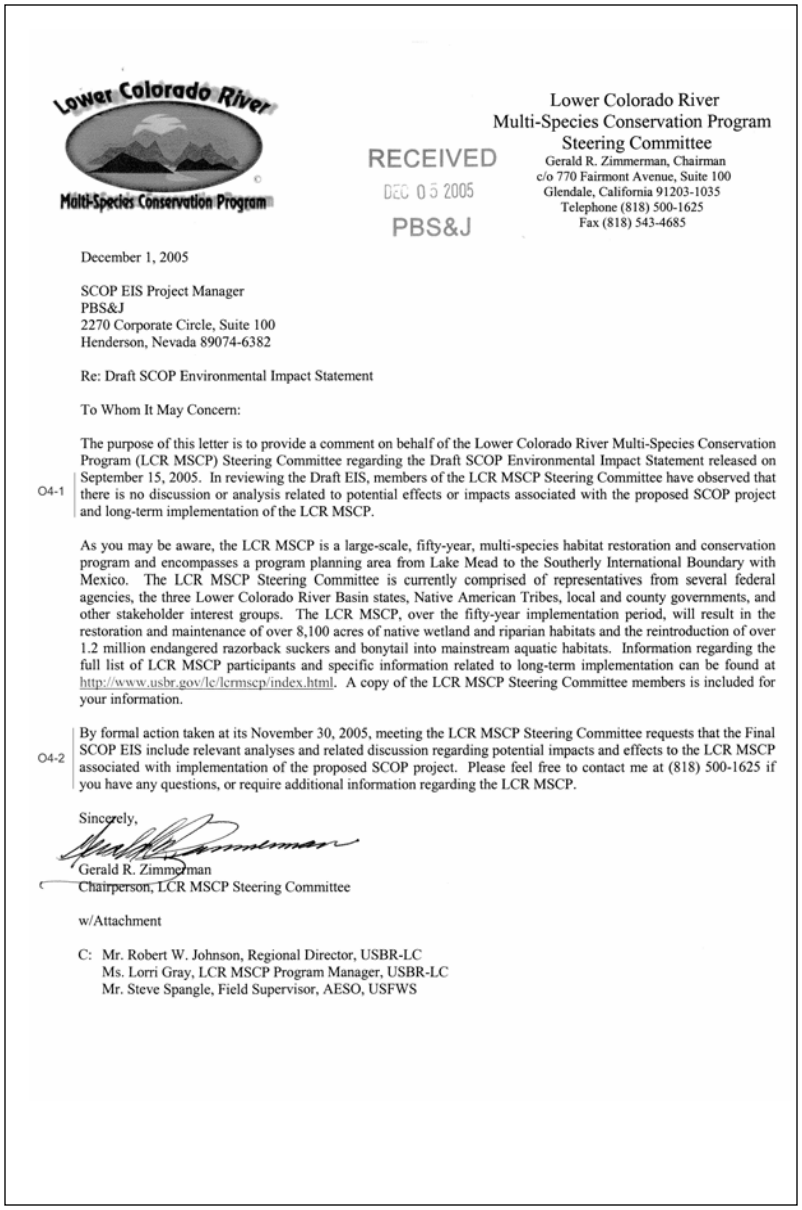
See General Response 7.

**O3-5**

See General Response 1.

See General Response 6.

The potential impacts to fish related to EDCs and PPCPs are described in Section 4.2.



Lower Colorado River
Multi-Species Conservation Program
Steering Committee
Gerald R. Zimmerman, Chairman
c/o 770 Fairmont Avenue, Suite 100
Glendale, California 91203-1035
Telephone (818) 500-1625
Fax (818) 543-4685

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December 1, 2005

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, Nevada 89074-6382

Re: Draft SCOP Environmental Impact Statement

To Whom It May Concern:

The purpose of this letter is to provide a comment on behalf of the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) Steering Committee regarding the Draft SCOP Environmental Impact Statement released on September 15, 2005. In reviewing the Draft EIS, members of the LCR MSCP Steering Committee have observed that O4-1 there is no discussion or analysis related to potential effects or impacts associated with the proposed SCOP project and long-term implementation of the LCR MSCP.

As you may be aware, the LCR MSCP is a large-scale, fifty-year, multi-species habitat restoration and conservation program and encompasses a program planning area from Lake Mead to the Southerly International Boundary with Mexico. The LCR MSCP Steering Committee is currently comprised of representatives from several federal agencies, the three Lower Colorado River Basin states, Native American Tribes, local and county governments, and other stakeholder interest groups. The LCR MSCP, over the fifty-year implementation period, will result in the restoration and maintenance of over 8,100 acres of native wetland and riparian habitats and the reintroduction of over 1.2 million endangered razorback suckers and bonytail into mainstream aquatic habitats. Information regarding the full list of LCR MSCP participants and specific information related to long-term implementation can be found at http://www.usbr.gov/lc/lcrmscp/index.html. A copy of the LCR MSCP Steering Committee members is included for your information.

By formal action taken at its November 30, 2005, meeting the LCR MSCP Steering Committee requests that the Final O4-2 SCOP EIS include relevant analyses and related discussion regarding potential impacts and effects to the LCR MSCP associated with implementation of the proposed SCOP project. Please feel free to contact me at (818) 500-1625 if you have any questions, or require additional information regarding the LCR MSCP.

Sincerely,

Gerald R. Zimmerman
Chairperson, LCR MSCP Steering Committee

w/Attachment

C: Mr. Robert W. Johnson, Regional Director, USBR-LC
Ms. Lorri Gray, LCR MSCP Program Manager, USBR-LC
Mr. Steve Spangle, Field Supervisor, AESO, USFWS

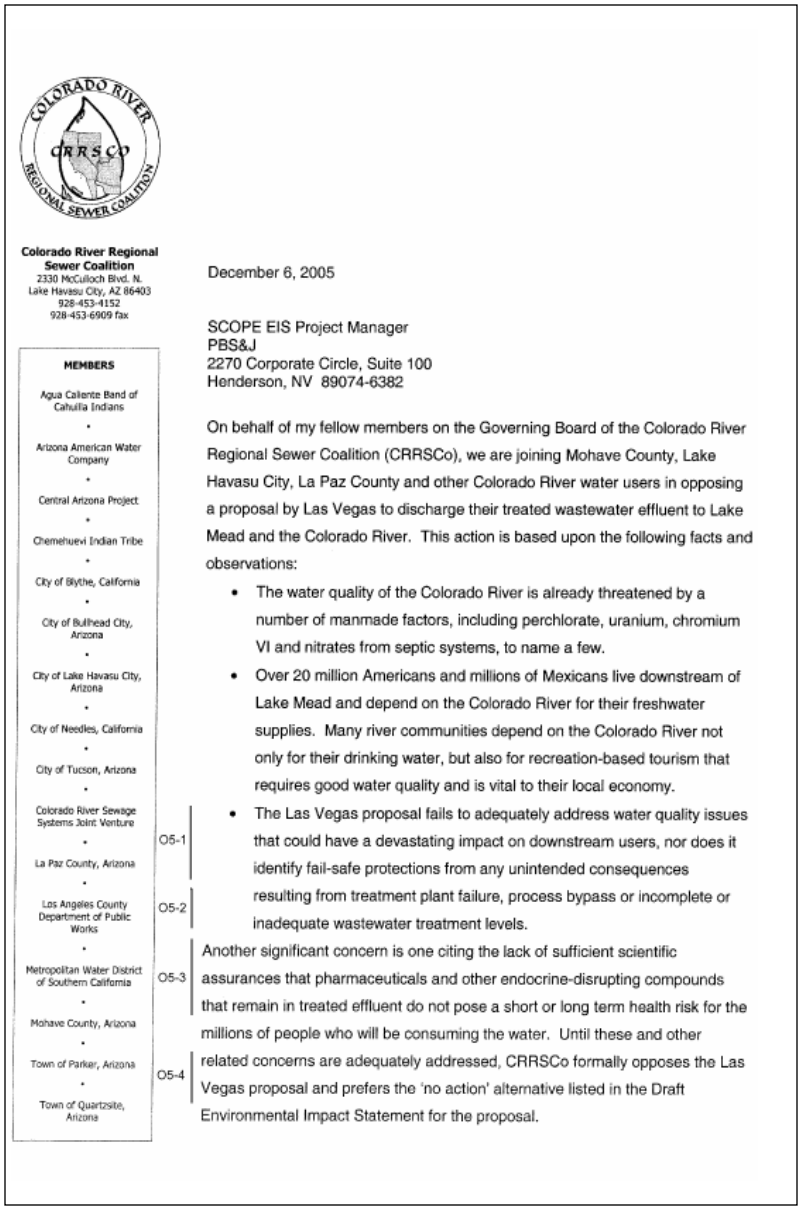
**Response O4** Lower Colorado River Multi-species Conservation Program

**O4-1**

See General Response 9.

**O4-2**

See General Response 9.



Colorado River Regional Sewer Coalition
2330 McCulloch Blvd. N.
Lake Havasu City, AZ 86403
928-453-4152
928-453-6909 fax

MEMBERS

Agua Caliente Band of Cahuilla Indians
•
Arizona American Water Company
•
Central Arizona Project
•
Chemehuevi Indian Tribe
•
City of Blythe, California
•
City of Bullhead City, Arizona
•
City of Lake Havasu City, Arizona
•
City of Needles, California
•
City of Tucson, Arizona
•
Colorado River Sewage Systems Joint Venture
•
La Paz County, Arizona
•
Los Angeles County Department of Public Works
•
Metropolitan Water District of Southern California
•
Mohave County, Arizona
•
Town of Parker, Arizona
•
Town of Quartzsite, Arizona

December 6, 2005

SCOPE EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074-6382

On behalf of my fellow members on the Governing Board of the Colorado River Regional Sewer Coalition (CRRSCo), we are joining Mohave County, Lake Havasu City, La Paz County and other Colorado River water users in opposing a proposal by Las Vegas to discharge their treated wastewater effluent to Lake Mead and the Colorado River. This action is based upon the following facts and observations:

- The water quality of the Colorado River is already threatened by a number of manmade factors, including perchlorate, uranium, chromium VI and nitrates from septic systems, to name a few.
- Over 20 million Americans and millions of Mexicans live downstream of Lake Mead and depend on the Colorado River for their freshwater supplies. Many river communities depend on the Colorado River not only for their drinking water, but also for recreation-based tourism that requires good water quality and is vital to their local economy.
- The Las Vegas proposal fails to adequately address water quality issues that could have a devastating impact on downstream users, nor does it identify fail-safe protections from any unintended consequences resulting from treatment plant failure, process bypass or incomplete or inadequate wastewater treatment levels. O5-1 O5-2

Another significant concern is one citing the lack of sufficient scientific assurances that pharmaceuticals and other endocrine-disrupting compounds that remain in treated effluent do not pose a short or long term health risk for the millions of people who will be consuming the water. Until these and other related concerns are adequately addressed, CRRSCo formally opposes the Las Vegas proposal and prefers the 'no action' alternative listed in the Draft Environmental Impact Statement for the proposal. O5-3 O5-4

## **Response O5** Colorado River Regional Sewer Coalition

### O5-1

Sections have been added to Section 4.1 of the Final EIS to clearly describe the potential water quality impacts to downstream users. The potential impacts to other resources downstream of Hoover Dam are described in the appropriate resouce sections of Chapter 4.

### O5-2

See response to comment E1-6.

### O5-3

See General Response 6.

There currently is little evidence to support the hypothesis that EDCs or PPCPs are causing adverse effects in humans at the levels encountered by the general population. Furthermore, treated wastewater effluent is diluted in the Lake, and water withdrawn from Lake Mead is subjected to drinking water treatment processes that can substantially remove many of these contaminants from finished drinking water. The text in Section 1.4 has been revised based on the results of the literature review presented in Appendix K.

### O5-4

See response to comment L1-5.

CRRSCo also requests to be listed as a stakeholder in this and any and all matters concerning the quantity and/or the quality of the waters of the Colorado River in the lower basin states.

Very truly yours,

CRRSCo Chair

Cc: Mr. Doug Karafa
Clean Water Coalition
1001 Whitney Ranch Drive, Ste. 100
Henderson, NV 89014

Terry Bracy
Bracy, Tucker, Brown & Valanzano

Representative Trish Groe

Representative Nancy McLain

Representative Ron Gould

Governor Napolitano

U.S. Senator Jon Kyl

U.S. Senator John McCain

U.S. Congressman Trent Franks

**RESOLUTION 05-02**
**A RESOLUTION OF THE BOARD OF DIRECTORS OF THE COLORADO RIVER REGIONAL SEWER COALITION FORMALLY OPPOSING THE DISCHARGE OF TREATED WASTEWATER INTO THE COLORADO RIVER**

WHEREAS: The Colorado River Regional Sewer Coalition (CRRSCo) was formed by elected officials and representatives of cities, towns, tribes and agencies representing the interests of over twenty million Americans who depend on the Colorado River for their freshwater needs; and,

WHEREAS: The quality of the waters of the Colorado River is currently endangered by the presence human-caused contaminants such as perchlorate, chromium VI, uranium and nitrates from septic systems; and,

WHEREAS: A proposal to discharge treated effluent produced in Las Vegas into Lake Mead and the Colorado River serves to exacerbate already serious threats to the water quality for downstream users; and,

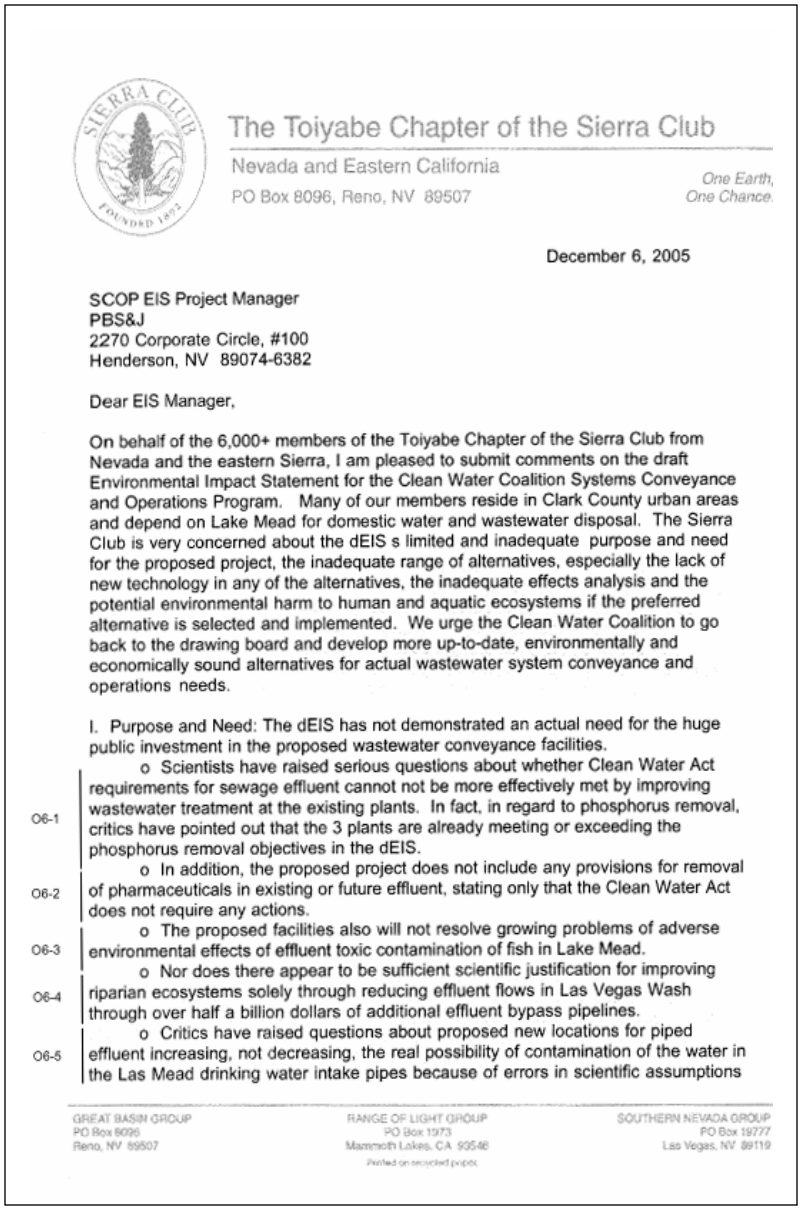
WHEREAS: The Las Vegas proposal fails to adequately study, address, or identify fail-safe measures regarding protecting downstream users from any accidental and/or unintentional contamination resulting from the proposed discharge of treated wastewater into Lake Mead and the Colorado River.

NOW, THEREFORE BE IT RESOLVED: that the Board of Directors of the Colorado River Regional Sewer Coalition formally opposes the Las Vegas proposal -and any other proposal- intended to authorized the discharge of wastewater effluent into the Colorado River without the written consent of downstream water users.

ATTEST:

_____ _____

Clifford Edey, Chairman Harvey Jackson, Vice-Chairman



The Toiyabe Chapter of the Sierra Club
Nevada and Eastern California
PO Box 8096, Reno, NV 89507
*One Earth, One Chance.*

December 6, 2005

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, #100
Henderson, NV 89074-6382

Dear EIS Manager,

On behalf of the 6,000+ members of the Toiyabe Chapter of the Sierra Club from Nevada and the eastern Sierra, I am pleased to submit comments on the draft Environmental Impact Statement for the Clean Water Coalition Systems Conveyance and Operations Program. Many of our members reside in Clark County urban areas and depend on Lake Mead for domestic water and wastewater disposal. The Sierra Club is very concerned about the dEIS s limited and inadequate purpose and need for the proposed project, the inadequate range of alternatives, especially the lack of new technology in any of the alternatives, the inadequate effects analysis and the potential environmental harm to human and aquatic ecosystems if the preferred alternative is selected and implemented. We urge the Clean Water Coalition to go back to the drawing board and develop more up-to-date, environmentally and economically sound alternatives for actual wastewater system conveyance and operations needs.

I. Purpose and Need: The dEIS has not demonstrated an actual need for the huge public investment in the proposed wastewater conveyance facilities.

O6-1 o Scientists have raised serious questions about whether Clean Water Act requirements for sewage effluent cannot not be more effectively met by improving wastewater treatment at the existing plants. In fact, in regard to phosphorus removal, critics have pointed out that the 3 plants are already meeting or exceeding the phosphorus removal objectives in the dEIS.

O6-2 o In addition, the proposed project does not include any provisions for removal of pharmaceuticals in existing or future effluent, stating only that the Clean Water Act does not require any actions.

O6-3 o The proposed facilities also will not resolve growing problems of adverse environmental effects of effluent toxic contamination of fish in Lake Mead.

O6-4 o Nor does there appear to be sufficient scientific justification for improving riparian ecosystems solely through reducing effluent flows in Las Vegas Wash through over half a billion dollars of additional effluent bypass pipelines.

O6-5 o Critics have raised questions about proposed new locations for piped effluent increasing, not decreasing, the real possibility of contamination of the water in the Las Mead drinking water intake pipes because of errors in scientific assumptions

GREAT BASIN GROUP
PO Box 8096
Reno, NV 89507

RANGE OF LIGHT GROUP
PO Box 1973
Mammoth Lakes, CA 93546

SOUTHERN NEVADA GROUP
PO Box 19777
Las Vegas, NV 89119

Printed on recycled paper.

## **Response O6** Sierra Club (Toiyabe Chapter)

### O6-1

Comment noted.

### O6-2

See General Response 6.

The text in Section 1.4 has been revised based on the results of the literature review presented in Appendix K.

### O6-3

See General Response 6.

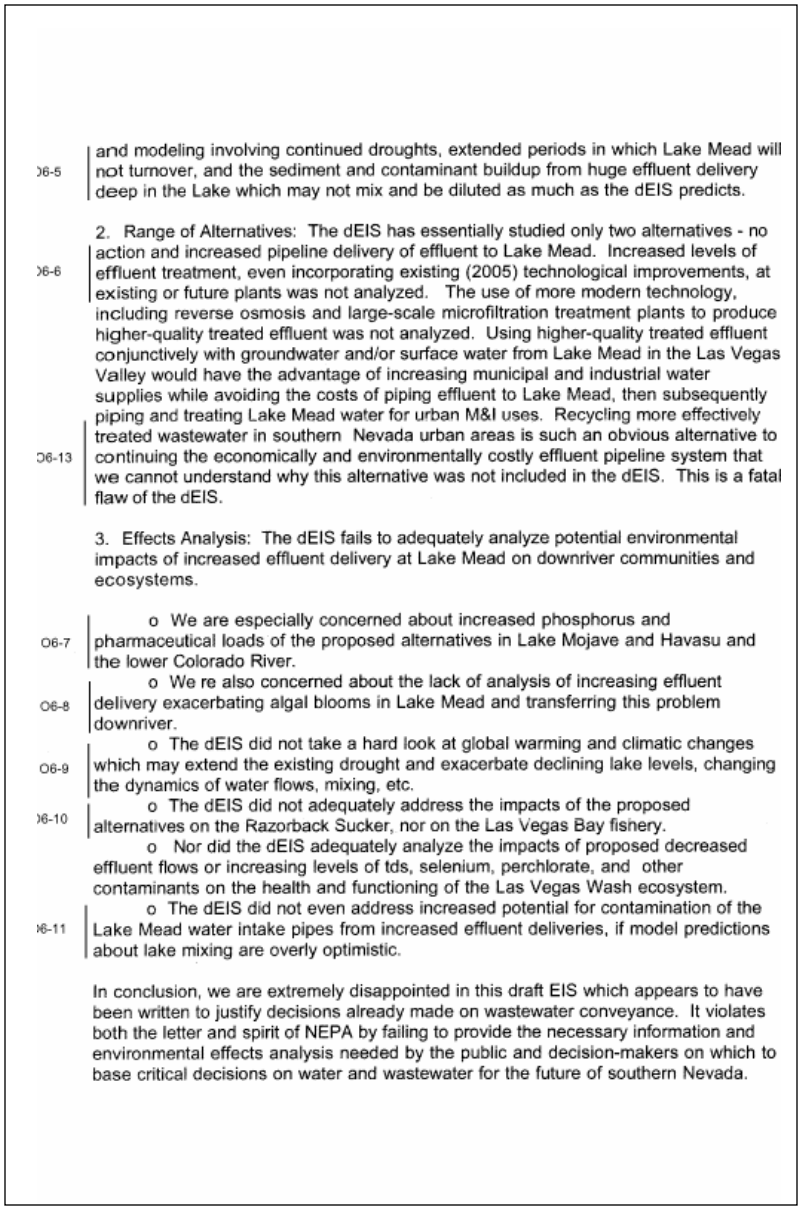
Section 4.2 has been revised to include the information presented in Appendix K.

### O6-4

One of the primary purpose and needs for this project as described in Section 1.5 of the EIS is to "…allow for flexible management of wastewater flow from the Valley to Lake Mead while protecting and maximizing Nevada's return flow credits." In addition, the effluent must continue to meet water quality standards for the Las Vegas Wash, Las Vegas Bay, and Lake Mead. The project is not intended to "improve riparian ecosystems in the Las Vegas Wash".

### O6-5

Modeling results presented in the Draft EIS indicate that the proposed Boulder Islands location for discharging effluent into Boulder Basin would not lead to increased possibilities of contamination to drinking water intakes. The ELCOM/CAEDYM model used in the Draft EIS is a sophisticated three-dimensional computational fluid dynamics model. The model has been validated and applied in numerous instances, many of which have been published in peer reviewed journals. ELCOM/CAEDYM has been verified for the specific application to Boulder Basin. Numerous comparisons of the model results to measured data were made to demonstrate the ability of the model to correctly predict the transport and mixing of substances in the basin.



and modeling involving continued droughts, extended periods in which Lake Mead will not turnover, and the sediment and contaminant buildup from huge effluent delivery deep in the Lake which may not mix and be diluted as much as the dEIS predicts. O6-5

2. Range of Alternatives: The dEIS has essentially studied only two alternatives - no action and increased pipeline delivery of effluent to Lake Mead. Increased levels of effluent treatment, even incorporating existing (2005) technological improvements, at existing or future plants was not analyzed. The use of more modern technology, including reverse osmosis and large-scale microfiltration treatment plants to produce higher-quality treated effluent was not analyzed. Using higher-quality treated effluent conjunctively with groundwater and/or surface water from Lake Mead in the Las Vegas Valley would have the advantage of increasing municipal and industrial water supplies while avoiding the costs of piping effluent to Lake Mead, then subsequently piping and treating Lake Mead water for urban M&I uses. Recycling more effectively treated wastewater in southern Nevada urban areas is such an obvious alternative to continuing the economically and environmentally costly effluent pipeline system that we cannot understand why this alternative was not included in the dEIS. This is a fatal flaw of the dEIS. O6-6 O6-13

3. Effects Analysis: The dEIS fails to adequately analyze potential environmental impacts of increased effluent delivery at Lake Mead on downriver communities and ecosystems.

o We are especially concerned about increased phosphorus and pharmaceutical loads of the proposed alternatives in Lake Mojave and Havasu and the lower Colorado River. O6-7

o We re also concerned about the lack of analysis of increasing effluent delivery exacerbating algal blooms in Lake Mead and transferring this problem downriver. O6-8

o The dEIS did not take a hard look at global warming and climatic changes which may extend the existing drought and exacerbate declining lake levels, changing the dynamics of water flows, mixing, etc. O6-9

o The dEIS did not adequately address the impacts of the proposed alternatives on the Razorback Sucker, nor on the Las Vegas Bay fishery. O6-10

o Nor did the dEIS adequately analyze the impacts of proposed decreased effluent flows or increasing levels of tds, selenium, perchlorate, and other contaminants on the health and functioning of the Las Vegas Wash ecosystem.

o The dEIS did not even address increased potential for contamination of the Lake Mead water intake pipes from increased effluent deliveries, if model predictions about lake mixing are overly optimistic. O6-11

In conclusion, we are extremely disappointed in this draft EIS which appears to have been written to justify decisions already made on wastewater conveyance. It violates both the letter and spirit of NEPA by failing to provide the necessary information and environmental effects analysis needed by the public and decision-makers on which to base critical decisions on water and wastewater for the future of southern Nevada.

**(O6-5 continued)**

The widely used EPA PLUMES algorithm was incorporated into the model to account for the near-field dilution and insertion elevation of the diffuser plume. The EPA PLUMES algorithms have been in development for over 30 years, and are approved by the EPA for prediction of plume evolution and dilution in arbitrarily stratified water bodies.

The Draft EIS considers the impact of continued droughts by evaluating the alternatives with an initial Lake level of 1,000 ft, which is considered a conservative lower limit of reservoir operation. Additionally, modeling provided results of simulations with an initial water surface elevation of 1,100 ft, which is a condition that possibly would persist in the immediate future.

See General Response 7.

**O6-6**

See General Response 1.

See General Response 2.

**O6-13**

See General Response 2.

**O6-7**

See General Response 8.

See General Response 6.

It is possible that pharmaceuticals entering Lake Mead via treated effluent discharged to the Las Vegas Wash might be attenuated to some extent before they pass through Hoover Dam and that their concentrations would be attenuated to a lesser degree before reaching the lower Colorado River if discharged closer to or downstream of Hoover Dam. However, discharging near the Boulder Islands would result in greater dilution such that there would be no difference in the concentrations passing through Hoover Dam. Many of the pharmaceuticals and hormones would not be expected to persist long enough to reach Hoover Dam regardless of the point of discharge upstream of the dam. Additional information is provided in Appendix K of the Final EIS.

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**(O6-7 continued)**

The text in Section 1.4 has been revised based on the results of the literature review presented in Appendix K.

**O6-8**

The Draft EIS presented predictions of algal growth in Boulder Basin for each of the Alternatives considered as well as the baseline scenario. Results indicated that the Boulder Islands alternatives would result in less algal growth in the Las Vegas Bay than the No Action Alternative, and less algal growth in the Las Vegas Bay than the baseline conditions. This is a result of the nutrients from the effluent being discharged below the photic zone. Less algae in Lake Mead would lead to less algae transported through Hoover Dam and downriver. Conversely, the No Action Alternative would result in the effluent entering Boulder Basin as an overflow from the Las Vegas Wash, resulting in increased algal growth. An extended period of overflow of the Las Vegas Wash has been identified as a significant contributing factor to the large 2001 Lake Mead algal bloom (LaBounty & Burns 2005) that subsequently caused problems downriver.

**O6-9**

The water quality modeling and impacts analyses conducted throughout the SCOP EIS process considered the impacts of ongoing drought conditions and addressed impacts that may occur when Lake Mead reaches 1,000 ft in elevation. Analyzing the potential impacts of global warming and climatic changes is beyond the scope of this EIS.

**O6-10**

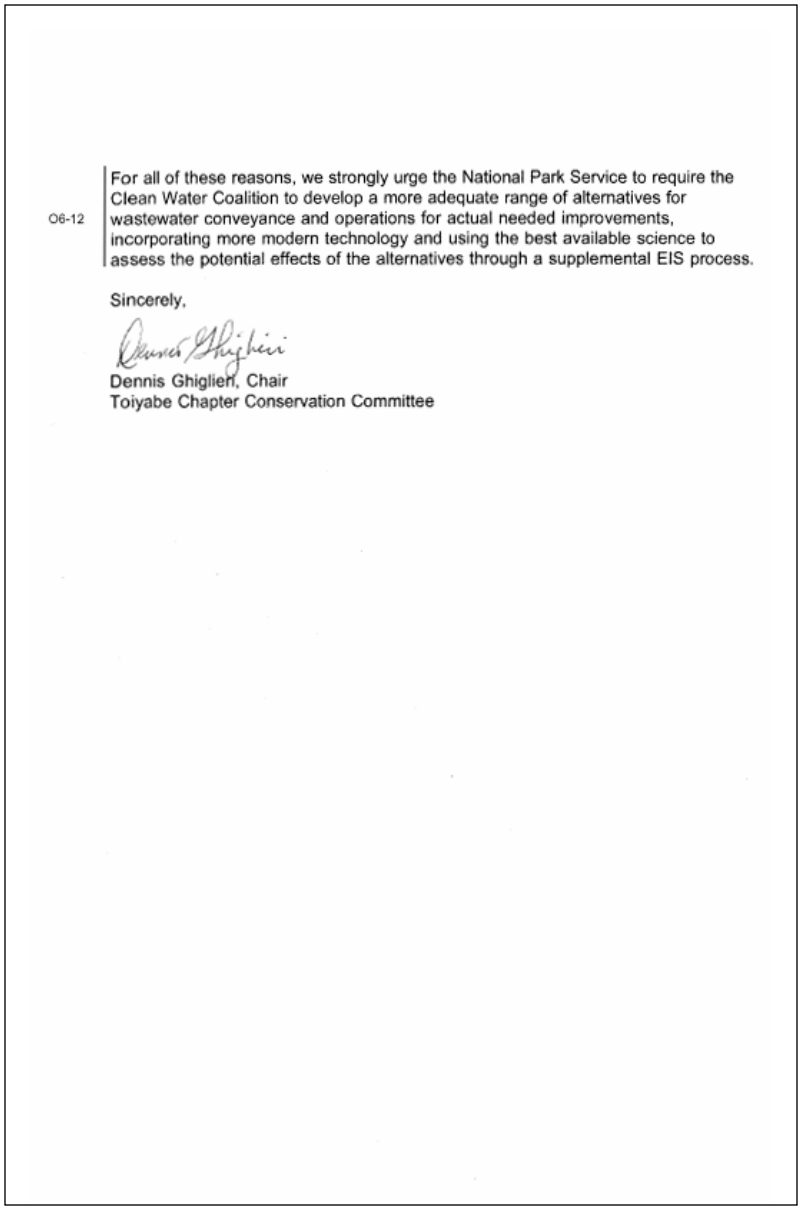
See General Response 9.

**O6-11**

See response to comment O6-5.

See General Response 7.

The modeling has been closely coordinated with SNWA and their plans for new intakes and how they would manage Lake withdrawals in the future. All of the modeling was conducted jointly with SNWA. The results indicate an environmental



O6-12 For all of these reasons, we strongly urge the National Park Service to require the Clean Water Coalition to develop a more adequate range of alternatives for wastewater conveyance and operations for actual needed improvements, incorporating more modern technology and using the best available science to assess the potential effects of the alternatives through a supplemental EIS process.

Sincerely,

Dennis Ghiglieri, Chair
Toiyabe Chapter Conservation Committee

**(O6-11 continued)**

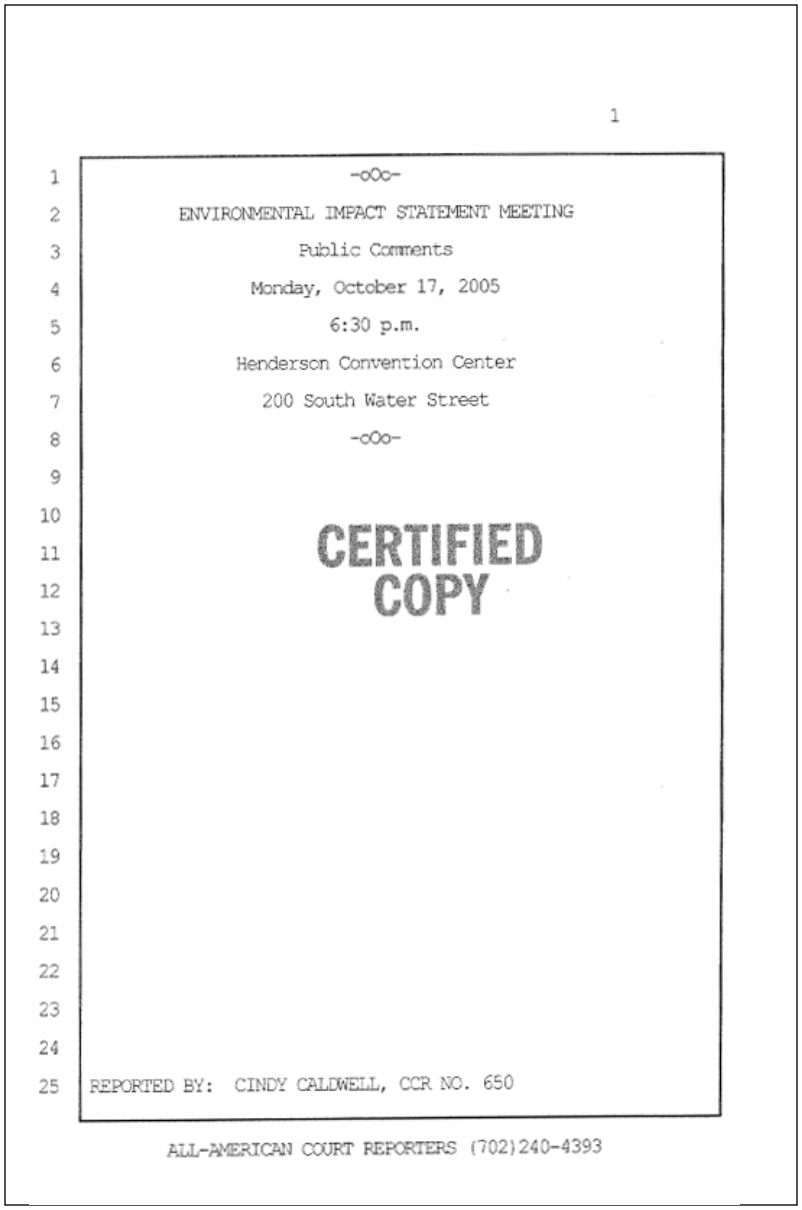
betterment to the existing and new intake over the current and projected future conditions if the discharge were to remain in the Las Vegas Wash.

This information has been added to Appendix D.

**O6-12**

See General Response 1.

An additional alternative, Process Improvements, has been added to consider increased treatment at the plants. This alternative is a variation of the previous No Action Alternative, and incorporates evaluations of treatment technologies previously considered. As part of this process, the most modern technology and best available science used to evaluate environmental effects has been considered. The Final EIS responds to all comments, which have not raised significant new issues or required a wholly new alternative that is not a variation of a previously considered alternative. A supplemental EIS is not considered necessary.



1

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ENVIRONMENTAL IMPACT STATEMENT MEETING

Public Comments

Monday, October 17, 2005

6:30 p.m.

Henderson Convention Center

200 South Water Street

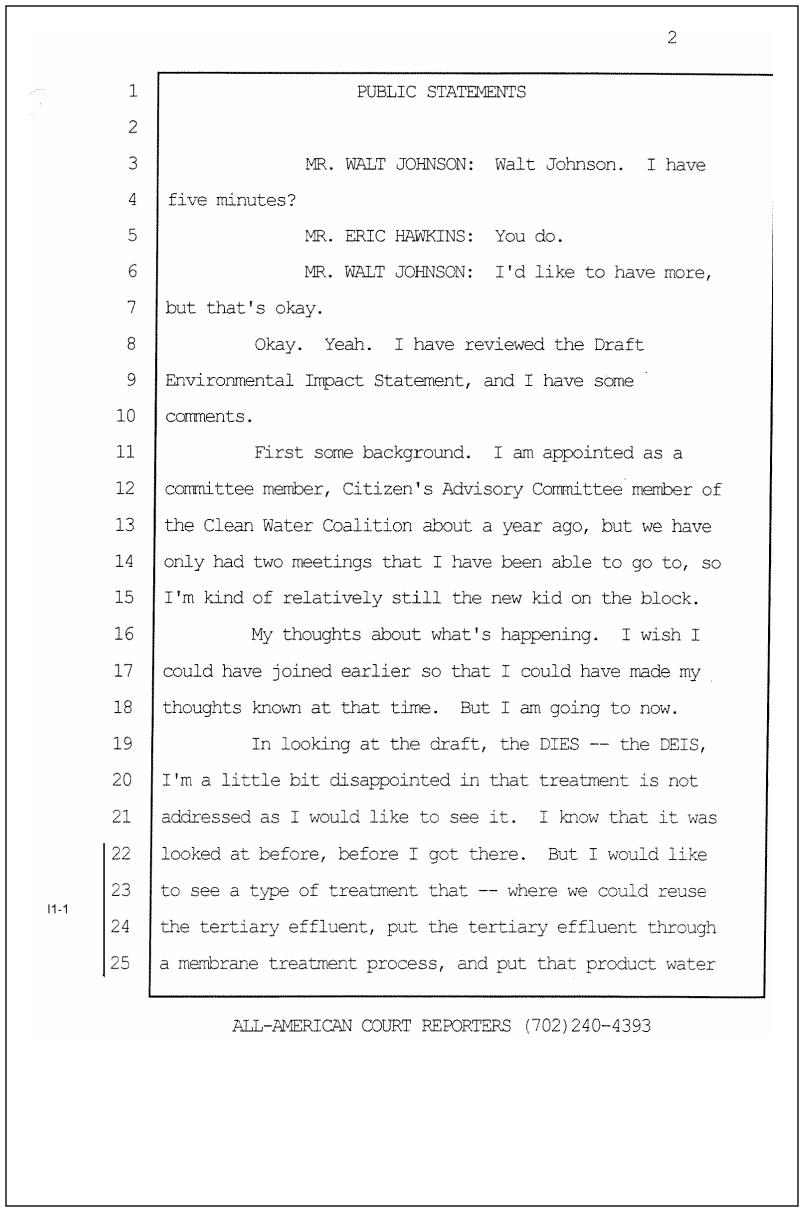
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REPORTED BY: CINDY CALDWELL, CCR NO. 650

ALL-AMERICAN COURT REPORTERS (702)240-4393

**Response I1** Walt Johnson



2

PUBLIC STATEMENTS

MR. WALT JOHNSON: Walt Johnson. I have five minutes?

MR. ERIC HAWKINS: You do.

MR. WALT JOHNSON: I'd like to have more, but that's okay.

Okay. Yeah. I have reviewed the Draft Environmental Impact Statement, and I have some comments.

First some background. I am appointed as a committee member, Citizen's Advisory Committee member of the Clean Water Coalition about a year ago, but we have only had two meetings that I have been able to go to, so I'm kind of relatively still the new kid on the block.

My thoughts about what's happening. I wish I could have joined earlier so that I could have made my thoughts known at that time. But I am going to now.

In looking at the draft, the DIES -- the DEIS, I'm a little bit disappointed in that treatment is not addressed as I would like to see it. I know that it was looked at before, before I got there. But I would like to see a type of treatment that -- where we could reuse the tertiary effluent, put the tertiary effluent through a membrane treatment process, and put that product water

I1-1

ALL-AMERICAN COURT REPORTERS (702)240-4393

**I1-1**

See General Response 1.

See General Response 2.

I1-1

back into our system.

I know that's a radical idea. But it is being done in other parts of the country. Especially in southwest USA where arid conditions prevail, and population is outstripping -- outstripping supply of water.

Here's some of my points to push this. If we could divert tertiary effluent instead of going to Lake Mead and go to a membrane treatment process, we could remove about 90 percent of all contaminants right there. I mean, if you're not putting it in the lake, you're removing it. So the 90 percent is from calculation of 400 MGD design and about 40 MGD going into Las Vegas Wash. So that about 90 percent would be diverted.

The quality of the water both in Las Vegas Valley and downstream users would, of course, be significantly improved with the diversion. And then based on studies by the Colorado River Basin Salinity Control Program, which anybody can go to on their Internet, based on those studies, there's about 770,000 tons per year -- Anthony, you're probably familiar with some of this -- of salt, of TDS that's removed through the eight projects, mainly dealing with farmlands where they are bypassing around soil that has salts in it.

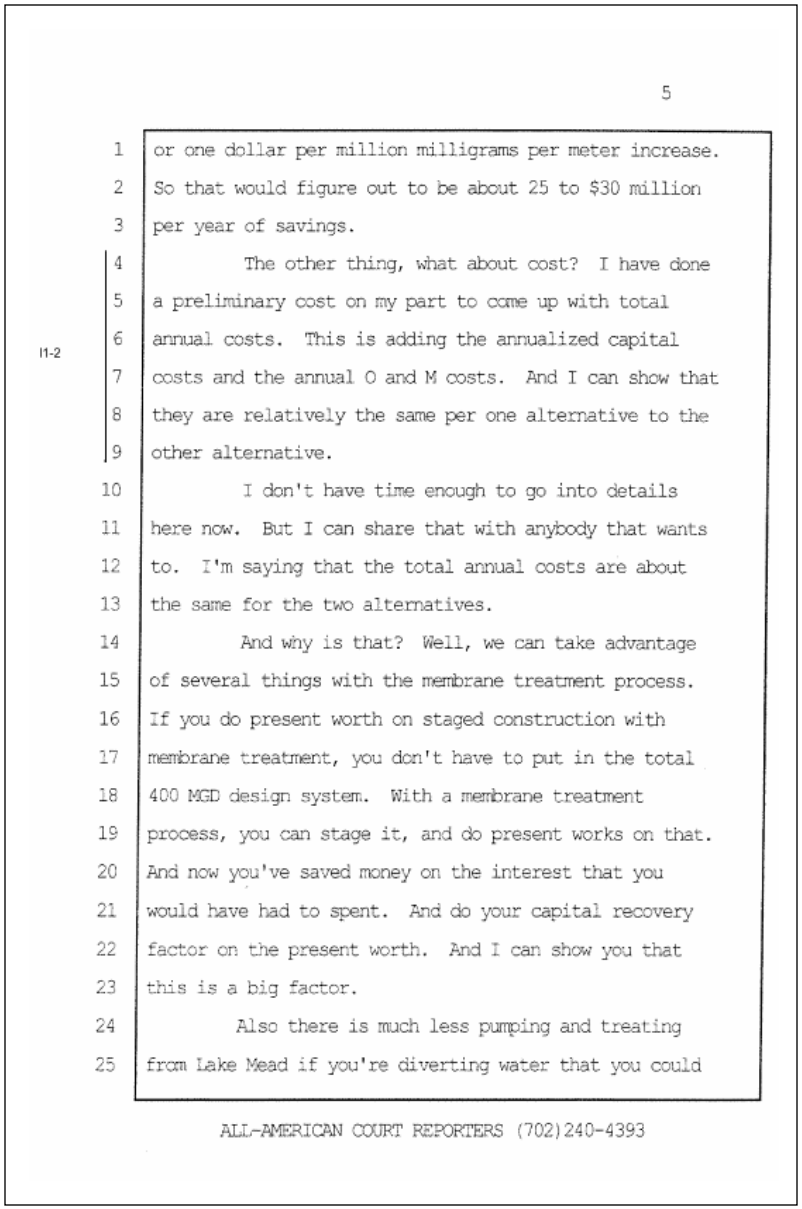
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I1-2

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Also there is much less pumping and treating from Lake Mead if you're diverting water that you could

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**I1-2**

See response to comment O2-4.

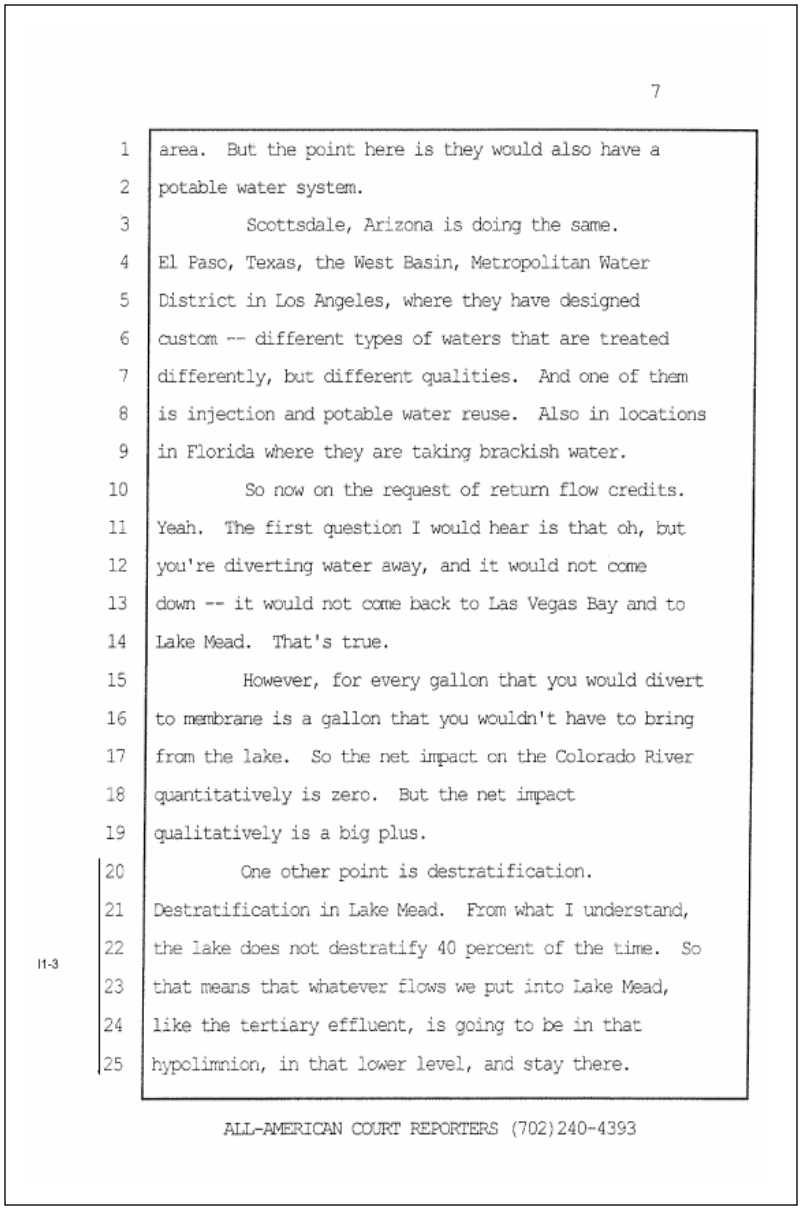
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So now on the request of return flow credits. Yeah. The first question I would hear is that oh, but you're diverting water away, and it would not come down -- it would not come back to Las Vegas Bay and to Lake Mead. That's true.

However, for every gallon that you would divert to membrane is a gallon that you wouldn't have to bring from the lake. So the net impact on the Colorado River quantitatively is zero. But the net impact qualitatively is a big plus.

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I1-3

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**I1-3**

See General Response 7.

And what happens to it then? Does it accumulate and accumulate? Is it possible that we could possibly contaminate our -- into our water intake structures?

Well, how am I doing on time?

MR. ERIC HAWKINS: We have given a couple extra minutes, but you're okay. Can you wrap it up for us.

MR. WALT JOHNSON: Just one last thought.

If we insist on putting 3.6 million, that's 3,600,000 people, population out here in the desert -- and I arrived at that 3.6 million from the Draft Environmental Impact Statement that has 3.13 permanent population, then I have added the transient population, which I based on data from the Las Vegas Valley -- the Las Vegas Convention and Visitors Authority, at about .47. You add that to 3.13. It comes up to 3.6 million people by 2035.

If we insist on putting 3.6 million by the year 2035 with a man-made lake as our source of water, and our dumping ground, I think we ought to be thinking about reuse.

Okay. That's total water use.

MR. ERIC HAWKINS: Thank you, Mr. Johnson.

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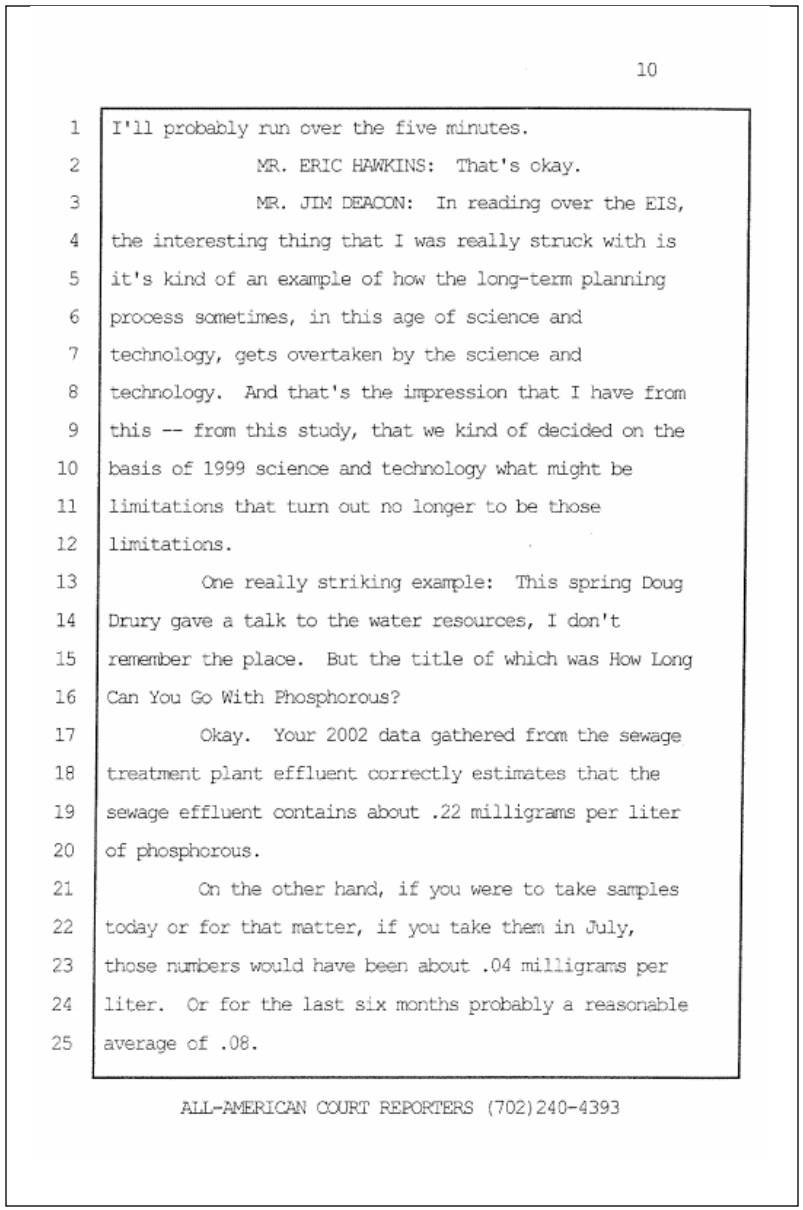
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MR. JIM DEACON: In reading over the EIS, the interesting thing that I was really struck with is it's kind of an example of how the long-term planning process sometimes, in this age of science and technology, gets overtaken by the science and technology. And that's the impression that I have from this -- from this study, that we kind of decided on the basis of 1999 science and technology what might be limitations that turn out no longer to be those limitations.

One really striking example: This spring Doug Drury gave a talk to the water resources, I don't remember the place. But the title of which was How Long Can You Go With Phosphorous?

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The implication of that means that in the Final Environmental Impact Statement, you really -- well, first you have to assume that if Doug has achieved this at Clark County, it's achievable at Las Vegas and Henderson in fairly, fairly short time frame.

That means in the final environmental impact statement, your number needs to change from .22 of phosphorous to .08. And when that happens, what happens is that, in effect, you don't need the preferred alternative, because by the year 2050, with a flow of about 400 million gallons per day, your total loading to Las Vegas Bay is 266 pounds per day of phosphorous.

The intent of -- in the EIS is to attempt to be able to conform with present total loading standards of 334 pounds per day of phosphorous. So, in effect, Doug has already achieved what will be the presumed limitation in the year 2050.

Anyway, in doing the final impact statement, I think it's really important that you make sure that you reflect today's reality, not the reality of 2002.

One of the other major issues that I think is really critical in the final impact statement is that again, the data taken for the mixing model for Lake Mead Boulder Basin in 2002 is a good set of data. And it works well with the model.

But what it does and hasn't happened is the recognition in the Environmental Impact Statement that that's reflective of about 60 percent of the years. The implication there is that 40 percent of the time in the winter the lake will not destratify.

And if you're putting diffuser pipe effluent into the hypolimnion of a lake, which in the wintertime does not destratify, and then you run two or three of those years together as inevitably must happen, what you've got is -- well, in short, you're asking the community to pay $600 million to increase the probability of contamination of the water intake structures. Because unless you get that turn over, your model doesn't reflect reality.

Then one of the other issues that I am concerned about in the EIS, the draft EIS, is that it doesn't -- it doesn't indicate that in the no action alternative, in the year 2050, you've exceeded the existing capacity of the underflow conduit structures under Lake Las Vegas.

Now, if the preferred alternative is designed to alleviate that problem, it needs to be stated in the Environmental Impact Statement. If that's not a problem, it needs to be recognized in the no action alternative or -- regardless of which way it goes, your

Environmental Impact Statement at present doesn't point to the fact that you cannot contain flows under Lake at Las Vegas that are projected for the year 2050, unless you do one of the alternatives or the preferred alternative. I think that issue needs to be addressed in the -- I believe it needs to be addressed in the Final Environmental Impact Statement.

And furthermore, if addressed, it raises almost the demand for evaluating the alternatives that zoologists propose. That is that it's entirely possible to meet that 400 or less million gallon per day limitation of the underflow through -- under Lake Las Vegas by recycling water through a membrane treatment system and controlling the amount of return flow that you get to whatever -- in effect, whatever it is you want up to the design capacity of the conduit.

But what it means is that you have -- if you bring up consideration of this membrane treatment alternative as a valid cost effective way of improving our water quality, you also can control the amount of return flow credit you get by selecting either tertiary effluent going down the wash or diversion to membrane treatment.

And so that in effect what you get is a really, apparently on the face of it, desirable alternative of

improving water quality, both in Las Vegas water supply and in the Colorado River, at a reduced cost from the preferred alternative. And in using a more flexible system that allows you to gain advantage from selecting which way you want to use the water.

Okay. Now, another real concern that I have was mentioned by the -- the previous speaker to some extent. That is, at the present time, with the improved water treatment that's been realized this summer, what we're getting is inflow into Las Vegas Wash of water that contains nutrients, which enhances the sport fishery.

They also -- it also brings in sediment, which the turbidity and the nutrient concentration that's going in there now, provide nutrient for submerged aquatic plants, turbidity that is used as cover by young fish to avoid predation. And so the preferred alternative will most likely reduce the ability of Las Vegas Wash as a sport fishery and as the -- one of the only remaining places where a major species, the razorback sucker, now reproduces.

So, in fact, your conclusion in the draft statement that there will be no affect on the fishery, I believe to be erroneous. That is it's likely to reduce the quality of the sport fishery in Las Vegas Bay. And

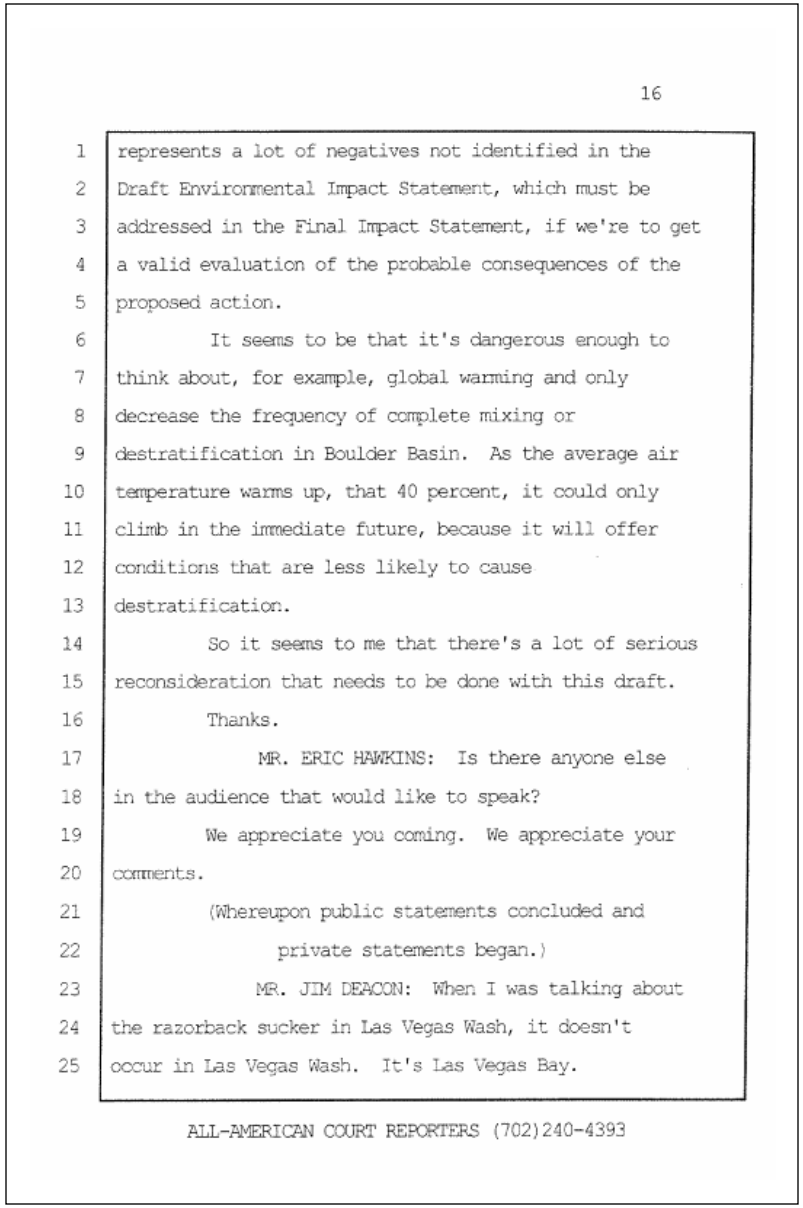
increase the threats to the continued survival of the only endangered species in Las Vegas Bay, the razorback sucker. So again, I think those considerations need to be reevaluated for the final impact statement.

And then, one other concern that I think is inadequately addressed here is the affect on Las Vegas Wash. That is this community has put a considerable amount of time, effort, thought, and money into the sort of rehabilitation of Las Vegas Wash as a functioning wetland.

And that functioning wetland is increasingly being demonstrated. For example, recently the demonstration that Las Vegas Wash is removing, approximately, 66 percent of the phosphorous that's released to it. And by the time you get through in to Las Vegas Bay, it's an approximate removal of about 99 percent of the phosphorous.

So that we're, in effect, getting that free ecological service from our reconstructed wetland that would be in part lost or at least be reevaluated much more clearly than it has been by the preferred alternative.

So from many standpoints, I get the impression that the preferred alternative, while it may have been valid as about the only thing we can do in 1999, now



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represents a lot of negatives not identified in the Draft Environmental Impact Statement, which must be addressed in the Final Impact Statement, if we're to get a valid evaluation of the probable consequences of the proposed action.

It seems to be that it's dangerous enough to think about, for example, global warming and only decrease the frequency of complete mixing or destratification in Boulder Basin. As the average air temperature warms up, that 40 percent, it could only climb in the immediate future, because it will offer conditions that are less likely to cause destratification.

So it seems to me that there's a lot of serious reconsideration that needs to be done with this draft.

Thanks.

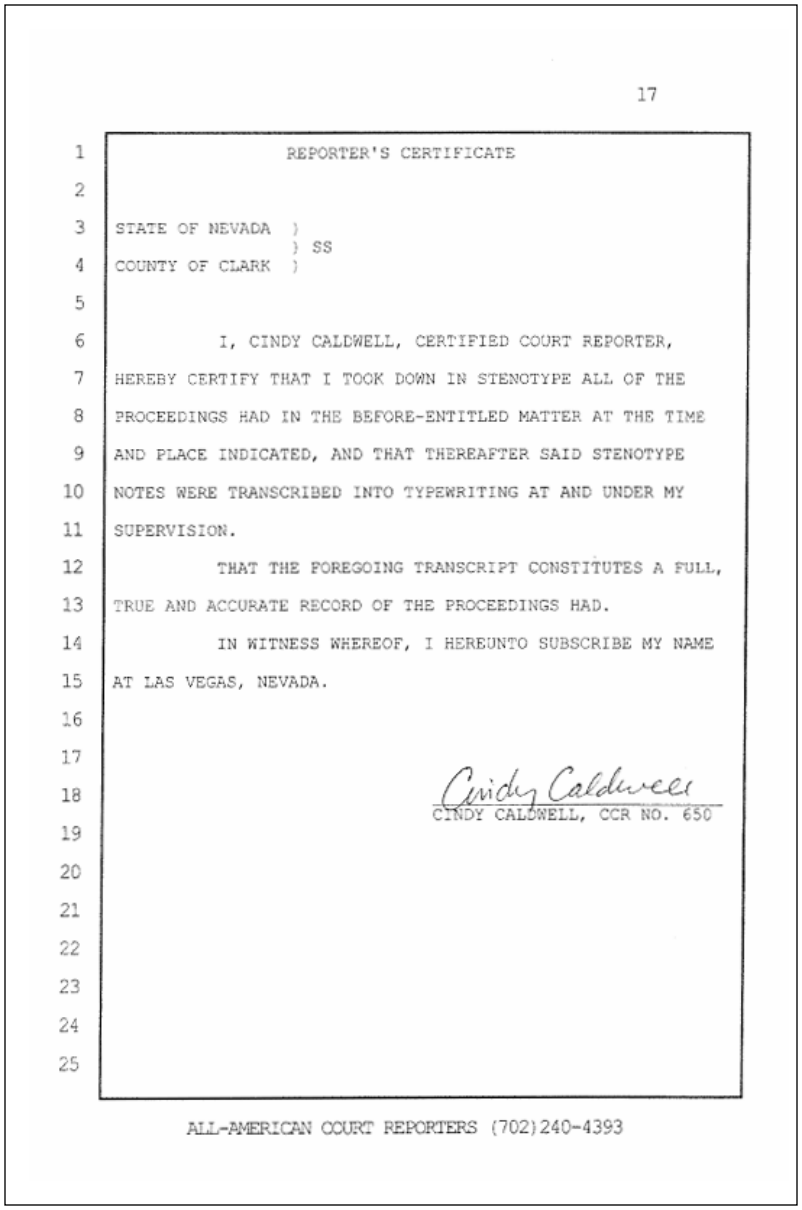
MR. ERIC HAWKINS: Is there anyone else in the audience that would like to speak?

We appreciate you coming. We appreciate your comments.

(Whereupon public statements concluded and private statements began.)

MR. JIM DEACON: When I was talking about the razorback sucker in Las Vegas Wash, it doesn't occur in Las Vegas Wash. It's Las Vegas Bay.

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REPORTER'S CERTIFICATE

STATE OF NEVADA )
) SS
COUNTY OF CLARK )

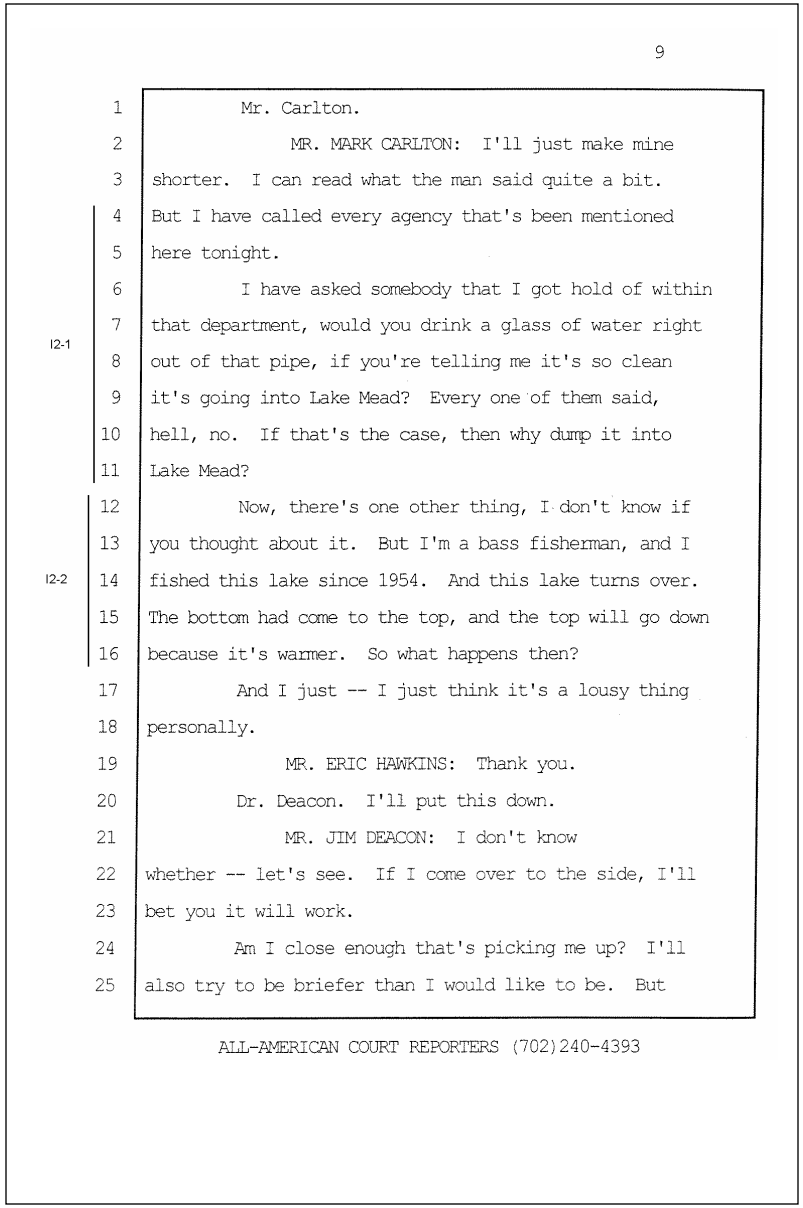
I, CINDY CALDWELL, CERTIFIED COURT REPORTER, HEREBY CERTIFY THAT I TOOK DOWN IN STENOTYPE ALL OF THE PROCEEDINGS HAD IN THE BEFORE-ENTITLED MATTER AT THE TIME AND PLACE INDICATED, AND THAT THEREAFTER SAID STENOTYPE NOTES WERE TRANSCRIBED INTO TYPEWRITING AT AND UNDER MY SUPERVISION.

THAT THE FOREGOING TRANSCRIPT CONSTITUTES A FULL, TRUE AND ACCURATE RECORD OF THE PROCEEDINGS HAD.

IN WITNESS WHEREOF, I HEREUNTO SUBSCRIBE MY NAME AT LAS VEGAS, NEVADA.

Cindy Caldwell
CINDY CALDWELL, CCR NO. 650

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I2-1

I2-2

## Response I2 Mark Carlton

### I2-1

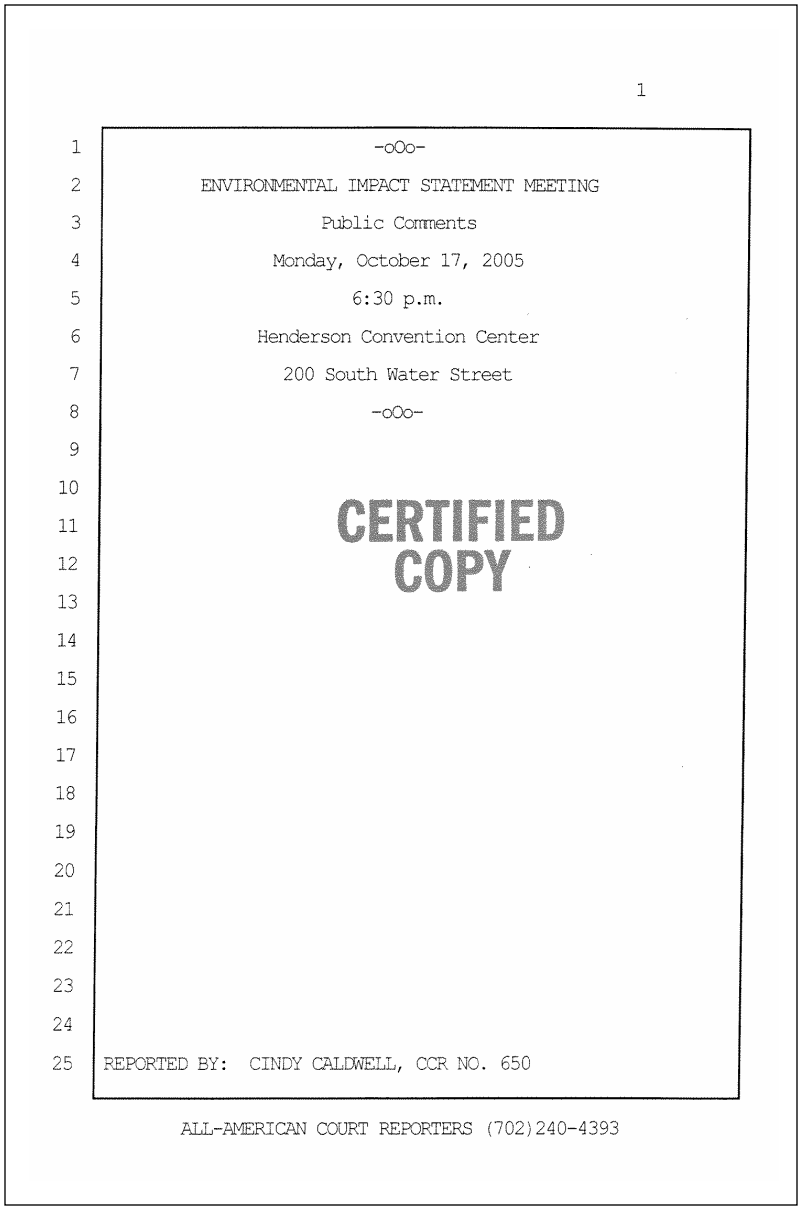
Treated wastewater from the Valley has been treated and discharged to Lake Mead via the Las Vegas Wash since 1956. Treated wastewater flows will continue to be discharged to Lake Mead, even under the No Action Alternative.

The following sentence has been added to Section 1.1: "Treated wastewater has been discharged to the Las Vegas Wash since 1956."

The wastewater treatment facilities in the Valley are some of the best in the nation--the quality of treatment is in the top 7 percent of wastewater treatment facilities in the nation.

### I2-2

See General Response 7.



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ENVIRONMENTAL IMPACT STATEMENT MEETING

Public Comments

Monday, October 17, 2005

6:30 p.m.

Henderson Convention Center

200 South Water Street

-oOo-

CERTIFIED COPY

REPORTED BY: CINDY CALDWELL, CCR NO. 650

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**Response I3** James Deacon

PUBLIC STATEMENTS

MR. WALT JOHNSON: Walt Johnson. I have five minutes?

MR. ERIC HAWKINS: You do.

MR. WALT JOHNSON: I'd like to have more, but that's okay.

Okay. Yeah. I have reviewed the Draft Environmental Impact Statement, and I have some comments.

First some background. I am appointed as a committee member, Citizen's Advisory Committee member of the Clean Water Coalition about a year ago, but we have only had two meetings that I have been able to go to, so I'm kind of relatively still the new kid on the block.

My thoughts about what's happening. I wish I could have joined earlier so that I could have made my thoughts known at that time. But I am going to now.

In looking at the draft, the DIES -- the DEIS, I'm a little bit disappointed in that treatment is not addressed as I would like to see it. I know that it was looked at before, before I got there. But I would like to see a type of treatment that -- where we could reuse the tertiary effluent, put the tertiary effluent through a membrane treatment process, and put that product water

back into our system.

I know that's a radical idea. But it is being done in other parts of the country. Especially in southwest USA where arid conditions prevail, and population is outstripping -- outstripping supply of water.

Here's some of my points to push this. If we could divert tertiary effluent instead of going to Lake Mead and go to a membrane treatment process, we could remove about 90 percent of all contaminants right there. I mean, if you're not putting it in the lake, you're removing it. So the 90 percent is from calculation of 400 MGD design and about 40 MGD going into Las Vegas Wash. So that about 90 percent would be diverted.

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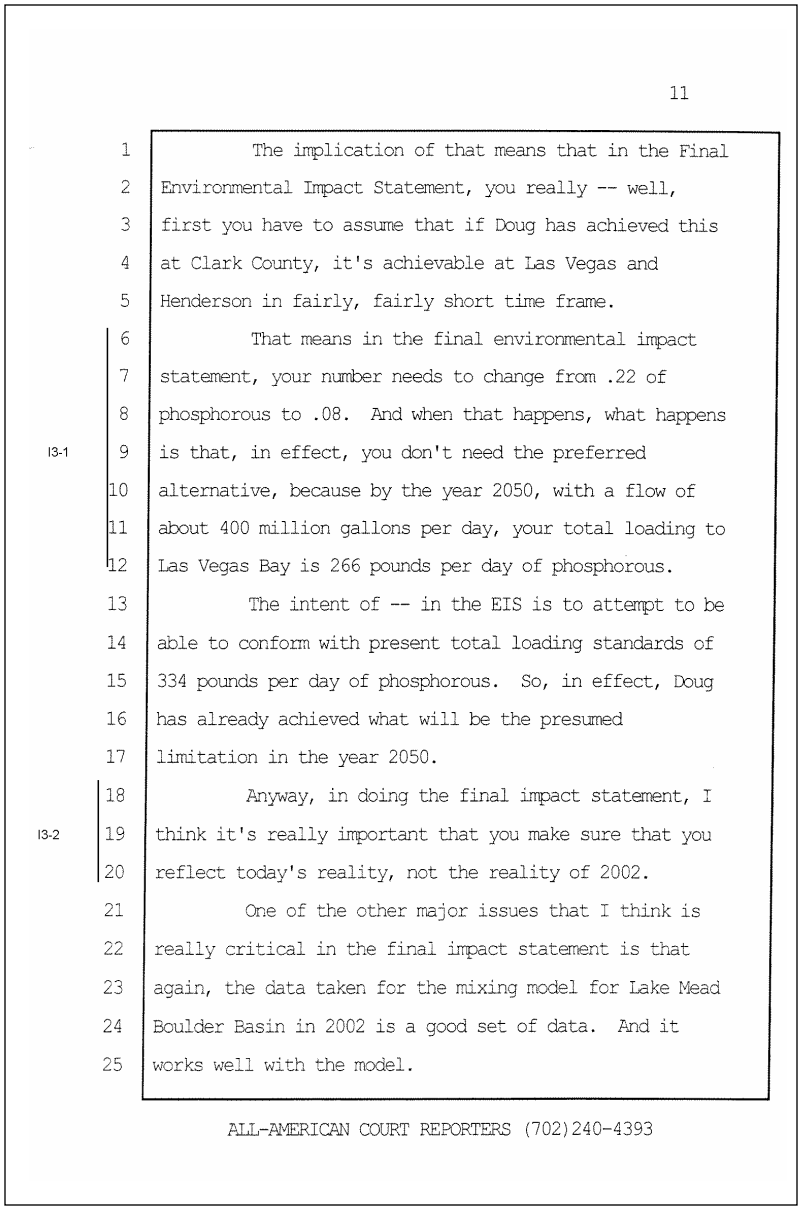
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11

The implication of that means that in the Final Environmental Impact Statement, you really -- well, first you have to assume that if Doug has achieved this at Clark County, it's achievable at Las Vegas and Henderson in fairly, fairly short time frame.

That means in the final environmental impact statement, your number needs to change from .22 of phosphorous to .08. And when that happens, what happens is that, in effect, you don't need the preferred alternative, because by the year 2050, with a flow of about 400 million gallons per day, your total loading to Las Vegas Bay is 266 pounds per day of phosphorous.

The intent of -- in the EIS is to attempt to be able to conform with present total loading standards of 334 pounds per day of phosphorous. So, in effect, Doug has already achieved what will be the presumed limitation in the year 2050.

Anyway, in doing the final impact statement, I think it's really important that you make sure that you reflect today's reality, not the reality of 2002.

One of the other major issues that I think is really critical in the final impact statement is that again, the data taken for the mixing model for Lake Mead Boulder Basin in 2002 is a good set of data. And it works well with the model.

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## I3-1

See response to comment F1-2.

See General Response 8.

The assumption in the comment that a total loading of 266 lbs/day of phosphorus to the Las Vegas Bay in 2050 would be acceptable is incorrect. The southwest U.S. is experiencing a drought. It is predicted that the water in Lake Mead will decline to 1,000 ft. As explained in Section 4.1 of the Final EIS, the TP loading to the Las Vegas Bay would need to be approximately 100 lbs/day to meet water quality standards in the Las Vegas Bay when Lake Mead is at a 1,000-ft level.

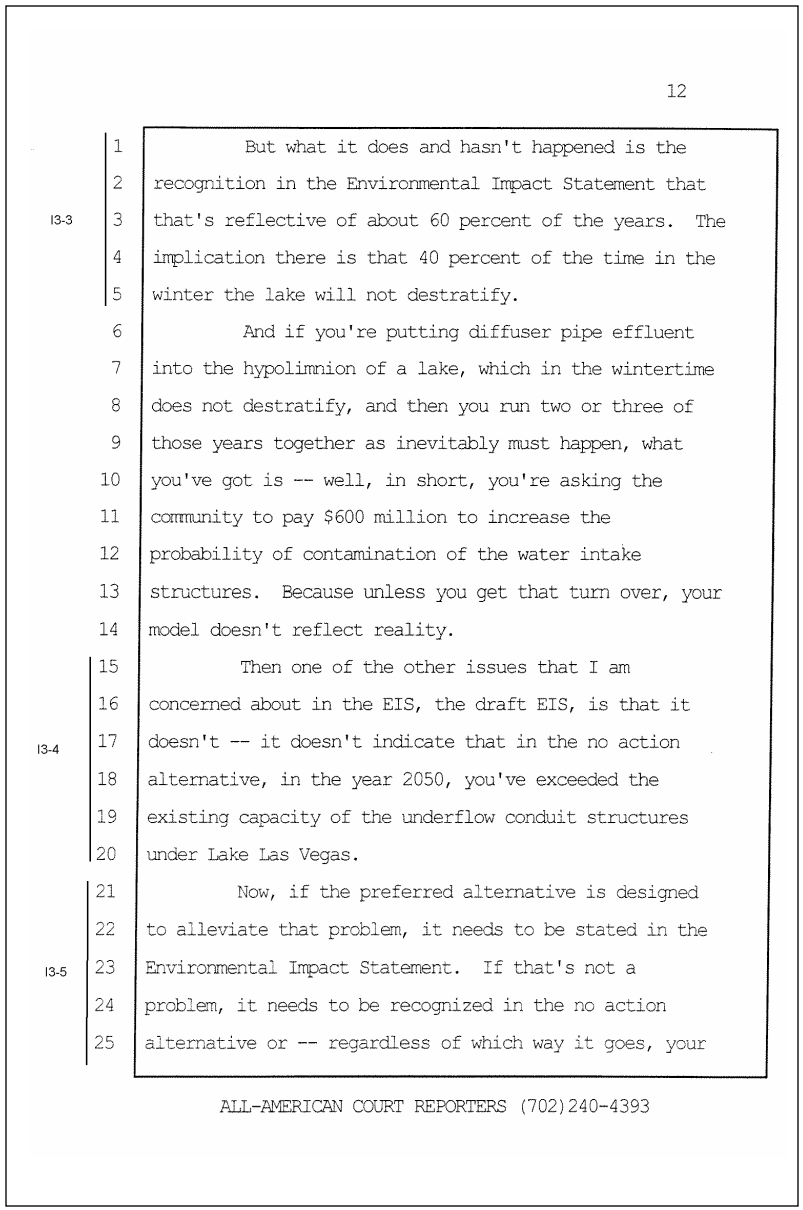
As described in the Purpose and Need, Section 1.5, management flexibility is one of the most important reasons for the proposed project. The alternatives that continue to discharge the treated effluent to only the Las Vegas Wash do not provide flexibility in the management of the flows.

## I3-2

Information regarding each plant's current capabilities has been added to Section 2.1 of the Final EIS.

See General Response 8.

In addition, it's important to recognize that preparation of an EIS for a complex project such as the SCOP takes a significant amount of time. Although federal agencies strive to provide the most up-to-date available information, situations and technology changes rapidly and incorporation of these changes into NEPA documents may not always be possible. Continual updating as new information becomes available would prevent any project from ever getting through the NEPA process. Thus, EISs typically present a "snapshot in time" to use as a baseline to analyze potential impacts.



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But what it does and hasn't happened is the recognition in the Environmental Impact Statement that that's reflective of about 60 percent of the years. The implication there is that 40 percent of the time in the winter the lake will not destratify.

And if you're putting diffuser pipe effluent into the hypolimnion of a lake, which in the wintertime does not destratify, and then you run two or three of those years together as inevitably must happen, what you've got is -- well, in short, you're asking the community to pay $600 million to increase the probability of contamination of the water intake structures. Because unless you get that turn over, your model doesn't reflect reality.

Then one of the other issues that I am concerned about in the EIS, the draft EIS, is that it doesn't -- it doesn't indicate that in the no action alternative, in the year 2050, you've exceeded the existing capacity of the underflow conduit structures under Lake Las Vegas.

Now, if the preferred alternative is designed to alleviate that problem, it needs to be stated in the Environmental Impact Statement. If that's not a problem, it needs to be recognized in the no action alternative or -- regardless of which way it goes, your

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### I3-3

See General Response 7.

### I3-4

There are two, 84-inch diameter conduits under Lake Las Vegas. These conduits have a capacity of 1,138 mgd (1,760 cubic feet per second [cfs]). As shown on Table 2.1-1 of the Draft and Final EIS, projected effluent flows are expected to be 537 mgd (861 cfs) in 2050. Therefore, the conduits under Lake Las Vegas have the capacity to handle the increased flows.

### I3-5

See response to comment I3-4.

The capacity of the Lake Las Vegas conduits would not be exceeded with year 2050 flows. Therefore, that is not part of the purpose and need for the SCOP.

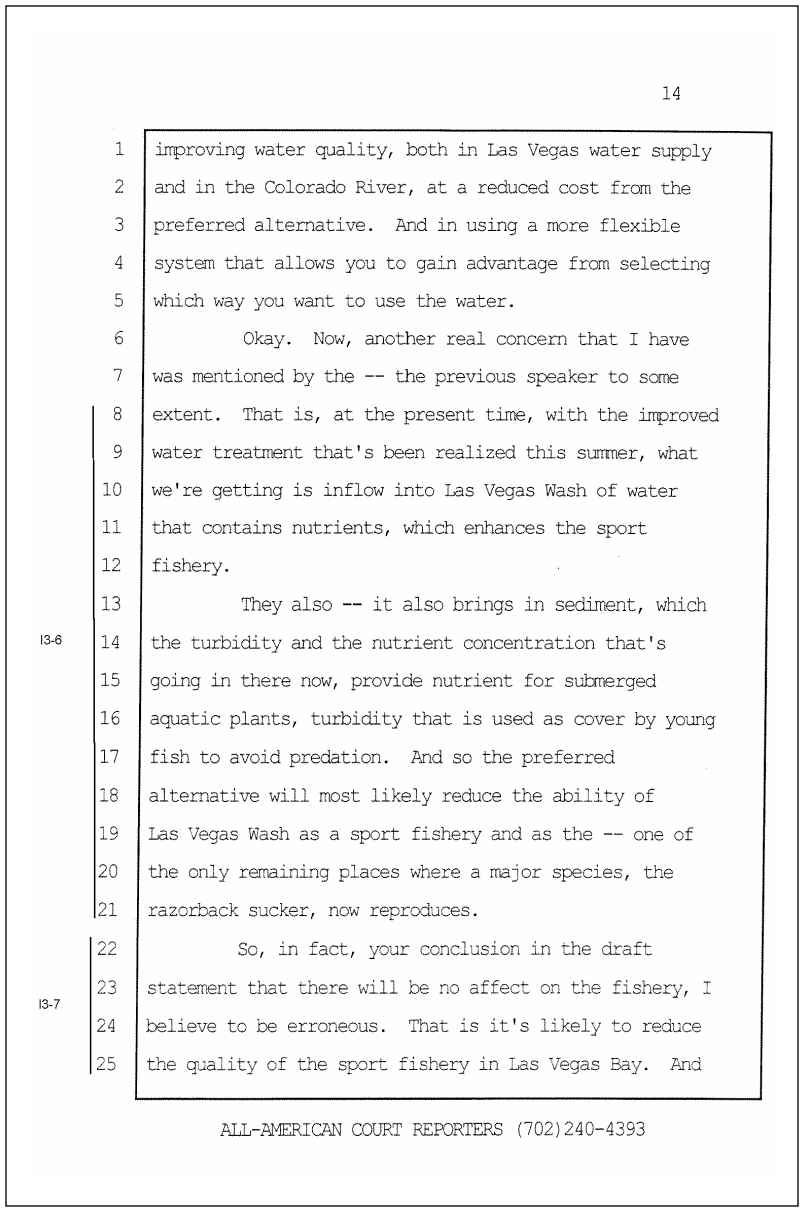
I3-5

Environmental Impact Statement at present doesn't point to the fact that you cannot contain flows under Lake at Las Vegas that are projected for the year 2050, unless you do one of the alternatives or the preferred alternative. I think that issue needs to be addressed in the -- I believe it needs to be addressed in the Final Environmental Impact Statement.

And furthermore, if addressed, it raises almost the demand for evaluating the alternatives that zoologists propose. That is that it's entirely possible to meet that 400 or less million gallon per day limitation of the underflow through -- under Lake Las Vegas by recycling water through a membrane treatment system and controlling the amount of return flow that you get to whatever -- in effect, whatever it is you want up to the design capacity of the conduit.

But what it means is that you have -- if you bring up consideration of this membrane treatment alternative as a valid cost effective way of improving our water quality, you also can control the amount of return flow credit you get by selecting either tertiary effluent going down the wash or diversion to membrane treatment.

And so that in effect what you get is a really, apparently on the face of it, desirable alternative of



14

improving water quality, both in Las Vegas water supply and in the Colorado River, at a reduced cost from the preferred alternative. And in using a more flexible system that allows you to gain advantage from selecting which way you want to use the water.

Okay. Now, another real concern that I have was mentioned by the -- the previous speaker to some extent. That is, at the present time, with the improved water treatment that's been realized this summer, what we're getting is inflow into Las Vegas Wash of water that contains nutrients, which enhances the sport fishery.

They also -- it also brings in sediment, which the turbidity and the nutrient concentration that's going in there now, provide nutrient for submerged aquatic plants, turbidity that is used as cover by young fish to avoid predation. And so the preferred alternative will most likely reduce the ability of Las Vegas Wash as a sport fishery and as the -- one of the only remaining places where a major species, the razorback sucker, now reproduces.

So, in fact, your conclusion in the draft statement that there will be no affect on the fishery, I believe to be erroneous. That is it's likely to reduce the quality of the sport fishery in Las Vegas Bay. And

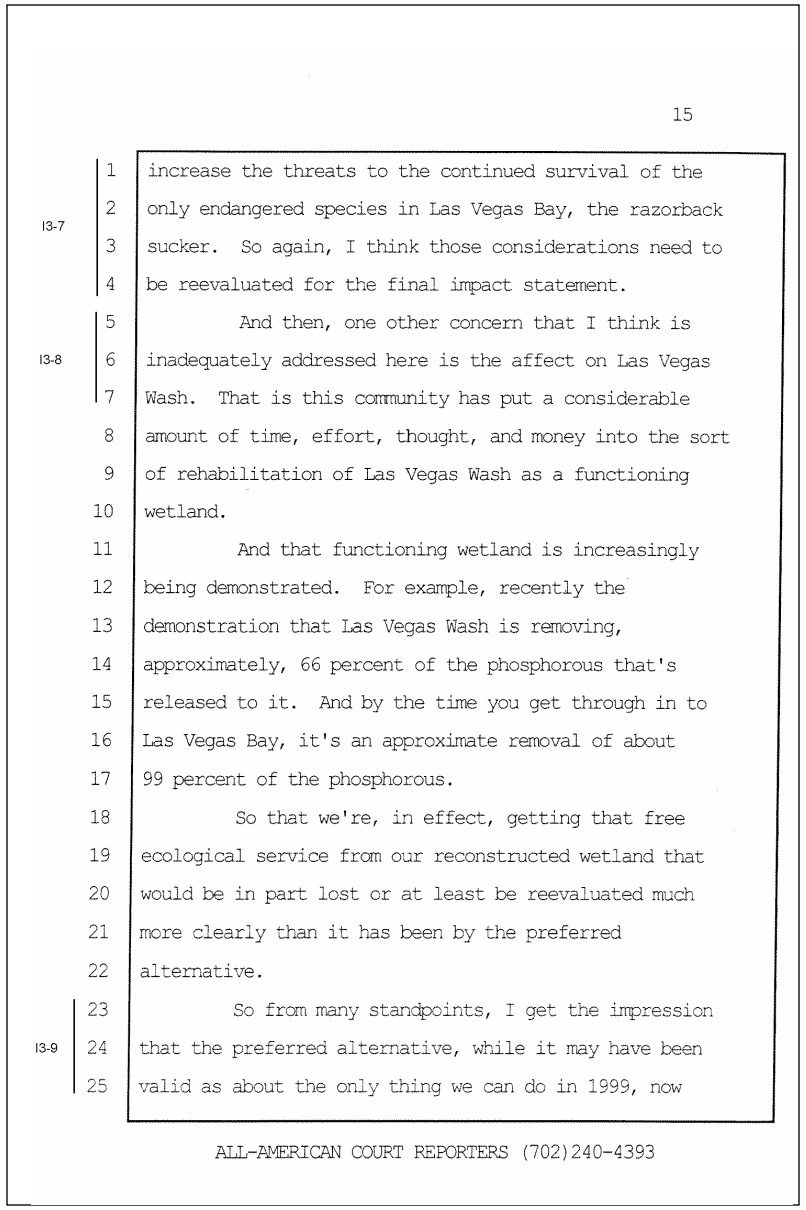
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**I3-6**

See General Response 9.

**I3-7**

See General Response 9.



15

increase the threats to the continued survival of the only endangered species in Las Vegas Bay, the razorback sucker. So again, I think those considerations need to be reevaluated for the final impact statement.

I3-7

And then, one other concern that I think is inadequately addressed here is the affect on Las Vegas Wash. That is this community has put a considerable amount of time, effort, thought, and money into the sort of rehabilitation of Las Vegas Wash as a functioning wetland.

I3-8

And that functioning wetland is increasingly being demonstrated. For example, recently the demonstration that Las Vegas Wash is removing, approximately, 66 percent of the phosphorous that's released to it. And by the time you get through in to Las Vegas Bay, it's an approximate removal of about 99 percent of the phosphorous.

So that we're, in effect, getting that free ecological service from our reconstructed wetland that would be in part lost or at least be reevaluated much more clearly than it has been by the preferred alternative.

So from many standpoints, I get the impression that the preferred alternative, while it may have been valid as about the only thing we can do in 1999, now

I3-9

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**I3-8**

See General Response 11.

See response to comment F1-26.

**I3-9**

See responses to comments I3-1 through I3-8.

I3-9 represents a lot of negatives not identified in the Draft Environmental Impact Statement, which must be addressed in the Final Impact Statement, if we're to get a valid evaluation of the probable consequences of the proposed action.

It seems to be that it's dangerous enough to think about, for example, global warming and only decrease the frequency of complete mixing or destratification in Boulder Basin. As the average air temperature warms up, that 40 percent, it could only climb in the immediate future, because it will offer conditions that are less likely to cause destratification.

So it seems to me that there's a lot of serious reconsideration that needs to be done with this draft.

Thanks.

MR. ERIC HAWKINS: Is there anyone else in the audience that would like to speak?

We appreciate you coming. We appreciate your comments.

(Whereupon public statements concluded and private statements began.)

MR. JIM DEACON: When I was talking about the razorback sucker in Las Vegas Wash, it doesn't occur in Las Vegas Wash. It's Las Vegas Bay.

REPORTER'S CERTIFICATE

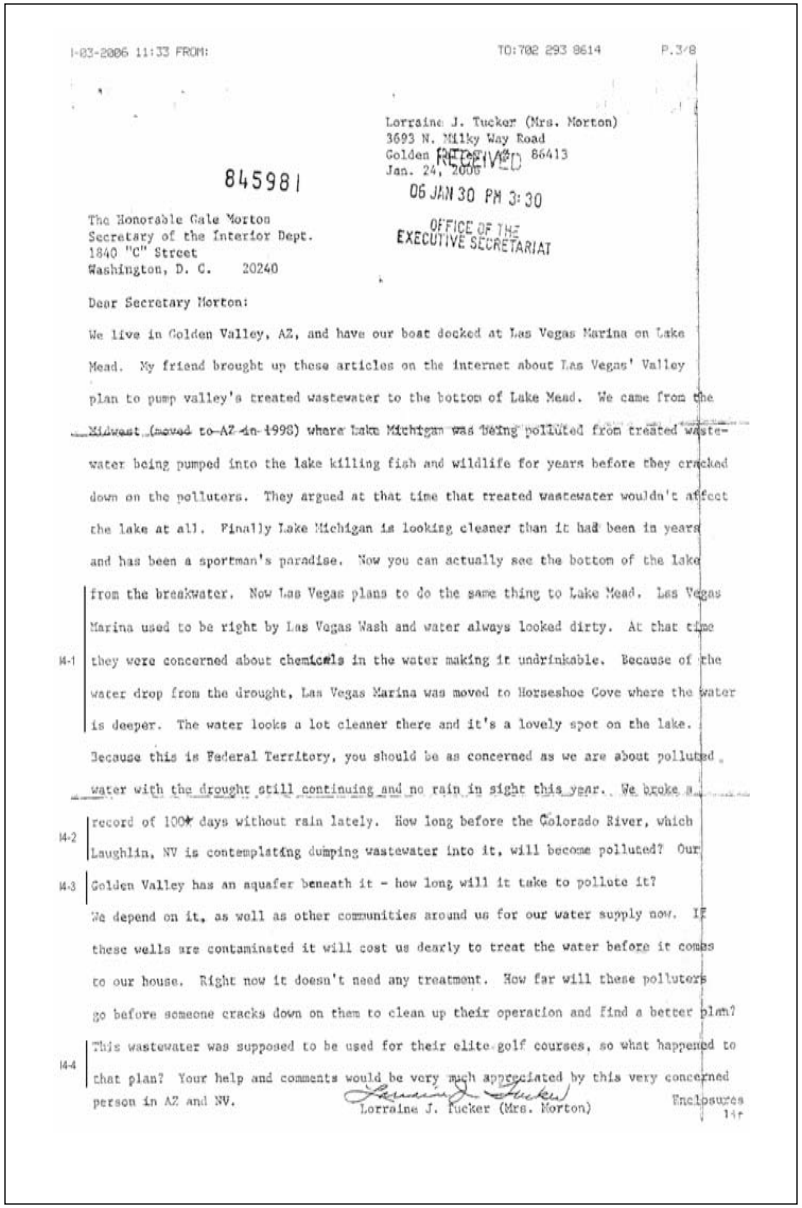
STATE OF NEVADA )
) SS
COUNTY OF CLARK )

I, CINDY CALDWELL, CERTIFIED COURT REPORTER, HEREBY CERTIFY THAT I TOOK DOWN IN STENOTYPE ALL OF THE PROCEEDINGS HAD IN THE BEFORE-ENTITLED MATTER AT THE TIME AND PLACE INDICATED, AND THAT THEREAFTER SAID STENOTYPE NOTES WERE TRANSCRIBED INTO TYPEWRITING AT AND UNDER MY SUPERVISION.

THAT THE FOREGOING TRANSCRIPT CONSTITUTES A FULL, TRUE AND ACCURATE RECORD OF THE PROCEEDINGS HAD.

IN WITNESS WHEREOF, I HEREUNTO SUBSCRIBE MY NAME AT LAS VEGAS, NEVADA.

Cindy Caldwell
CINDY CALDWELL, CCR NO. 650



1-03-2006 11:33 FROM: TO:702 293 8614 P.3/8

Lorraine J. Tucker (Mrs. Morton)
3693 N. Milky Way Road
Golden Valley, AZ 86413
Jan. 24, 2006

RECEIVED
06 JAN 30 PM 3:30
OFFICE OF THE
EXECUTIVE SECRETARIAT

845981

The Honorable Gale Morton
Secretary of the Interior Dept.
1840 "C" Street
Washington, D. C. 20240

Dear Secretary Morton:

We live in Golden Valley, AZ, and have our boat docked at Las Vegas Marina on Lake Mead. My friend brought up these articles on the internet about Las Vegas' Valley plan to pump valley's treated wastewater to the bottom of Lake Mead. We came from the Midwest (moved to AZ in 1998) where Lake Michigan was being polluted from treated wastewater being pumped into the lake killing fish and wildlife for years before they cracked down on the polluters. They argued at that time that treated wastewater wouldn't affect the lake at all. Finally Lake Michigan is looking cleaner than it had been in years and has been a sportman's paradise. Now you can actually see the bottom of the lake from the breakwater. Now Las Vegas plans to do the same thing to Lake Mead. Las Vegas Marina used to be right by Las Vegas Wash and water always looked dirty. At that time I4-1 they were concerned about chemicals in the water making it undrinkable. Because of the water drop from the drought, Las Vegas Marina was moved to Horseshoe Cove where the water is deeper. The water looks a lot cleaner there and it's a lovely spot on the lake. Because this is Federal Territory, you should be as concerned as we are about polluted water with the drought still continuing and no rain in sight this year. We broke a record of 100+ days without rain lately. How long before the Colorado River, which I4-2 Laughlin, NV is contemplating dumping wastewater into it, will become polluted? Our I4-3 Golden Valley has an aquafer beneath it - how long will it take to pollute it? We depend on it, as well as other communities around us for our water supply now. If these wells are contaminated it will cost us dearly to treat the water before it comes to our house. Right now it doesn't need any treatment. How far will these polluters go before someone cracks down on them to clean up their operation and find a better plan? This wastewater was supposed to be used for their elite golf courses, so what happened to I4-4 that plan? Your help and comments would be very much appreciated by this very concerned person in AZ and NV.

Lorraine J. Tucker (Mrs. Morton)

Enclosures 14r

## Response I4 Lorraine J. Tucker

### I4-1

One of the very reasons that the effluent discharge is being moved is because of the drought, and especially the water quality effects at the Las Vegas Wash and Las Vegas Bay. Increasing wastewater effluent flows have continued to erode the Las Vegas Wash, and bring more sediment into the Las Vegas Bay, making the water look dirty. As Lake Mead water levels drop lower, the ability of the Las Vegas Bay to accommodate more effluent is limited. Current projections indicate that if the drought continues, Lake Mead may drop another 100 to 140 ft over the next 5 to 10 years. The impacts analyses in the EIS address the potential water quality impacts when the level of Lake Mead drops to 1,000 ft.

### I4-2

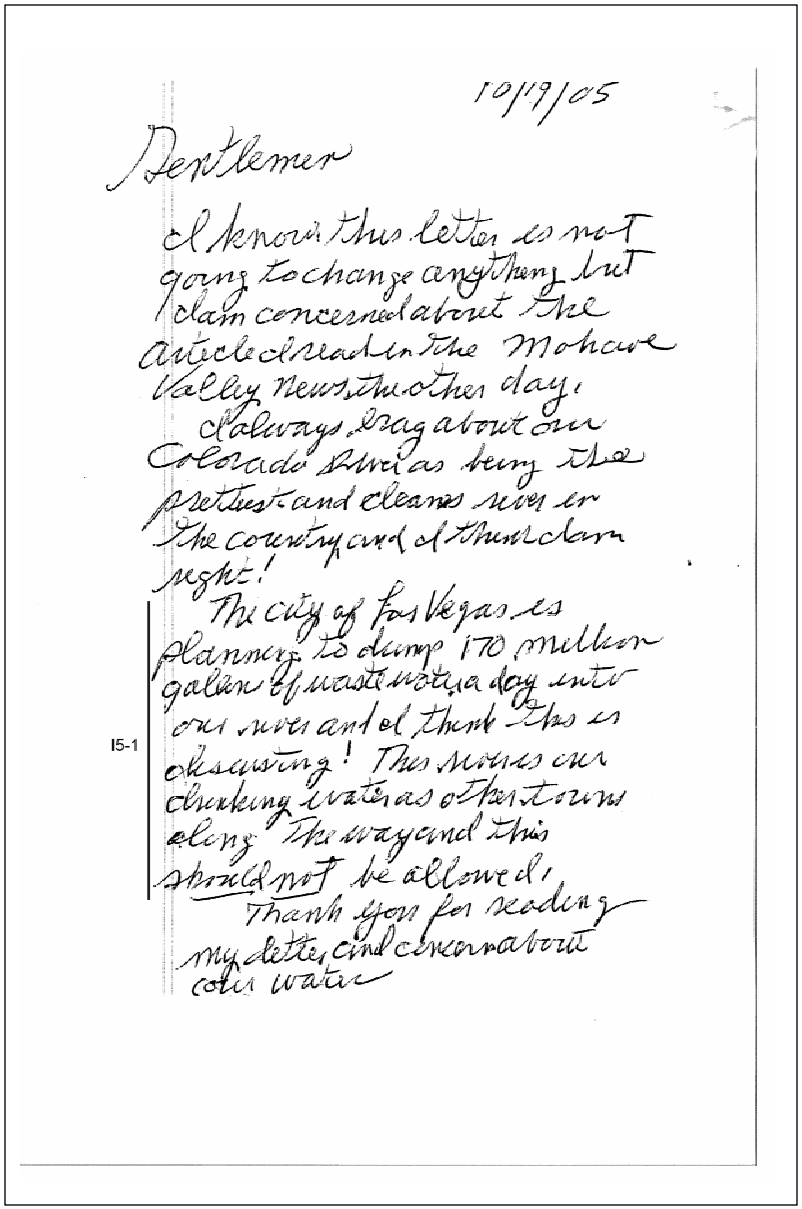
Laughlin, Nevada is not "contemplating" dumping wastewater into the Colorado River. Laughlin has been discharging highly treated effluent to the Colorado River since 1997, in accordance with standards set by NDEP.

### I4-3

Golden Valley is situated approximately 25 miles from the Colorado River, and as far as we know is not hydrologically connected to the Colorado River. If you have knowledge that you will be drawing Colorado River water, you will need to contact Reclamation and begin the process to obtain water rights for that water.

### I4-4

See General Response 2.



10/19/05

Gentlemen

I know this letter is not going to change anything but I am concerned about the article I read in the Mohave Valley News the other day. I always brag about our Colorado River as being the prettiest and cleanest river in the country and I think I am right!

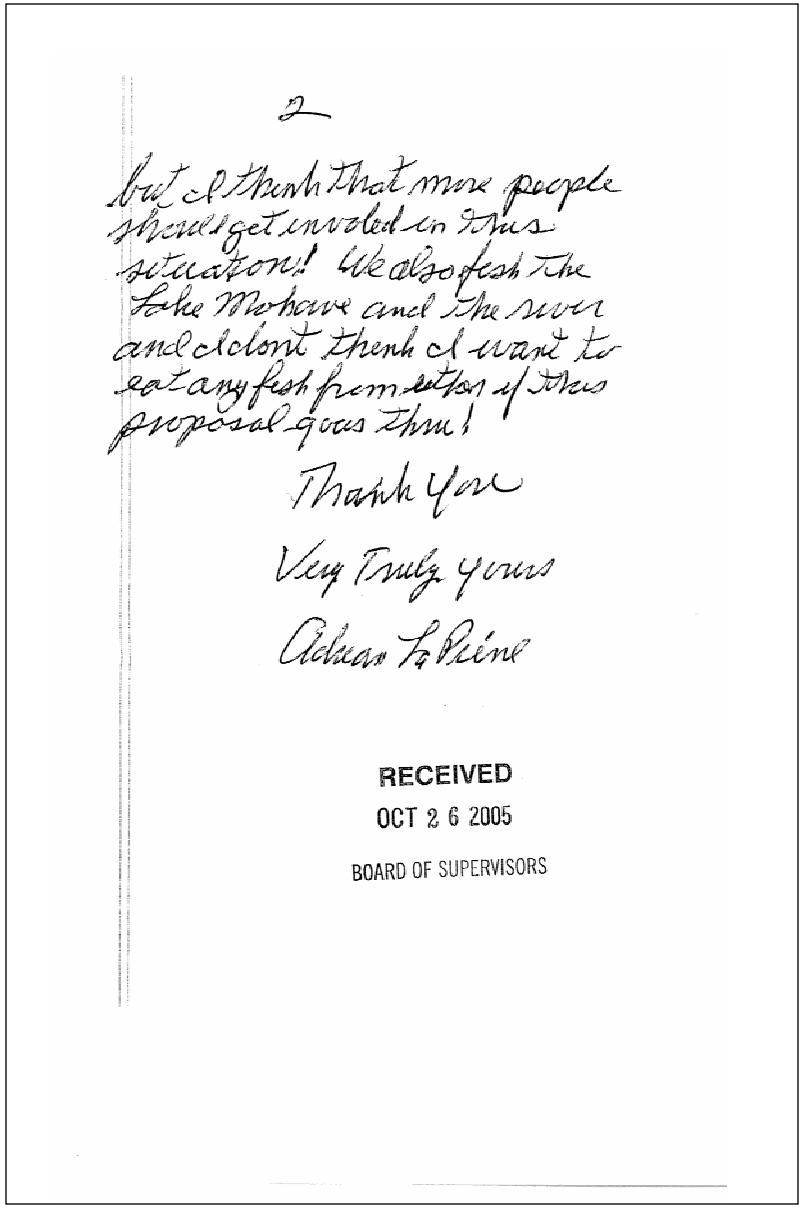
I5-1 The city of Las Vegas is planning to dump 170 million gallon of waste water a day into our river and I think this is disgusting! This means our drinking water as it flows down along the way and this should not be allowed.

Thank you for reading my letter and concern about our water

## Response I5 Adrian LaPiene

### I5-1

See response to comment L1-5.



2

but I think that more people should get involved in this situation! We also fish the Lake Mohave and the river and I don't think I want to eat any fish from either of this proposal goes thru!

Thank You

Very Truly Yours

Adrian LaRiviere

RECEIVED
OCT 26 2005
BOARD OF SUPERVISORS

SCOP EIS Project Manager
PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074-6382

October 20, 2005

Below are my comments regarding the Draft Environmental Impact Statement analyzing the probable environmental impact of the Clean Water Coalition Systems Conveyance and Operations Program.

The Draft Environmental Impact Statement describing the Clean Water Coalition Systems Conveyance and Operations Program represents a major effort to understand the probable impacts of each of four alternatives for discharge of highly treated effluent to alternate locations in Lake Mead. The analysis relies on a large amount of information gathered over a long period of time, and appears based on assumptions valid in the 20th century, but not modified by practical, lower-cost opportunities that have become available in the 21st century. This is especially true in the analysis of the "No Action Alternative" and in the failure to examine new membrane treatment alternatives that are increasingly being used elsewhere because they are increasingly cost-effective and practical. In addition, some of the assumptions made in the application of the Lake Mead Model contain serious inadequacies that, if left unchallenged and unmodified, will be very expensive to correct, and could lead to serious contamination problems for the Las Vegas drinking water supply. Finally, the Preferred Alternative will almost certainly adversely impact the sport fishery and the endangered Razorback Sucker.

THE NO ACTION ALTERNATIVE

The draft EIS states that effluent from the Henderson, Las Vegas, and Clark County water treatment plants contains phosphorus concentrations of about 0.2 mg/L. That concentration is used to represent baseline conditions for 2002. At that concentration, the three sewage treatment plants in Las Vegas Valley are said to produce an average of 292 pounds per day of total phosphorus at average effluent flows of 150 MGD (actually a phosphorus load of 292 pounds per day with effluent flows of 150 MGD would be produced at an average phosphorus concentration of about 0.234 mg/L).

For at least the past six months, the Clark County Water Reclamation District has been producing sewage effluent with average monthly phosphorus concentrations of about 0.08 mg/L (Dr. Doug Drury, CCWRD, conference presentation, September 28-29, 2005). In fact, in July, 2005 their monthly average phosphorus concentration was 0.04 mg/L. It is reasonable to presume that all three sewage treatment plants could be capable of achieving those standards of treatment in the near future. Therefore, in the Final Environmental

Comment I-06

## **Response I6** James Deacon

PROBLEMS WITH THE LAKE MEAD MODEL:

The major problem that MUST be corrected in the Final Environmental Impact Statement is the fact that winter conditions of thermal stratification in 2002 in Lake Mead are representative of conditions that apply in only about 60% of the years (LaBounty and Burns, *Lake and Reservoir Management*, volume 21, 2005, p 284, fig, 6). In winter 2002 Lake Mead did completely destratify. Those conditions permit effluent discharged into the hypolimnion through a diffuser pipe to be mixed throughout the entire volume of water in Boulder Basin during winter. Conclusions derived from examination of the model depend on this complete mixing every winter. However, approximately 40% of the time winter destratification does not occur. Under those conditions, effluent discharged into the hypolimnion through a diffuser pipe would continue to accumulate in the hypolimnion. Such accumulation would greatly increase the probability that effluent would reach the proposed new water intake structure in Boulder Basin in both winter and summer. It would also increase the probability that effluent would reach the existing water intake structures at Saddle Island during summer.

Several consecutive years in which winter destratification does not occur would virtually guarantee contamination of the Las Vegas water supply. With expected long-term increases in average temperature as a result of global warming, there is increasing probability that complete destratification in the winter will become even less frequent in the future. This very expensive Preferred Alternative therefore has the potential of seriously threatening the Las Vegas water supply, and that potential is likely to increase with time.

While the Draft EIS correctly points out the requirement of meeting a "no degradation" standard in Boulder Basin, it does not convincingly demonstrate that the "Preferred Alternative" will be capable of meeting that requirement. Release of treated effluent into the hypolimnion of Lake Mead will add both turbidity and nutrients which, during approximately 60% of the years will be mixed throughout the water column. The increased algal production as well as the increased turbidity will reduce water clarity (reduce Secchi depth). The degree to which this will adversely affect the recreational experience by visitors to Lake Mead National Recreation Area must be evaluated in the Final EIS.

The Lake Mead model uses total phosphorus as an important determinant of concentration of chlorophyll *a* in Boulder Basin, Lake Mojave, and Lake Havasu. LaBounty and Burns (*Lake and Reservoir Management*, pages 277-307, volume 21, 2005) demonstrate a weak relationship between total phosphorus and chlorophyll *a* in Boulder Basin, but a strong relationship between ortho phosphorus and chlorophyll *a*. Therefore, ortho phosphate should be substituted for total phosphorus in the modeling done for the Final EIS.

Comment I-06

The DEIS indicates that some of increased phosphorus in Boulder Basin may extend downstream into Mohave and Havasu. Evaluation of this expected increased phosphorus load on Lakes Mojave and Havasu, and on the consequent water quality problems encountered by the Metropolitan Water District must be presented in the Final EIS.

In addition to these major problems with the Lake Mead model, there may be a number of other details that call into question or render invalid many of the conclusions presented in the Draft Environmental Impact Statement. Unfortunately, I have not had sufficient time to examine these in detail. Nevertheless, I think it is important to re-examine many of the assumptions used as input to the model. For example, are the correct depths used to represent depth of release of water from Hoover Dam? Does the temporal pattern of water released from Hoover Dam used in the model reflect reality? Incorrect input to the model of these and other parameters would greatly affect mixing patterns.

THE LAS VEGAS BAY FISHERY AND ENDANGERED SPECIES

The Draft Environmental Impact Statement demonstrates that under the Preferred Alternative, Secchi depth in Las Vegas Bay will increase and nutrient input will decrease. Chapter 4 states that there are no expected impacts to the fish populations in Las Vegas Bay. How can this be true when you clearly state that nutrient input to Las Vegas Bay will be reduced. In fact, nutrient reduction to Las Vegas Bay is one of the stated reasons for choosing the "Preferred Alternative". Numerous investigations by numerous State and Federal agencies over the past 40 years have demonstrated that Las Vegas Bay is the most productive fishery habitat in Lake Mead. That productivity is a consequence of nutrient input into Las Vegas Bay over the past 40 years. Reduced nutrient input will clearly reduce productivity as demonstrated by your chlorophyll *a* modeling. The Final EIS must evaluate the effects of this reduced productivity on the sport fishery.

Las Vegas Bay harbors one of the only known reproducing populations of an endangered species, the Razorback Sucker. Impacts to this species by implementation of the Preferred Alternative have not been objectively evaluated. The DEIS documents the fact that water clarity will increase and nutrient input will decrease under the preferred alternative. Decreased nutrient input will reduce productivity and probably reduce density of submerged vegetation. The effect of these two processes will be to substantially reduce cover and food available to Razorback Sucker. Many reports by Bio-West, Inc. demonstrate that reduced cover in Las Vegas Bay will substantially increase the Razorback's susceptibility to predation and therefore reduce its chances for survival. Predation has been documented to be one of the most serious threats to the survival of Razorback Sucker throughout the lower Colorado River. Las Vegas Bay provides one of the few remaining habitats in which reproduction by Razorback Sucker is moderately successful. Implementation of the Preferred

Comment I-06

Alternative therefore would almost certainly reduce chances of survival for this endangered species. This issue must be addressed in the Final EIS, with specific reference to the many Bio-West reports and the extensive literature about requirements of Razorback sucker in the lower Colorado River.

CONSEQUENCES FOR LAS VEGAS WASH

The draft EIS fails to adequately evaluate the probable impacts of the "Preferred Alternative" to the Las Vegas Wash system. This inadequacy must be addressed in the "Final EIS". There has been a very considerable community investment put into construction of erosion control structures, expansion of marsh habitat, revegetation of a diverse marsh community, and re-creation of an increasingly functional marsh ecosystem that is increasingly providing valuable ecological services (Las Vegas Wash Coordination Committee annual reports). Success of those ongoing efforts has been shown in a number of ways, including the fact that the Wash is presently removing approximately 66% of the reactive phosphorous discharged to it. In combination with processes functioning in the inner Las Vegas Bay, 99% of the reactive phosphorous is presently being removed before it has an opportunity to move into middle Las Vegas Bay and then on through the outer bay into Boulder Basin. The "Preferred Alternative" will destroy most of the benefits presently accruing to the Las Vegas community as a consequence of this increasingly functional marsh. The statement on page ES -9 that, "A group of agencies are monitoring the concentrations of substances associated with groundwater and urban runoff in the Las Vegas Wash, and will address the issue as needed." is inadequate to describe impacts. The Final EIS must completely re-evaluate the impacts of the preferred alternative on Las Vegas Wash, using existing or projected quantities of nutrient discharge based on an average tertiary effluent concentration of 0.08 mg/L of phosphorus and recent information about the functioning of the Wash ecosystem.

The "Preferred Alternative" will reduce effluent flows in Las Vegas Wash, thereby effectively increasing concentration of TDS, selenium, perchlorate, and other constituents. It will also reduce water exchange with the ponds created by the erosion control structures, thereby degrading the quality of the pond/marsh environment. The extent of the environmental impact of these increased concentrations of pollutants to the Las Vegas Wash system must be described in the Final EIS.

SUMMARY:
The following items must be evaluated or reevaluated in the final EIS:

I6-1 1. Throughout the final EIS change baseline conditions for phosphorus concentrations produced by all three tertiary sewage treatment plants from 0.2 mg/L to 0.08 mg/L.

Comment I-06

## Response I6 James Deacon

### I6-1

See response to comment F1-2.

I6-2 | 2. Evaluate the implications of flow capacity under Lake Las Vegas. Include reference to membrane treatment as a method of avoiding exceeding flow capacity.

I6-3 | 3. Present results of model runs analyzing potential threats to the Las Vegas water supply of accumulation of tertiary effluent in the hypolimnion over the course of 2, 3, or more winters in which destratification does not occur. Use standard credible projections of the effects of global warming over the next 100 years to evaluate probable increase in frequency of winters in which destratification does not occur.

I6-4 | 4. Evaluate the effects of increased algal production and decreased water clarity on the recreational experience of visitors to Boulder Basin.

I6-5 | 5. Substitute Ortho phosphorus for total phosphorus in the model as a means of estimating concentration of chlorophyll *a*.

I6-6 | 6. Recheck model runs to make sure that depth of release of water from Hoover Dam and temporal variability of water release is accurately reflected in the model.

I6-7 | 7. Evaluate the effects of reduced nutrient input on the quality of the sport fishery in Las Vegas Bay.

I6-8 | 8. Evaluate the effects of reduced cover on susceptibility to predation of Razorback Sucker in Las Vegas Bay.

I6-9 | 9. Evaluate the effects of the preferred alternative compared to the no action alternative on wetland area and wetland function in Las Vegas Wash. Use an average tertiary effluent phosphorus concentration of 0.08 mg/L.

I6-10 | 10. Evaluate the effects of increased concentration of TDS, Selenium, Perchlorate, and other probable pollutants on Las Vegas Wash and Las Vegas Bay under both the preferred alternative and the no action alternative.

James E. Deacon
Distinguished Professor Emeritus, UNLV
968 Camelia Drive
Henderson, NV 89015

702-568-6720
deaconj@unlv.nevada.edu

Comment I-06

### I6-2

There are two, 84-inch diameter conduits under Lake Las Vegas. These conduits have a capacity of 1,138 mgd (1,760 cfs). As shown on Table 2.1-1 of the Draft and Final EIS, projected effluent flows are expected to be 537 mgd (861 cfs) in 2050. Therefore, the conduits under Lake Las Vegas have the capacity to handle the increased flows.

### I6-3

See General Response 7.

The water quality modeling and impacts analyses conducted throughout the SCOP EIS process considered the impacts of ongoing drought conditions and addressed impacts that may occur when Lake Mead reaches 1,000 ft in elevation. Analyzing the potential impacts of global warming and climatic changes is beyond the scope of this EIS.

### I6-4

Water quality modeling indicates that the alternative that would potentially result in increased algal production is the No Action Alternative. The potential impact to recreation from increased algal production is presented in Section 4.4 of the Final EIS.

### I6-5

The model uses ortho-phosphorus to estimate algae growth. The model uses sophisticated equations to predict the algae growth based upon ortho-phosphorus, nitrate, temperature, and light. In addition, the model considers exchange between solid and soluble phosphorus in the lake, as well as internal phosphorus within the algae.

### I6-6

See response to comment I5-6.

The temporal variability of the Hoover Dam releases was correctly modeled by using hourly flow rate data obtained from Reclamation.

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**I6-7**

A description of sport fishing at Lake Mead has been added to Section 3.2.3.3 of the Final EIS. The impacts to the sport fishery are presented in Section 4.2.

**I6-8**

See General Response 9.

**I6-9**

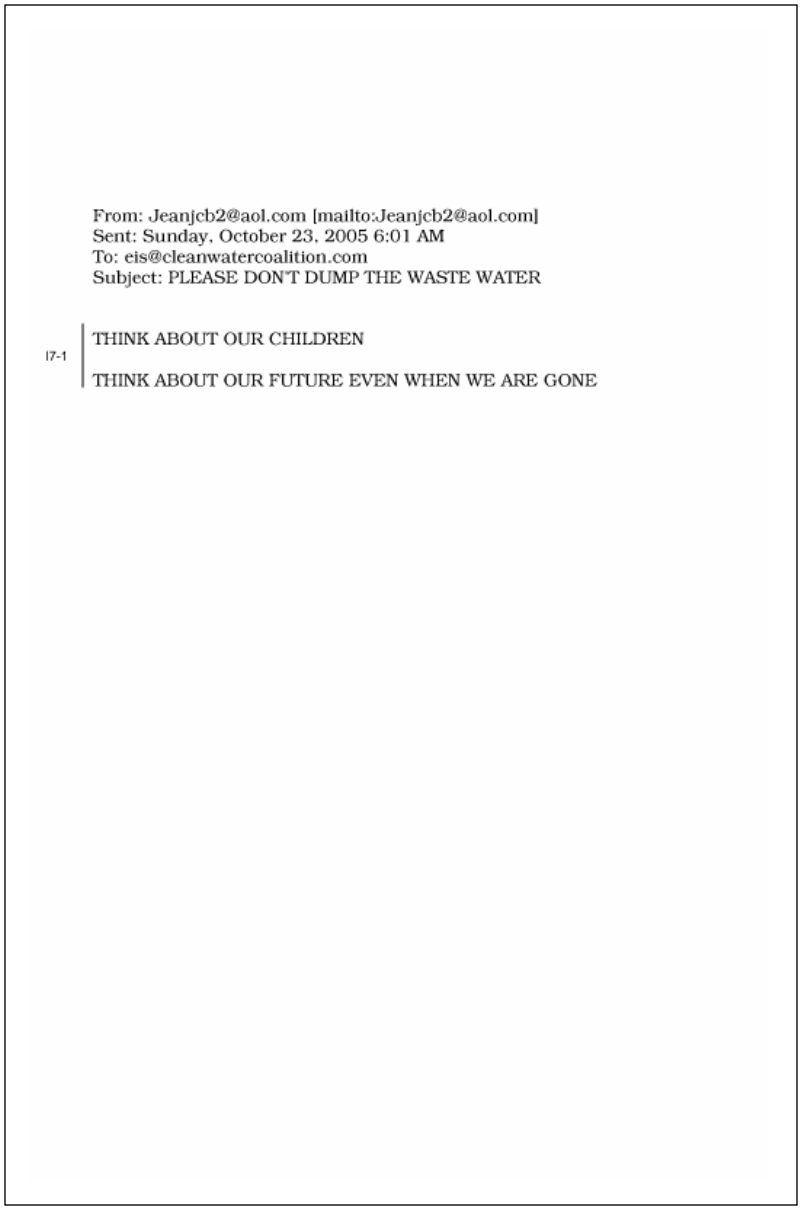
See response to comment F1-2.See General Response 8.

The potential impacts to wetlands is addressed in Section 4.2 of the Final EIS.

See response to comment I3-1.

**I6-10**

The Las Vegas Wash model was used to determine the changes in concentrations when effluent flows decrease and increase in the Las Vegas Wash. The concentrations and potential impacts are described in Sections 4.1 and 4.2 of the Final EIS.



From: Jeanjcb2@aol.com [mailto:Jeanjcb2@aol.com]
Sent: Sunday, October 23, 2005 6:01 AM
To: eis@cleanwatercoalition.com
Subject: PLEASE DON'T DUMP THE WASTE WATER

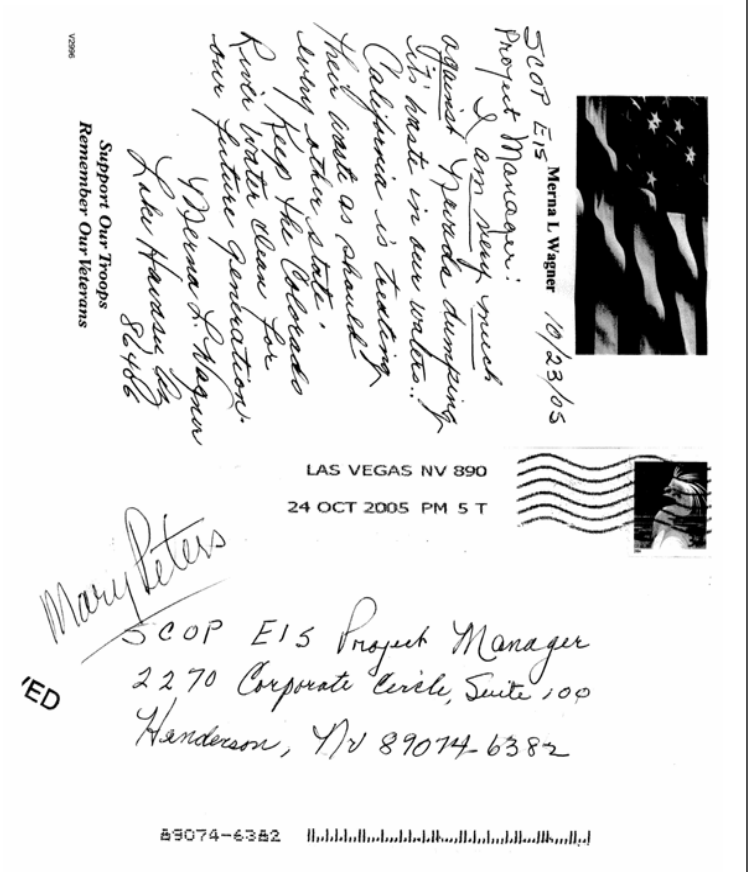
I7-1 THINK ABOUT OUR CHILDREN

THINK ABOUT OUR FUTURE EVEN WHEN WE ARE GONE

## Response I7 Jeanjcb2

### I7-1

Comment noted.




## Response I8 Merna L. Wagner

### I8-1

The wastewater treatment facilities in the Valley are some of the best in the nation--the quality of treatment is in the top 7 percent of wastewater treatment facilities in the nation.

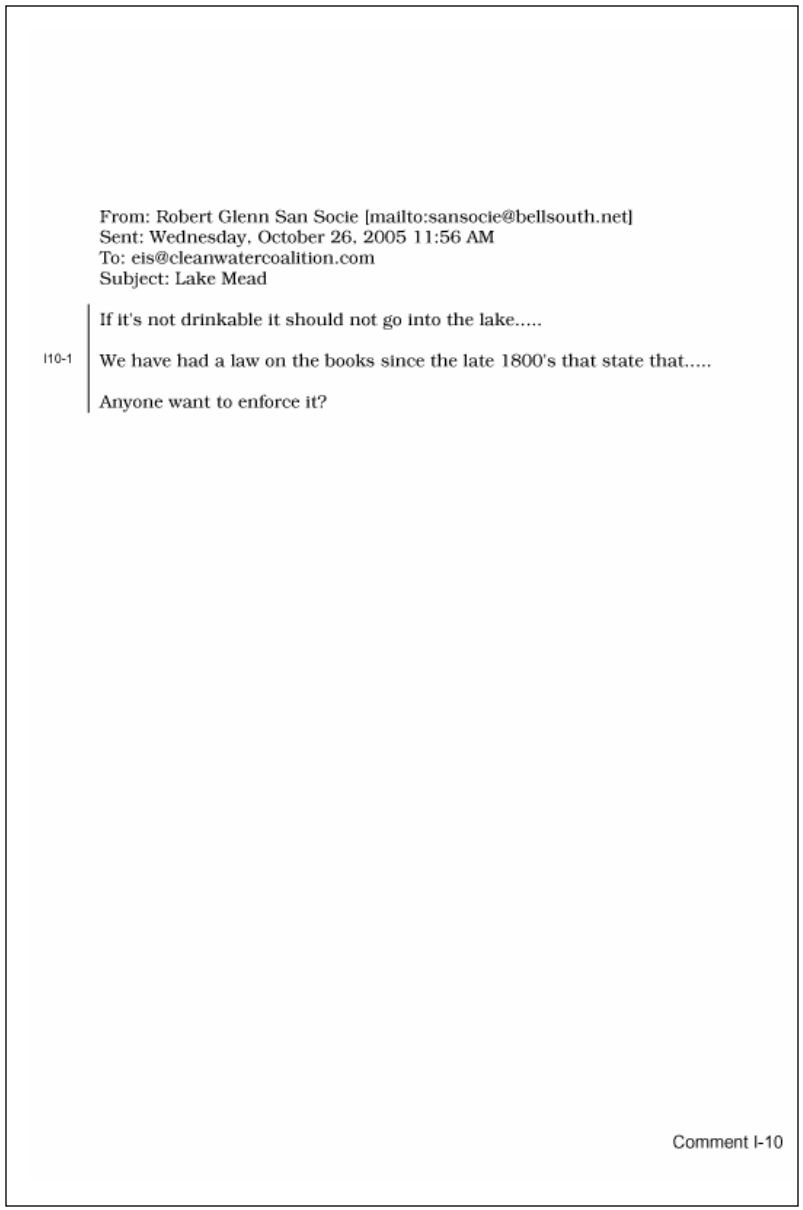
From: Bill McLeod [mailto:bmar@swiftwireless.net]
Sent: Sunday, October 23, 2005 2:40 PM
To: eis@cleanwatercoalition.com
Subject: treated water into Colorado River

I9-1 I am totally against the dumping of efluent into the Colorado River. We live in Lake Havasu City down river from Las Vegas and no one seems to know what effect this will have in the future. If it is so safe and acceptable why don't they just pipe it right into the Las Vegas water supply especially into all the new casinos.

## Response I9 Bill McLeod

### I9-1

Comment noted.



From: Robert Glenn San Socie [mailto:sansocie@bellsouth.net]
Sent: Wednesday, October 26, 2005 11:56 AM
To: eis@cleanwatercoalition.com
Subject: Lake Mead

If it's not drinkable it should not go into the lake.....

I10-1 We have had a law on the books since the late 1800's that state that.....

Anyone want to enforce it?

Comment I-10

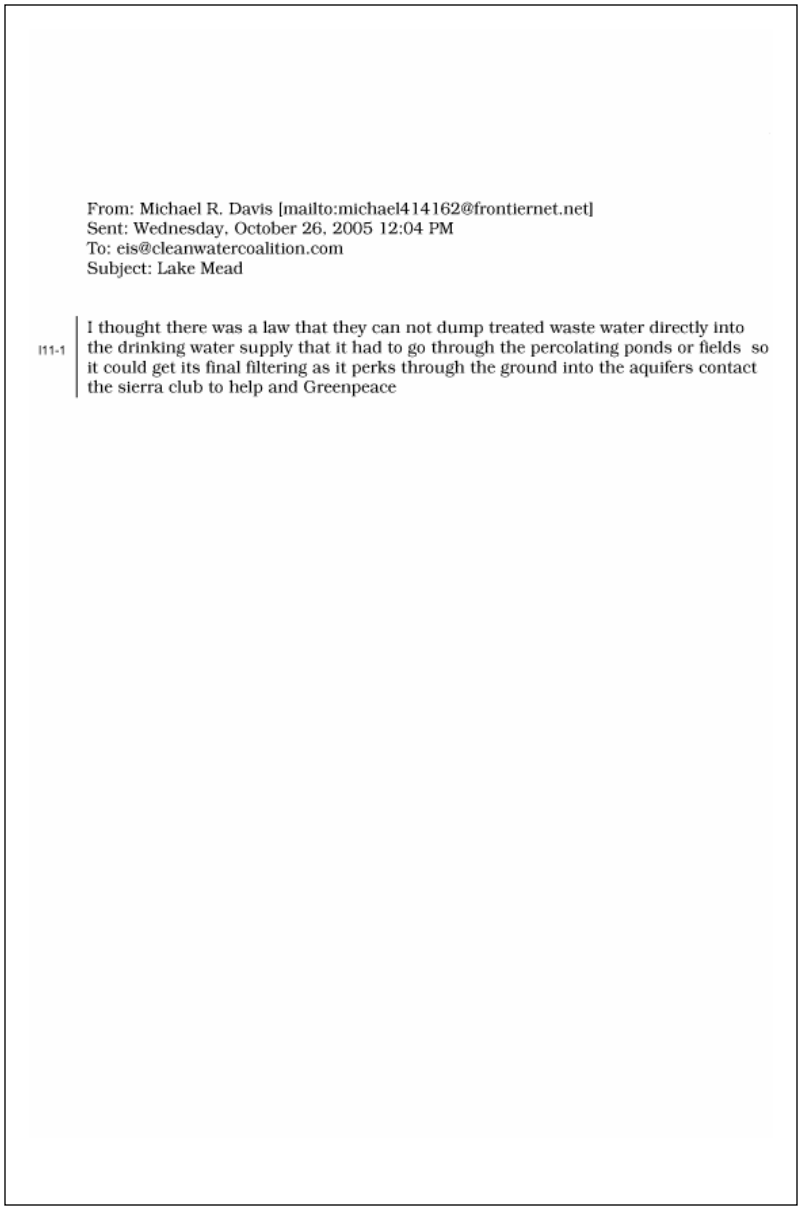
## Response I10 Robert Glenn

### I10-1

Treated wastewater from the Valley has been treated and discharged to Lake Mead via the Las Vegas Wash since 1956. Treated wastewater flows will continue to be discharged to Lake Mead, even under the No Action Alternative.

The following sentence has been added to Section 1.1: "Treated wastewater has been discharged to the Las Vegas Wash since 1956."

The CWA allows for discharges of municipal wastewater to surface waters, so long as they comply with stringent requirements. The CWA imposes minimum treatment requirements on all municipal treatment plants. It imposes additional requirements to make sure discharges into receiving waters do not exceed the natural assimilative capacity of those waters. For Lake Mead, the NDEP has imposed additional requirements for phosphorus and ammonia to protect Lake Mead. The plants operated by the COH, City of Las Vegas (CLV), and CCWRD meet these requirements and go beyond them to provide a very high level of treatment. In addition, lakes naturally assimilate discharges and provide natural purification and removal of many substances. These processes are similar in some ways to the natural treatment processes that take place when wastewater is spread on land and allowed to percolate through the soil, and be assimilated by beneficial microbes, before it passes into groundwater used as a source of drinking water. The entities simulate this process in part by filtering their wastewater through beds of sand and other materials, and by subjecting the wastewater to intense microbial treatment. The Lake provides additional natural assimilation.



From: Michael R. Davis [mailto:michael414162@frontiernet.net]
Sent: Wednesday, October 26, 2005 12:04 PM
To: eis@cleanwatercoalition.com
Subject: Lake Mead

I11-1 I thought there was a law that they can not dump treated waste water directly into the drinking water supply that it had to go through the percolating ponds or fields so it could get its final filtering as it perks through the ground into the aquifers contact the sierra club to help and Greenpeace

## **Response I11** Michael R. Davis

### I11-1

The Rivers & Harbors Act passed in 1899 authorized the USACE to issue permits regulating discharges of materials that might interfere with navigation. Since 1972 discharges of municipal wastewater have been regulated by the CWA, which authorizes EPA and State agencies to issue NPDES permits. The NDEP has been delegated authority to issue NPDES permits, and has issued permits to the COH, CLV, and CCWRD. These entities, which have been discharging treated wastewater to Las Vegas Wash since the 1950s, provide a very high level of wastewater treatment.

From: Steven.Taylor@SCE.com [mailto:Steven.Taylor@SCE.com]
Sent: Wednesday, October 26, 2005 1:12 PM
To: eis@cleanwatercoalition.com
Subject: contamination

NO ABSOLUTELY NO WASTE WATER SHOULD BE DUMPED INTO ANY NATURAL WATER SHED .

I12-1 LAS VEGAS and others are dumping to much badly treated waste in to the water shed . You still have not cleaned up Las Vegas wash from years of polluting it and now you want to hide it by dumping it deeper and further out in to the lake . VERY BAD IDEA AND UNETHICAL . We know that it is a cheap way to get more water by returning badly treated waste to the lake .
You should have more common courtesy for your neighbors down stream .

## Response I12 Steven Taylor

### I12-1

The wastewater treatment facilities in the Valley are some of the best in the nation--the quality of treatment is in the top 7 percent of wastewater treatment facilities in the nation.

Treated wastewater from the Valley has been treated and discharged to Lake Mead via the Las Vegas Wash since 1956. Treated wastewater flows will continue to be discharged to Lake Mead, even under the No Action Alternative.

The following sentence has been added to Section 1.1: “Treated wastewater has been discharged to the Las Vegas Wash since 1956.”

From: Carol Mayer [mailto:mayerca@sbcglobal.net]
Sent: Wednesday, October 26, 2005 6:52 PM
To: eis@cleanwatercoalition.com
Subject: Waste Water

I13-1 I am resident of Laguna Niguel, California and have a home in Lake Havasu, Arizona as well. I do not want waste water dumped in the Colorado River.

Mrs. Carol Mayer
27935 Loretha Lane
Laguna Niguel, CA 92677
Phone 949 831-3295

## Response I13 Carol Mayer

### I13-1

See response to comment L1-5.

From: Carol Mayer [mailto:mayerca@sbcglobal.net]
Sent: Wednesday, October 26, 2005 8:08 PM
To: eis@cleanwatercoalition.com
Subject: Waste Water

Supervisor Buster Johnson

I14-1 Please keep up your work against waste water being dumped in Lake Mead (Colorado River). We are downstream from Lake Mead and are totally against this for any reason. There are some areas that have growth limitations - limits on building until they have enough water. We also need limitations on building until we can figure out how to get rid of waste water safely.

Mrs. Mayer
375 London Bridge Rd. #24
Lake Havasu City, AZ 86403
Phone 949 831-3295

## Response I14 Carol Mayer (2)

### I14-1

Comment noted.

From: mayerjg [mailto:mayerjg@sbcglobal.net]
Sent: Wednesday, October 26, 2005 7:32 PM
To: eis@cleanwatercoalition.com
Subject: Effluent into Lake Mead

I15-1 I agree with Supervisor Johnston's reason on why effluent SHOULD NOT be dumped into Lake Mead.
There are thousands of square miles of desert for this effluent to percolate into that could be used at some future date to allow the Las Vegas are to expand.

DOWN RIVER RESIDENT

## Response I15 MayerJG

### I15-1

See response to comment I2-1.

From: jacquelyn [mailto:riverbrat@citlink.net]
Sent: Wednesday, October 26, 2005 9:54 PM
To: eis@cleanwatercoalition.com
Subject: wastewater wishes

I16-1 I am a junior at River Valley high school, taking a Ecology class and I think that the treated wastewater should be used on parks, golf courses and residences. I know that there is still alot of wastewater left over but if we re-use the water we will still be getting rid of most of it. I don't know alot about what can or can't be done but maybe we could re-use half and than maybe dumping half. Thank you

## Response I16 Jacquelyn

### I16-1

See General Response 2.

From: Sam Gay [mailto:sgkc@frontiernet.net]
Sent: Thursday, October 27, 2005 11:18 PM
To: jripplinger@cleanwatercoalition.com
Cc: sgkc@frontier.net
Subject: my opinion on lake meid

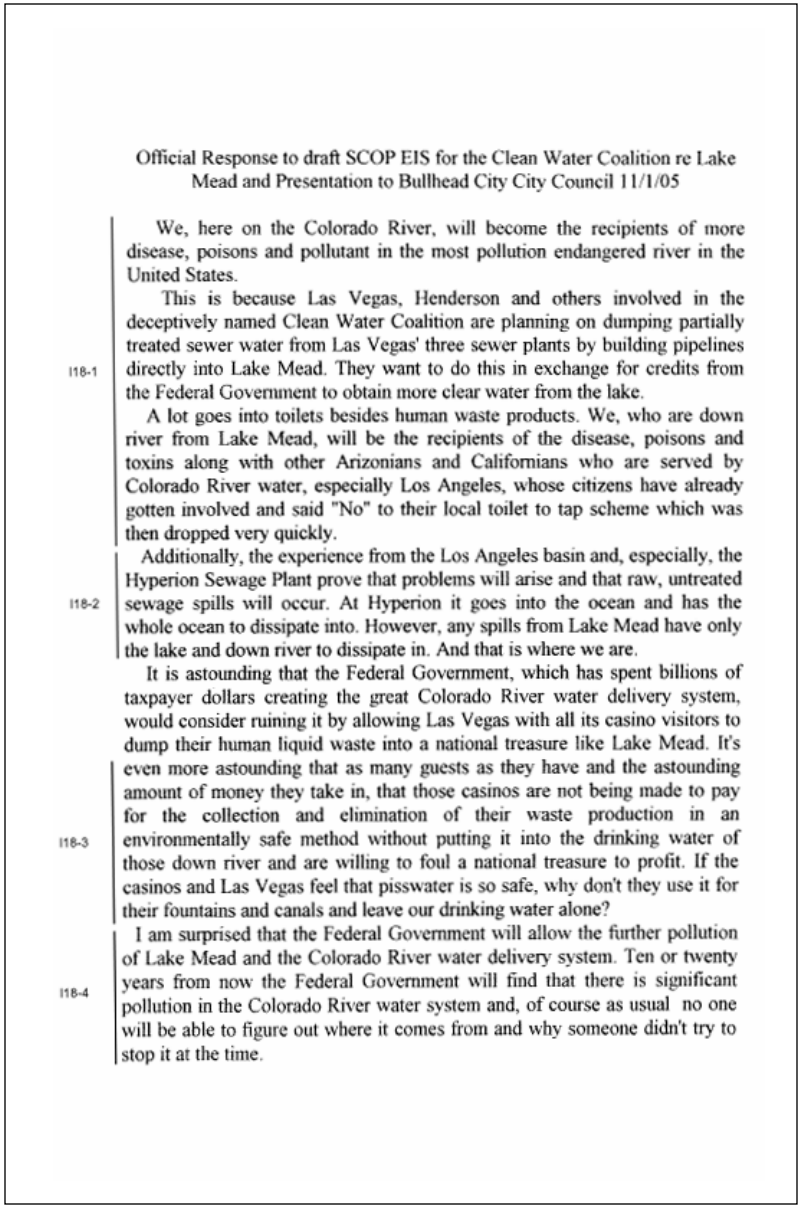
I17-1 I think that dumping waste water into lake mede is a dangerous thing to do to the environment and the animals in it. I hope they decide not to dump anymore wastewater in to the lake because people, animals, and plants could get sick. There are other ways of disposing of wastewater so it doesnt effect the envoronment and that should be taken to full advantage. I hope my opinion has brought some sort of insight on the issue. thank you for your time and letting me e-mail my opinion.

## Response I17 Sam Gay

### I17-1

See response to comment L1-5.

To meet the purpose and need for this project, many alternatives were considered. However, as described in Section 2.6, most of these alternatives were eliminated from further consideration because they do not meet the purpose and need for the project or because they result in significant environmental impacts.



Official Response to draft SCOP EIS for the Clean Water Coalition re Lake Mead and Presentation to Bullhead City City Council 11/1/05

We, here on the Colorado River, will become the recipients of more disease, poisons and pollutant in the most pollution endangered river in the United States.

This is because Las Vegas, Henderson and others involved in the deceptively named Clean Water Coalition are planning on dumping partially treated sewer water from Las Vegas' three sewer plants by building pipelines directly into Lake Mead. They want to do this in exchange for credits from the Federal Government to obtain more clear water from the lake. I18-1

A lot goes into toilets besides human waste products. We, who are down river from Lake Mead, will be the recipients of the disease, poisons and toxins along with other Arizonians and Californians who are served by Colorado River water, especially Los Angeles, whose citizens have already gotten involved and said "No" to their local toilet to tap scheme which was then dropped very quickly.

Additionally, the experience from the Los Angeles basin and, especially, the Hyperion Sewage Plant prove that problems will arise and that raw, untreated sewage spills will occur. At Hyperion it goes into the ocean and has the whole ocean to dissipate into. However, any spills from Lake Mead have only the lake and down river to dissipate in. And that is where we are. I18-2

It is astounding that the Federal Government, which has spent billions of taxpayer dollars creating the great Colorado River water delivery system, would consider ruining it by allowing Las Vegas with all its casino visitors to dump their human liquid waste into a national treasure like Lake Mead. It's even more astounding that as many guests as they have and the astounding amount of money they take in, that those casinos are not being made to pay for the collection and elimination of their waste production in an environmentally safe method without putting it into the drinking water of those down river and are willing to foul a national treasure to profit. If the casinos and Las Vegas feel that pisswater is so safe, why don't they use it for their fountains and canals and leave our drinking water alone? I18-3

I am surprised that the Federal Government will allow the further pollution of Lake Mead and the Colorado River water delivery system. Ten or twenty years from now the Federal Government will find that there is significant pollution in the Colorado River water system and, of course as usual no one will be able to figure out where it comes from and why someone didn't try to stop it at the time. I18-4

## Response I18 Martin Koppel

### I18-1

See response to comment I12-1.

### I18-2

See response to comment E1-6.

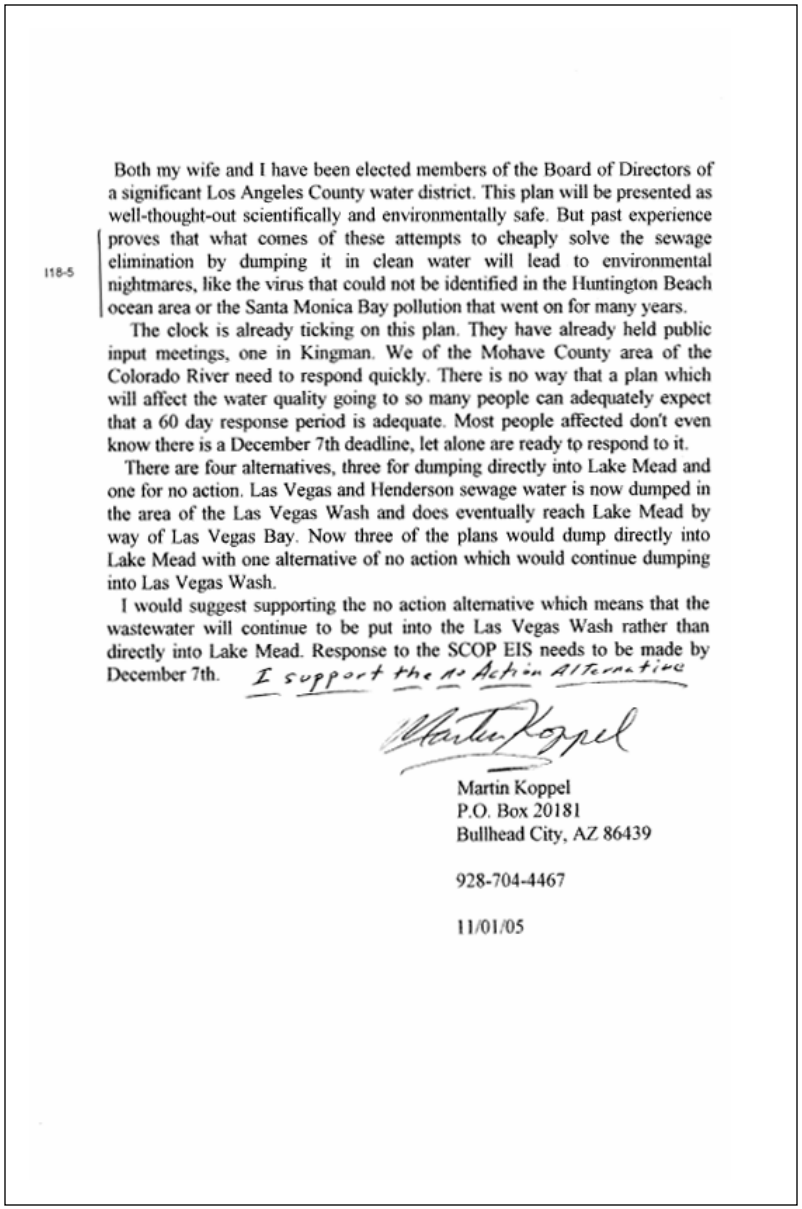
### I18-3

The wastewater treatment facilities in the Valley are some of the best in the nation--the quality of treatment is in the top 7 percent of wastewater treatment facilities in the nation.

See General Response 2.

### I18-4

See response to comment L1-5.



Both my wife and I have been elected members of the Board of Directors of a significant Los Angeles County water district. This plan will be presented as well-thought-out scientifically and environmentally safe. But past experience proves that what comes of these attempts to cheaply solve the sewage elimination by dumping it in clean water will lead to environmental nightmares, like the virus that could not be identified in the Huntington Beach ocean area or the Santa Monica Bay pollution that went on for many years.

I18-5

The clock is already ticking on this plan. They have already held public input meetings, one in Kingman. We of the Mohave County area of the Colorado River need to respond quickly. There is no way that a plan which will affect the water quality going to so many people can adequately expect that a 60 day response period is adequate. Most people affected don't even know there is a December 7th deadline, let alone are ready to respond to it.

There are four alternatives, three for dumping directly into Lake Mead and one for no action. Las Vegas and Henderson sewage water is now dumped in the area of the Las Vegas Wash and does eventually reach Lake Mead by way of Las Vegas Bay. Now three of the plans would dump directly into Lake Mead with one alternative of no action which would continue dumping into Las Vegas Wash.

I would suggest supporting the no action alternative which means that the wastewater will continue to be put into the Las Vegas Wash rather than directly into Lake Mead. Response to the SCOP EIS needs to be made by December 7th. I support the No Action Alternative

Martin Koppel

Martin Koppel
P.O. Box 20181
Bullhead City, AZ 86439

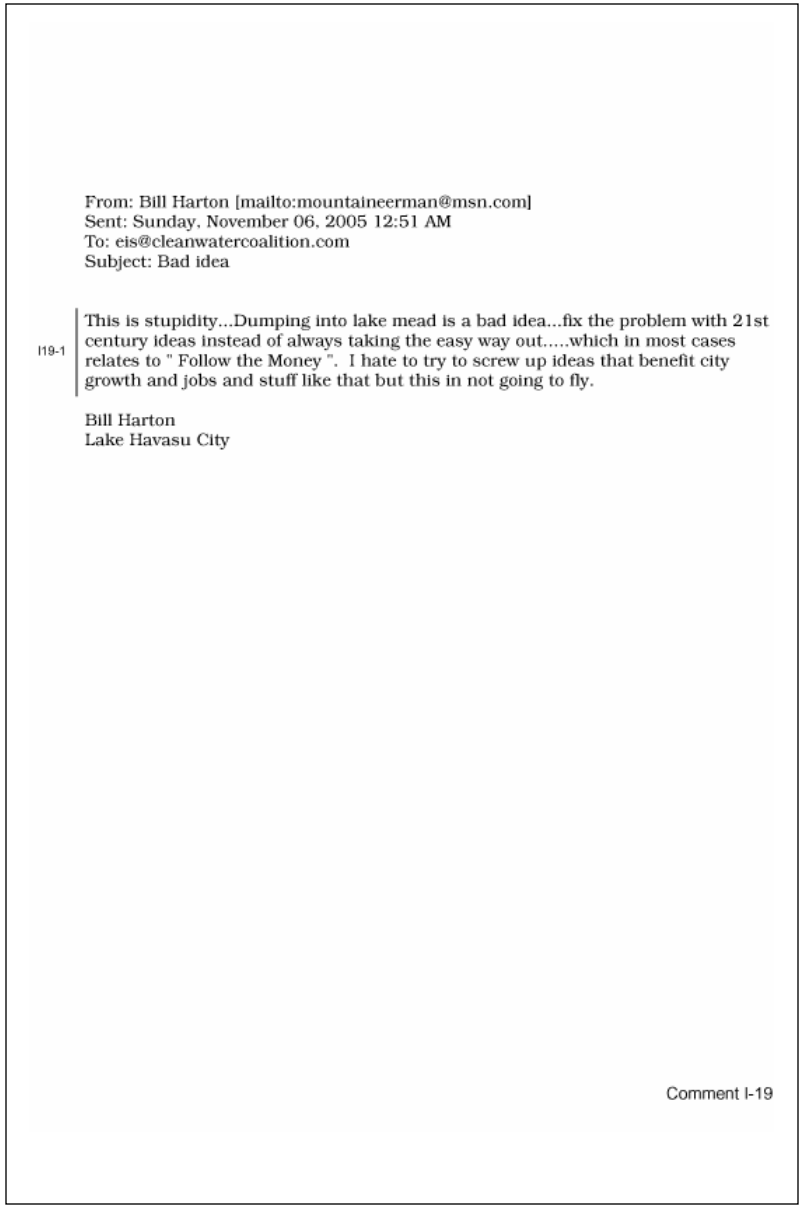
928-704-4467

11/01/05

**I18-5**

Comment noted.

It is important to note that none of the alternatives for managing the increasing Valley treated wastewater is "cheap" for the residents of southern Nevada.



From: Bill Harton [mailto:mountaineerman@msn.com]
Sent: Sunday, November 06, 2005 12:51 AM
To: eis@cleanwatercoalition.com
Subject: Bad idea

I19-1 This is stupidity...Dumping into lake mead is a bad idea...fix the problem with 21st century ideas instead of always taking the easy way out.....which in most cases relates to " Follow the Money ". I hate to try to screw up ideas that benefit city growth and jobs and stuff like that but this in not going to fly.

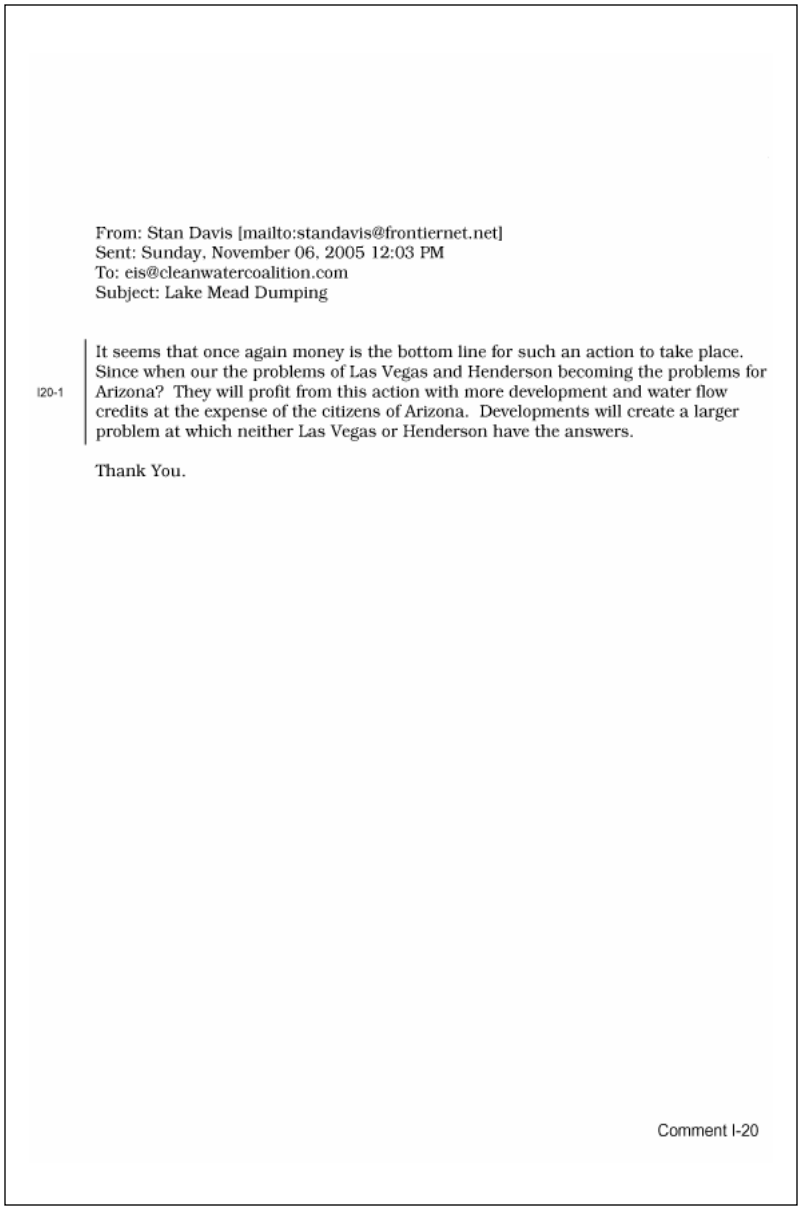
Bill Harton
Lake Havasu City

Comment I-19

## Response I19 Bill Harton

### I19-1

See response to comment L1-5.



From: Stan Davis [mailto:standavis@frontiernet.net]
Sent: Sunday, November 06, 2005 12:03 PM
To: eis@cleanwatercoalition.com
Subject: Lake Mead Dumping

I20-1 It seems that once again money is the bottom line for such an action to take place. Since when our the problems of Las Vegas and Henderson becoming the problems for Arizona? They will profit from this action with more development and water flow credits at the expense of the citizens of Arizona. Developments will create a larger problem at which neither Las Vegas or Henderson have the answers.

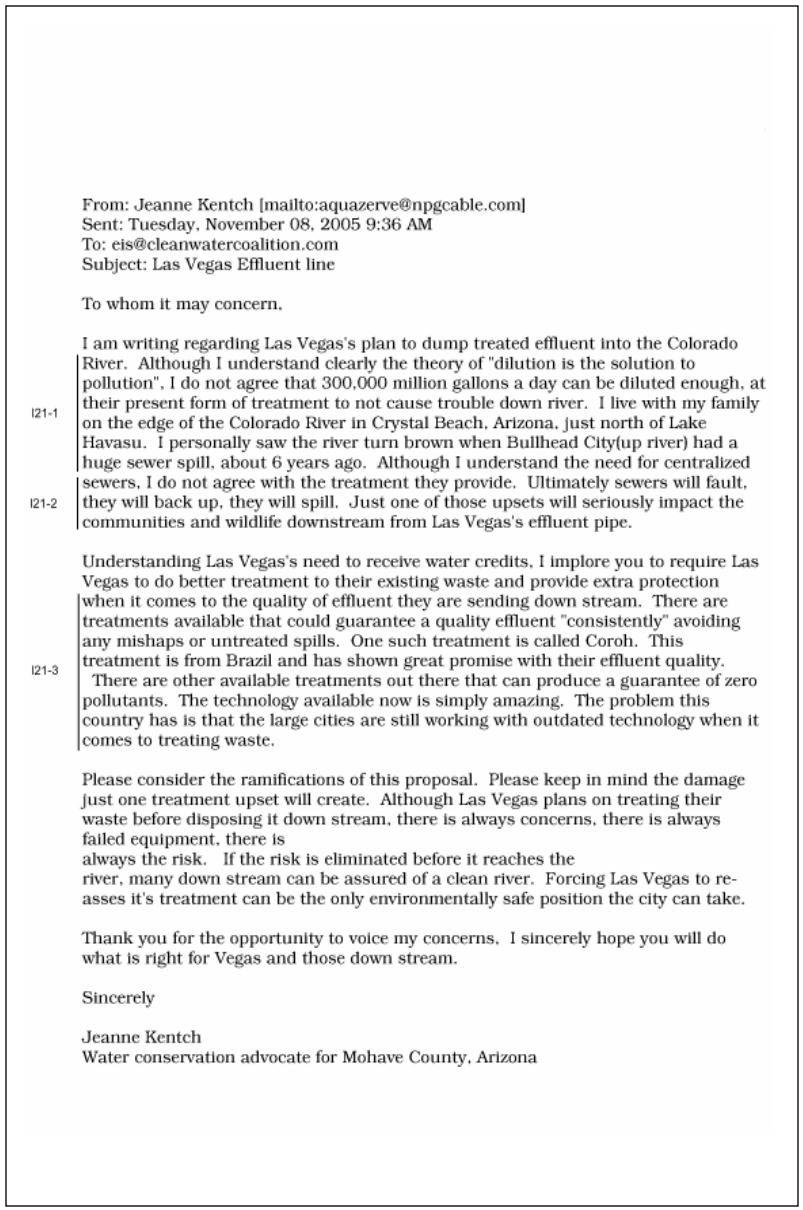
Thank You.

Comment I-20

## Response I20 Stan Davis

### I20-1

Comment noted.



From: Jeanne Kentch [mailto:aquazerve@npgcable.com]
Sent: Tuesday, November 08, 2005 9:36 AM
To: eis@cleanwatercoalition.com
Subject: Las Vegas Effluent line

To whom it may concern,

I21-1 I am writing regarding Las Vegas's plan to dump treated effluent into the Colorado River. Although I understand clearly the theory of "dilution is the solution to pollution", I do not agree that 300,000 million gallons a day can be diluted enough, at their present form of treatment to not cause trouble down river. I live with my family on the edge of the Colorado River in Crystal Beach, Arizona, just north of Lake Havasu. I personally saw the river turn brown when Bullhead City(up river) had a huge sewer spill, about 6 years ago. Although I understand the need for centralized sewers, I do not agree with the treatment they provide. Ultimately sewers will fault,
I21-2 they will back up, they will spill. Just one of those upsets will seriously impact the communities and wildlife downstream from Las Vegas's effluent pipe.

Understanding Las Vegas's need to receive water credits, I implore you to require Las Vegas to do better treatment to their existing waste and provide extra protection when it comes to the quality of effluent they are sending down stream. There are treatments available that could guarantee a quality effluent "consistently" avoiding any mishaps or untreated spills. One such treatment is called Coroh. This
I21-3 treatment is from Brazil and has shown great promise with their effluent quality. There are other available treatments out there that can produce a guarantee of zero pollutants. The technology available now is simply amazing. The problem this country has is that the large cities are still working with outdated technology when it comes to treating waste.

Please consider the ramifications of this proposal. Please keep in mind the damage just one treatment upset will create. Although Las Vegas plans on treating their waste before disposing it down stream, there is always concerns, there is always failed equipment, there is always the risk. If the risk is eliminated before it reaches the river, many down stream can be assured of a clean river. Forcing Las Vegas to re-asses it's treatment can be the only environmentally safe position the city can take.

Thank you for the opportunity to voice my concerns, I sincerely hope you will do what is right for Vegas and those down stream.

Sincerely

Jeanne Kentch
Water conservation advocate for Mohave County, Arizona

## Response I21 Jean Kentch

### I21-1

Three-hundred mgd of highly treated effluent diluted in the Colorado River flow results in a 30:1 dilution (based upon 1999-2003 average Hoover Dam outflow rate of 9,100 mgd).

The wastewater treatment facilities in the Valley are some of the best in the nation--the quality of treatment is in the top 7 percent of wastewater treatment facilities in the nation.

The water quality modeling conducted for the SCOP Boulder Islands alternatives indicates that dilution is sufficient for meeting water quality standards in Lake Mead and the Lower Colorado River.

### I21-2

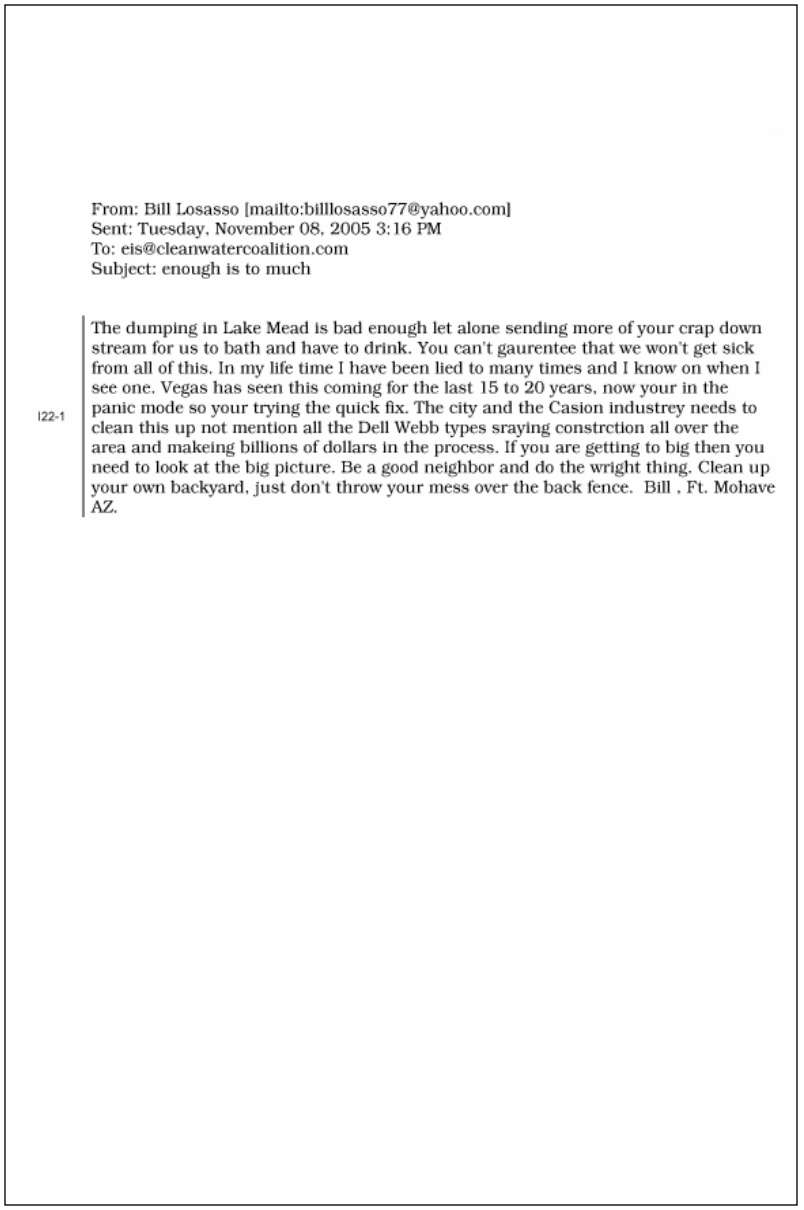
See response to comment E1-6.

### I21-3

See General Response 1.

The statement in the comment that “there are other available treatments out there that can produce a guarantee of zero pollutants” is incorrect. Many treatment processes produce byproducts that then need to be managed and disposed of properly. In some cases, the toxicology of these byproducts is unknown. Additionally, emerging compounds of concern have been identified, but because their toxicological properties are not yet known, it is incorrect to assume that there is a treatment process that will eliminate these compounds.

The engineers and wastewater treatment process specialists involved with SCOP are not familiar with the treatment technology noted in the comment. In addition, they are not aware of any installations using the technology in the U.S.



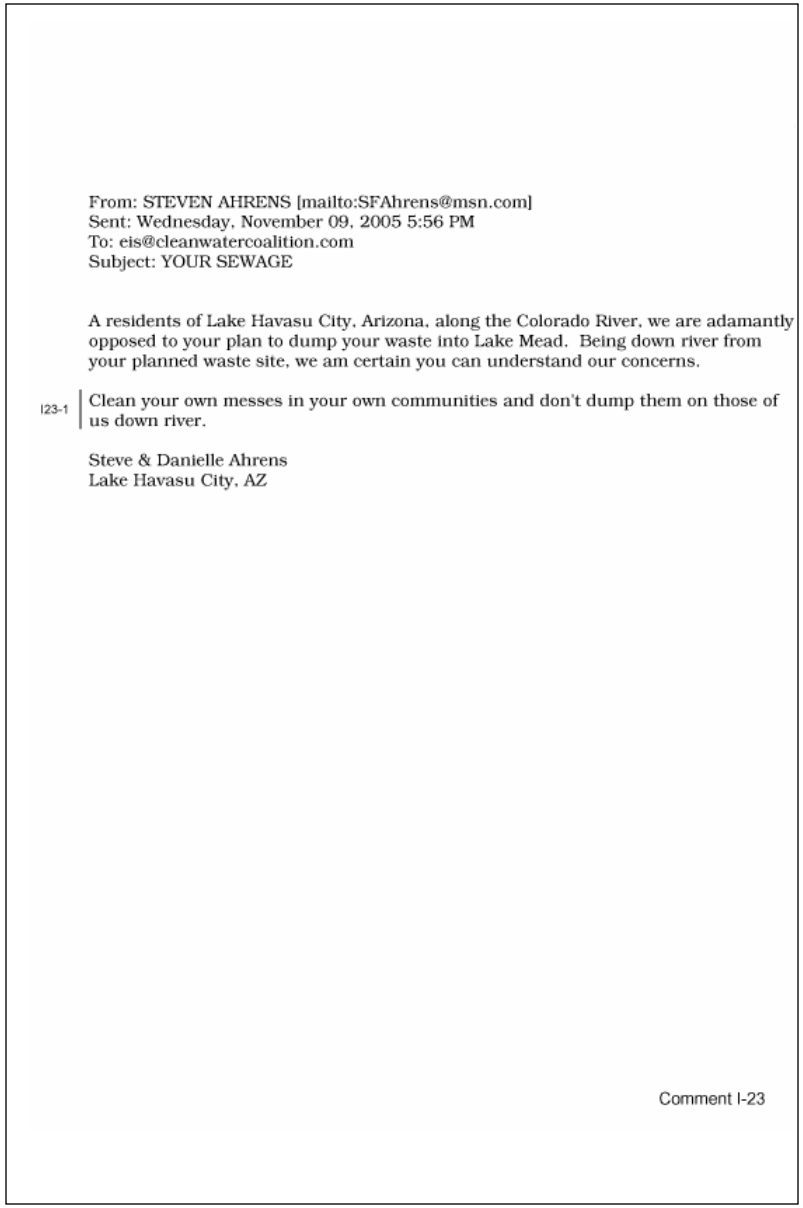
From: Bill Losasso [mailto:billlosasso77@yahoo.com]
Sent: Tuesday, November 08, 2005 3:16 PM
To: eis@cleanwatercoalition.com
Subject: enough is to much

I22-1 The dumping in Lake Mead is bad enough let alone sending more of your crap down stream for us to bath and have to drink. You can't gaurentee that we won't get sick from all of this. In my life time I have been lied to many times and I know on when I see one. Vegas has seen this coming for the last 15 to 20 years, now your in the panic mode so your trying the quick fix. The city and the Casion industrey needs to clean this up not mention all the Dell Webb types sraying constrction all over the area and makeing billions of dollars in the process. If you are getting to big then you need to look at the big picture. Be a good neighbor and do the wright thing. Clean up your own backyard, just don't throw your mess over the back fence. Bill , Ft. Mohave AZ.

## Response I22 Bill Losasso

### I22-1

See response to comment L1-5.



From: STEVEN AHRENS [mailto:SFAhrens@msn.com]
Sent: Wednesday, November 09, 2005 5:56 PM
To: eis@cleanwatercoalition.com
Subject: YOUR SEWAGE

A residents of Lake Havasu City, Arizona, along the Colorado River, we are adamantly opposed to your plan to dump your waste into Lake Mead. Being down river from your planned waste site, we am certain you can understand our concerns.

I23-1 Clean your own messes in your own communities and don't dump them on those of us down river.

Steve & Danielle Ahrens
Lake Havasu City, AZ

Comment I-23

## Response I23 Steven Ahrens

### I23-1

See response to comment L1-5.

From: Tom and Nan Nicoll [mailto:nicoll@citlink.net]
Sent: Friday, November 11, 2005 7:05 AM
To: eis@cleanwatercoalition.com
Subject: "Wastwater Treatment"

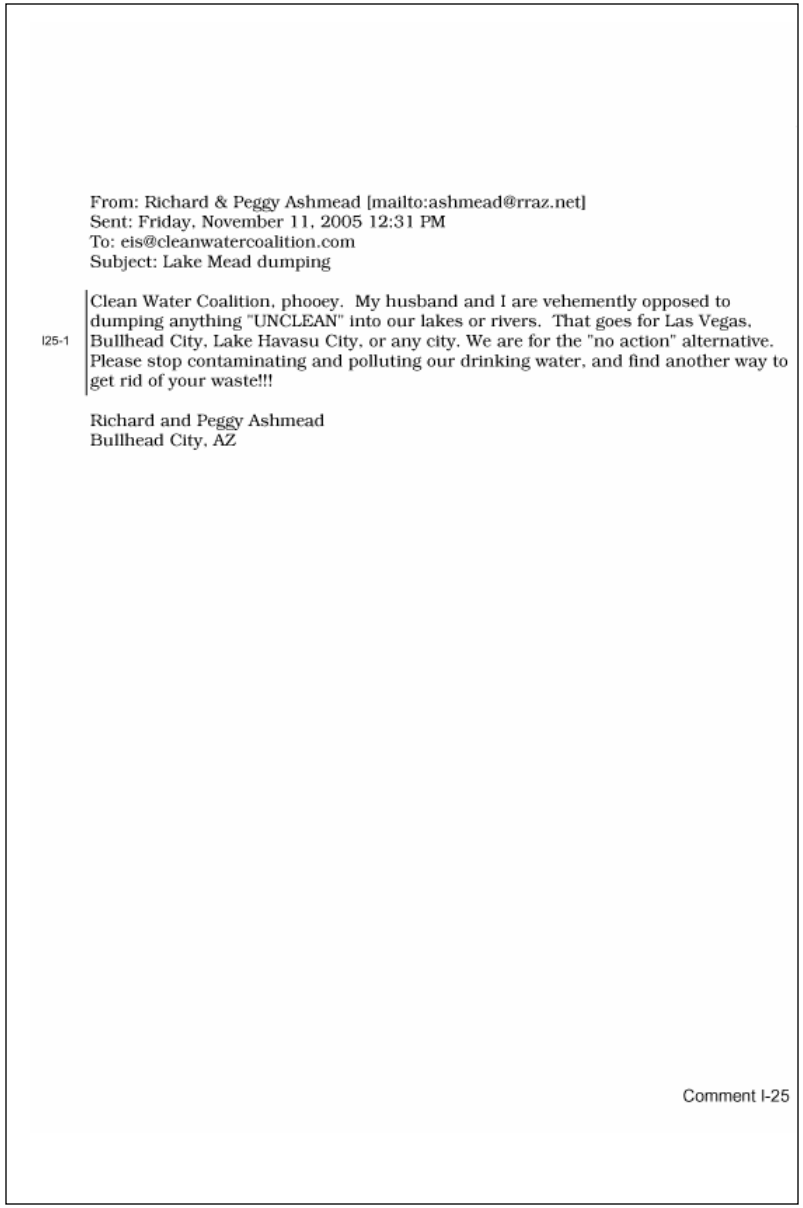
I24-1 I am supporting the "no action" alternative regarding dumping effluent into the Las Vegas Wash. By no means damage our river water by changing the method whereby this effluent is being processed. This will ensure that our river water will be protected against from pollution.

Nan Nicoll
4096 South Cassidy Court
Fort Mohave AZ 86426

## Response I24 Tom and Nan Nicoll

### I24-1

See response to comment L1-5.



From: Richard & Peggy Ashmead [mailto:ashmead@rraz.net]
Sent: Friday, November 11, 2005 12:31 PM
To: eis@cleanwatercoalition.com
Subject: Lake Mead dumping

I25-1 Clean Water Coalition, phooey. My husband and I are vehemently opposed to dumping anything "UNCLEAN" into our lakes or rivers. That goes for Las Vegas, Bullhead City, Lake Havasu City, or any city. We are for the "no action" alternative. Please stop contaminating and polluting our drinking water, and find another way to get rid of your waste!!!

Richard and Peggy Ashmead
Bullhead City, AZ

Comment I-25

## Response I25 Richard and Peggy Ashmead

### I25-1

See response to comment L1-5.

From: Bill & Judy [mailto:bnjkendrick@mohaveaz.com]
Sent: Friday, November 11, 2005 1:44 PM
To: eis@cleanwatercoalition.com
Subject: Protecting our river

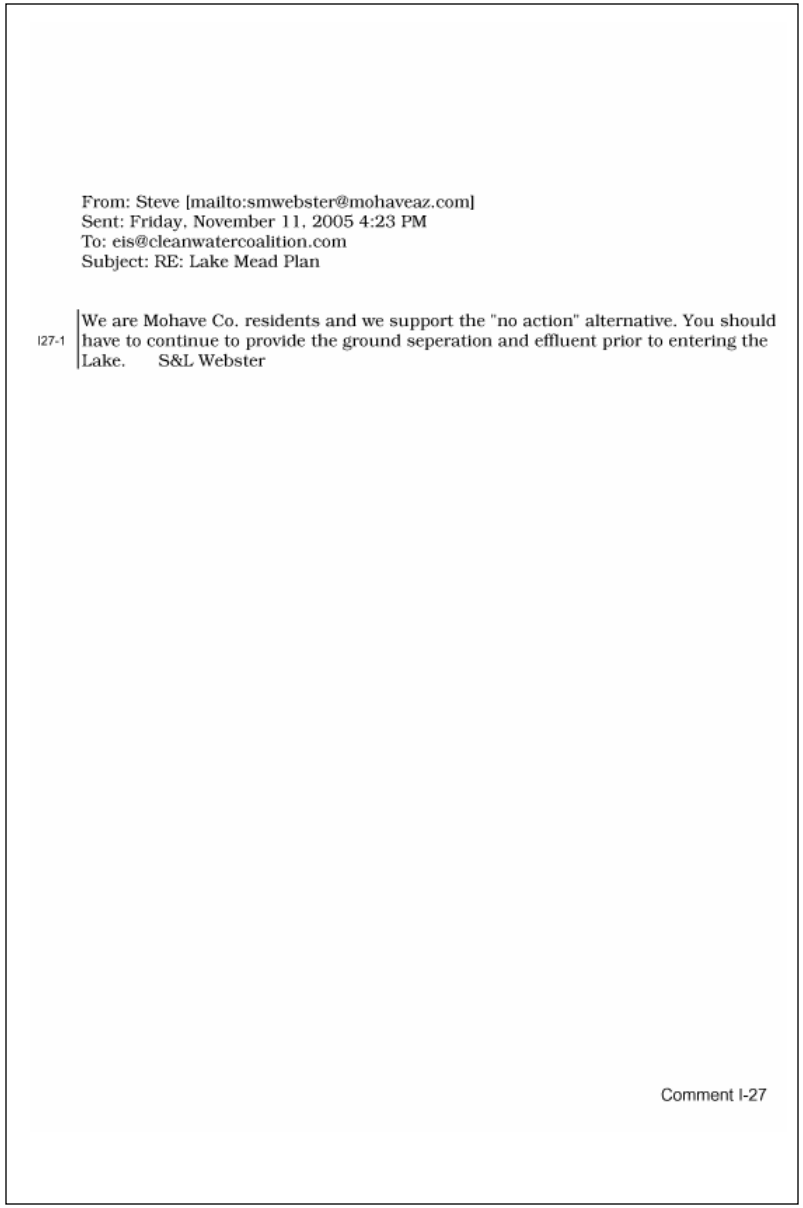
I26-1 With regard to the "no action" alternative - I totally support that. By no means should Las Vegas be able to discharge their effluent into the river that flows through our town. They have the money, let them figure out the problem...why don't developers or the City be responsible to figure that out, before all the building took place.

Judy and Bill Kendrick

## Response I26 Bill and Judy Kendrick

### I26-1

See response to comment L1-5.



From: Steve [mailto:smwebster@mohaveaz.com]
Sent: Friday, November 11, 2005 4:23 PM
To: eis@cleanwatercoalition.com
Subject: RE: Lake Mead Plan

I27-1 We are Mohave Co. residents and we support the "no action" alternative. You should have to continue to provide the ground seperation and effluent prior to entering the Lake. S&L Webster

Comment I-27

## Response I27 Steve Webster

### I27-1

See response to comment L1-5.

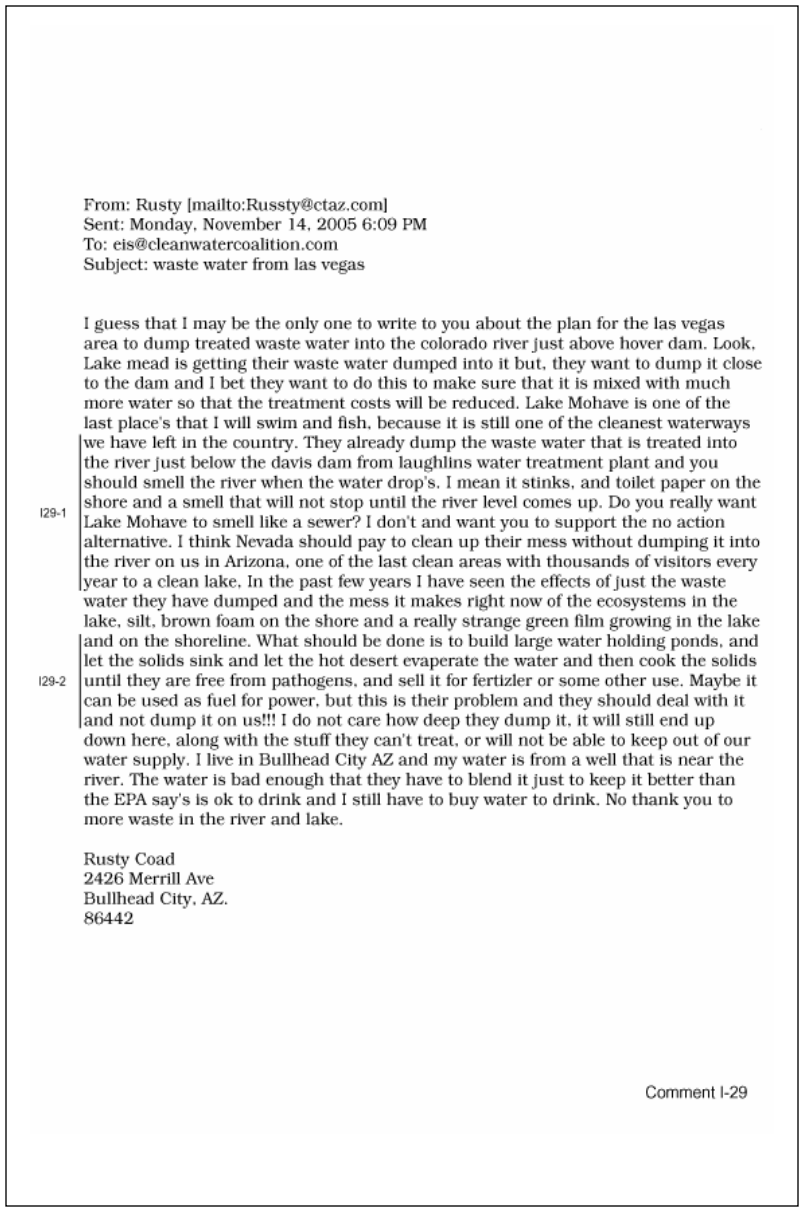
From: Bob & Joal [mailto:jwmugsy@frontiernet.net]
Sent: Monday, November 14, 2005 5:57 AM
To: eis@cleanwatercoalition.com
Subject: Lake Mead

I28-1 To whom it may concern, Recent articles in the Mojave Valley Daily News have prompted this response. As a resident of Bullhead City,Az.I feel it imperative that water flowing through my community be pure. I realize that in this present modern day and age we have treat our water to some degree but to deliberately contaminate it seems counter productive. I am especially upset that localities downstream of Lake Mead must endure water that is effected by the input of contaminates upstream. Environmental quality will surely be compromised by the deliberate input of the contaminants generated by the city of Las Vegas. W.R.Morrison jwmorris2004 @frontiernet.net

## Response I28 Bob and Joal Morrison

### I28-1

See response to comment L1-5.



From: Rusty [mailto:Russty@ctaz.com]
Sent: Monday, November 14, 2005 6:09 PM
To: eis@cleanwatercoalition.com
Subject: waste water from las vegas

I guess that I may be the only one to write to you about the plan for the las vegas area to dump treated waste water into the colorado river just above hover dam. Look, Lake mead is getting their waste water dumped into it but, they want to dump it close to the dam and I bet they want to do this to make sure that it is mixed with much more water so that the treatment costs will be reduced. Lake Mohave is one of the last place's that I will swim and fish, because it is still one of the cleanest waterways we have left in the country. They already dump the waste water that is treated into the river just below the davis dam from laughlins water treatment plant and you should smell the river when the water drop's. I mean it stinks, and toilet paper on the shore and a smell that will not stop until the river level comes up. Do you really want Lake Mohave to smell like a sewer? I don't and want you to support the no action alternative. I think Nevada should pay to clean up their mess without dumping it into the river on us in Arizona, one of the last clean areas with thousands of visitors every year to a clean lake. In the past few years I have seen the effects of just the waste water they have dumped and the mess it makes right now of the ecosystems in the lake, silt, brown foam on the shore and a really strange green film growing in the lake and on the shoreline. What should be done is to build large water holding ponds, and let the solids sink and let the hot desert evaperate the water and then cook the solids until they are free from pathogens, and sell it for fertizler or some other use. Maybe it can be used as fuel for power, but this is their problem and they should deal with it and not dump it on us!!! I do not care how deep they dump it, it will still end up down here, along with the stuff they can't treat, or will not be able to keep out of our water supply. I live in Bullhead City AZ and my water is from a well that is near the river. The water is bad enough that they have to blend it just to keep it better than the EPA say's is ok to drink and I still have to buy water to drink. No thank you to more waste in the river and lake.

I29-1

I29-2

Rusty Coad
2426 Merrill Ave
Bullhead City, AZ.
86442

Comment I-29

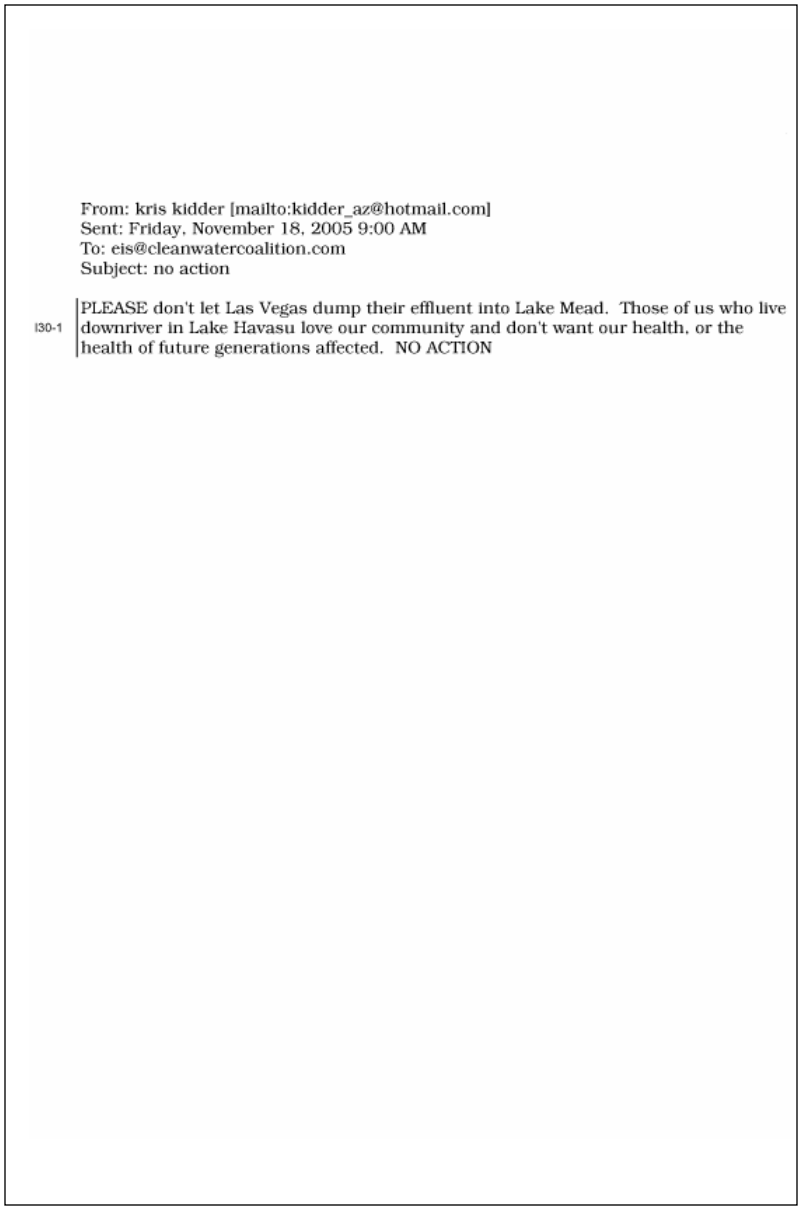
## Response I29 Rusty Coad

### I29-1

See response to comment L1-5.

### I29-2

See response to comment I2-1.



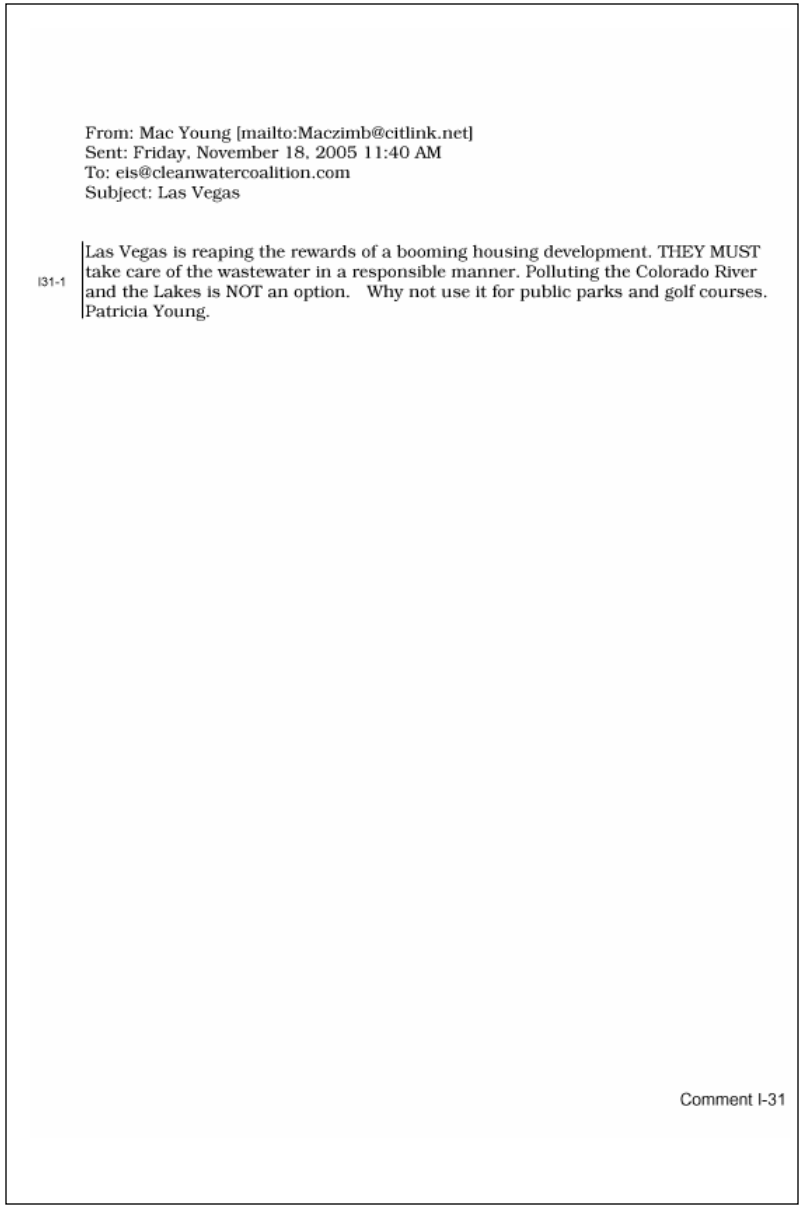
From: kris kidder [mailto:kidder_az@hotmail.com]
Sent: Friday, November 18, 2005 9:00 AM
To: eis@cleanwatercoalition.com
Subject: no action

I30-1 PLEASE don't let Las Vegas dump their effluent into Lake Mead. Those of us who live downriver in Lake Havasu love our community and don't want our health, or the health of future generations affected. NO ACTION

## Response I30 Kris Kidder

### I30-1

See response to comment L1-5.



From: Mac Young [mailto:Maczimb@citlink.net]
Sent: Friday, November 18, 2005 11:40 AM
To: eis@cleanwatercoalition.com
Subject: Las Vegas

I31-1 Las Vegas is reaping the rewards of a booming housing development. THEY MUST take care of the wastewater in a responsible manner. Polluting the Colorado River and the Lakes is NOT an option. Why not use it for public parks and golf courses. Patricia Young.

Comment I-31

## Response I31 Patricia Young

### I31-1

See response to comment L1-5.

See General Response 2.

From: Laura [mailto:panther57@npgcable.com]
Sent: Friday, November 18, 2005 4:57 PM
To: eis@cleanwatercoalition.com
Subject: Don't let Vegas pullute our water

To whom it may concern,

I am writing in opposition of Las Vegas being allowed to dump their effluent into Lake Mead at Boulder Island.

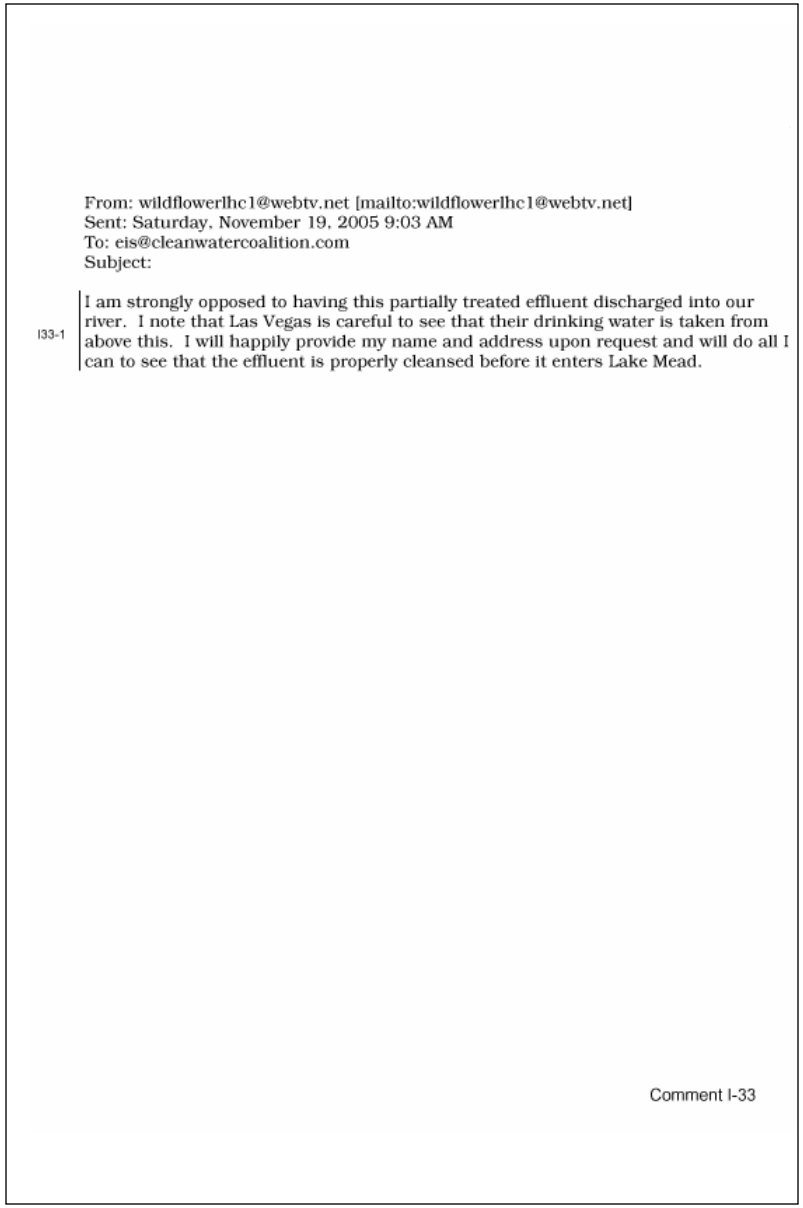
I32-1 I therefore, support the "no action" alternative.

Submitted by,
Laura L. Smith
Lake Havasu City, AZ
928-855-9360

## Response I32 Laura Smith

### I32-1

See response to comment L1-5.



From: wildflowerlhc1@webtv.net [mailto:wildflowerlhc1@webtv.net]
Sent: Saturday, November 19, 2005 9:03 AM
To: eis@cleanwatercoalition.com
Subject:

I33-1 I am strongly opposed to having this partially treated effluent discharged into our river. I note that Las Vegas is careful to see that their drinking water is taken from above this. I will happily provide my name and address upon request and will do all I can to see that the effluent is properly cleansed before it enters Lake Mead.

Comment I-33

## Response I33 Wildflowerlhc1

### I33-1

Comment noted.

From: wcwpmw [mailto:wcwpmw@rraz.net]
Sent: Sunday, November 20, 2005 10:12 AM
To: eis@cleanwatercoalition.com
Subject: Waste Water.

I34-1 | What a very bad idea dumping Las Vegas waste water in Lake Mead.

Bill and Pat Wallace
Lake Havasu AZ

## Response I34 Bill and Pat Wallace

### I34-1

See response to comment L1-5.

From: Sue [mailto:bvandme@uneedspeed.net]
Sent: Sunday, November 20, 2005 10:48 AM
To: eis@cleanwatercoalition.com
Subject: NO DUMPING IN LAKE MEAD

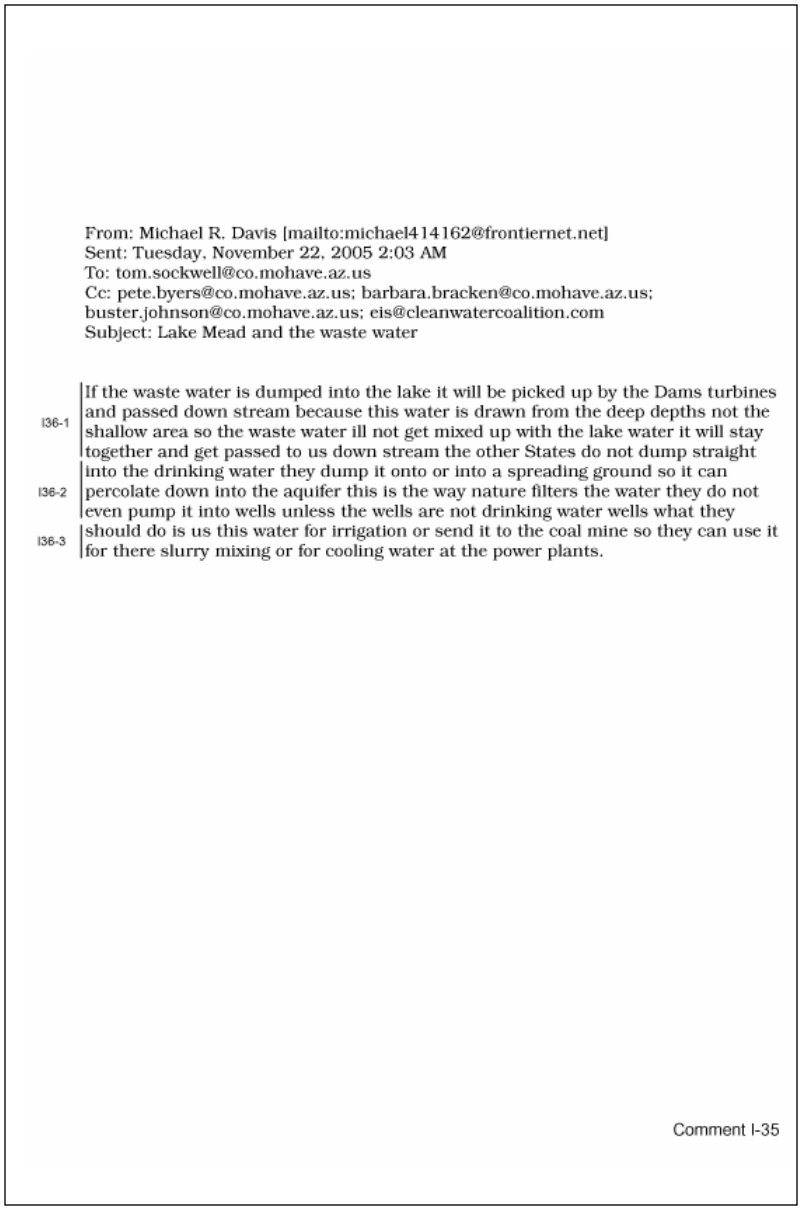
I35-1 I oppose vehemently the dumping of any effluent water from Las Vegas into Lake Mead. What more can I say!!!!!!!!

Bob Vessells
1770 Laramie Dr.
Lake Havasu City, AZ. 86404 928-854-2357

## Response I35 Bob Vessels

### I35-1

See response to comment L1-5.



From: Michael R. Davis [mailto:michael414162@frontiernet.net]
Sent: Tuesday, November 22, 2005 2:03 AM
To: tom.sockwell@co.mohave.az.us
Cc: pete.byers@co.mohave.az.us; barbara.bracken@co.mohave.az.us; buster.johnson@co.mohave.az.us; eis@cleanwatercoalition.com
Subject: Lake Mead and the waste water

I36-1 If the waste water is dumped into the lake it will be picked up by the Dams turbines and passed down stream because this water is drawn from the deep depths not the shallow area so the waste water ill not get mixed up with the lake water it will stay together and get passed to us down stream the other States do not dump straight into the drinking water they dump it onto or into a spreading ground so it can

I36-2 percolate down into the aquifer this is the way nature filters the water they do not even pump it into wells unless the wells are not drinking water wells what they

I36-3 should do is us this water for irrigation or send it to the coal mine so they can use it for there slurry mixing or for cooling water at the power plants.

Comment I-35

## Response I36 Michael R. Davis

### I36-1

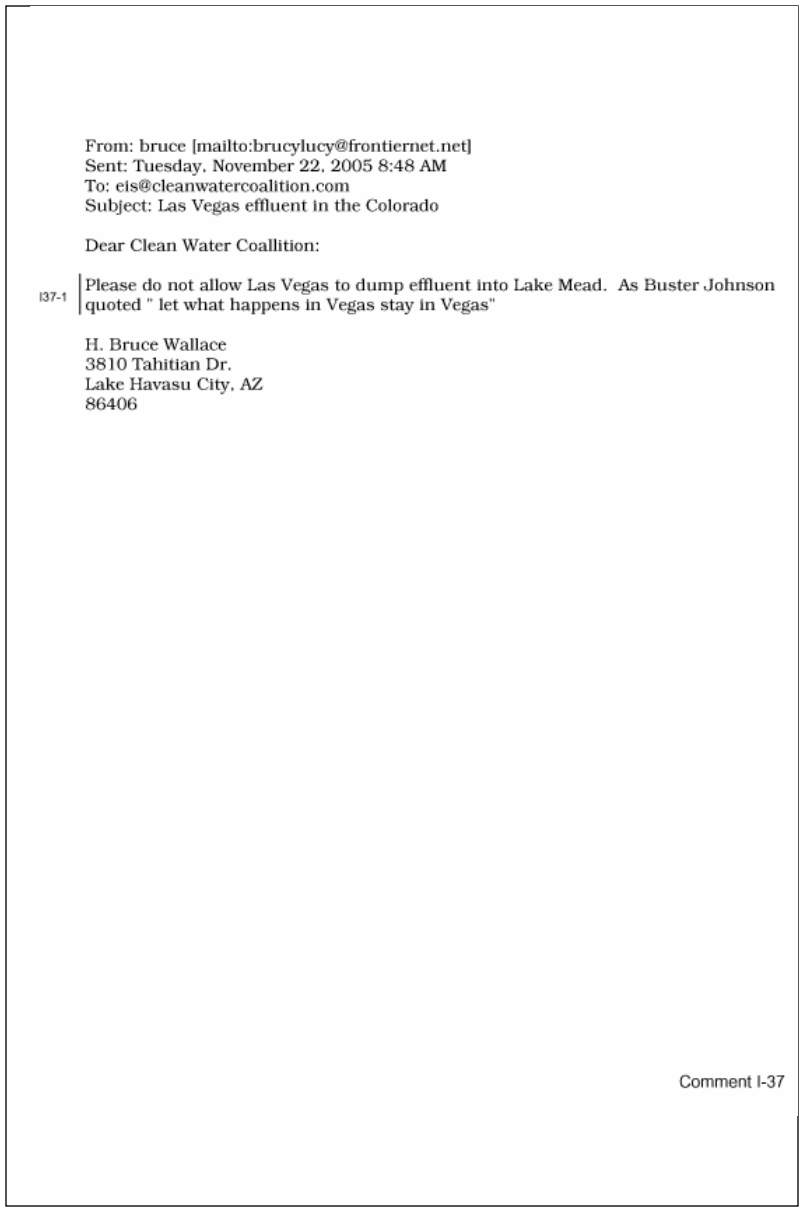
See response to comment E2-1.

### I36-2

As described in Section 1.4.1, return flow credits are extremely important to southern Nevada. Therefore, any alternative that reduces or eliminates Nevada's ability to earn return flow credits, such as evaporation of wastewater, does not meet the purpose and need for the project and is not considered a reasonable alternative.

### I36-3

See General Response 2.



From: bruce [mailto:brucylucy@frontiernet.net]
Sent: Tuesday, November 22, 2005 8:48 AM
To: eis@cleanwatercoalition.com
Subject: Las Vegas effluent in the Colorado

Dear Clean Water Coallition:

I37-1 Please do not allow Las Vegas to dump effluent into Lake Mead. As Buster Johnson quoted " let what happens in Vegas stay in Vegas"

H. Bruce Wallace
3810 Tahitian Dr.
Lake Havasu City, AZ
86406

Comment I-37

## Response I37 H. Bruce Wallace

### I37-1

See response to comment L1-5.

From: John [mailto:jwscully@conectus.com]
Sent: Tuesday, November 22, 2005 10:17 AM
To: eis@cleanwatercoalition.com
Subject: Waste Water

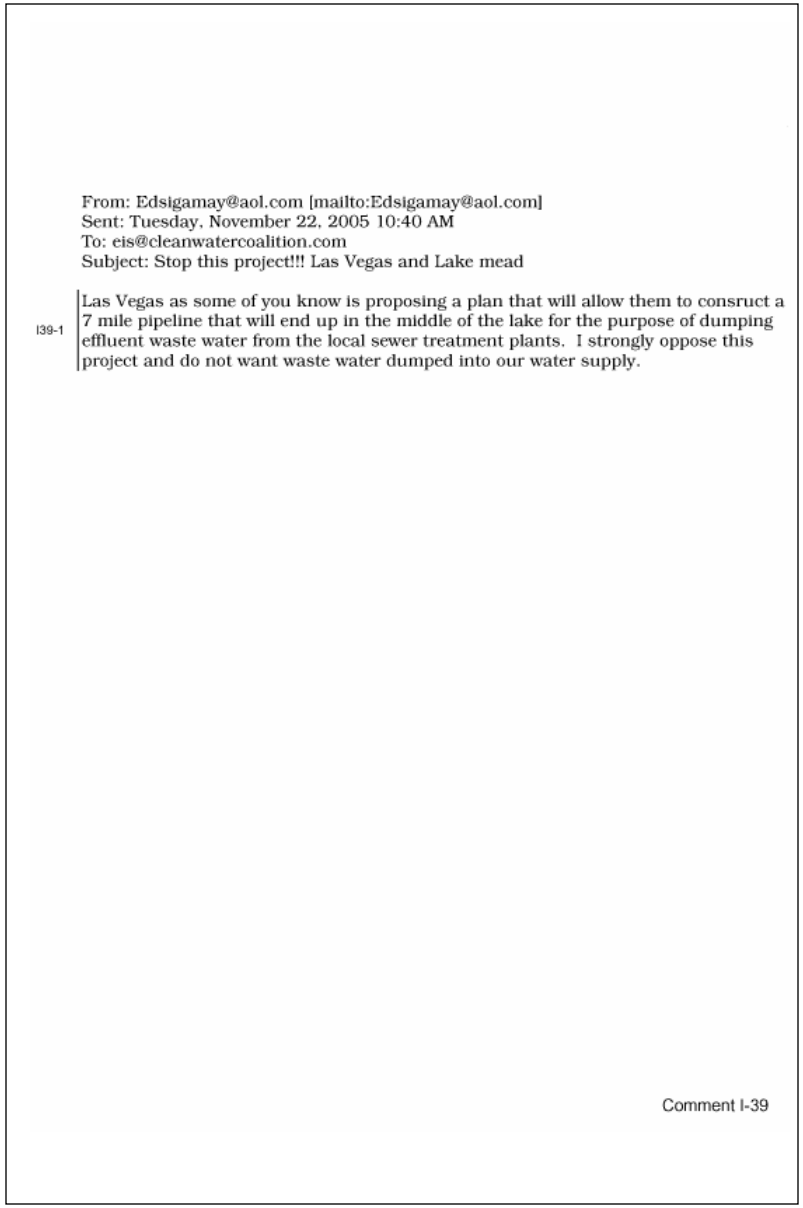
I38-1 I don't want waste water dumped into Lake Mead, this is our family playground. I oppose this project!

John Scully

## Response I38 John Scully

### I38-1

See response to comment L1-5.



From: Edsigamay@aol.com [mailto:Edsigamay@aol.com]
Sent: Tuesday, November 22, 2005 10:40 AM
To: eis@cleanwatercoalition.com
Subject: Stop this project!!! Las Vegas and Lake mead

I39-1 Las Vegas as some of you know is proposing a plan that will allow them to consruct a 7 mile pipeline that will end up in the middle of the lake for the purpose of dumping effluent waste water from the local sewer treatment plants. I strongly oppose this project and do not want waste water dumped into our water supply.

Comment I-39

## Response I39 Edsigamay

### I39-1

See response to comment L1-5.

From: Dan H. [mailto:danyz125@yahoo.com]
Sent: Thursday, November 24, 2005 11:53 AM
To: eis@cleanwatercoalition.com
Subject: Lake Mead

I40-1 I am writing to ask to you to not install the pipeline that will dump treated waste water in Lake Mead. I have been going there for 30 years because of the beauty and quality of water. I am a third generation "Lake Meader". I have 5 younger siblings and we all plan to bring our children to Mead like our parents and grandparents have. However, if the quality of the water is compromised, we will not return. I currently spend 12-15 weekends a year at Lake Mead and spend a substantial amount of money in your county. Please consider what impact myself and others not coming will do to your economy, but more importantly, what impact this will have on our delicate environment. Thank you.

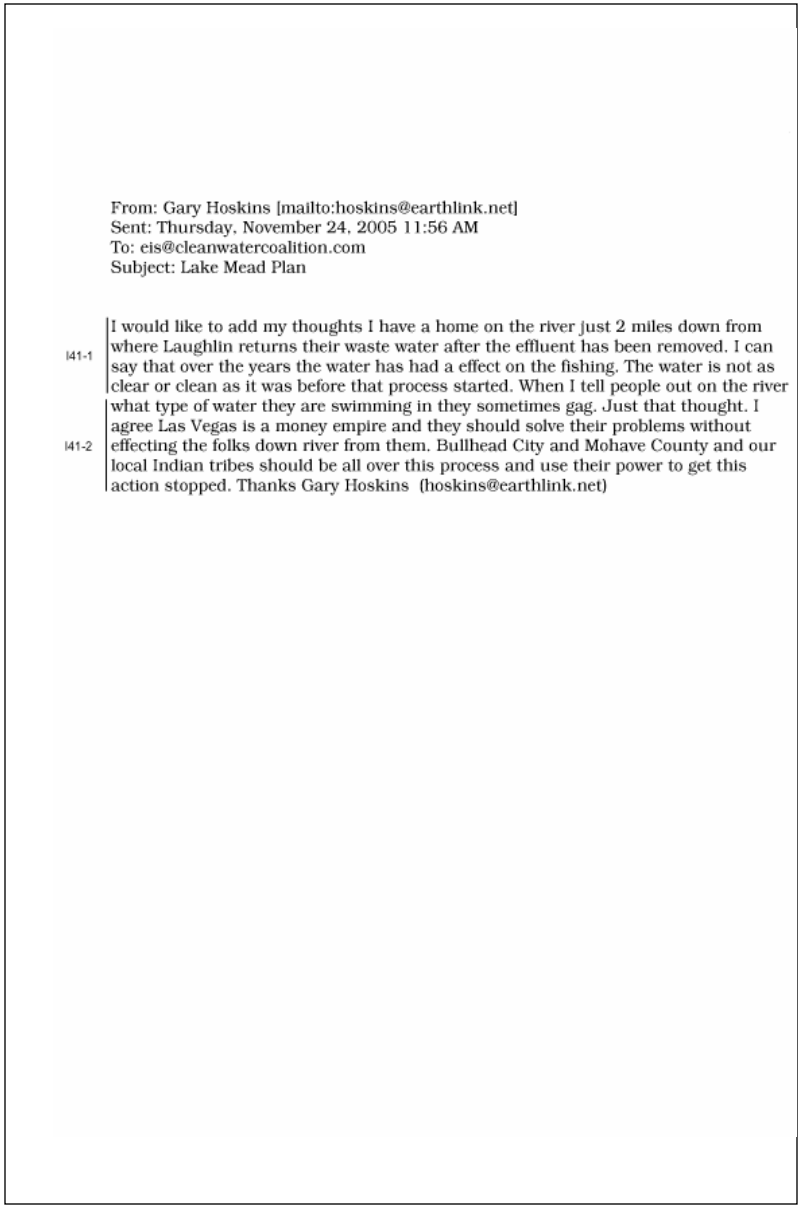
Dan Hernandez

Comment I-40

## Response I40 Dan Hernandez

### I40-1

See response to comment L1-5.



From: Gary Hoskins [mailto:hoskins@earthlink.net]
Sent: Thursday, November 24, 2005 11:56 AM
To: eis@cleanwatercoalition.com
Subject: Lake Mead Plan

I41-1 I would like to add my thoughts I have a home on the river just 2 miles down from where Laughlin returns their waste water after the effluent has been removed. I can say that over the years the water has had a effect on the fishing. The water is not as clear or clean as it was before that process started. When I tell people out on the river what type of water they are swimming in they sometimes gag. Just that thought. I

I41-2 agree Las Vegas is a money empire and they should solve their problems without effecting the folks down river from them. Bullhead City and Mohave County and our local Indian tribes should be all over this process and use their power to get this action stopped. Thanks Gary Hoskins (hoskins@earthlink.net)

## Response I41 Gary Hoskins

### I41-1

Comment noted.

### I41-2

Comment noted.

From: C & D Tweedy [mailto:cndtweedy@hotmail.com]
Sent: Friday, November 25, 2005 12:05 PM
To: eis@cleanwatercoalition.com
Subject: Dumping sewer water

I42-1 We have a house in Parker and our kids ourselves, friends and family swim in this water everyday, this is outrageous and extremely dangerous.

Cecilia & Dean Tweedy

## Response I42 Cecelia and Dean Tweedy

### I42-1

Comment noted.

From: Peggy Sheppard [mailto:ptpegcruiser@yahoo.com]
Sent: Tuesday, November 29, 2005 10:22 AM
To: eis@cleanwatercoalition.com
Subject: water polluting by las vegas

I43-1 I support the "no action" alternative, which means it will continue to provide the ground separation and cleansing of the effluent prior to entering Lake Mead.
Joseph Sheppard, Lake Havasu City

## Response I43 Peggy Sheppard

### I43-1

See response to comment L1-5.

RESPONSE TO SCOP EIS BY CLEAN WATER COALITION

I am the former president of a Board of Directors of a water district located in Los Angeles County. As such, I dealt with water quality issues many times.

Out of the 835 pages of the EIS, there is one sentence that represents the core purpose for the need for this project. The need stated is - "Addressing public perception issues regarding water intake in relation to wastewater discharge location."

A map of Lake Mead area indicates that the effluent from the Las Vegas Wash enters Lake Mead at Las Vegas Bay. Shortly down flow is where Las Vegas picks up its drinking water near Saddle Island. This process allows the effluent to affect drinking water and that in turn affects public perception.

So the Coalition's Citizen's Advisory Committee recommends the alternative option of building the pipeline to Boulder Island which is just before the dam and as far away from their drinking water intake as they can get. And it will go most immediately through the dam and down river to Bullhead City and all points downriver like Needles, Lake Havasu and Parker and finally to LA as part of their drinking water.

I44-1 Once they move the effluent pipeline away from their drinking water intake to the dam and into the river, they will have even less incentive to successfully clean the effluent than they do now. In essence, they are just moving their pollution problem down flow so it will become the problem of cities along the river and those who use Colorado River water for drinking and recreation.

I44-2 Then the economic responsibility as well as the public perception issue will belong to those of us who live down river. More importantly, Las Vegas has the money, rather than the communities down river, to solve this problem before it becomes a problem beyond our resources to fix.

I44-3 It is very clear that the only acceptable alternative is "no action". The current method of dumping into Las Vegas Wash provides a certain amount of ground separation and cleansing by percolation. This fact is apparent when you consider that the Coalition hopes to gain more drinking water credits with the pipeline alternative. Obviously, a lot of the effluent going into Las Vegas Wash percolates through the ground and is not going directly into the Lake

## **Response I44** Eleanor Koppel

### I44-1

Treated wastewater from the Valley has been treated and discharged to Lake Mead via the Las Vegas Wash since 1956. The wastewater treatment facilities in the Valley are some of the best in the nation--the quality of treatment is in the top 7 percent of wastewater treatment facilities in the nation.

Treated effluent discharged into Lake Mead must meet water quality standards and the requirements of the NPDES discharge permits that are issued by NDEP.

### I44-2

The CWC and lead federal agencies have invested a lot of time and money to determine the best possible action that meets the purpose and need for the project. Water quality modeling indicates that discharge in the vicinity of the Boulder Islands would not increase nutrient loadings through Hoover Dam. The modeling results are described further in Section 4.1 of the Final EIS.

### I44-3

Treated wastewater from the Valley has been treated and discharged to Lake Mead via the Las Vegas Wash since 1956. Treated wastewater flows will continue to be discharged to Lake Mead, even under the No Action Alternative.

The following sentence has been added to Section 1.1: “Treated wastewater has been discharged to the Las Vegas Wash since 1956.”

The return flow credits earned by discharging treated effluent into the Colorado River system would be the same whether the effluent is discharged to the Las Vegas Wash or transported in a pipeline to an alternate location in Lake Mead.

The commenter’s statement that “a lot of the effluent going into Las Vegas Wash percolates through the ground and is not going directly into the Lake” is incorrect. Water in the Las Vegas Wash does not percolate into the ground.

The pipeline direct into the Lake may be the cheaper solution for now. But in the future, the pollution in Lake Mead, Lake Mohave and the Colorado River will cost an unimaginable fortune in reparation and lost tourist recreation dollars. It is vitally necessary for Las Vegas, using their vast resources, to clean up their effluent problem at the Las Vegas Wash before it detrimentally affects the Lake and the river.

I44-4

The only way to be sure they will actually keep the effluent within prescribed parameters is by making them continue to use it for their drinking water. If they had done the right thing with the Las Vegas Wash, they would not be seeking an alternative now. This is what they need to fix.

If Las Vegas population is to continue to grow, then they need to seriously undertake the planning and expense to realistically, reasonably deal with their sewer elimination process and with their drinking water supply. As members of a water district board we had to be sure we had an adequate supply before we would issue a will-serve letter to a new development. All of Clark County needs to deal with this issue.

Since this EIS received little attention in our newspapers or radio news prior to recent City Council and Board of Supervisor meetings, I don't expect 60 days will be sufficient for many citizens to understand the situation and put in a response. Therefore, I would ask for an extension of time to respond.

I44-5

As for me, I strongly support the "no action" alternative.

Eleanor Koppel

Eleanor Koppel
P.O. Box 20181
Bullhead City, AZ 86439

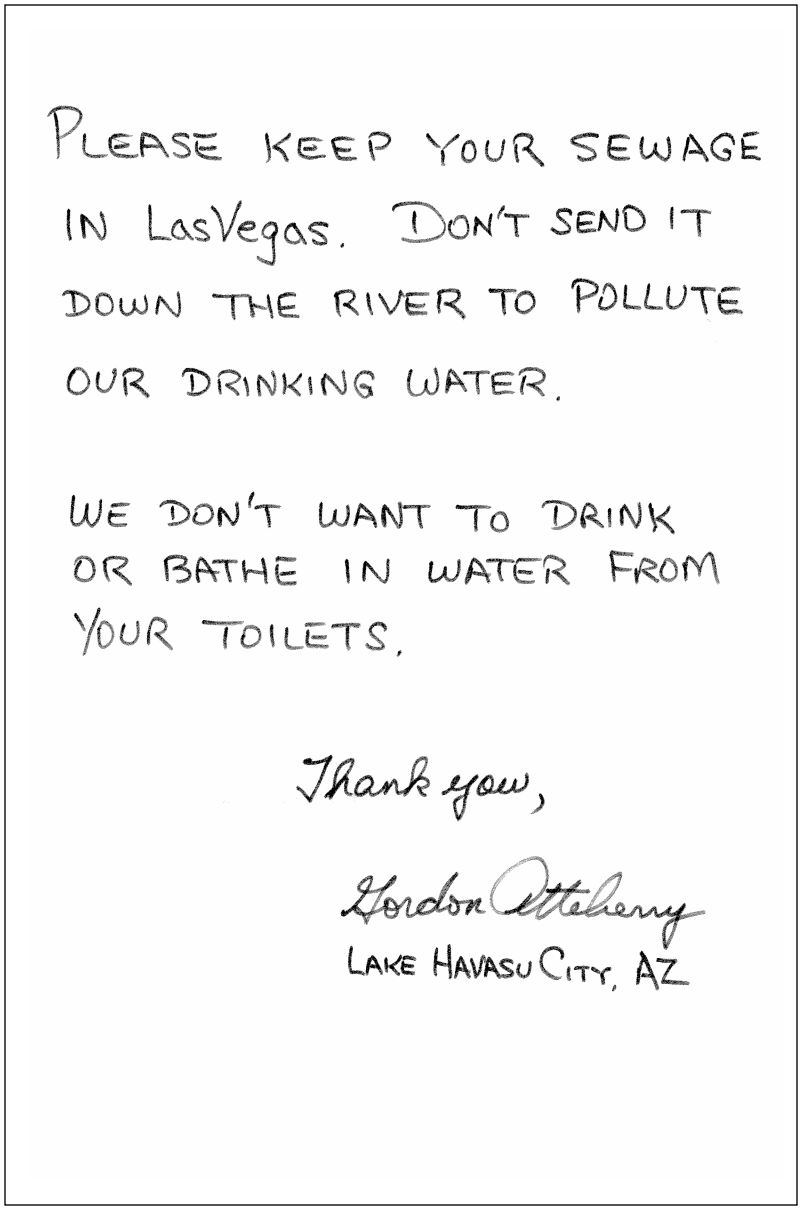
928-704-4467

**I44-4**

Comment noted.

**I44-5**

Comment noted.


PLEASE KEEP YOUR SEWAGE IN LasVegas. DON'T SEND IT DOWN THE RIVER TO POLLUTE OUR DRINKING WATER.

WE DON'T WANT TO DRINK OR BATHE IN WATER FROM YOUR TOILETS.

Thank you,

Gordon Atteberry

LAKE HAVASU CITY, AZ

**Response I45** Gordon Atteberry

**I45-1**

Comment noted.

From: maryhelen4@aol.com [mailto:maryhelen4@aol.com]
Sent: Saturday, November 19, 2005 10:48 AM
To: eis@cleanwatercoalition.com
Subject:

I46-1 As a resident of Lake Havasu City, I support any action that will prevent Las Vegas from compromising the water quality of Lake Havasu. We depend on clean water for our very existence. Any pollution of our lake will turn our little gem of a city into a wasteland.

Please do all you can to prevent this pollution.
Mary Helen Hollensbe

## Response I46 Mary Helen Hollensbe

### I46-1

Comment noted.

# Appendix M

NPDES Process and Permits

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# M.0 National Pollutant Discharge Elimination System (NPDES) Process and NPDES Permits

The U.S. Environmental Protection Agency (EPA) has delegated responsibility to the State of Nevada to implement the National Pollutant Discharge Elimination System (NPDES) program authorized by the Clean Water Act. The NPDES permits regulate discharges to "waters of the United States." The state issues NPDES permits for discharges to surface waters, including lakes, streams, dry washes, and storm drains. All surface discharge permits are sent to EPA, Region IX for review before they are issued.

A NPDES permit is basically a license for a facility to discharge a particular amount of a pollutant into a receiving water under certain conditions. Permits could also authorize facilities to process, incinerate, landfill, or beneficially use sewage sludge.

There are a minimum of five general sections to be completed for a NPDES permit:

1. A cover page that contains the name and location of the permittee, a statement that authorizes the discharge, and a specific location of where the discharge is authorized.
2. Effluent limits that are based on applicable technology-based and water quality-based standards.
3. Monitoring and reporting requirements that are used to characterize waste streams and receiving waters, evaluate wastewater treatment efficiency, and determine if the wastewater is in compliance with the permit conditions.
4. Special conditions that are developed to supplement effluent limit guidelines (i.e. best management practices, additional monitoring activities, ambient stream surveys, and toxicity reduction evaluations).
5. Standard conditions are predetermined conditions that apply to all NPDES permits and delineate the legal, administrative, and procedural requirements of the permit.

These are standard sections to the NPDES permit, but the contents could vary depending on the type of facility and number of dischargers. For example, the contents of a permit for a municipal facility may differ from those of an industrial facility. A NPDES permit for an individual facility (individual permit) may differ from a permit for multiple dischargers (general permit).

A municipal source is defined as a publicly owned treatment works facility that receives primarily domestic sewage from residential and commercial customers. Non-municipal sources include industrial and commercial facilities that are unique with respect to the products and processes present at the facility.

## M.1 Individual Permit Process

The individual permit is specifically for individual facilities. When a facility submits a permit application, the Nevada Division of Environmental Protection (NDEP) develops a permit specifically for that facility based on the information contained in the application (i.e. type of activity, nature of discharge, receiving water quality). This permit has a time limit, not to exceed 5 years and requires that the facility reapply for a new permit before the current permit expires.

The major steps for a permit writer to develop and issue an individual NPDES permit are:

1. Receive application from permittee (permittee is the operator of the facility).
2. Review application for completeness and accuracy.
3. Request additional information as necessary.
4. Develop technology-based effluent limits using application data and other sources.
5. Develop water quality-based effluent limits using application data and other sources.
6. Compare water quality-based effluent limits with technology-based effluent limits and choose the more stringent of the two as the effluent limits for the permit.
7. Develop monitoring requirements for each pollutant.
8. Develop special conditions.
9. Develop standard conditions.
10. Consider variances and other applicable regulations.
11. Prepare the fact sheet, summarizing the principal facts and the significant factual legal, methodological and policy questions considered in preparing the draft permit including public notice of the draft permit, and other supporting documentation.
12. Complete the review and issuance process.
13. Issue the final permit.
14. Ensure permit requirements are implemented.

The permit process starts when the permittee submits a permit application. Once the permit application is received and the decision to proceed occurs, the permit writer reviews the application to insure that the information is complete and correct. After this is complete the permit writer begins to develop a draft permit using the application data, and justification for permit conditions (referred to as the fact sheet or statement of basis).

During the development process the permit writer needs to derive the technology-based effluent limits, and then must derive the effluent limits that are protective of the state's water quality standards (i.e. water quality-based effluent limits). Once this is complete the permit writer compares the technology-based effluent limits and water quality-based effluent limits and uses the stricter of the two. Then the decision is documented in the fact sheet. There is a possibility that the permit could contain both technology-based effluent limits and water quality-based effluent limits for certain parameters. After the effluent limits are established, the permit writer develops an appropriate monitoring and reporting condition, facility-specific special conditions that includes the standard conditions, which are the same for all permits.

Once the draft permit is completed the permitting authority gives the public a chance to participate in the permit process. There is a public notice announced and interested persons have the chance to comment on the draft permit. Then the permitting authority develops a final permit based on the comments received, carefully documenting the process and decisions for the administrative record, and the final permit is issued to the facility.

Each of the three current wastewater dischargers in the Las Vegas Valley has an Individual Permit for their plant. Copies of the current permits are provided in Attachment 1 of this appendix.

## M.2 General Permit Process

The process for a general permit is similar to the individual permit process with some differences in the order of events. The first step in a general permit is the permitting authority must collect data that demonstrates a group, or category, of dischargers that have similarities to warrant a general permit. To decide if a general permit should be developed, the permitting authorities must consider the following:

- Are there a large number of facilities to be covered?
- Do the facilities have similar production processes or activities?
- Do the facilities generate similar pollutants?
- Do only a small percentage of the facilities have the potential for violations of water quality standards?

The remaining steps are the same for the general permit as they are for the individual permit. Once the general permit is issued, any facility that wants to be covered by the general permit must submit a Notice of Intent to the permitting authority. Additional information may be required by the permitting authority describing the facility, and then the facility that is covered by the general permit must be notified. The permitting authority may require the facility to apply for an individual permit.

Each of the three current wastewater dischargers in the Las Vegas Valley has an Individual Permit for their plant. Copies of the current permits are provided in Attachment 1 of this appendix.

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# Appendix M

Attachment 1 – NPDES Permits

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**Permit No. NV0020133**

**Nevada Division of Environmental Protection**

## AUTHORIZATION TO DISCHARGE

In compliance with the provisions of the Clean Water Act as amended, (33 U.S.C. 1251 et. seq; the "Act"), and Chapter 445A of the Nevada Revised Statutes,

City of Las Vegas
6005 East Vegas Valley Drive
Las Vegas, NV 89142

is authorized to discharge from facilities located at

6005 East Vegas Valley Drive
Las Vegas, NV 89142
Clark County
(Water Pollution Control Facility)

and

3271 N. Durango Drive
Las Vegas, NV 89129
Clark County
(Durango Hills Water Resource Center)

Outfall 001 (Water Pollution Control Facility) — Latitude N36° 07' 48", Longitude W115° 02' 15"

Outfall 002 (Durango Hills WRC) — Latitude N36° 13' 20", Longitude W115° 17' 05"

to receiving waters named Las Vegas Wash

in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Part I, II, and III hereof.

This permit shall become effective on July 31, 2006.

This permit and the authorization to discharge shall expire at midnight, July 31, 2011.

Signed this 31st day of July, 2006.

Alan Tinney, P.E., Supervisor
Permitting Branch
Bureau of Water Pollution Control

## PART I

### A. EFFLUENT LIMITATIONS, MONITORING REQUIREMENTS AND CONDITIONS

1. During the period beginning on the effective date of this permit, and lasting until the permit expires, the Permittee is authorized to discharge treated sanitary wastewater, stormwater, and facility dewatering water from:

   - Outfall 001 (Water Pollution Control Facility) via the concrete lined channel to the Las Vegas Wash, and
   - Outfall 002 (Durango Hills WRC) via the stormdrain system to the Las Vegas Wash,

   Effluent samples taken in compliance with the monitoring requirements specified below shall be taken downstream of the disinfection facilities, but prior to mixing with Las Vegas Wash. Influent samples are to be taken at the headworks and are designated as **INF**. Sampling frequencies for Outfall 002 (Durango Hills WRC) apply after the Permittee has discharged for a week to the stormdrain system. The discharges for Outfall 001 (Water Pollution Control Facility) shall be limited and monitored by the Permittee as specified in Table I.1, for Outfall 002 (Durango Hills WRC) as specified in Table I.2.

**TABLE I.1 (Outfall 001, WATER POLLUTION CONTROL FACILITY)**

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Flow-001** | 91 MGD | Monitor and Report: MGD | NA | INF, 001 | Continuous | Flow meter |
| **$BOD_5$ (uninhibited)** | 30 mg/l | 45 mg/l | 22,768 | 001 | Daily | Composite |
| | Monitor and Report | Monitor and Report | NA | INF | | |
| **Total Suspended Solids** | 30 mg/l | 45 mg/l | 22,768 | 001 | Daily | Composite |
| | Monitor and Report | Monitor and Report | NA | INF | | |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **$BOD_5$ (uninhibited) &TSS** | The Permittee shall demonstrate that the 30-day average percentage removal rate is at least 85%. | | | NA | Monthly | Calculate |
| **pH** | Minimum 6.0 and maximum 9.0 SU, except as allowed in Parts I.A.3 and I.A.19. | | NA | 001 | Daily | Discrete |
| **Fecal Coliform[1]** | Log mean 200 cfu or mpn/100ml | See footnote 1 | NA | 001 | Daily | Discrete |
| **Total Residual Chlorine** | NA | 0.1 mg/l-except as allowed in Part I.A.19. | NA | 001 | Daily | Discrete |
| **Total Phosphorus as P: mg/l** | See Part I.A.2 | | | 001 | Daily | Composite |
| **Total Ammonia as N: mg/l** | See Part I.A.2 | | | 001 | Daily | Composite |
| **Total Inorganic Nitrogen as N: mg/l** | See Part I.A.3 | | | 001 | Weekly | Composite |
| **Total Dissolved Solids: mg/l** | See Part I.A.4 | | | 001 | Weekly | Composite |
| **Priority Pollutants** | Monitor and Report, See Attachment A | | | 001 | Per Part I.A.18.d. | Discrete or Composite |
| **WET testing** | See Part I.A.17. | | | 001 | Monthly | Composite |
| **Receiving Water Monitoring** | Monitor and Report | | | See Part I.S.21 | See Part I.A.21 | Discrete |
| **Temperature: °C** | Monitor and Report | | NA | 001 | Weekly | Discrete |
| **Dissolved Oxygen: mg/L** | Monitor and Report | | NA | 001 | Weekly | Discrete |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Orthophosphorus as P: mg/l** | Monitor and Report | | | 001 | Daily | Composite |
| **Nitrate + Nitrite as N: mg/l** | Monitor and Report | | | 001 | Weekly | Composite |
| **Total Kjeldahl Nitrogen as N: mg/l** | Monitor and Report | | | 001 | Weekly | Composite |

1. The discharge shall not exceed a log mean of 200 cfu or mpn per 100 ml over a 30 day period nor may more than 10 percent of the total samples taken exceed 400 cfu or mpn per 100 ml.
2. For those parameters sampled weekly or less frequently, the Permittee shall report the single value instead of the 7-day or 30 day average.

## TABLE I.2 (Outfall 002, DURANGO HILLS WRC)

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Flow-002** | 10 MGD | Monitor and Report: MGD | NA | 002 | Continuous | Flow Meter |
| **$BOD_5$ (uninhibited)** | 30 mg/l | 45 mg/l | 2,502 | 002 | Daily | Composite |
| | Monitor and Report | Monitor and Report | NA | INF | | |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Total Suspended Solids** | 30 mg/l | 45 mg/l | 2,502 | 002 | Daily | Composite |
| | Monitor and Report | Monitor and Report | NA | INF | | |
| **$BOD_5$ (uninhibited) &TSS** | The Permittee shall demonstrate that the 30-day average percentage removal rate is at least 85%. | | | NA | Monthly | Calculate |
| **Fecal Coliform[1]** | Log mean 200 cfu or mpn/100ml | See footnote 1 | NA | 002 | Daily | Discrete |
| **pH** | Minimum 6.0 and maximum 9.0 SU, except as allowed in Parts I.A.3 and I.A.19 | | NA | 002 | Daily | Discrete |
| **Total Residual Chlorine** | NA | 0.1 mg/l Except as allowed in Part I.A.19 | NA | 002 | Daily | Discrete |
| **Total Phosphorus as P: mg/l** | See Part I.A.2 | | | 002 | Daily | Composite |
| **Total Ammonia as N: mg/l** | See Part I.A.2 | | | 002 | Daily | Composite |
| **Total Inorganic Nitrogen as N: mg/l** | See Part I.A.3 | | | 002 | Weekly | Composite |
| **Total Dissolved Solids: mg/l** | See Part I.A.4 | | | 002 | Weekly | Composite |
| **Priority Pollutants** | Monitor and Report. See Attachment A | | | 002 | Per Part I.A.18.d. | Discrete or Composite |
| **WET testing** | See Part I.A.17 | | | 002 | Quarterly | Composite |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Temperature: °C** | Monitor and Report | | NA | 002 | Daily | Discrete |
| **Orthophosphorus as P: mg/l** | Monitor and Report | | | 002 | Daily | Composite |
| **Nitrate + Nitrite as N: mg/l** | Monitor and Report | | | 002 | Weekly | Composite |
| **Total Kjeldahl Nitrogen as N: mg/l** | Monitor and Report | | | 002 | Weekly | Composite |

1. The discharge shall not exceed a log mean of 200 cfu or mpn per 100 ml over a 30 day period nor may more than 10 percent of the total samples taken exceed 400 cfu or mpn per 100 ml.
2. For those parameters sampled weekly or less frequently, the Permittee shall report the single value instead of the 7-day or 30 day average.

I.A.2. **Waste Load Allocation (WLA) for Discharges into Las Vegas Wash**: The Permittee is authorized to discharge the waste loads listed in WLA Table for Total Phosphorus as P and Total Ammonia as N to the Las Vegas Wash. The WLA applies to the combined loading from Outfalls 001 and 002. This permit condition constitutes a cooperative agreement between the City of Las Vegas, Clark County Water Reclamation District, and City of Henderson (hereinafter Dischargers) to allow discharge flexibility. Each facility has an **Individual Waste Load Allocation (IWLA)** and there is a **Sum of Individual Waste Load Allocations (∑IWLA)** defined below for the three facilities. Treatment facilities which are used to attain a waste load allocation are not required to be operated when not needed to meet that allocation.

a. The Permittee shall be considered in compliance if **either**:
   i. The Permittee does not exceed the **IWLA** listed below or the **IWLA** in effect due to transfers, **or**
   ii. The **Sum of the Individual Waste Load Allocations (∑IWLA)** listed below is not exceeded.

I.A.3. **Confirmation of Standards Compliance**

a. The Permittee shall coordinate with the other dischargers identified in Part I.A.2 to determine whether on an annual basis the 95th percentile of the monitoring data for Las Vegas Wash complies with the 20 mg/l total inorganic nitrogen (TIN) water quality standard at the control point, Las Vegas Wash 2 (LVW2, LW6.05).

b. The Permittee shall coordinate with the other dischargers identified in Part I.A.2 to determine whether the pH at LVW2 (LW6.05) complies with the water quality standard of 6.5-9.0 standard units.

c. The results of these determinations shall be reported in the annual report identified in Part I.B.1.a.

d. If the Permittee finds that Las Vegas Wash is not in compliance with the water quality standards identified in Part I.A.3. a. or b., the Permittee shall:
   i. Consider whether reasonable changes in the Permittee's discharge from any outfall would result in compliance;
   ii. Coordinate with the other dischargers identified in Part I.A.2 to consider whether coordinated reasonable changes would achieve compliance; and
   iii. Submit a report to the Division explaining the analytical process and conclusions.

I.A.4 **Salinity Control:** The Permittee shall continue to implement the existing ordinances and public education programs for salinity control and identify and correct all identified infiltration/inflow problems which contribute to exceedance of the goal of more than 400 mg/l TDS increase above the Colorado River water supply. The Permittee shall provide the following information **annually by May 31st:**

a. Description of the municipal entity and facilities.

b. Description of significant salt sources of the municipal wastewater collection system, and identification of entities responsible for each source, if available.

c. Description of the wastewater discharge, covering location, receiving waters, quantity of salt load, and salinity concentration.

d. Description of alternative plans for minimizing salt contribution to the municipal discharge. Alternative plans should include:
   i. Description of system salt sources and alternative means of control.
   ii. Cost of alternative plans in dollars per ton, of salt removed from any new discharges to the municipality.

e. In order to calculate the net increase in salinity the Permittee shall obtain the concentration of TDS in the water supply at least quarterly. The Permittee may rely on data collected by any water purveyors, and shall identify the source of the data.

**Waste Load Allocation Table**

| Constituent | City of Las Vegas IWLA | Clark County Water Reclamation District IWLA | City of Henderson IWLA | ∑WLA |
|---|---|---|---|---|
| **Total Phosphorus as P** | 123 lb/day | 173 lb/day | 38 lb/day | 334 lb/day, Note: This WLA only applies March 1 - October 31; no limit applies the rest of the year. |
| **Total Ammonia as N** | 358 lb/day | 502 lb/day | 110 lb/day | 970 lb/day, Note: This WLA only applies April 1 - September 30; no limit applies the rest of the year. |

b. **Annual Reallocation of IWLA:** On an annual basis, the Permittee may modify the **IWLA** by either transferring or receiving waste load from another discharger. This reallocation shall become effective upon submittal of a notification signed by all three dischargers. The annual reallocation shall be **submitted by May 31st if applicable**. The notification of reallocation shall include the flow, waste load discharged, treatment plant removal efficiency in tabular and graphical format. The reallocation of **IWLA**'s shall be considered a minor modification to the permit as long as the **∑WLA** are not modified.

c. **Temporary Trading of IWLA:** The Permittee may temporarily trade **IWLA** upon submittal of a notification signed by all three dischargers describing the amount of **IWLA** transferred, the length of time the transfer is effective and the basis for the transfer. The basis for the transfer shall include the last monthly flows and waste load discharged for each discharger. The waste load transfer shall be effective on the date of the submittal to the Division. This transfer is binding on the parties and cannot be revoked without a notification signed by all three dischargers. The transferred **IWLA** shall revert back to the original Permittee at the end of the time specified on the notification. A copy of the latest **IWLA** agreement and any agreements made during the reporting period shall be **submitted with each quarterly report required by Part I.B.1.**

d. **Reporting:** The Permittee shall **submit quarterly reports** pursuant to Part I.B.1.b, the **IWLA** and the **∑WLA** for Total Phosphorus as P and Total Ammonia as N, reported monthly as a 30 day average in lb/day. The data for the **∑WLA** shall be provided to and obtained from the other dischargers. In the event the Permittee cannot obtain the **∑WLA** information in time for submittal with the quarterly DMR, then an explanation shall be included with the report along with a schedule for timely submittal.

f. An evaluation of the impact of the discharge on the lower stem of the Colorado River system in terms of average annual average tons/day and concentration of TDS discharged.

I.A.5 **Narrative Standards** (*Nevada Administrative Code (NAC) 445A.121)*: Discharges shall not cause the following standards to be violated in any surface waters of the state. Waters must be free from:

a. Substances that will settle to form sludge or bottom deposits in amounts sufficient to be unsightly, putrescent or odorous;

b. Floating debris, oil, grease, scum, and other floating materials in amounts sufficient to be unsightly;

c. Materials in amounts sufficient to produce taste or odor in the water or detectable off-flavor in the flesh of fish or in amounts sufficient to change the existing color, turbidity or other conditions in the receiving stream to such a degree as to create a public nuisance;

d. High temperature, biocides, organisms pathogenic to human beings, toxic, corrosive or other deleterious substances at levels or combinations sufficient to be toxic to human, animal, plant or aquatic life;

e. Radioactive materials must not result in accumulations of radioactivity in plants or animals that result in a hazard to humans or harm to aquatic life;

f. Untreated or uncontrolled wastes or effluents that are reasonably amenable to treatment or control; and

g. Substances or conditions, which interfere with the beneficial use of the receiving waters.

The narrative standards are not considered violated when the natural conditions of the receiving water are outside the established limits, including periods of high or low flow. Where effluents are discharged to such waters, the discharges are not considered a contributor to substandard conditions provided maximum treatment in compliance with permit requirements is maintained.

I.A.6. The Permittee shall annually review monitoring data, conduct aquatic life studies using water with a hardness representative of the Las Vegas Wash (e.g., 800 mg/l) or conduct other studies to evaluate the existing water quality standards or other data issues, for the following parameters: cadmium, copper, hexavalent chromium, molybdenum, selenium, silver, and sulfide. Results shall be included as part of the annual report required by Part I.B.1.a.i.

I.A.7. There shall be no objectionable odors from the collection system, treatment facility or disposal area, or biosolids treatment, use, storage or disposal area that the Permittee owns or operates.

I.A.8. There shall be no discharge of substances that would cause a violation of water quality standards of the State of Nevada as defined by the permit. The permit may be reopened, and additional limits imposed, if it is determined that the discharge is causing a violation of ambient water quality standards of the State of Nevada.

I.A.9. There shall be no discharge from the collection, treatment and disposal facilities except as authorized by this permit or in accordance with the Division's Spill Reporting Policy.

I.A.10. The treatment and disposal facility shall be fenced and posted.

I.A.11. The collection, treatment and disposal facilities shall be constructed in conformance with plans approved by the Administrator, as required by NAC 445A.284, except as provided in the Division's "Plan and Specification Review Policy for Collection and Treatment Systems in Clark County" latest edition.

I.A.12. The facility shall be operated in accordance with the Operations and Maintenance (O&M) manual, which must be approved by the Administrator.

I.A.13. There shall be no discharge of floating solids or visible foam in other than trace amounts.

I.A.14. **Biosolids and Sewage Sludge**

a. **Disposal:** The Permittee shall comply with all applicable sections of the following regulations for biosolids, which are disposed and inform any biosolids disposer of the requirement that they must comply with the following regulations as applicable.
   i. 40 CFR 257 and 258: for biosolids disposed in municipal solid waste landfills as approved by the Administrator and the County;
   ii. 40 CFR 261 for hazardous biosolids or 40 CFR 761 for biosolids with a PCB concentration greater than 50 mg/kg; or
   iii. 40 CFR 503: placed in surface disposal sites (dedicated land disposal sites or monofills), or incinerated.

b. **Reuse:** The Permittee shall comply with any applicable sections of 40 CFR 503 for biosolids generated at the facility including solid waste screening and sewage sludge which is to be used, land applied, stored or treated in compliance with any applicable sections of the following regulations:
   i. 40 CFR 503: for non-hazardous biosolids that are land applied;
   ii. The Permittee is responsible for informing any biosolids preparer, applier, or disposer, of all requirements and the applicable regulations listed above.
   iii. Facilities which are regulated under 40 CFR part 503 shall monitor parameters listed in Part I.A.18., and shall also monitor the pathogen density requirements in 40 CFR 503.32 (a) and (b)(2) through (4) and the vector attraction reduction requirements in 503.33(b)(1) through (8); at the frequencies listed below.

| **Dry Biosolids Disposal rate in metric tons/yr.** | **Frequency** |
|---|---|
| >0 - <290 | each year |
| ≥290 -<1500 | once a quarter |
| ≥1500 -<15000 | once every 2 months |
| ≥15000 | once a month |

iv. Biosolids to be land applied shall be tested for organic nitrogen as N, ammonia as N, nitrate as N, and Total Nitrogen as N on the frequency required above.
v. Biosolids, which are to be land applied, shall be characterized annually pursuant to 40 CFR 261 to determine if they are hazardous.

c. If biosolids are stored at any facility owned or operated by the Permittee for over two years from the time they are generated, the Permittee shall notify the Division within 30 days and shall ensure compliance with all the requirements of surface disposal 40 CFR 503 C, or must submit a written notification to the Division and EPA with the information listed at 40 CFR 503.20 (b), demonstrating the need for longer temporary storage.

d. Biosolids treatment or storage facilities owned or operated by the Permittee shall be designed to divert stormwater run-on for the 100-year storm event, and be designed to prevent erosion, which could cause biosolids to run-off.

e. The Permittee shall take all appropriate precautions to inform biosolids haulers that all necessary measures to contain the biosolids should be taken before leaving the treatment facility.

f. The Permittee shall comply with the following notification requirements either directly or through contractual arrangements with a biosolids management contractor:
   i. If biosolids are shipped to another state or to Indian lands, the Permittee shall send notice of the shipment to the state permitting authorities, the EPA Regional Office of the region receiving the biosolids or the Indian authorities.
   ii. For land application or un-permitted disposal sites, the Permittee shall notify the Division 180 days prior to shipping any biosolids to enable the site to obtain a permit.

g. **Biosolids Monitoring Report (BMR):** The Permittee shall submit a BMR annually which shall be submitted by **May 31st** for the period covering the previous calendar year. The report shall contain all the required biosolids analytical data, the volume of biosolids generated that year, any volume accumulated from previous years, descriptions of pathogen and vector attraction reduction methods and the required certifications as required by 40 CFR 503.17 and 27, the names, mailing and street addresses and telephone numbers of all facilities which received biosolids for storage, disposal, use, treatment, land application or any other use or disposal methods not mentioned and the volume of biosolids taken to each facility.

I.A.15. **Annual Fee:** The Permittee shall remit an annual review and services fee in accordance with NAC 445A.232 starting **July 1, 2007** and every year thereafter until the permit is terminated.

I.A.16. The treatment facility shall be operated by a Nevada Certified Grade IV Wastewater Operator. The first DMR submitted under this permit must include the written designation of the authorized representative as required by Part III.A.2. If the certified operator in responsible charge changes, a new designation letter must be submitted.

I.A.17. **Whole Effluent Toxicity Testing:** Beginning with the effective date of this permit, the Permittee shall conduct monthly toxicity tests on 24-hour composite effluent samples as described below on the discharge from Outfall 001.

a. **Acute Toxicity Limit:** The effluent shall be deemed acutely toxic when there is a statistically significant difference at the 95th% confidence interval between the survival of the control (0% effluent) test organisms and the survival of the test organisms in the 100% effluent at the following limits:
   i. The survival of test organisms in the undiluted effluent sample is less than 90 percent in six (6) out of eleven (11) consecutive samples; or
   ii. The survival rate of test organisms in the undiluted effluent sample is less than 70 percent in any two of eleven consecutive samples.

b. **Test Methods**
   i. The acute flow through or static replacement tests shall be conducted in general accordance with the procedures set out in the latest revision of "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms," EPA/600/4-90/027. The Permittee shall conduct an acute 48-hour flow through or static replacement toxicity test using any Daphnid approved by the Division and an acute 96-hour flow through or static replacement toxicity test using fathead minnows, Pimephales promelas. After each 24-hours of the test period the dilutions shall be replaced with freshly prepared dilutions of the original effluent sample.
      1. If more than 10 percent control mortality occurs, the test shall be repeated until satisfactory control survival is achieved.
      2. The source of the dilution water shall be reported with the test results. The tests shall be run using 4 replicate chambers, with a minimum of 5 organisms per test chamber for the Daphnid and 2 replicate chambers with a minimum of 10 organisms per test chamber for the Pimephales promelas.
   ii. **Alternative Species and Protocols:** The Permittee may undertake an investigation of alternative site specific toxicity test species and alternative site specific toxicity protocols. If alternative, site-specific toxicity test species or protocols are developed as a result of work by the Permittee, such species or protocols may be substituted for those specified in this permit on approval by the Division under 40 CFR Part 136. Alternative protocols must be compared to EPA protocols to demonstrate appropriateness and reliability.

c. **Testing Schedule**
   i. *Routine Schedule*: The Permittee shall conduct an acute toxicity test monthly.
   ii. *Accelerated schedule*: Whenever the effluent has been determined to be acutely toxic per Part I.A.17.a., the Permittee shall increase the frequency of acute toxicity testing to every other week. The accelerated testing shall also be conducted to determine an endpoint of either the LC50 or the No Observed Effects Concentration (NOEC) as defined in the above referenced method. When 4 (four) consecutive tests show greater than 70 percent survival of undiluted effluent, the Permittee may resume its routine test schedule.

d. **Follow-up Responses:** Whenever the acute toxicity effluent limitation as defined under either Part I.A.17.a.i or ii has been exceeded, **and** one or more of the tests conducted under Part I.A.17.c ii. has a survival rate of less than 70% in an undiluted effluent sample, the Permittee shall:
   i. In general accordance with EPA manuals and EPA/600/6-91/003, EPA/600/3-88/035, or any subsequent revisions and/or methods approved by the Division, initiate an identification investigation within 24 hours of the exceedance to identify the cause(s) of the toxicity. After the initiation of the investigation phase pursuant to this condition, the Permittee may suspend the accelerated testing required by Part I.A.17.c.ii. as long as the routine testing required by Part I.A.17.c.i. is resumed.
   ii. In general accordance with EPA manuals and EPA/600/R-92/081, or any subsequent revisions and/or methods approved by the Division, conduct an evaluation of findings where appropriate; and
   iii. Notify the Division within fifteen (15) days of becoming aware of the exceedance and provide the following:
      1. Times and dates when the limitation was exceeded;
      2. The findings of the identification investigation or other investigations to identify the cause(s) of the toxicity or a plan for continuing the identification investigation if it was not conclusive;
      3. The actions the Permittee has taken or will take to mitigate the impact of the discharge, to correct the noncompliance and prevent the recurrence of toxicity; and
      4. Where corrective actions have not been completed, an expeditious schedule under which the corrective actions will be implemented.

e. In no event shall the discharger cause any impairment of the receiving water or of the beneficial uses, nor cause a violation of any other provision of this permit, the Clean Water Act and State or local regulation or law.

f. **Toxicity Testing Reopener:** This permit may be reopened and modified by the Division to include effluent limits, additional testing and/or other appropriate actions to address demonstrated effluent toxicity. This permit may also be reopened and modified by the permitting authority to incorporate alternative permit conditions reflecting State Water Quality Standards revisions related to effluent toxicity.

g. In addition to the quarterly DMR submittals, the Permittee shall submit an annual summary, **which** provides a review of the survival rates of both the control and the 100% effluent. The summary shall be submitted by **May 31st of each year**.

h. **Chronic Toxicity:** The Permittee shall conduct chronic toxicity study using Ceriodaphnia dubia to confirm existing nontoxic conditions identified in studies conducted during the previous permit cycle and, if toxicity is found, to identify pollutants that may require additional controls under the pretreatment program, Part I.A.18.
   i. The Permittee shall submit a study plan and schedule within one hundred eighty (180) days from the date of issuance of this permit for concurrence by the Division.
   ii. The study will include the following:
      1. Chronic toxicity testing to be conducted at least once per quarter over a one year period following concurrence of the study plan by the Division.
      2. Samples of wastewater shall be taken at the same location as the effluent compliance samples, unless otherwise approved in writing by the Division.
      3. If chronic toxicity is identified, using appropriate statistical procedures or other evaluation methods acceptable to the Division, the Permittee may either increase testing frequency to monthly or conduct a toxicity identification evaluation (TIE). If after two additional months of testing the chronic toxicity has abated, the Permittee may return to quarterly testing. If it has not, the Permittee shall continue accelerated testing, conduct a TIE, or submit an alternate proposal to the Division for approval.
      4. Chronic toxicity testing shall be conducted in accordance with procedures specified in 40 CFR Part 136.
      5. TIEs shall be conducted in accordance with procedures set forth in *Toxicity Identification Evaluations: Characterization of Chronically Toxic Effluents, Phase I,* EPA/600/6-91/003, USEPA, 1991A; and *Toxicity Reduction Evaluation Protocol for Municipal Wastewater Treatment Plants,* EPA/600/2-88/062, USEPA, 1989A, as appropriate.
   iii. The Permittee shall take appropriate actions to address any pollutant of concern identified through this study.
   iv. A report on the study shall be submitted to the Division within the time provided for in the study plan and schedule. The Permittee and the Division will review the information and any subsequent actions taken by the Permittee to assess the results and determine what actions, e.g., additional chronic toxicity testing, are necessary and appropriate.
   v. The data collected through this study, and through the chronic toxicity testing and TIE procedures, are for informational purposes only and shall not be used to assess compliance or in an enforcement action against the Permittee.

I.A.18. **Pretreatment of Industrial Wastewaters:** The Permittee shall implement and enforce a pretreatment program under 40 CFR Part 403 (hereinafter 403), including any subsequent regulatory revisions to 403 and be responsible for and liable for the performance of all Control Authority pretreatment requirements contained in 403. Where 403 or subsequent revision places mandatory actions upon the Permittee as Control Authority but does not specify a timetable of completion of the

actions, the Permittee shall complete the required actions within 6 months from the issuance date of this permit or the effective date of the 403 revisions, whichever comes later. For violations of pretreatment requirements, the Permittee shall be subject to enforcement actions, penalties, fines, and other remedies by the U.S. EPA or other appropriate parties, as provided in the Act. EPA may initiate enforcement action against a non-domestic user for noncompliance with applicable standards and requirements as provided in the Act and as provided by the Division and EPA in the enforcement agreement.

a. The Permittee will comply with the Pretreatment Program as submitted to and approved by the Division and EPA. This program shall include written agreements, with all sewage agencies who contribute flows to the treatment facility, that provide the Permittee with the legal authority to enforce the pretreatment program. The Permittee shall comply with all parts of the schedule listed below, Pretreatment of Industrial Wastewaters.

b. The Permittee shall enforce the requirements promulgated under sections 307(b) through (d) and 402(b) of the Act with timely, appropriate and effective enforcement actions. The Permittee shall cause all non-domestic users subject to federal categorical standards to achieve compliance no later than the date specified in those requirements or in the case of a new non-domestic user, upon commencement of the discharge.

c. The Permittee shall perform the pretreatment functions as required in 403 including but not limited to:
   i. Implement the necessary legal authorities as provided in 403.8(f)(1);
   ii. Enforce the pretreatment requirements under 403.5 and 6;
   iii. Implement the programmatic functions as provided in 403.8(f)(2); and
   iv. Provide the requisite funding and personnel to implement the pretreatment program as provided in 403.8(f)(3).

d. The Permittee shall submit annually a report to the Division and EPA describing its pretreatment activities over the previous year. In the event the Permittee is not in compliance with any conditions or requirements of this permit, then the Permittee shall also include reasons for non-compliance and state how and when the Permittee shall comply with such conditions and requirements. This annual report shall cover operations for the previous calendar year and is due **May 31st** of each year. The report shall contain, but is not limited to, the following information:
   i. A summary of the analytical results from representative, flow proportioned, 24-hour composite sampling of the Publicly Owned Treatment Works' (POTW's) influent and effluent for those pollutants EPA has identified under section 307(a) of the Act which are known or suspected to be discharged by non-domestic users. This will consist of an annual full priority pollutant scan, with
   ii. Quarterly samples analyzed only for those pollutants detected in the full scan. Sludge shall be sampled during the same 24-hour period and analyzed for the same pollutants as the influent and effluent. The sludge analyzed shall be a composite sample of a minimum of twelve discrete samples taken at equal time intervals over a 24-hour period or a composite of

discreet samples every two hours when the sludge production period is less than 24 hours. Wastewater and sludge sampling and analysis shall be performed a minimum of once per quarter. The Permittee shall also provide any influent or effluent monitoring data for non-priority pollutants, which the Permittee believes, may be causing or contributing to interference, pass through, or adversely impacting sludge quality. Sampling and analysis shall be performed with the techniques prescribed in 40 CFR 136;

iii. A discussion of upset, interference, or pass through incidents, if any, at the treatment plant, which the Permittee knows, or suspects were caused by non-domestic users of the POTW system. The discussion shall include the reasons why the incidents occurred, the corrective actions taken and, if known, the name and address of the non-domestic user responsible. The discussion shall also include a review of the applicable pollutant limitations to determine whether any additional limitations, or changes to existing requirements, may be necessary to prevent pass through or interference;

iv. An update of the Permittee's significant industrial users (SIU's) including their names and addresses, and a list of deletions, additions and SIU name changes keyed to the previously submitted list. The Permittee shall provide a brief explanation for each change. The list shall identify the SIU's subject to federal categorical standards by specifying which set(s) of standards are applicable to each SIU. The list shall also indicate which SIUs are subject to local limitations;

v. The Permittee shall characterize the compliance status of each SIU by providing a list or table which includes the following information:
   1. Name of the SIU;
   2. Category, if subject to federal categorical standards;
   3. The type of wastewater treatment or control process in place;
   4. The number of samples taken by the POTW during the year;
   5. The number of samples taken by the SIU during the year;
   6. For an SIU subject to discharge requirements for total toxic organics, whether all required certifications were provided;
   7. A list of the standards violated during the year. Identify whether the violations were for categorical standards or local limits;
   8. Whether the facility is in significant noncompliance (SNC) as defined at 403.12(f)(2)(vii) at any time during the year; and
   9. A summary of enforcement or other actions taken during the year to return the SIU to compliance. Describe the type of action, final compliance date, and the amount of fines and penalties collected, if any. Describe any proposed actions for bringing the SIU into compliance;

vi. A brief description of any programs the POTW implements to reduce pollutants from non-domestic users that are not classified as SIU's;

vii. A brief description of any significant changes in operating the pretreatment program which differ from the previous year including, but not limited to, changes concerning the program's administrative structure, local limits, monitoring program or monitoring frequencies, legal authority, enforcement policy, funding levels, or staffing levels;

viii. A summary of the annual pretreatment budget, including the cost of the pretreatment

program functions and equipment purchases; and

ix. A summary of activities to involve and inform the public of the program including a copy of the newspaper notice, if any, required under 403.8(f)(2)(vii).

e. The Permittee shall submit quarterly SIU compliance status reports to EPA, Region 9 and the Division. The reports shall cover the periods of January 1 through March 31, April 1 through June 30, July 1 through September 30, and October 1 through December 31. Each report shall be submitted by the end of the month following the quarter except the report for October 1 through December 31, which may be included in the annual report. The reports, which may be submitted in outline form, shall contain:

i. The name and address of all SIU's which violated any discharge or reporting requirements during the quarter;

ii. A description of the violations including whether any discharge violations were for categorical standards or local limits;

iii. A description of the enforcement or other actions that were taken to remedy the noncompliance; and

iv. The status of active enforcement and other actions taken in response to SIU noncompliance identified in previous reports.

I.A.19. **Chlorine Residual and pH Effluent Limitation**

a. The Permittee may determine compliance with chlorine residual and pH either by grab sampling or by continuous monitoring.

b. If the Permittee chooses continuous monitoring, the Permittee shall maintain the chlorine residual and pH of such effluent within the range set forth in the applicable effluent limitations guidelines, except excursions from the range are permitted subject to the following limitations:

i. The total time during which the chlorine residual and pH values are outside the required range shall not exceed 7 hours and 26 minutes in any calendar month;

ii. No individual excursion from the range of chlorine and pH shall exceed 60 minutes; and

iii. If the continuous monitoring equipment fails, estimates derived from historical or contemporary data may be used.

c. The Division may allow the Permittee to discontinue monitoring for chlorine upon approval of a submittal, which demonstrates that there is no reasonable potential for the chlorine concentrations to be toxic.

I.A.20. **Schedule of Compliance:** The Permittee shall implement and comply with the provisions of the schedule of compliance after approval by the Administrator, including in said implementation and compliance, any additions or modifications, which the Administrator may make in approving the schedule of compliance.

a. The Permittee shall achieve compliance with the effluent limitations upon issuance of the permit.

b. The Permittee shall submit a report in accordance with permit condition Part I.B.1.c. within 14

days of a compliance date detailing compliance or noncompliance with that date.

c. Within six (6) months of the completion of the plant expansion and/or modification, the Permittee shall submit a revised O&M manual to the Division for review and approval.

I.A.21. **Lake Mead and Las Vegas Wash Monitoring:** By **November 1st** of each year, the Permittee shall jointly submit, with the Clark County Water Reclamation District and the City of Henderson, an annual plan for monitoring ambient water quality in Lake Mead and Las Vegas Wash during the following year. Following approval by the Division, the Permittee shall implement its portion of the plan beginning **January 1st** of each year. The joint monitoring plan shall include, as a minimum, the following:

a. The identification of at minimum three locations in Las Vegas Wash at which water quality will be routinely monitored.

b. The identification of at minimum five locations within Lake Mead at which water quality will be routinely monitored, including at least one station near the mouth of Las Vegas Wash.

c. An identification of the depths at which each station will be sampled.

d. An explanation of why the station locations and depths were chosen.

e. A schedule for monitoring water quality at the selected stations, at minimum biweekly in Las Vegas Wash and, during April through September, in Lake Mead.

f. A list of parameters to be monitored, including at minimum chlorophyll (in epilimnetic samples), total phosphorus, orthophosphorus, nitrate, ammonia, dissolved oxygen, conductivity, temperature, pH, and fecal coliforms or E. coli.

g. If the Permittee is unable to reach agreement with the other dischargers, the Permittee shall submit an explanation and a proposed individual monitoring plan.

## I.B. MONITORING AND REPORTING

### I.B.1. Reporting

a. **Annual Reports**

i. On or before **May 31st** of each year, the Permittee shall submit a plot of concentration (y-axis) versus date (x-axis) for each analyzed constituent, which has been detected greater than 25% of the time. The plot shall include data from the preceding five years, if available. Any data point from the current year detected at concentrations greater than the limits in Part I.A.1 or the applicable water quality standard must be explained by a narrative.

ii. The BMR required by Part I.A.14., the pretreatment annual report required by Part I.A.18.d., the Lake Mead and Las Vegas Wash Annual Report required by Part I.A.21, the TIN annual report required by Part I.A.3, the Salinity Control Report required by Part I.A.4 and WET annual reports required by Part I.A.17 are due each **May 31st**.

b. **Quarterly Reporting:** Monitoring results obtained pursuant to Part I.A of the permit for the previous three (3) month period shall be summarized for each month and reported on a Discharge Monitoring Report (DMR) form. The DMR is to be received in this office no later than the 28th day of the month following the completed reporting period. The Permittee shall also submit the data in an electronic format provided by the Division. The first report is due on October 28, 2006. Summaries of laboratory results for analyses conducted by outside laboratories must accompany the DMR, and the full data package provided by the laboratory must be provided if requested in writing by the Division. If at any time the Permittee concludes that submitted data were incorrect, the Permittee shall notify the Division in writing, identify the incorrect data, and replace the incorrect data with corrected data, which shall thereafter be used for determining compliance with this permit.

c. **Compliance Report**: Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

d. **Other information:** Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Administrator, it shall promptly submit such facts or information.

e. **Planned changes:** The Permittee shall give notice to the Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition to a permitted facility;
   i. May meet one of the criteria for determining whether a facility is a new source (40 CFR 122.29(b));
   ii. Could significantly change the nature or increase the quantity of pollutants discharged; or
   iii. Results in a significant change to the Permittee's sludge management practice or disposal sites.

f. **Anticipated non-compliance:** The Permittee shall give advance notice to the Administrator of any planned changes in the permitted facility or activity, which may result in noncompliance with permit requirements.

g. An original signed copy of these, and all other reports required herein, shall be submitted to the State at the following address:

Division of Environmental Protection

Bureau of Water Pollution Control
ATTN: Compliance Coordinator
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701

h. A signed copy of all Discharge Monitoring Reports and any other reports shall be submitted to the Regional Administrator at the following address:

U.S. Environmental Protection Agency, Region IX
NPDES/DMR WTR-7-1
75 Hawthorne Street
San Francisco, CA 94105

I.B.2 **Monitoring**

a. **Representative Samples:** Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

b. **Test Procedures:** Monitoring for the analysis of pollutants shall be conducted according to test procedures approved under 40 CFR 136 published pursuant to Section 304(h) of the Act, or SW-846, or in the case of sludge disposal, approved under 40 CFR 503, or other procedures as approved by the Administrator. Analysis shall be performed by a State of Nevada certified laboratory.

c. **Recording the Results:** For each measurement or sample taken pursuant to the requirements of this permit, the Permittee shall record the following information:
   i. The exact place, date, and time of sampling;
   ii. The dates the analyses were performed;
   iii. The person(s) who performed the analyses;
   iv. The analytical techniques or methods used; and
   v. The results of all required analyses.

d. **Additional Monitoring by Permittee:** If the Permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form. Such increased frequency shall also be indicated on the DMR. If a Permittee monitors more often than once per day, the Permittee shall compute the 7-day average or 30-day average by first averaging the samples for each day, and then averaging the daily averages or discrete samples representing all sampled days within the period; provided, however, that the Permittee may instead average all samples taken within the period if it notifies the Division that it will use this method.

e.

f. **Records Retention:** All records and information resulting from the monitoring activities, permit application, reporting required by this permit, including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation, shall be retained for a minimum of five years, or longer if required by the Administrator. Records of monitoring information required by this permit related to the Permittee's sewage sludge use and/or disposal activities shall be retained for a period of at least 5 years or longer as required by 40 CFR 503.

g. **Detection Limits:** All laboratory analysis conducted in accordance with this discharge permit must meet the following criteria:

i. All methods used must be specified or approved in either 40 CFR 136, SW-846 or otherwise approved by the Division. All analytical results must be generated by analytical laboratories certified by the state of Nevada laboratory certification program;

ii. The reporting limit for each metal monitored in accordance with this permit shall be less than or equal to the water quality standards for metals which apply to the Las Vegas Wash on the effective date of the permit, except for mercury. This requirement does not apply if a water quality standard is lowered after the issuance of this permit; however, the Permittee shall review methods used and by letter notify the division if the reporting limit will exceed the new criterion, and if so the Division may reopen the permit to impose new monitoring requirements;

iii. The Permittee shall determine whether any laboratories certified by the State of Nevada are analyzing mercury using EPA Method 1631 and achieving results within acceptable limits. If so, the Permittee shall provide a sample for analysis using EPA Method 1631 once per year. If not, the Permittee, acting individually or with other Permittees, shall initiate a dialog with its contract laboratories or other laboratories that might be interested in providing service to the Permittee to inform them of the opportunity to provide additional testing services to the Permittee, and to provide information on current sampling and analytical practices and procedures that might assist the laboratories in their determinations about whether to institute the use of the method; and

iv. All priority pollutant data reported by contract laboratories shall be submitted to the Division.

g. **Modification of Monitoring Frequency and Sample Type:** After considering monitoring data, stream flow, discharge flow and receiving water conditions, the Administrator, may for just cause, modify the monitoring frequency and/or sample type by issuing an order to the Permittee.

I.B.3. **Definitions**

a. The "30-day average discharge" means the total discharge during a month divided by the number of samples in the period for that discharge facility. Where less than daily sampling is required by this permit, the 30-day average discharge shall be determined by the summation of all the measured discharges divided by the number of samples during the period when the measurements were made.

b. The "7-day average" concentration means the arithmetic mean of measurements made during a week. If there are more than one measurement per day, the measurements may be averaged in accordance with Part I.B.2.d.

b. The "daily maximum" is the highest measurement during the monitoring period.

c. The "30-day average concentration", other than for fecal coliform bacteria, means the arithmetic mean of measurements made during a month. If there are more than one measurement per day, the measurements may be averaged in accordance with Part I.B.2.d. The "30-day average concentration" for fecal coliform bacteria means the geometric mean of measurements made during a month. The geometric mean is the "$n^{th}$" root of the product of "n" numbers. Geometric mean calculations where there are non-detect results for fecal coliform shall use one half the detection limit as the value for the non-detect results.

d. A "discrete" sample means any individual sample collected in less than 15 minutes.

e. For flow-rate measurements a "composite" sample means the arithmetic mean of no fewer than six individual measurements taken at equal time intervals for 24 hours, or for the duration of discharge, whichever is shorter. For other than flow-rate a "composite" sample means a combination of no fewer than six individual flow-weighted samples obtained at equal time intervals for 24 hours, or for the duration of discharge, whichever is shorter. Flow-weighted sample means that the volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling.

f. "Acute toxicity" is defined in the whole effluent testing procedures presented in this permit in Part I.A.17.

g. "Biosolids" are non-hazardous sewage sludge or domestic septage as these terms are defined in 40 CFR 503.9.

## PART II

### A. MANAGEMENT REQUIREMENTS

II.A.1. **Change in Discharge:** All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, or treatment modifications which will result in new, different, or increased discharges of pollutants must be reported by submission of a new application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes. Any changes to the permitted treatment facility must comply with Nevada Administrative Code (NAC) 445A.283 to 445A.285. Pursuant to NAC 445A.263, the

permit may be modified to specify and limit any pollutants not previously limited.

II.A.2. **Facilities Operation-Proper Operation and Maintenance:** The Permittee shall at all times maintain in good working order and properly operate all treatment and control facilities, collection systems and pump stations installed or used by the Permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance/quality control procedures.

II.A.3. **Adverse Impact-Duty to Mitigate:** The Permittee shall take all reasonable steps to minimize releases to the environment resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge. The Permittee shall carry out such measures, as reasonable, to prevent significant adverse impacts on human health or the environment.

II.A.4. **Noncompliance, Unauthorized Discharge, Bypassing and Upset**

a. Any diversion, bypass, spill, overflow or discharge of treated or untreated wastewater from wastewater treatment or conveyance facilities under the control of the Permittee to navigable waters is prohibited except as authorized by this permit or in accordance with the Division's Spill Reporting Policy. The Division may take enforcement action for a diversion, bypass, spill, overflow, or discharge of treated or untreated wastewater to waters of the state except as authorized by this permit or in accordance with the Division's Spill Reporting Policy. In the event the Permittee has knowledge that a diversion, bypass, spill, overflow or discharge not authorized by this permit or in accordance with the Division's Spill Reporting Policy is probable, the Permittee shall notify the Administrator immediately.

b. The Permittee shall notify the Administrator within twenty-four (24) hours of any diversion, bypass, spill, upset, overflow or release of treated or untreated discharge from wastewater treatment or conveyance facilities under the control of the Permittee other than that which is authorized by the permit or in accordance with the Division's Spill Reporting Policy. A written report shall be submitted to the Administrator within five (5) days of diversion, bypass, spill, overflow, upset or discharge, detailing the entire incident including:
   i. Time and date of discharge;
   ii. Exact location and estimated amount of discharge;
   iii. Flow path and any bodies of water which the discharge reached;
   iv. The specific cause of the discharge; and
   v. The preventive and/or corrective actions taken.

c. The following shall be included as information which must be reported within 24 hours:
   i. Any unanticipated bypass which exceeds any effluent limitation in the permit;
   ii. Any upset which exceeds any effluent limitation in the permit;
   iii. Violation of a limitation for any toxic pollutant or any pollutant identified as the method to

control a toxic pollutant.

d. The Permittee shall report all instances of noncompliance not reported under Part II.A.4.b. at the time monitoring reports are submitted. The reports shall contain the information listed in Part II.A.4.b.

e. A "**bypass**" means the intentional diversion of waste streams from any portion of a treatment facility.
   i. **Bypass not exceeding limitations:** The Permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts II.A.4.a, II.A.4.b, and II.A.4.f.
   ii. **Anticipated bypass:** If the Permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of bypass.

f. **Prohibition of Bypass:** Bypass is prohibited, and the Administrator may take enforcement action against a Permittee for bypass, unless:
   i. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage.
   ii. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment down time. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
   iii. The Permittee submitted notices as required under Part II.A.4.e.

g. The Administrator may approve an anticipated bypass, after considering its adverse effects, if the Administrator determines that it will meet the three conditions listed in Part II.A.4.f.

h. An "**upset**" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

i. **Effect of an upset:** An upset constitutes an affirmative defense to an action brought for non-compliance with such technology-based permit effluent limitations if the requirements of Part II.A.4.j. are met.

j. **Conditions necessary for a demonstration of an upset:** A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
   i. An upset occurred and that the Permittee can identify the cause(s) of the upset;
   ii. The permitted facility was at the time being properly operated;

iii. The Permittee submitted notice of the upset as required under paragraph c of this section; and

iv. The Permittee complied with any remedial measures required under Part II.A.3.

k. In selecting the appropriate enforcement option, the Administrator shall consider whether or not the noncompliance was the result of an upset. The burden of proof is on the Permittee to establish that an upset occurred.

II.A.5. **Removed Substances:** Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of waste waters shall be disposed of in a manner such as to prevent any pollution from such materials from entering any navigable waters.

II.A.6. **Safeguards to Electric Power Failure:** In order to maintain compliance with the effluent limitations and prohibitions of this permit the Permittee shall either:

a. Provide at the time of discharge an alternative power source sufficient to operate the wastewater control facilities; or

b. Halt or reduce all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

## II.B. RESPONSIBILITIES

II.B.1. **Right of Entry and Inspection:** The Permittee shall allow the Administrator and/or his authorized representatives, upon the presentation of credentials, to:

a. Enter at reasonable times upon the Permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit;

b. Have access to and copy any records required to be kept under the terms and conditions of this permit at reasonable times;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations required in this permit; and

d. Perform any necessary sampling or monitoring to determine compliance with this permit at any location for any parameter.

II.B.2. **Transfer of Ownership or Control:** In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the Permittee shall notify the succeeding owner or controller of the existence of this permit, by letter, a copy of which shall be forwarded to the Administrator. The Administrator may require modification or revocation and reissuance of the permit to change the name of the Permittee and incorporate such other requirements as may be

necessary. The Administrator shall approve ALL transfer of permits.

II.B.3. **Availability of Reports:** Except for data determined to be confidential under NRS 445A.665, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of the Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NRS 445A.710.

II.B.4. **Furnishing False Information and Tampering with Monitoring Devices:** Any person who intentionally or with criminal negligence makes any false statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained by the provisions of NRS 445A.300 to 445A.730, inclusive, or by any permit, rule, regulation or order issued pursuant thereto, or who falsifies, tampers with or knowingly renders inaccurate any monitoring device or method required to be maintained under the provisions of NRS 445A.300 to 445A.730, inclusive, or by any permit, rule, regulation or order issued pursuant thereto, is guilty of a gross misdemeanor and shall be punished by a fine of not more than $10,000 or by imprisonment. This penalty is in addition to any other penalties, civil or criminal, provided pursuant to NRS 445A.300 to 445A.730, inclusive.

II.B.5. **Penalty for Violation of Permit Conditions:** Nevada Revised Statutes (NRS) 445A.675 provides that any person who violates a permit condition is subject to administrative and judicial sanctions as outlined in NRS 445A.690 through 445A.705.

II.B.6. **Permit Modification, Suspension or Revocation**

a. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:
   i. Violation of any terms or conditions of this permit;
   ii. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;
   iii. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge;
   iv. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination;
   v. There are material and substantial alterations or additions to the permitted facility or activity;
   vi. The Administrator has received new information;
   vii. The standards or regulations have changed; or
   viii. The Administrator has received notification that the permit will be transferred.

b. **Minor Modifications:** With the consent of the Permittee and without public notice, the Administrator may make minor modifications in a permit to:
   i. Correct typographical errors;
   ii. Clarify permit language;
   iii. Require more frequent monitoring or reporting;

iv. Change an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the permit and does not interfere with attainment of the final compliance date;
v. Allow for change in ownership;
vi. Change the construction schedule for a new discharger provided that all equipment is installed and operational prior to discharge; or
vii. Delete an outfall when the discharge from that outfall is terminated and does not result in discharge of pollutants from other outfalls except in accordance with permit limits;
viii. Reallocation of the Waste Load Allocation as long as the sum of the allocations does not change.

II.B.7. **Toxic Pollutants:** Notwithstanding Part II.B.6., if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition and the Permittee so notified.

II.B.8. **Liability:** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable Federal, State or local laws, regulations, or ordinances. However, except for any toxic effluent standards and prohibitions imposed under section 307 of the Clean Water Act or toxic water quality standards set forth in NAC 445A.144, compliance with this permit constitutes compliance with Clean Water Act sections 301, 302, 306, 307, 318, 403, 405(a) and (b), and with NRS 445A.300 through 445A.730.

II.B.9. **Property Rights:** The issuance of this permit does not convey any property rights, in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

II.B.10. **Severability:** The provisions of this permit are severable, and if any provision of this permit, or the application of any provisions of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

II.B.11. **Duty to Comply:** The Permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination; revocation and reissuance, or modification; or denial of a permit renewal application.

II.B.12. ***Need to Halt or Reduce Activity Not a Defense:*** *It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this permit.*

II.B.13. **Duty to Provide Information:** The Permittee shall furnish to the Administrator, within a reasonable time, any relevant information which the Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this permit. The Permittee shall also furnish to the Administrator, upon request, copies of records required to be kept by this Permit.

## PART III

### III.A. OTHER REQUIREMENTS

III.A.1. **Reapplication:** If the Permittee desires to continue to discharge, he shall reapply not later than 180 days before this permit expires on the application forms then in use. POTW's with NPDES permits shall submit the sludge information listed at 40 CFR 501.15(a)(2) with the renewal application. The renewal application shall be accompanied by the fee required by NAC 445A.232.

III.A.2. **Signatures, certification required on application and reporting forms**

a. All applications, reports, or information submitted to the Administrator shall be signed and certified by making the following certification.

> **"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."**

b. All applications, reports or other information submitted to the Administrator shall be signed by one of the following:
   i. A principal executive officer of the corporation (of at least the level of vice president) or his authorized representative who is responsible for the overall operation of the facility from which the discharge described in the application or reporting form originates;
   ii. A general partner of the partnership;
   iii. The proprietor of the sole proprietorship; or
   iv. A principal executive officer, ranking elected official or other authorized employee of the municipal, state or other public facility.

c. **Changes to Authorization:** If an authorization under paragraph b. of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph b. of this section must be submitted to the Administrator prior to or together with any reports, information, or

applications to be signed by an authorized representative.

III.A.3. **Holding Pond Conditions:** If any wastewater from the Permittee's facility is placed in ponds owned or operated by the Permittee, such ponds shall be located and constructed so as to:

a. Contain with no discharge the once-in-the twenty-five year, 24 hour storm at said location;

b. Withstand with no discharge the once-in-one-hundred year flood of said location; and

c. Prevent escape of wastewater by leakage other than as authorized by this permit;

unless otherwise approved by the Division.

III.A.4. **Flow Rate Notification:** The Permittee shall notify the Administrator, by letter, not later than ninety (90) days after the 30-day average daily influent flow rate first equals or exceeds 85% of the design treatment capacity of the Permittee's facility given in Part I.A. The letter shall include:

c. The 30-day average daily influent flow rate;

d. The maximum 24-hour flow rate during the 30-day period reported above and the date the maximum flow occurred;

e. The Permittee's estimate of when the 30-day average influent flow rate will equal or exceed the design treatment capacity of the Permittee's facility;

f. A status report on the treatment works which will outline but not be limited to past performance, remaining capacity of the limiting treatment and disposal units or sites, past operational problems and improvements instituted, modifications to the treatment works which are needed to attain the permitted flow rate due to changing site specific conditions or design criteria; and

g. The Permittee's schedule of compliance to provide additional treatment capacity before the 30-day average daily influent flow rate equals the present design treatment capacity of the Permittee's facility.

III.A.5. **Publicly Owned Treatment Works** [40 CFR 122.42(b)]: All POTWs must provide adequate notice to the Administrator of the following:

h. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the Act if it were directly discharging those pollutants: and

i. Any substantial change in the volume or character of pollutants being introduced into that

POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

j. For the purposes of this part, adequate notice shall include information on: (1) the quality and quantity of effluent introduced into the POTW and (2) any anticipated impact of the change on the quantity or quality of effluent to be discharge from the POTW.

# ATTACHMENT A
# PRIORITY POLLUTANTS

## BASE NEUTRAL EXTRACTIBLES

Acenaphthene
Benzidine
1,2,4-Trichlorobenzene
Hexachlorobenzene
Hexachloroethane
Bis(2-chloroethyl) ether
2-Chloronaphthalene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
3,3'-Dichlorobenzidine
2,4-Dinitrotoluene
2,6-Dinitrotoluene
1,2-Diphenylhydrazine
Fluoranthene
4-Chlorophenyl phenyl ether
4-Bromophenyl phenyl ether
Bis(2-Chloroisopropyl) ether
Bis(2-Chloroethoxy) methane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
N-Nitrosodi-n-propylamine
Bis(2-ethylhexyl) phthalate
n-Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Chrysene
Acenaphthylene
Antracene
Benzo(g,h,i)perylene
Fluorene
Phenanthrene
Dibenzo(a,h)anthracene
Indeno(1,2,3-cd)pyrene
Pyrene

## VOLATILE ORGANICS

Acrolein
Acrylonitrile
Benzene
Carbon tetrachloride
Chlorobenzene
1,2-Dichloroethane
1,1,1-Trichloroethane
1,1-Dichloroethane
1,1,2-Trichloroethane
1,1,2,2-Tetrachloroethane
Chloroethane
2-Chloroethylvinylether
Chloroform
1,1-Dichloroethene
Trans-1,2-Dichloroethene
1,2-Dichloropropane
1,3-Dichloropropane
Ethylbenzene
Dichloromethane
Chloromethane
Bromomethane
Bromoform
Bromodichloromethane
Dibromochloromethane
Tetrachloroethene
Toluene
Trichloroethene
Vinyl chloride

## PESTICIDES

Aldrin
Dieldrin
Chlordane (Technical)
4,4'-DDT
4,4'-DDE
4,4'-DDD
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
Alpha-BHC
Beta-BHC
Gamma-BHC (Lindane)
Delta-BHC
PCB 1016
PCB 1221
PCB 1232
PCB 1242
PCB 1248
PCB 1254
PCB 1260
Toxaphene

## ACID EXTRACTIBLES

2,4,6-Trichlorophenol
4-Chloro-3-methylphenol
2-Chlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2-Nitrophenol
4-Nitrophenol
2,4-Dinitrophenol
2-Methyl-4,6-dinitrophenol
Pentachlorophenol
Phenol

## METALS

Antimony
Arsenic
Beryllium
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Thallium
Zinc

## DIOXINS

TCDD

## OTHER

Cyanide
Asbestos

Note: Priority Pollutants to be analyzed using Environmental Protection Agency (EPA) Methods 200 Series, 353.3, 420.2, 624,625, 608, and/or an appropriate combination of these methods to verify compliance with permit-specified effluent discharge limitations.

# NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

## FACT SHEET

(pursuant to NAC 445A.236)

I. **Permittee Name**: City of Las Vegas
6005 East Vegas Valley Drive
Las Vegas, NV 89142

II. **Permit Number**: NV0020133 – Renewal

III. **Location:** 6005 East Vegas Valley Drive
Las Vegas, NV 89142
and
3271 N. Durango Drive
Las Vegas, NV 89129

IV. **General**: The Permittee has applied for a National Pollutant Discharge Elimination System (NPDES) permit renewal to extend the authorization to discharge to the Las Vegas Wash.

The discharge is from a 91 million gallons per day (MGD) wastewater treatment plant located at 6005 East Vegas Valley Drive, Las Vegas, NV 89142. Treatment at the plant, after preliminary treatment consisting of bar screen and grit removal, is provided by two types of treatment trains. One consists of primary sedimentation, trickling filters and secondary sedimentation followed by nitrification (activated sludge) for the conversion of ammonia to nitrate, chemical addition and filtration for phosphorus removal, chlorination and dechlorination. The other consists of primary sedimentation, BOD and biological nutrient removal using the Bardenpho process, secondary sedimentation, chemical addition and filtration for additional phosphorus removal, chlorination, and dechlorination. Odor control is used at the various processes. Sludge is removed from sedimentation and activated sludge processes and is thickened, digested and dewatered for final disposal in a landfill. The plant discharges through Outfall 001 to Las Vegas Wash.

The permit also covers the 10 MGD Durango Hills WRC located at 3271 N. Durango Drive, Las Vegas, NV 89129, which is primarily used to provide re-use water for irrigation, but may discharge during non-irrigation season. Irrigation re-use water from the Durango Hills Plant is regulated under the state discharge permit NEV98005. The plant is authorized to discharge up to 10 MGD from Outfall 002 through the storm-sewer system to Las Vegas Wash. Sampling will apply after the Permittee has discharged for a week to the stormdrain system. Treatment at the Durango Hills Plant consists of preliminary treatment including grinding and grit removal, activated sludge, secondary sedimentation, ultraviolet treatment for disinfection, and flow equalization. Odor control is used throughout the plant. Sludge from the plant is returned to the sanitary sewers, and treated at the main plant.

The majority of the flow into the plants is from domestic wastewater. There is a small percentage of flow from industry in the service area and there is a pretreatment program which regularly samples effluent from

the industrial dischargers. The pretreatment program is authorized through the United States Environmental Protection Agency (USEPA).

The existing permit was issued on July 20, 2001, and expires on July 20, 2006. Since the permit effective date, the plant has consistently been in compliance with its permit. The proposed permit is based on a completed permit application submitted by the Permittee, plant monitoring data, and ambient water quality data.

V. **Discharge Characteristics:** Discharges from the main plant have the following characteristics:

| Parameter | Long-Term Average, 2005 |
|---|---|
| Flow | 64 MGD |
| Uninhibited $BOD_5$ | <2 mg/l |
| pH | 6.7 SU |
| Chlorine Residual | <0.1 mg/L |
| Total Dissolved Solids | 1200 mg/l |
| TSS | <2 mg/l |
| Ammonia as N | <0.1 mg/l |
| Nitrate as N | 17 mg/l |
| Total Kjeldahl Nitrogen | <2 mg/l |
| Phosphorus as P | 0.17 mg/l |
| Orthophosphorus as P | 0.12 mg/l |
| Dissolved Oxygen | 6.2 mg/l |
| Fecal Coliforms | <2 MPN/100 ml |

Treated re-use water from the Durango Hills WRC has not yet been discharged through Outfall 002. Re-use water from the plant has the following characteristics:

| Parameter | Long-Term Average, 2005 |
|---|---|
| Flow | 3 MGD |
| Uninhibited $BOD_5$ | 4 mg/l |
| pH | 6.9 SU |
| Total Dissolved Solids | 1200 mg/l |
| TSS | <2 mg/l |
| Ammonia as N | 0.3 mg/l |
| Nitrate as N | 16 mg/l |
| Total Kjeldahl Nitrogen | <2 mg/l |
| Phosphorus as P | 1.8mg/l |
| Orthophosphorus as P | 1.6 mg/l |
| Fecal | |

VI. **Receiving Water:** The receiving water is the Las Vegas Wash. The standards applicable to the Las Vegas Wash are attached to this fact sheet as Attachment A. Pursuant to NAC 445A.198, the designated beneficial uses for the appropriate reach of Las Vegas Wash are:

Irrigation
Watering of livestock
Recreation not involving contact with the water
Maintenance of a freshwater marsh
Propagation of wildlife
Propagation of aquatic life, excluding fish. This does not preclude the establishment of a fishery.

This reach of the Las Vegas Wash also has an established goal of the propagation of aquatic life, including, without limitation, fish by the next triennial review. This goal may be reevaluated in the near future considering the construction of the grade control structures in the Las Vegas Wash.

Las Vegas Wash has been included on the 303(d) list because of suspended solids and iron. The exceedances identified were not attributed to the Permittee or other publicly owned treatment works in Southern Nevada, but instead were attributable to erosion resulting from high velocity streamflows produced by steep gradients and from loose unconsolidated soils. Several erosion-control structures have been installed in the affected area, and additional structures are planned, along with streambank protection, revegetation, and other control measures. The suspended solids has been de-listed and the iron is being reviewed for de-listing.

## VII. Summary of Changes From Previous Permit:

The main changes from the previous permit are:

| Item | Change |
|---|---|
| Ambient Water Quality Monitoring | Replace 2 fixed-location monitoring stations in Las Vegas Wash and 5 fixed-location monitoring stations in Lake Mead with annual plan in which Permittee proposes and the Division approves locations of at minimum 3 stations in Las Vegas Wash and 5 in Lake Mead. Revision improves flexibility of monitoring program so that stations at locations no longer considered necessary can be moved to locations that provide representative data. |

**VIII. Proposed Effluent Limitations:** The Permittee is required to meet the following permit limits. Note: The load limits are calculated using the 30 day average flow and the permit limit expressed as a concentration. If higher flows are allowed in future permits, the load limits will increase accordingly.

## TABLE I.1 (Outfall 001, WATER POLLUTION CONTROL FACILITY)

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Flow-001** | 91 MGD | Monitor and Report: MGD | NA | INF, 001 | Continuous | Flow meter |
| **$BOD_5$ (uninhibited)** | 30 mg/l | 45 mg/l | 22,768 | 001 | Daily | Composite |
| | M&R | M&R | NA | INF | | |
| **Total Suspended Solids** | 30 mg/l | 45 mg/l | 22,768 | 001 | Daily | Composite |
| | M&R | M&R | NA | INF | | |
| **$BOD_5$ (uninhibited) &TSS** | The Permittee shall demonstrate that the 30-day average percentage removal rate is at least 85%. | | | NA | Monthly | Calculate |
| **pH** | Minimum 6.0 and maximum 9.0 SU, except as allowed in Parts I.A.3 and I.A.19. | | NA | 001 | Daily | Discrete |
| **Fecal Coliform[1]** | Log mean 200 cfu or mpn/100ml | See footnote 1 | NA | 001 | Daily | Discrete |
| **Total Residual Chlorine** | NA | 0.1 mg/l- except as allowed in Part I.A.19. | NA | 001 | Daily | Discrete |
| **Total Phosphorus as P: mg/L** | See Part I.A.2 | | | 001 | Daily | Composite |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Total Ammonia as N: mg/l** | See Part I.A.2 | | | 001 | Daily | Composite |
| **Total Inorganic Nitrogen as N: mg/l** | See Part I.A.3 | | | 001 | Weekly | Composite |
| **Total Dissolved Solids: mg/l** | See Part I.A.4 | | | 001 | Weekly | Composite |
| **Priority Pollutants** | Monitor and Report, See Attachment A | | | 001 | Per Part I.A.18.d. | Discrete or Composite |
| **WET testing** | See Part I.A.17. | | | 001 | Monthly | Composite |
| **Receiving Water Monitoring** | Monitor and Report | | | See Part I.A.21 | See Part I.A.21 | Discrete |
| **Temperature: °C** | Monitor and Report | | NA | 001 | Weekly | Discrete |
| **Dissolved Oxygen: mg/L** | Monitor and Report | | NA | 001 | Weekly | Discrete |
| **Orthophosphorus as P: mg/l** | Monitor and Report | | | 001 | Daily | Composite |
| **Nitrate + Nitrite as N: mg/l** | Monitor and Report | | | 001 | Weekly | Composite |
| **Total Kjeldahl Nitrogen as N: mg/l** | Monitor and Report | | | 001 | Weekly | Composite |

1. The discharge shall not exceed a log mean of 200 cfu or mpn per 100 ml over a 30 day period nor may more than 10 percent of the total samples taken exceed 400 cfu or mpn per 100 ml.
2. For those parameters sampled weekly or less frequently, the Permittee shall report the single value

instead of the 7-day or 30 day average.

**TABLE I.2 (Outfall 002, DURANGO HILLS WRC)**

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Flow-002** | 10 MGD | Monitor and Report: MGD | NA | 002 | Continuous | Flow Meter |
| **$BOD_5$ (uninhibited)** | 30 mg/l | 45 mg/l | 2,502 | 002 | Daily | Composite |
| | M&R | M&R | NA | INF | | |
| **Total Suspended Solids** | 30 mg/l | 45 mg/l | 2,502 | 002 | Daily | Composite |
| | M&R | M&R | NA | INF | | |
| **$BOD_5$ (uninhibited) &TSS** | The Permittee shall demonstrate that the 30-day average percentage removal rate is at least 85%. | | | NA | Monthly | Calculate |
| **Fecal Coliform[1]** | Log mean 200 cfu or mpn/100ml | See footnote 1 | NA | 002 | Daily | Discrete |
| **pH** | Minimum 6.0 and maximum 9.0 SU, except as allowed in Parts I.A.3 and I.A.19 | | NA | 002 | Daily | Discrete |
| **Total Residual Chlorine** | NA | 0.1 mg/l Except as allowed in Part I.A.19 | NA | 002 | Daily | Discrete |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Total Phosphorus as P: mg/l** | See Part I.A.2 | | | 002 | Daily | Composite |
| **Total Ammonia as N: mg/l** | See Part I.A.2 | | | 002 | Daily | Composite |
| **Total Inorganic Nitrogen as N: mg/l** | See Part I.A.3 | | | 002 | Weekly | Composite |
| **Total Dissolved Solids: mg/l** | See Part I.A.4 | | | 002 | Weekly | Composite |
| **Priority Pollutants** | Monitor and Report, See Attachment A | | | 002 | Per Part I.A.18.d. | Discrete or Composite |
| **WET testing** | See Part I.A.17 | | | 002 | Quarterly | Composite |
| **Temperature** | Monitor and Report | | NA | 002 | Daily | Discrete |
| **Orthophosphorus as P: mg/l** | Monitor and Report | | | 002 | Daily | Composite |
| **Nitrate + Nitrite as N: mg/l** | Monitor and Report | | | 002 | Weekly | Composite |
| **Total Kjeldahl Nitrogen as N: mg/l** | Monitor and Report | | | 002 | Weekly | Composite |

1. The discharge shall not exceed a log mean of 200 cfu or mpn per 100 ml over a 30 day period nor may more than 10 percent of the total samples taken exceed 400 cfu or mpn per 100 ml.
2. For those parameters sampled weekly or less frequently, the Permittee shall report the single value instead of the 7-day or 30 day average.

**Attachment A** This attachment to the permit is the list of Priority Pollutants which are required to be sampled under the pretreatment permit requirements.

**IX. Proposed Technology Based Effluent Limitations:** Federal regulations at 40 CFR section 133 require publicly owned treatment works to achieve specified limits in discharged BOD, suspended solids, and pH. The permit includes these limits.

**X. Proposed Water Quality-Based Effluent Limitations:** The Nevada water quality standards require that point source discharges not cause a violation of any applicable water quality standards in the receiving water nor interfere with the attainment or maintenance of beneficial uses. The following requirements are included in the permit to ensure that the discharge does not cause water quality standards violations. In addition, the permit requires monitoring and reporting of constituents which are present in the discharge and the subject of ambient water quality standards.

**Total Dissolved Solids.** The permit includes the goal of not more than a 400 mg/l increase in Total Dissolved Solids (TDS) over the drinking water supply, a goal established by the Colorado River Salinity Forum. The Permittee has implemented the salinity public education program required by the permit. This activity is a continuing requirement of the proposed permit.

**Phosphorus and Ammonia.** Total Maximum Daily Loads (TMDLs) were developed for Total Ammonia as N and Phosphorus as P in 1989. The Permittee has been allocated a Waste Load for Total Ammonia as N and Total Phosphorus as P. This permit includes language which allows waste load allocation trading between the City of Las Vegas, Clark County Water Reclamation District, and City of Henderson (hereafter Dischargers). The WLA applies to the combined loading from all outfalls. This permit condition constitutes a cooperative agreement between the Dischargers to allow discharge flexibility. Each facility has an **Individual Waste Load Allocation (IWLA)** and there is a **Sum of Waste Load Allocations (∑WLA)** defined below for the three facilities. The Permittee shall be considered in compliance if **either**:

i. The Permittee does not exceed the **IWLA** listed below or the **IWLA** in effect due to transfers, **or**

ii. The **Sum of the Waste Load Allocations (∑WLA)** listed below is not exceeded.

**Waste Load Allocation Table**

| Constituent | City of Las Vegas IWLA | Clark County Sanitation District IWLA | City of Henderson IWLA | ∑WLA |
|---|---|---|---|---|
| Total Phosphorus as P | 123 lb/day | 173 lb/day | 38 lb/day | 334 lb/day. Note: This WLA only applies March 1 - October 31; no limit applies the rest of the year. Non-point source load is 100 lb/day. |
| Total Ammonia as N | 358 lb/day | 502lb/day | 110 lb/day | 970 lb/day. Note: This WLA only applies April 1 - September 30; no limit applies the rest of the year. No non-point source load. |

**Fecal Coliform.** Water quality standards for Las Vegas Wash specify fecal coliform requirements to be imposed on discharges into the wash. Water quality standards for Lake Mead include fecal coliform standards. These standards have been imposed as effluent limits on discharges into the Wash and Lake Mead.

**Total Residual Chlorine.** Water quality standards for Las Vegas Wash prohibit the discharge of toxic substances in toxic amounts. The Permittee dechlorinates the effluent to remove free chlorine. An excess of the dechlorinating agent is used to ensure that no free chlorine remains. The effluent limit of 0.1 mg/l Total Residual Chlorine is included in the permit as an indicator that no free chlorine is present in the effluent.

**Acute WET Testing.** Acute whole effluent toxicity requirement have been imposed to prevent discharges of toxic substances in toxic amounts.

**XI. Special Conditions:** In addition to the technology based effluent limitations and the water quality based effluent limitations, the permit includes standard conditions required by 40 CFR section 122.41, including requirements on duty to comply, duty to reapply, need to halt or reduce activity not a defense, duty to mitigate, proper operation and maintenance, permit actions, property rights, duty to provide information, inspection and entry, monitoring and records, signatory requirement, reporting requirements (including planned change, anticipated noncompliance, transfers, monitoring reports, compliance schedules, 24 hour reporting, and other non-compliance), bypass requirements, and upset requirements. In addition, the permit includes the following special conditions.

**Total inorganic nitrogen and pH.** The Permittee is required to coordinate with the Clark County Water Reclamation District and the City of Henderson to determine whether Las Vegas Wash complies with the RMHQ criterion for total inorganic nitrogen, and for the beneficial use standard for pH. If the Permittee and other dischargers determine that the wash has exceeded these criteria, they must consider whether reasonable changes would result in compliance, and report to the Division.

**Chronic WET Testing.** The Permittee previously conducted a chronic whole effluent toxicity testing study and determined that there was no chronic whole effluent toxicity present in the effluent. The permit requires additional chronic WET testing to ensure that chronic toxicity does not appear.

**Cadmium, copper, hexavalent chromium, molybdenum, selenium, silver, sulfide.** The Permittee previous conducted studies to ascertain whether hardness levels above 400 mg/l provided additional protection against toxicity, and determined that Las Vegas Wash water, which contains 800 mg/l of hardness, had a protective effect. The permit requires annual data review to determine whether additional aquatic studies or other investigations are needed.

**Biosolids.** The permit includes requirements on the disposal or reuse of biosolids. No changes are proposed from existing requirements.

**Pretreatment.** The permit includes requirements for a pretreatment program, which the Permittee has

established. No changes are proposed from existing requirements.

**Miscellaneous.** The permit includes miscellaneous requirements for odors, fencing, fees, operator qualifications, etc. No changes are proposed from existing requirements.

**Effluent Monitoring.** The permit includes extensive effluent monitoring requirements for all substances subject to effluent limitations or included in ambient water quality standards.

**Ambient Water Quality Monitoring.** The existing permit specifies locations and monitoring intervals for ambient water quality monitoring. The proposed permit would revise the provision by requiring the Permittee to submit a proposed monitoring plan annually, consistent with minimum requirements imposed by the permit. In the plan, the Permittee would identify locations and sampling schedules. The minimum permit requirements provide for monitoring at least as intensive as in the existing permit. The revisions allow for greater flexibility, including the moving of existing stations to areas of current interest, and the addition and deletion of stations to provide monitoring for specific issues and for limited times.

**XII. Reasonable Potential Analysis and Antidegradation Review.** EPA regulations require that "Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." (40 CFR § 122.44(d)(1)(i).) Before issuance of the permit in 2001, a detailed reasonable potential analysis was conducted on the potential for wastewater discharges from the City of Henderson, City of Las Vegas, and Clark County Water Reclamation District to cause or contribute to excursions above water quality standards. The conclusion from that analysis was that there was no reasonable potential, and no numeric effluent limits were imposed. Since that permit was issued, the Permittee, in coordination with the other Dischargers, have conducted aquatic life studies demonstrating that Las Vegas Wash, which has hardness concentrations of 800 mg/l, provides a protective effect beyond the protective effect associated with 400 mg/l of hardness, and that it is appropriate to use the concentrations of 800 mg/l in calculating hardness-based water quality criteria. The discharges are unlikely to exceed the ambient water quality metals criteria, and there is no reasonable potential for Las Vegas Wash.

In Nevada, antidegradation review is conducted through the criteria known as Requirements to Maintain Higher Quality (RMHQ). RMHQ criteria were reviewed and applied to this permit, and none of the discharges can reasonably be expected to exceed any RMHQ criterion.

**XIII. Flow: 91 MGD, Water Pollution Control Facility**
10 MGD, Durango Hills WRC

**XIV. Quantities**: At the 30 day average flow allowed by this permit, the discharge from Outfalls 001 and 002 combined will consist of the following maximum loadings:

| | Outfall 001 | Outfall 002 |
|---|---|---|
| **$BOD_5$** | 22,768 lb/day | 2,502 lb/day |
| **Total Suspended Solids** | 22,768 lb/day | 2,502 lb/day |

## XV. Discharges From Future Outfalls

As part of its application, the Permittee has submitted a request for a mixing zone and information on proposed discharges from future outfall 003 to lower Las Vegas Wash and from future outfall 004 to Lake Mead. These discharges will require the construction of a pipeline from the Permittee's plant along Las Vegas Wash to Lake Mead. This proposed pipeline will require approval of federal agencies, and is currently undergoing environmental review through the preparation of an environmental impact statement. The Division is holding the request for a mixing zone and the application for additional outfalls in abeyance at this time, pending a written request from the Permittee to proceed. When it receives a written request to proceed, the Division will prepare a major modification of the permit, which will be subject to public review and comment. No additional application will be required from the Permittee.

## XVI. Procedures for Public Comment

The Notice of the Division's intent to reissue a permit authorizing the facility to discharge to surface waters of the State of Nevada subject to the conditions contained within the permit, is being sent to the **Las Vegas Review Journal** for publication. The notice is being mailed to interested persons on our mailing list. Anyone wishing to comment on the proposed permit can do so in writing until 5:00 P.M. July 24, 2006, a period of 30 days following the date of the public notice. The comment period can be extended at the discretion of the Administrator.

A public hearing on the proposed determination can be requested by the applicant, any affected State, any affected interstate agency, the Regional Administrator of EPA Region IX or any interested agency, person or group of persons. The request must be filed within the comment period and must indicate the interest of the person filing the request and the reasons why a hearing is warranted. Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determined to be appropriate. All public hearings must be conducted to accordance with NAC 445A.238.

The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.650.

## XVII. Proposed Determination

The Division has made the tentative determination to re-issue the proposed 5-year permit.

Prepared by: Alan Tinney
April 24, 2006

# ATTACHMENT A
# PRIORITY POLLUTANTS

## BASE NEUTRAL EXTRACTIBLES

Acenaphthene
Benzidine
1,2,4-Trichlorobenzene
Hexachlorobenzene
Hexachloroethane
Bis(2-chloroethyl) ether
2-Chloronaphthalene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
3,3'-Dichlorobenzidine
2,4-Dinitrotoluene
2,6-Dinitrotoluene
1,2-Diphenylhydrazine
Fluoranthene
4-Chlorophenyl phenyl ether
4-Bromophenyl phenyl ether
Bis(2-Chloroisopropyl) ether
Bis(2-Chloroethoxy) methane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
N-Nitrosodi-n-propylamine
Bis(2-ethylhexyl) phthalate
n-Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Chrysene
Acenaphthylene
Antracene
Benzo(g,h,i)perylene
Fluorene
Phenanthrene
Dibenzo(a,h)anthracene
Indeno(1,2,3-cd)pyrene
Pyrene

## VOLATILE ORGANICS

Acrolein
Acrylonitrile
Benzene
Carbon tetrachloride
Chlorobenzene
1,2-Dichloroethane
1,1,1-Trichloroethane
1,1-Dichloroethane
1,1,2-Trichloroethane
1,1,2,2-Tetrachloroethane
Chloroethane
2-Chloroethylvinylether
Chloroform
1,1-Dichloroethene
Trans-1,2-Dichloroethene
1,2-Dichloropropane
1,3-Dichloropropane
Ethylbenzene
Dichloromethane
Chloromethane
Bromomethane
Bromoform
Bromodichloromethane
Dibromochloromethane
Tetrachloroethene
Toluene
Trichloroethene
Vinyl chloride

## PESTICIDES

Aldrin
Dieldrin
Chlordane (Technical)
4,4'-DDT
4,4'-DDE
4,4'-DDD
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
Alpha-BHC
Beta-BHC
Gamma-BHC (Lindane)
Delta-BHC
PCB 1016
PCB 1221
PCB 1232
PCB 1242
PCB 1248
PCB 1254
PCB 1260
Toxaphene

## ACID EXTRACTIBLES

2,4,6-Trichlorophenol
4-Chloro-3-methylphenol
2-Chlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2-Nitrophenol
4-Nitrophenol
2,4-Dinitrophenol
2-Methyl-4,6-dinitrophenol
Pentachlorophenol
Phenol

## METALS

Antimony
Arsenic
Beryllium
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Thallium
Zinc

## DIOXINS

TCDD

## OTHER

Cyanide
Asbestos

Note: Priority Pollutants to be analyzed using Environmental Protection Agency (EPA) Methods 200 Series, 353.3, 420.2, 624,625, 608, and/or an appropriate combination of these methods to verify compliance with permit-specified effluent discharge limitations.

**Permit No. NV0021261**

**Nevada Division of Environmental Protection**

## AUTHORIZATION TO DISCHARGE

In compliance with the provisions of the Clean Water Act as amended, (33 U.S.C. 1251 et. seq; the "Act"), and Chapter 445A of the Nevada Revised Statutes,

Clark County Water Reclamation District
5857 E. Flamingo Road
Las Vegas, NV 89122

is authorized to discharge from a facility located at

| | | |
|---|---|---|
| 4300 S Hollywood Blvd.<br>Las Vegas, Nevada 89122<br>Clark County | **AND** | 5857 E. Flamingo Road<br>Las Vegas, Nevada 89122<br>Clark County |
| **Outfall 001 -AWT**<br>Latitude N36° 06' 00"<br>Longitude W115° 02' 00" | **AND** | **Outfall 002 – Central Plant**<br>Latitude N36° 06' 34"<br>LongitudeW115° 01' 26" |

to receiving waters named Las Vegas Wash

in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Part I, II, and III hereof.

This permit shall become effective on July 31, 2006.

This permit and the authorization to discharge shall expire at midnight, July 31, 2011.

Signed this 31st day of July, 2006

Alan Tinney, P.E., Supervisor
Permitting Branch
Bureau of Water Pollution Control

## PART 1
## A. EFFLUENT LIMITATIONS, MONITORING REQUIREMENTS AND CONDITIONS

1. During the period beginning on the effective date of this permit, and lasting until the permit expires, the Permittee is authorized to discharge treated sanitary wastewater and facility dewatering water from:

   - Outfall **001**, AWT plant; and
   - Outfall **002**, effluent from the Central Plant to the Las Vegas Wash.

   Effluent samples taken in compliance with the monitoring requirements specified below shall be taken downstream of the disinfection facilities but prior to mixing with Las Vegas Wash. Influent samples are to be taken at the headworks and are designated as **INF**. The Effluent sites are sampled separately and will be designated by their Outfall numbers **001** and **002**. The discharges for Outfall **001 and** Outfall **002** shall be limited and monitored by the Permittee as specified in Table I.1.

**TABLE I.1 (Outfalls 001 - AWT, 002- Central Plant)**

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS[4] | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | **30 Day Average** | **7 day Average** | **30 Day Aveerage lb/day** | **Sample Location** | **Measurement Frequency** | **Sample Type[3]** |
| **Flow** | 150 MGD[4] | Monitor and Report | NA | INF, 001, 002 | Continuous | Flow meter |
| **$BOD_5$ (uninhibited)** | 30 mg/L | 45 mg/L | 37,530 | 001, 002 | Daily | Composite |
| | Monitor and Report | Monitor and Report | NA | INF | | |
| **Total Suspended Solids** | 30 mg/L | 45 mg/L | 37,530 | 001, 002 | Daily | Composite |
| | Monitor and Report | Monitor and Report | NA | INF | | |
| **$BOD_5$ (uninhibited) &TSS** | The Permittee shall demonstrate that the 30 day average percentage removal rate is at least 85%. | | | NA | Monthly | Calculate |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS[4] | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average | 7 day Average | 30 Day Aveerage lb/day | Sample Location | Measurement Frequency | Sample Type[3] |
| **pH** | Minimum 6.0 and maximum 9.0 SU, except as allowed in Parts I.A.3 and I.A.19 | | NA | 001, 002 | Daily | Discrete |
| **Fecal Coliform[1]** | 200 cfu or mpn/100ml | See footnote 1 | NA | 001, 002 | Daily | Discrete |
| **Total Residual Chlorine** | NA | 0.1 mg/L- except as allowed in Part I.A.19. | NA | 001, 002 | Daily | Discrete |
| **Total Phosphorus as P: mg/L** | See Part I.A.2 | | | 001, 002 | Daily | Composite |
| **Total Ammonia as N: mg/L** | See Part I.A.2 | | | 001, 002 | Daily | Composite |
| **Total Inorganic Nitrogen as N: mg/L** | See Part I.A.3 | | | 001, 002 | Weekly | Composite |
| **Total Dissolved Solids: mg/L** | See Part I.A.4 | | | 001, 002 | Weekly | Composite |
| **Priority Pollutants** | Monitor and Report, See Attachment A | | | 001, 002 | Per Part I.A.18.d. | Discrete or Composite |
| **WET testing** | See Part I.A.17. | | | 001, 002 | Monthly | Composite |
| **Receiving Water** | Monitor and Report | | | Per Part I.A.21 | Per Part I.A.21 | Discrete |
| **Temperature: °C** | Monitor and Report | | NA | 001, 002 | Weekly | Discrete |
| **Dissolved Oxygen:** | Monitor and Report | | NA | 001, 002 | Weekly | Discrete |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS[4] | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average | 7 day Average | 30 Day Aveerage lb/day | Sample Location | Measurement Frequency | Sample Type[3] |
| mg/L | | | | | | |
| Orthophosphorus as P: mg/L | Monitor and Report | | | 001, 002 | Daily | Composite |
| Nitrate + Nitrite as N: mg/L | Monitor and Report | | | 001, 002 | Weekly | Composite |
| Total Kjeldahl Nitrogen as N: mg/L | Monitor and Report | | | 001, 002 | Weekly | Composite |

1. The discharge shall not exceed a log mean of 200 cfu or mpn per 100 ml over a 30 day period nor may more than 10 percent of the total samples taken exceed 400 cfu or mpn per 100 ml.
2. For monitor and Report parameters, the Permittee shall report the maximum value, consistent with the measurement frequency, instead of the 7 day average.
3. Composite samples may be either physical or mathematical composites.
4. The 150 MGD limit applies to the sum of the Permittee's discharges through Outfalls 001, and 002.

I.A.2. **Waste Load Allocation (WLA) For Discharges Into Las Vegas Wash** The Permittee is authorized to discharge the waste loads listed for Total Phosphorus as P and Total Ammonia as N to the Las Vegas Wash. The WLA applies to the combined loading from Outfalls **001** and **002**. This permit condition constitutes a cooperative agreement between the City of Las Vegas, Clark County Water Reclamation District, and City of Henderson (hereinafter Dischargers) to allow discharge flexibility. Each facility has an **Individual Waste Load Allocation (IWLA)** and there is a **Sum of Waste Load Allocations (∑WLA)** defined below for the three facilities. Treatment facilities which are used to attain a waste load allocation are not required to be operated when not needed to meet that allocation.

a. The Permittee shall be considered in compliance if **either**:
   i. The Permittee does not exceed the **IWLA** listed below or the **IWLA** in effect due to transfers, **or**
   ii. The **Sum of the Waste Load Allocations (∑WLA)** listed below is not exceeded.

## Waste Load Allocation Table

| Constituent | City of Las Vegas<br><br>IWLA | Clark County Water Reclamation District IWLA | City of Henderson<br><br>IWLA | ∑WLA |
|---|---|---|---|---|
| **Total Phosphorus as P** | 123 lb/day | 173 lb/day | 38 lb/day | 334 lb/day, Note: This WLA only applies March 1 - October 31; no limit applies the rest of the year. |
| **Total Ammonia as N** | 358 lb/day | 502 lb/day | 110 lb/day | 970 lb/day, Note: This WLA only applies April 1 - September 30; no limit applies the rest of the year. |

b. **Annual Reallocation of IWLA** On an annual basis, the Permittee may modify the **IWLA** by either transferring or receiving waste load from another discharger. This reallocation shall become effective upon submittal of a notification signed by all three dischargers. The annual reallocation shall be **submitted by May 31st if applicable**. The notification of reallocation shall include the flow, waste load discharged, treatment plant removal efficiency in tabular and graphical format. The reallocation of **IWLAs** shall be considered a minor modification to the permit as long as the **∑WLA** is not modified.

c. **Temporary Trading of IWLA** The Permittee may temporarily trade **IWLA** upon submittal of a notification signed by all three dischargers describing the amount of **IWLA** transferred, the length of time the transfer is effective and the basis for the transfer. The basis for the transfer shall include the last monthly flows and waste load discharged for each discharger. The waste load transfer shall be effective on the date of the submittal to the Division. This transfer is binding on the parties and cannot be revoked without a notification signed by all three dischargers. The transferred **IWLA** shall revert back to the original Permittee at the end of the time specified on the notification. A copy of the latest **IWLA** agreement and any agreements made during the reporting period shall be **submitted with each quarterly report required by Part I.B.1.**

d. **Reporting** The Permittee shall **submit quarterly reports** pursuant to Part I.B.1, the **IWLA** and the **∑WLA** for Total Phosphorus as P and Total Ammonia as N, reported monthly as a 30 day average in lb/day. The data for the **∑WLA** shall be provided to and obtained from the other dischargers. In the event the Permittee cannot obtain the **∑WLA** information in time for submittal with the quarterly DMR, then an explanation shall be included with the report along with a schedule for timely submittal.

I.A.3. **Confirmation of Standards Compliance**

a. The Permittee shall coordinate with the other dischargers identified in Part I.A.2 to determine whether on an annual basis the 95th percentile of the monitoring data for Las Vegas Wash complies with the 20 mg/l total inorganic nitrogen (TIN) water quality standard at the control point, Las Vegas Wash 2 (LVW2, LW 6.05).

b. The Permittee shall coordinate with the other dischargers identified in Part I.A.2 to determine whether the pH at LVW2 (LW6.05) complies with the water quality standard of 6.5-9.0 standard units.

c. The results of these determinations shall be reported in the annual report identified in Part I.B.1.a.

d. If the Permittee finds that Las Vegas Wash is not in compliance with the water quality standards identified in Parts I.A.3. a. or b., the Permittee shall:

i. Consider whether reasonable changes in the Permittee's discharge from any outfall would result in compliance;
ii. Coordinate with the other dischargers identified in Part I.A.2 to consider whether coordinated reasonable changes would achieve compliance; and
iii. Submit a report to the Division explaining the analytical process and conclusions.

I.A.4 **Salinity Control**: The Permittee shall continue to implement the existing ordinances and public education programs for salinity control and identify and correct all identified infiltration/inflow problems which contribute to exceedance of the goal of more than 400 mg/l TDS increase above the Colorado River water supply. The Permittee shall provide the following information **annually by May 31st:**

a. Description of the municipal entity and facilities.

b. Description of significant salt sources of the municipal wastewater collection system, and identification of entities responsible for each source, if available.

c. Description of the wastewater discharge, covering location, receiving waters, quantity of salt load, and salinity concentration.

d. Description of alternative plans for minimizing salt contribution to the municipal discharge. Alternative plans should include:
i. Description of system salt sources and alternative means of control.
ii. Cost of alternative plans in dollars per ton, of salt removed from any new discharges to the municipality.

e. In order to calculate the net increase in salinity the Permittee shall obtain the concentration of TDS in the water supply at least quarterly. The Permittee may rely on data collected by any water purveyors.

and shall identify the source of the data.

f. An evaluation of the impact of the discharge on the lower stem of the Colorado River system in terms of average annual average tons/day and concentration of TDS discharged.

I.A.5 **Narrative Standards** *Nevada Administrative* Code (*NAC) 445A.121*: Discharges shall not cause the following standards to be violated in any surface waters of the state. Waters must be free from:

a. Substances that will settle to form sludge or bottom deposits in amounts sufficient to be unsightly, putrescent or odorous;

b. Floating debris, oil, grease, scum, and other floating materials in amounts sufficient to be unsightly;

c. Materials in amounts sufficient to produce taste or odor in the water or detectable off-flavor in the flesh of fish or in amounts sufficient to change the existing color, turbidity or other conditions in the receiving stream to such a degree as to create a public nuisance;

d. High temperature, biocides, organisms pathogenic to human beings, toxic, corrosive or other deleterious substances at levels or combinations sufficient to be toxic to human, animal, plant or aquatic life;

e. Radioactive materials must not result in accumulations of radioactivity in plants or animals that result in a hazard to humans or harm aquatic life;

f. Untreated or uncontrolled wastes or effluents that are reasonably amenable to treatment or control; and

g. Substances or conditions which interfere with the beneficial use of the receiving waters.

The narrative standards are not considered violated when the natural conditions of the receiving water are outside the established limits, including periods of high or low flow. Where effluents are discharged to such waters, the discharges are not considered a contributor to substandard conditions provided maximum treatment in compliance with permit requirements is maintained.

I.A.6. The Permittee shall annually review monitoring data, conduct aquatic life studies using water with a hardness representative of the Las Vegas Wash (e.g. 800 mg/l) or conduct other studies to evaluate the existing water quality standards or other data issues, for the following parameters: cadmium, copper, hexavalent chromium, molybdenum, selenium, silver, sulfide. Results shall be included as part of the annual report required by Part I.B.1.a.i.

I.A.7. There shall be no objectionable odors from the collection system, treatment facility or disposal area, or biosolids treatment, use, storage or disposal area that the Permittee owns or operates.

I.A.8. There shall be no discharge of substances that would cause a violation of water quality standards of the State of Nevada as defined by the permit. The permit may be reopened, and additional limits imposed, if it is determined that the discharge is causing a violation of ambient water quality standards of the State of Nevada.

I.A.9. There shall be no discharge from the collection, treatment and disposal facilities except as authorized by this permit or in accordance with the Division's Spill Reporting Policy.

I.A.10. The treatment and disposal facility shall be fenced and posted.

I.A.11. The collection, treatment and disposal facilities shall be constructed in conformance with plans approved by the Administrator, as required by NAC 445A.284, except as provided in the Division's " Plan Specification Review Policy for Collection and Treatment Systems in Clark County", latest edition.

I.A.12. The facility shall be operated in accordance with the Operations and Maintenance (O&M) manual which must be approved by the Administrator.

I.A.13. There shall be no discharge of floating solids or visible foam in other than trace amounts.

I.A.14. **Biosolids and Sewage Sludge**

a. **Disposal:** The Permittee shall comply with all applicable sections of the following regulations for biosolids which are disposed and inform any biosolids disposer of the requirement that they must comply with the following regulations as applicable.

i. 40 CFR 257 and 258: for biosolids disposed in municipal solid waste landfills as approved by the Administrator and the County;
ii. 40 CFR 261 for hazardous biosolids or 40 CFR 761 for biosolids with a PCB concentration greater than 50 mg/kg; or
iii. 40 CFR 503 placed in surface disposal sites (dedicated land disposal sites or monofills), or incinerated.

b. **Reuse:** The Permittee shall comply with any applicable sections of 40 CFR 503 for biosolids generated at the facility including, solid waste screening and sewage sludge which is to be used, land applied, stored or treated in compliance with any applicable sections of the following regulations:

i. 40 CFR 503: for non-hazardous biosolids that are land applied.
ii. The Permittee is responsible for informing any biosolids preparer, applier, or disposer, of all requirements and the applicable regulations listed above.
iii. Facilities which are regulated under 40 CFR Part 503 shall monitor parameters listed in I.A.18., and shall also monitor the pathogen density requirements in 40 CFR 503.32 (a) and (b)(2) through (4) and the vector attraction reduction requirements in 503.33(b)(1) through (8); at the frequencies listed below.

| **Dry Biosolids Disposal rate in metric tons/yr.** | **Frequency** |
|---|---|
| >0 - <290 | each year |
| ≥290 -<1500 | once a quarter |
| ≥1500 -<15000 | once every 2 months |
| ≥15000 | once a month |

iv. Biosolids to be land applied shall be tested for organic nitrogen as N, ammonia as N, nitrate as N, and Total Nitrogen as N on the frequency required above.

v. Biosolids which are to be land applied shall be characterized annually pursuant to 40 CFR 261 to determine if they are hazardous.

c. If biosolids are stored at any facility owned or operated by the Permittee for over two years from the time they are generated, the Permittee shall notify the Division within 30 days and shall ensure compliance with all the requirements of surface disposal 40 CFR 503 C, or must submit a written notification to the Division and EPA with the information listed at 40 CFR 503.20 (b), demonstrating the need for longer temporary storage.

d. Biosolids treatment or storage facilities owned or operated by the Permittee shall be designed to divert stormwater run-on for the 100-year storm event, and be designed to prevent erosion which could cause biosolids to run-off.

e. The Permittee shall take all appropriate precautions to inform biosolids haulers that all necessary measures to contain the biosolids should be taken before leaving the treatment facility.

f. The Permittee shall comply with the following notification requirements either directly or through contractual arrangements with a biosolids management contractor:

i. If biosolids are shipped to another state or to Indian lands, the Permittee shall send notice of the shipment to the state permitting authorities, the EPA Regional Office of the region receiving the biosolids or the Indian authorities.

ii. For land application or unpermitted disposal sites, the Permittee shall notify the Division 180 days prior to shipping any biosolids to enable the site to obtain a permit.

g. **Biosolids Monitoring Report (BMR):** The Permittee shall submit a BMR annually which shall be submitted by **May 31st** for the period covering the previous calendar year. The report shall contain all the required biosolids analytical data, the volume of biosolids generated that year, any volume accumulated from previous years, descriptions of pathogen and vector attraction reduction methods and the required certifications as required by 40 CFR 503.17 and 27, the names, mailing and street addresses and telephone numbers of all facilities which received biosolids for storage, disposal, use, treatment, land application or any other use or disposal methods not mentioned and the volume of biosolids taken to each facility.

I.A.15. **Annual Fee:** The Permittee shall remit an annual review and services fee in accordance with NAC 445A.232 starting **July 1, 2007** and every year thereafter until the permit is terminated.

I.A.16. The treatment facility shall be operated by a Nevada Certified Grade V Wastewater Operator. The first DMR submitted under this permit must include the written designation of the authorized representative as required by Part III.A.2. If the certified operator in responsible charge changes, a new designation letter must be submitted.

I.A.17. **Whole Effluent Testing:** Beginning with the effective date of this permit, the Permittee shall conduct monthly toxicity tests on 24-hour composite effluent samples of Outfall 001 and 002 as described below:

a. **Acute Toxicity Limit:** The effluent shall be deemed acutely toxic when there is a statistically significant difference at the 95th% confidence interval between the survival of the control (0% effluent) test organisms and the survival of the test organisms in the 100% effluent at the following limits:
   i. The survival of test organisms in the undiluted effluent sample is less than 90 percent in six (6) out of eleven (11) consecutive samples; or
   ii. The survival rate of test organisms in the undiluted effluent sample is less than 70 percent in any two of eleven consecutive samples.

b. **Test Methods**
   i. The acute flow through or static replacement tests shall be conducted in general accordance with the procedures set out in the latest revision of "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms," EPA/600/4-90/027. The Permittee shall conduct an acute 48-hour flow through or static replacement toxicity test using any Daphnid approved by the Division and an acute 96-hour flow through or static replacement toxicity test using fathead minnows, Pimephales promelas. After each 24-hours of the test period the dilutions shall be replaced with freshly prepared dilutions of the original effluent sample.
      1. If more than 10 percent control mortality occurs, the test shall be repeated until satisfactory control survival is achieved.
      2. The source of the dilution water shall be reported with the test results. The tests shall be run using 4 replicate chambers, with a minimum of 5 organisms per test chamber for the Daphnid and 2 replicate chambers with a minimum of 10 organisms per test chamber for the Pimephales promelas.
   ii. **Alternative Species and Protocols:** The Permittee may undertake an investigation of alternative site specific toxicity test species and alternative site specific toxicity protocols. If alternative, site-specific toxicity test species or protocols are developed as a result of work by the Permittee, such species or protocols may be substituted for those specified in this permit on approval by the Division under 40 CFR Part 136. Alternative protocols must be compared to EPA protocols to demonstrate appropriateness and reliability.

c. **Testing Schedule**
   i. *Routine Schedule*: The Permittee shall conduct an acute toxicity test monthly.

ii. *Accelerated schedule*: Whenever the effluent has been determined to be acutely toxic per Part I.A.17.a., the Permittee shall increase the frequency of acute toxicity testing to every other week. The accelerated testing shall also be conducted to determine an endpoint of either the LC50 or the No Observed Effects Concentration (NOEC) as defined in the above referenced method. When 4 (four) consecutive tests show greater than 70 percent survival of undiluted effluent, the Permittee may resume its routine test schedule.

d. **Follow-up Responses:** Whenever the acute toxicity effluent limitation as defined under either Part I.A.17.a.i or ii has been exceeded, **and** one or more of the tests conducted under Part I.A.17.c ii. has a survival rate of less than 70% in an undiluted effluent sample, the Permittee shall:

i. In general accordance with EPA manuals and EPA/600/6-91/003, EPA/600/3-88/035, or any subsequent revisions and/or methods approved by the Division, initiate an identification investigation within 24 hours of the exceedance to identify the cause(s) of the toxicity. After the initiation of the investigation phase pursuant to this condition, the Permittee may suspend the accelerated testing required by Part I.A.17.c.ii. as long as the routine testing required by Part I.A.17.c.i. is resumed.

ii. In general accordance with EPA manuals and EPA/600/R-92/081, or any subsequent revisions and/or methods approved by the Division, conduct an evaluation of findings where appropriate; and

iii. Notify the Division within fifteen (15) days of becoming aware of the exceedance and provide the following:

1. Times and dates when the limitation was exceeded;
2. The findings of the identification investigation or other investigations to identify the cause(s) of the toxicity and a plan for continuing the identification investigation if it was not conclusive;
3. The actions the Permittee has taken or will take to mitigate the impact of the discharge, to correct the noncompliance and prevent the recurrence of toxicity; and
4. Where corrective actions have not been completed, an expeditious schedule under which the corrective actions will be implemented.

e. In no event shall the discharger cause any impairment of the receiving water or of the beneficial uses, nor cause a violation of any other provision of this permit, the Clean Water Act and State or local regulation or law.

f. **Toxicity Testing Reopener:** This permit may be reopened and modified by the Division to include effluent limits, additional testing and/or other appropriate actions to address demonstrated effluent toxicity. This permit may also be reopened and modified by the permitting authority to incorporate alternative permit conditions reflecting State Water Quality Standards revisions related to effluent toxicity.

g. In addition to the quarterly DMR submittals, the Permittee shall submit an annual summary **which** provides a review of the survival rates of both the control and the 100% effluent. The summary shall be submitted by **May 31st of each** year.

h. **Chronic Toxicity:** The Permittee shall conduct chronic toxicity study using *Ceriodaphnia dubia* to confirm existing nontoxic conditions identified in studies conducted during the previous permit cycle and, if toxicity is found, to identify pollutants that may require additional controls under the pretreatment program, Part I.A.18.

i. The Permittee shall submit a study plan and schedule within one hundred eighty (180) days from the date of issuance of this permit for concurrence by the Division.

ii. The study will include the following:

1. Chronic toxicity testing to be conducted at least once per quarter over a one year period following concurrence of the study plan by the Division.
2. Samples of wastewater shall be taken at the same location as the effluent compliance samples, unless otherwise approved in writing by the Division.
3. If chronic toxicity is identified, using appropriate statistical procedures or other evaluation methods acceptable to the Division, the Permittee may either increase testing frequency to monthly or conduct a toxicity identification evaluation (TIE). If after two additional months of testing the chronic toxicity has abated, the Permittee may return to quarterly testing. If it has not, the Permittee shall continue accelerated testing, conduct a TIE, or submit an alternate proposal to the Division for approval.
4. Chronic toxicity testing shall be conducted in accordance with procedures specified in 40 CFR Part 136.
5. TIEs shall be conducted in accordance with procedures set forth in *Toxicity Identification Evaluations: Characterization of Chronically Toxic Effluents*, Phase I, EPA/600/6-91/003, USEPA, 1991A; and *Toxicity Reduction Evaluation Protocol for Municipal Wastewater Treatment Plants*, EPA/600/2-88/062, USEPA, 1989A, as appropriate.

iii. The Permittee shall take appropriate actions to address any pollutant of concern identified through this study.

iv. A report on the study shall be submitted to the Division within the time provided for in the study plan and schedule. The Permittee and the Division will review the information and any subsequent actions taken by the Permittee to assess the results and determine what actions, e.g., additional chronic toxicity testing, are necessary and appropriate.

v. The data collected through this study, and through the chronic toxicity testing and TIE procedures, are for informational purposes only and shall not be used to assess compliance or in an enforcement action against the Permittee.

I.A.18. **Pretreatment of Industrial Wastewaters:** The Permittee shall implement and enforce a pretreatment program under 40 CFR Part 403 (hereinafter 403), including any subsequent regulatory revisions to 403 and be responsible for and liable for the performance of all Control Authority pretreatment requirements contained in 403. Where 403 or subsequent revision places mandatory actions upon the Permittee as Control Authority but does not specify a timetable of completion of the actions, the Permittee shall complete the required actions within 6 months from the issuance date of this permit or the effective date of the 403 revisions, whichever comes later. For violations of pretreatment requirements, the Permittee shall be subject to enforcement actions, penalties, fines, and other remedies by the U.S. EPA or other appropriate parties, as provided in the Act. EPA may initiate enforcement action against a nondomestic

user for noncompliance with applicable standards and requirements as provided in the Act and as provided by the Division and EPA in the enforcement agreement.

a. The Permittee will comply with the Pretreatment Program as submitted to and approved by the Division and EPA. This program shall include written agreements, with all sewage agencies who contribute flows to the treatment facility, that provide the Permittee with the legal authority to enforce the pretreatment program. The Permittee shall comply with all parts of the schedule listed below, Pretreatment of Industrial Wastewaters.

b. The Permittee shall enforce the requirements promulgated under sections 307(b) through (d) and 402(b) of the Act with timely, appropriate and effective enforcement actions. The Permittee shall cause all nondomestic users subject to federal categorical standards to achieve compliance no later than the date specified in those requirements or in the case of a new nondomestic user, upon commencement of the discharge.

c. The Permittee shall perform the pretreatment functions as required in 403 including but not limited to:
   i. Implement the necessary legal authorities as provided in 403.8(f)(1);
   ii. Enforce the pretreatment requirements under 403.5 and 6;
   iii. Implement the programmatic functions as provided in 403.8(f)(2); and
   iv. Provide the requisite funding and personnel to implement the pretreatment program as provided in 403.8(f)(3).

d. The Permittee shall submit annually a report to the Division and EPA describing its pretreatment activities over the previous year. In the event the Permittee is not in compliance with any conditions or requirements of this permit, then the Permittee shall also include reasons for non-compliance and state how and when the Permittee shall comply with such conditions and requirements. This annual report shall cover operations for the previous calendar year and is due May 31st of each year. The report shall contain, but is not limited to, the following information:
   i. A summary of the analytical results from representative, flow proportioned, 24-hour composite sampling of the Publicly Owned Treatment Works' (POTWs) influent and effluent for those pollutants EPA has identified under section 307(a) of the Act which are known or suspected to be discharged by nondomestic users. This will consist of an annual full priority pollutant scan, with quarterly samples analyzed only for those pollutants detected in the full scan.
   ii. Sludge shall be sampled during the same 24 hour period and analyzed for the same pollutants as the influent and effluent. The sludge analyzed shall be a composite sample of a minimum of twelve discrete samples taken at equal time intervals over a 24 hour period or a composite of discreet samples taken every two hours when the sludge production period is less than 24 hours. Wastewater and sludge sampling and analysis shall be performed a minimum of once per quarter. The Permittee shall also provide any influent or effluent monitoring data for non-priority pollutants which the Permittee believes may be causing or contributing to interference, pass through or adversely impacting sludge quality. Sampling and analysis shall be performed with

the techniques prescribed in 40 CFR 136;

iii. A discussion of upset, interference, or pass through incidents, if any, at the treatment plant which the Permittee knows or suspects were caused by nondomestic users of the POTW system. The discussion shall include the reasons why the incidents occurred, the corrective actions taken and, if known, the name and address of the non-domestic user responsible. The discussion shall also include a review of the applicable pollutant limitations to determine whether any additional limitations, or changes to existing requirements, may be necessary to prevent pass through or interference;

iv. An update of the Permittee's significant industrial users (SIUs) including their names and addresses, and a list of deletions, additions and SIU name changes keyed to the previously submitted list. The Permittee shall provide a brief explanation for each change. The list shall identify the SIUs subject to federal categorical standards by specifying which set(s) of standards are applicable to each SIU. The list shall also indicate which SIUs are subject to local limitations;

v. The Permittee shall characterize the compliance status of each SIU by providing a list or table which includes the following information:
   1. Name of the SIU;
   2. Category, if subject to federal categorical standards;
   3. The type of wastewater treatment or control process in place;
   4. The number of samples taken by the POTW during the year;
   5. The number of samples taken by the SIU during the year;
   6. For an SIU subject to discharge requirements for total toxic organics, whether all required certifications were provided;
   7. A list of the standards violated during the year. Identify whether the violations were for categorical standards or local limits;
   8. Whether the facility is in significant noncompliance (SNC) as defined at 403.12(f)(2)(vii) at any time during the year; and
   9. A summary of enforcement or other actions taken during the year to return the SIU to compliance. Describe the type of action, final compliance date, and the amount of fines and penalties collected, if any. Describe any proposed actions for bringing the SIU into compliance;

vi. A brief description of any programs the POTW implements to reduce pollutants from nondomestic users that are not classified as SIUs;

vii. A brief description of any significant changes in operating the pretreatment program which differ from the previous year including, but not limited to, changes concerning the program's administrative structure, local limits, monitoring program or monitoring frequencies, legal authority, enforcement policy, funding levels, or staffing levels;

viii. A summary of the annual pretreatment budget, including the cost of the pretreatment program functions and equipment purchases; and

ix. A summary of activities to involve and inform the public of the program including a copy of the newspaper notice, if any, required under 403.8(f)(2)(vii).

e. The Permittee shall submit quarterly SIU compliance status reports to EPA Region 9 and the

Division. The reports shall cover the periods of January 1 through March 31, April 1 through June 30, July 1 through September 30, and October 1 through December 31. Each report shall be submitted by the end of the month following the quarter except the report for October 1 through December 31, which may be included in the annual report. The reports shall contain:

i. The name and address of all SIUs which violated any discharge or reporting requirements during the quarter;
ii. A description of the violations including whether any discharge violations were for categorical standards or local limits;
iii. A description of the enforcement or other actions that were taken to remedy the noncompliance; and
iv. The status of active enforcement and other actions taken in response to SIU noncompliance identified in previous reports.

I.A.19. **Chlorine Residual and pH Effluent Limitation**

a. The Permittee may determine compliance with chlorine residual and pH either by grab sampling or by continuous monitoring.

b. If the Permittee chooses continuous monitoring, the Permittee shall maintain the chlorine residual and pH of such effluent within the range set forth in the applicable effluent limitations guidelines, except excursions from the range are permitted subject to the following limitations:

i. The total time during which the chlorine residual and pH values are outside the required range, values shall not exceed 7 hours and 26 minutes in any calendar month;
ii. No individual excursion from the range of chlorine and pH shall exceed 60 minutes; and,
iii. If the continuous monitoring equipment fails, estimates derived from historical or contemporary data may be used.

c. The Division may allow the Permittee to discontinue monitoring for chlorine upon approval of a submittal which demonstrates that there is no reasonable potential for the chlorine concentrations to be toxic.

I.A.20. **Schedule of Compliance:** The Permittee shall implement and comply with the provisions of the schedule of compliance after approval by the Administrator, including in said implementation and compliance, any additions or modifications which the Administrator may make in approving the schedule of compliance.

a. The Permittee shall achieve compliance with the effluent limitations upon issuance of the permit.

b. The Permittee shall submit a report in accordance with Part I.B.1.c. within 14 days of a compliance date detailing compliance or noncompliance with that date.

c. Within six (6) months of the completion of the plant expansion and/or modification, the Permittee shall submit a revised O&M manual to the Division for review and approval.

I.A.21. **Lake Mead and Las Vegas Wash Monitoring: By November 1st** of each year, the Permittee shall jointly submit, with the Clark County Water Reclamation District and the City of Las Vegas and the City of Henderson, an annual plan for monitoring ambient water quality in Lake Mead and Las Vegas Wash during the following year. Following approval by the Division, the Permittee shall implement its portion of the plan beginning **January 1st** of each year. The joint monitoring plan shall include as a minimum, the following:

a. The identification of at minimum three locations in Las Vegas Wash at which water quality will be routinely monitored.

b. The identification of at minimum five locations within Lake Mead at which water quality will be routinely monitored, including at least one station near the mouth of Las Vegas Wash

c. An identification of the depths at which each station will be sampled.

d. An explanation of why the station locations and depths were chosen.

e. A schedule for monitoring water quality at the selected stations, at minimum biweekly in Las Vegas Wash and, during April through September, in Lake Mead.

f. A list of parameters to be monitored, including at minimum chlorophyll (in epilimnetic samples), total phosphorus, orthophosphorus, nitrate, ammonia, dissolved oxygen, conductivity, temperature, pH, and fecal coliforms or E. coli.

a. If the Permittee is unable to reach agreement with the other dischargers, the Permittee shall submit an explanation and a proposed individual monitoring plan.

## B. MONITORING AND REPORTING

### I.B.1. Reporting

a. **Annual Reports**

i. On or before **May 31st** of each year, the Permittee shall submit a plot of concentration (y-axis) versus date (x-axis) for each analyzed constituent which has been detected greater than 25% of the time. The plot shall include data from the preceding five years, if available. **Any data point from the current year detected at concentrations greater than the limits in Part I.A.1 or the applicable water quality standard must be explained by a narrative.**

ii. The BMR required by Part I.A.14, the pretreatment annual report required by Part I.A.18.d., the Lake Mead and Las Vegas Wash Annual Report required by Part I.A.21, the TIN annual report

required by Part I.A.3., the Salinity Control Report required by Part I.A.4. and the WET reports required by Part I.A.17 are due each **May 31st**.

b. **Quarterly Reporting:** Monitoring results obtained pursuant to Part I.A of the permit for the previous three (3) month period shall be summarized for each month and reported on a Discharge Monitoring Report (DMR) form. The DMR is to be received in this office no later than the 28th day of the month following the completed reporting period. The Permittee shall also submit the data in an electronic format provided by the Division. The first report is due on October 28, 2006. Summaries of laboratory results for analyses conducted by outside laboratories must accompany the DMR, and the full data package provided by the laboratory must be provided if requested in writing by the Division. If at any time the Permittee concludes that submitted data were incorrect, the Permittee shall notify the Division in writing, identifying the incorrect data, and replace the incorrect data with corrected data, which shall thereafter be used for determining compliance with this permit.

c. **Compliance Report:** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

d. **Other information:** Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Administrator, it shall promptly submit such facts or information.

e. **Planned changes:** The Permittee shall give notice to the Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition to a permitted facility;
   i. May meet one of the criteria for determining whether a facility is a new source (40 CFR 122.29(b));
   ii. Could significantly change the nature or increase the quantity of pollutants discharged; or
   iii. Results in a significant change to the Permittee's sludge management practice or disposal sites.

f. **Anticipated non-compliance:** The Permittee shall give advance notice to the Administrator of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

g. An original signed copy of these, and all other reports required herein, shall be submitted to the State at the following address:

Division of Environmental Protection
Bureau of Water Pollution Control
ATTN: Compliance Coordinator
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701

h. A signed copy of all Discharge Monitoring Reports and any other reports shall be submitted to the Regional Administrator at the following address:

U.S. Environmental Protection Agency, Region IX
NPDES/DMR WTR-7-1
75 Hawthorne Street
San Francisco, CA 94105

## I.B.2 Monitoring

a. **Representative Samples:** Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

b. **Test Procedures:** Monitoring for the analysis of pollutants shall be conducted according to test procedures approved under 40 CFR 136 published pursuant to Section 304(h) of the Act, or SW-846, or in the case of sludge disposal, approved under 40 CFR 503, or other procedures as approved by the Administrator. Analysis shall be performed by a State of Nevada certified laboratory.

c. **Recording the Results:** For each measurement or sample taken pursuant to the requirements of this permit, the Permittee shall record the following information:
   i. The exact place, date, and time of sampling;
   ii. The dates the analyses were performed;
   iii. The person(s) who performed the analyses;
   iv. The analytical techniques or methods used; and
   v. The results of all required analyses.

d. **Additional Monitoring by Permittee:** If the Permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form. Such increased frequency shall also be indicated on the DMR. If a Permittee monitors more often than once per day, the Permittee shall compute the 7-day average or 30-day average by first averaging the samples for each day, and then averaging the daily averages or discrete samples representing all sampled days within the period; provided, however, that the Permittee may instead average all samples taken within the period if it notifies the Division that it will use this method.

e. **Records Retention:** All records and information resulting from the monitoring activities, permit application, reporting required by this permit, including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation, shall be retained for a minimum of five (5) years, or longer if required by the Administrator. Records of monitoring information required by this permit related to the Permittee's sewage sludge use and/or disposal activities shall be retained for a period of at least 5 years or longer as required by 40 CFR 503.

f. **Detection Limits:** All laboratory analysis conducted in accordance with this discharge permit must meet the following criteria:

i. All methods used must be specified or approved in either 40 CFR 136, SW-846 or otherwise approved by the Division. All analytical results must be generated by analytical laboratories certified by the Nevada laboratory certification program;

ii. The reporting limit for each metal monitored in accordance with this permit shall be less than or equal to the water quality standards for metals which apply to the Las Vegas Wash on the effective date of the permit, except for mercury. This requirement does not apply if a water quality standard is lowered after the issuance of this permit; however, the Permittee shall review methods used and by letter notify the Division if the reporting limit will exceed the new criterion, and if so the Division may reopen the permit to impose new monitoring requirements;

iii. The Permittee shall determine whether any laboratories certified by the State of Nevada are analyzing mercury using EPA Method 1631 and achieving results within acceptable limits. If so, the Permittee shall provide a sample for analysis using EPA Method 1631 once per year. If not, the Permittee, acting individually or with other Permittees, shall initiate a dialog with its contract laboratories or other laboratories that might be interested in providing service to the Permittee to inform them of the opportunity to provide additional testing services to the Permittee, and to provide information on current sampling and analytical practices and procedures that might assist the laboratories in their determinations about whether to institute the use of the method; and

iv. All priority pollutant data reported by contract laboratories shall be submitted to the Division.

g. **Modification of Monitoring Frequency and Sample Type:** After considering monitoring data, stream flow, discharge flow and receiving water conditions, the Administrator, may for just cause, modify the monitoring frequency and/or sample type by issuing an order to the Permittee.

## I.B.3. Definitions

a. The "30-day average discharge" means the total discharge during a month divided by the number of samples in the period for that discharge facility. Where less than daily sampling is required by this permit, the 30-day average discharge shall be determined by the summation of all the measured discharges divided by the number of samples during the period when the measurements were made.

b. The "7- day average" concentration means the arithmetic mean of measurements made during a week. If there are more than one measurement per day, the measurements may be averaged in accordance with Part I.B.2.d.

c. The "daily maximum" is the highest measurement during the monitoring period.

d. The "30-day average concentration", other than for fecal coliform bacteria, means the arithmetic mean of measurements made during a month. If there are more than one measurement per day, the measurements may be averaged in accordance with Part I.B.2.d. The "30-day average concentration" for fecal coliform bacteria means the geometric mean of measurements made during a month. The

geometric mean is the "$n^{th}$" root of the product of "n" numbers. Geometric mean calculations where there are non-detect results for fecal coliform shall use one half the detection limit as the value for the non-detect results.

e. A "discrete" sample means any individual sample collected in less than 15 minutes.

f. For flow-rate measurements a "composite" sample means the arithmetic mean of no fewer than six individual measurements taken at equal time intervals for 24 hours, or for the duration of discharge, whichever is shorter. For other than flow-rate a "composite" sample means a combination of no fewer than six individual flow-weighted samples obtained at equal time intervals for 24 hours, or for the duration of discharge, whichever is shorter. Flow-weighted sample means that the volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling.

g. "Acute toxicity" is defined in the whole effluent testing procedures presented in this permit in Part I.A.17.

h. "Biosolids" are non-hazardous sewage sludge or domestic septage as these terms are defined in 40 CFR 503.9.

## PART II

## A. MANAGEMENT REQUIREMENTS

II.A.1. **Change in Discharge:** All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, or treatment modifications which will result in new, different, or increased discharges of pollutants must be reported by submission of a new application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes. Any changes to the permitted treatment facility must comply with Nevada Administrative Code (NAC) 445A.283 to 445A.285. Pursuant to NAC 445A.263, the permit may be modified to specify and limit any pollutants not previously limited.

II.A.2. **Facilities Operation-Proper Operation and Maintenance:** The Permittee shall at all times maintain in good working order and properly operate all treatment and control facilities, collection systems and pump stations installed or used by the Permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance/quality control procedures.

II.A.3. **Adverse Impact-Duty to Mitigate:** The Permittee shall take all reasonable steps to minimize releases to the environment resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the

noncomplying discharge. The Permittee shall carry out such measures, as reasonable, to prevent significant adverse impacts on human health or the environment.

II.A.4. **Noncompliance, Unauthorized Discharge, Bypassing and Upset**

a. Any diversion, bypass, spill, overflow or discharge of treated or untreated wastewater from wastewater treatment or conveyance facilities under the control of the Permittee to navigable waters is prohibited except as authorized by this permit or in accordance with the Division's Spill Reporting Policy, however, the Division may take enforcement action for a diversion, bypass, spill, overflow, or discharge of treated or untreated wastewater to waters of the state except as authorized by this permit or in accordance with the Division's Spill Reporting Policy. In the event the Permittee has knowledge that a diversion, bypass, spill, overflow or discharge not authorized by this permit or in accordance with the Division's Spill Reporting Policy is probable, the Permittee shall notify the Administrator immediately.

b. The Permittee shall notify the Administrator within twenty-four (24) hours of any diversion, bypass, spill, upset, overflow or release of treated or untreated discharge from wastewater treatment or conveyance facilities under the control of the Permittee other than that which is authorized by the permit or in accordance with the Division's Spill Reporting Policy. A written report shall be submitted to the Administrator within five (5) days of diversion, bypass, spill, overflow, upset or discharge, detailing the entire incident including:
   i. Time and date of discharge;
   ii. Exact location and estimated amount of discharge;
   iii. Flow path and any bodies of water which the discharge reached;
   iv. The specific cause of the discharge; and
   v. The preventive and/or corrective actions taken.

c. The following shall be included as information which must be reported within 24 hours:
   i. Any unanticipated bypass which exceeds any effluent limitation in the permit;
   ii. Any upset which exceeds any effluent limitation in the permit;
   iii. Violation of a limitation for any toxic pollutant or any pollutant identified as the method to control a toxic pollutant.

d. The Permittee shall report all instances of noncompliance not reported under Part II.A.4.b. at the time monitoring reports are submitted. The reports shall contain the information listed in Part II.A.4.b.

e. A "**bypass**" means the intentional diversion of waste streams from any portion of a treatment facility.
   i. **Bypass not exceeding limitations:** The Permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts II.A.4.a, II.A.4.b, and II.A.4.f.

ii. **Anticipated bypass:** If the Permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of bypass.

f. **Prohibition of Bypass:** Bypass is prohibited, and the Administrator may take enforcement action against a Permittee for bypass, unless:
   i. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage.
   ii. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment down time. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
   iii. The Permittee submitted notices as required under Part II.A.4.e.

g. The Administrator may approve an anticipated bypass, after considering its adverse effects, if the Administrator determines that it will meet the three conditions listed in Part II.A.4. f.

h. An "**upset**" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
   i. **Effect of an upset:** An upset constitutes an affirmative defense to an action brought for non-compliance with such technology-based permit effluent limitations if the requirements of Part II.A.4.j of this section are met.

j. **Conditions necessary for a demonstration of an upset:** A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
   i. An upset occurred and that the Permittee can identify the cause(s) of the upset;
   ii. The permitted facility was at the time being properly operated;
   iii. The Permittee submitted notice of the upset as required under paragraph c of this section; and
   iv. The Permittee complied with any remedial measures required under Part II.A.3.

k. In selecting the appropriate enforcement option, the Administrator shall consider whether or not the noncompliance was the result of an upset. The burden of proof is on the Permittee to establish that an upset occurred.

II.A.5. **Removed Substances:** Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of waste waters shall be disposed of in a manner such as to prevent any pollution from such materials from entering any navigable waters.

II.A.6. **Safeguards to Electric Power Failure:** In order to maintain compliance with the effluent limitations and prohibitions of this permit the Permittee shall either:

a. Provide at the time of discharge an alternative power source sufficient to operate the wastewater control facilities; or

b. Halt or reduce all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

## II.B. RESPONSIBILITIES

II.B.1. **Right of Entry and Inspection:** The Permittee shall allow the Administrator and/or his authorized representatives, upon the presentation of credentials, to:

a. Enter at reasonable times upon the Permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit;

b. Have access to and copy any records required to be kept under the terms and conditions of this permit at reasonable times;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations required in this permit; and

d. Perform any necessary sampling or monitoring to determine compliance with this permit at any location for any parameter.

II.B.2. **Transfer of Ownership or Control:** In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the Permittee shall notify the succeeding owner or controller of the existence of this permit, by letter, a copy of which shall be forwarded to the Administrator. The Administrator may require modification or revocation and reissuance of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary. The Administrator shall approve ALL transfer of permits.

II.B.3. **Availability of Reports:** Except for data determined to be confidential under NRS 445A.665, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of the Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NRS 445A.710.

II.B.4. **Furnishing False Information and Tampering with Monitoring Devices:** Any person who intentionally or with criminal negligence makes any false statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained by the provisions of

NRS 445A.300 to 445A.730, inclusive, or by any permit, rule, regulation or order issued pursuant thereto, or who falsifies, tampers with or knowingly renders inaccurate any monitoring device or method required to be maintained under the provisions of NRS 445A.300 to 445A.730, inclusive, or by any permit, rule, regulation or order issued pursuant thereto, is guilty of a gross misdemeanor and shall be punished by a fine of not more than $10,000 or by imprisonment. This penalty is in addition to any other penalties, civil or criminal, provided pursuant to NRS 445A.300 to 445A.730, inclusive.

II.B.5. **Penalty for Violation of Permit Conditions:** Nevada Revised Statutes (NRS) 445A.675 provides that any person who violates a permit condition is subject to administrative and judicial sanctions as outlined in NRS 445A.690 through 445A.705.

II.B.6. **Permit Modification, Suspension or Revocation**

a. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:
   i. Violation of any terms or conditions of this permit;
   ii Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;
   iii. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge;
   iv. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination;
   v. There are material and substantial alterations or additions to the permitted facility or activity;.
   vi. The Administrator has received new information;
   vii. The standards or regulations have changed; or
   viii. The Administrator has received notification that the permit will be transferred.

b. **Minor Modifications:** With the consent of the Permittee and without public notice, the Administrator may make minor modifications in a permit to:
   i. Correct typographical errors;
   ii. Clarify permit language;
   iii. Require more frequent monitoring or reporting;
   iv. Change an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the permit and does not interfere with attainment of the final compliance date;
   v. Allow for change in ownership;
   vi. Change the construction schedule for a new discharger provided that all equipment is installed and operational prior to discharge; or
   vii. Delete an outfall when the discharge from that outfall is terminated and does not result in discharge of pollutants from other outfalls except in accordance with permit limits;
   viii. Reallocation of the Waste Load Allocation as long as the sum of the allocations does not change.

II.B.7. **Toxic Pollutants:** Notwithstanding Part II.B.6. if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition and the Permittee so notified.

II.B.8. **Liability:** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable Federal, State or local laws, regulations, or ordinances. However, except for any toxic effluent standards and prohibitions imposed under section 307 of the Clean Water Act or toxic water quality standards set forth in NAC 445A.144, compliance with this permit constitutes compliance with Clean Water Act sections 301, 302, 306, 307, 318, 403, 405(a) and (b), and with NRS 445A.300 through 445A.730.

II.B.9. **Property Rights:** The issuance of this permit does not convey any property rights, in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

II.B.10. **Severability:** The provisions of this permit are severable, and if any provision of this permit, or the application of any provisions of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

II.B.11. **Duty to Comply:** The Permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination; revocation and reissuance, or modification; or denial of a permit renewal application.

II.B.12. **Need to Halt or Reduce Activity Not a Defense:** It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this permit.

II.B.13. **Duty to Provide Information:** The Permittee shall furnish to the Administrator, within a reasonable time, any relevant information which the Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this permit. The Permittee shall also furnish to the Administrator, upon request, copies of records required to be kept by this Permit.

## PART III

### III.A. OTHER REQUIREMENTS

III.A.1. **Reapplication:** If the Permittee desires to continue to discharge, he shall reapply not later than 180 days before this permit expires on the application forms then in use. POTWs with NPDES permits shall submit the sludge information listed at 40 CFR 501.15(a)(2) with the renewal application. The renewal application shall be accompanied by the fee required by NAC 445A.232.

III.A.2. **Signatures, certification required on application and reporting forms**

a. All applications, reports, or information submitted to the Administrator shall be signed and certified by making the following certification.

**"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."**

b. All applications, reports or other information submitted to the Administrator shall be signed by one of the following:
   i. A principal executive officer of the corporation (least the level of vice president) or his authorized representative who is responsible for the overall operation of the facility from which the discharge described in the application or reporting form originates;
   ii. A general partner of the partnership;
   iii. The proprietor of the sole proprietorship; or
   iv. A principal executive officer, ranking elected official or other authorized employee of the municipal, state or other public facility.

c. **Changes to Authorization:** If an authorization under paragraph b. of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph b. of this section must be submitted to the Administrator prior to or together with any reports, information, or applications to be signed by an authorized representative.

III.A.3. **Holding Pond Conditions:** If any wastewater from the Permittee's facility is placed in ponds owned or operated by the Permittee, such ponds shall be located and constructed so as to:

a. Contain with no discharge the once-in-the twenty-five year, 24 hour storm at said location;

b. Withstand with no discharge the once-in-one-hundred year flood of said location; and

c. Prevent escape of wastewater by leakage other than as authorized by this permit.

unless otherwise approved by the Division.

III.A.4. **Flow Rate Notification:** The Permittee shall notify the Administrator, by letter, not later than ninety (90) days after the 30-day average daily influent flow rate first equals or exceeds 85% of the design treatment capacity of the Permittee's facility given in Part I.A. The letter shall include:

a. The 30-day average daily influent flow rate;

b. The maximum 24-hour flow rate during the 30-day period reported above and the date the maximum flow occurred;

c. The Permittee's estimate of when the 30-day average influent flow rate will equal or exceed the design treatment capacity of the Permittee's facility;

d. A status report on the treatment works which will outline but not be limited to past performance, remaining capacity of the limiting treatment and disposal units or sites, past operational problems and improvements instituted, modifications to the treatment works which are needed to attain the permitted flow rate due to changing site specific conditions or design criteria; and

e. The Permittee's schedule of compliance to provide additional treatment capacity before the 30-day average daily influent flow rate equals the present design treatment capacity of the Permittee's facility.

III.A.5. **Publicly Owned Treatment Works** [40 CFR 122.42(b)]**:** All POTWs must provide adequate notice to the Administrator of the following:

a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the Act if it were directly discharging those pollutants; and

b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

c. For the purposes of this part, adequate notice shall include information on: (1) the quality and quantity of effluent introduced into the POTW; and (2) any anticipated impact of the change on the quantity or quality of effluent to be discharge from the POTW.

# ATTACHMENT A
# PRIORITY POLLUTANTS

## BASE NEUTRAL EXTRACTIBLES

Acenaphthene
Benzidine
1,2,4-Trichlorobenzene
Hexachlorobenzene
Hexachloroethane
Bis(2-chloroethyl) ether
2-Chloronaphthalene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
3,3'-Dichlorobenzidine
2,4-Dinitrotoluene
2,6-Dinitrotoluene
1,2-Diphenylhydrazine
Fluoranthene
4-Chlorophenyl phenyl ether
4-Bromophenyl phenyl ether
Bis(2-Chloroisopropyl) ether
Bis(2-Chloroethoxy) methane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
N-Nitrosodi-n-propylamine
Bis(2-ethylhexyl) phthalate
n-Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Chrysene
Acenaphthylene
Antracene
Benzo(g,h,i)perylene
Fluorene
Phenanthrene
Dibenzo(a,h)anthracene
Indeno(1,2,3-cd)pyrene
Pyrene

## VOLATILE ORGANICS

Acrolein
Acrylonitrile
Benzene
Carbon tetrachloride
Chlorobenzene
1,2-Dichloroethane
1,1,1-Trichloroethane
1,1-Dichloroethane
1,1,2-Trichloroethane
1,1,2,2-Tetrachloroethane
Chloroethane
2-Chloroethylvinylether
Chloroform
1,1-Dichloroethene
Trans-1,2-Dichloroethene
1,2-Dichloropropane
1,3-Dichloropropane
Ethylbenzene
Dichloromethane
Chloromethane
Bromomethane
Bromoform
Bromodichloromethane
Dibromochloromethane
Tetrachloroethene
Toluene
Trichloroethene
Vinyl chloride

## PESTICIDES

Aldrin
Dieldrin
Chlordane (Technical)
4,4'-DDT
4,4'-DDE
4,4'-DDD
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
Alpha-BHC
Beta-BHC
Gamma-BHC (Lindane)
Delta-BHC
PCB 1016
PCB 1221
PCB 1232
PCB 1242
PCB 1248
PCB 1254
PCB 1260
Toxaphene

## ACID EXTRACTIBLES

2,4,6-Trichlorophenol
4-Chloro-3-methylphenol
2-Chlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2-Nitrophenol
4-Nitrophenol
2,4-Dinitrophenol
2-Methyl-4,6-dinitrophenol
Pentachlorophenol
Phenol

## METALS

Antimony
Arsenic
Beryllium
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Thallium
Zinc

## DIOXINS

TCDD

## OTHER

Cyanide
Asbestos

Note: Priority Pollutants to be analyzed using Environmental Protection Agency (EPA) Methods 200 Series, 353.3, 420.2, 624,625, 608, and/or an appropriate combination of these methods to verify compliance with permit-specified effluent discharge limitations.

# NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

## FACT SHEET

(pursuant to NAC 445A.236)

I. **Permittee Name**: Clark County Water Reclamation District
5857 E. Flamingo Road
Las Vegas, NV 89122

II. **Permit Number**: NV0021261 – Renewal

III. **Location:** 5857 E. Flamingo Road
Las Vegas, NV 89122
Outfall 002
and
4300 S. Hollywood Blvd.
Las Vegas, NV 89122
Outfall 001

IV. **General**: The Permittee has applied for a National Pollutant Discharge Elimination System (NPDES) permit renewal to extend the authorization to discharge to the Las Vegas Wash.

The discharge is from a 150 million gallons per day (MGD) tertiary wastewater treatment facility located at 5857 E. Flamingo Road, Las Vegas NV 89122. Treatment at the plant consists of preliminary treatment, primary sedimentation, advanced activated sludge, secondary clarification, filtration and ultraviolet disinfection. The facility utilizes Biological Nutrient Removal (BNR) in the activated sludge process. This process provides for significant phosphorus removal, as well as conversion of ammonia to nitrates (nitrification) and partial removal of nitrogen (denitrification). Supplemental phosphorus removal can also be achieved by chemical coagulation prior to filtration. Filtration is accomplished at two separate facilities and discharged through separate outfalls, Outfall 001 – AWT, Advanced Wastewater Treatment Plant and Outfall 002 – Central Plant. Filtered effluent is disinfected by ultraviolet light disinfection, and discharged to the Las Vegas Wash. A portion of the treated effluent flow is disinfected with sodium hypochlorite and distributed for reuse. Solids removed from sedimentation and activated sludge processes are thickened and dewatered for final disposal in a landfill.

This permit includes a 40 MGD expansion the existing 110 MGD for a total flow of 150 MGD. The expansion includes primary treatment, an activated sludge BNR process, solids dewatering, and additional capacity for filtration and ultraviolet disinfection.

The majority of the flow into the plant is from domestic wastewater. There is a small percentage of flow from industry in the service area and there is a pretreatment program which regularly samples the effluent from the industrial dischargers. The pretreatment program is authorized through the United States Environmental Protection Agency (USEPA).

The existing permit was issued on July 20, 2001, and expires on July 20, 2006. Since the permit effective

date, the plant has consistently been in compliance with the permit. The proposed permit is based on a completed permit application submitted by the Permittee, plant monitoring data, ambient water quality data and a request for a mixing zone.

**V. Discharge Characteristics** : Discharges from both outfalls have the following characteristics:

| Parameter | Long-Term Average, 2005 |
|---|---|
| Flow | 96 MGD |
| Uninhibited $BOD_5$ | <2 mg/L |
| pH | 6.9 SU |
| Chlorine Residual | <0.1 mg/L |
| Total Dissolved Solids | 1285 mg/L |
| TSS | <5 mg/L |
| Ammonia as N | <0.08 mg/L |
| Nitrate as N | 14 mg/L |
| Total Kjeldahl Nitrogen | <1 mg/L |
| Phosphorus as P | 0.08 mg/L |
| Orthophosphorus as P | 0.03 mg/L |
| Dissolved Oxygen | 5.7 mg/L |
| Fecal Coliforms | 3 MPN/100 ml |

**VI. Receiving Water:** The receiving water for Outfalls 001 and 002 is the Las Vegas Wash. The standards applicable to the Las Vegas Wash are attached to this fact sheet as Attachment A. Pursuant to NAC 445A.198, the designated beneficial uses for the appropriate reach of Las Vegas Wash are:

Irrigation
Watering of livestock
Recreation not involving contact with the water
Maintenance of a freshwater marsh
Propagation of wildlife
Propagation of aquatic life, excluding fish. This does not preclude the establishment of a fishery.

This reach of the Las Vegas Wash also has an established goal of the propagation of aquatic life, including, without limitation, fish by the next triennial review. This goal may need re-evaluation in the near future with the construction of the grade control structures in the Las Vegas Wash.

Las Vegas Wash has been included on the 303(d) list because of suspended solids and iron. The exceedances identified were not attributed to the Permittee or other publicly owned treatment works in Southern Nevada, but instead were attributable to erosion resulting from high velocity streamflows produced by steep gradients and from loose unconsolidated soils. Several erosion-control structures have been installed in the affected area, and additional structures are planned, along with streambank protection, revegetation, and other control measures. The suspended solids has been de-listed and the iron is being reviewed for de-listing.

## VII. Summary of Changes From Previous Permit:

The main changes from the previous permit are:

| Item | Change |
|---|---|
| Ambient Water Quality Monitoring | Replace 2 fixed-location monitoring stations in Las Vegas Wash and 5 fixed-location monitoring stations in Lake Mead with annual plan in which Permittee proposes and the Division approves locations of at minimum 3 stations in Las Vegas Wash and 5 in Lake Mead. Revision improves flexibility of monitoring program so that stations at locations no longer considered necessary can be moved to locations of that provide representative data. |

**VIII. Proposed Effluent Limitations:** The Permittee is required to meet the following permit limits. Note: The load limits are calculated using the 30 day average flow and the permit limit expressed as a concentration. If higher flows are allowed in future permits, the load limits will increase accordingly.

**TABLE I.1 (Outfall 001 and 002)**

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS[3] | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type [(3)] |
| **Flow – 001 & 002** | 150 MGD[4] | Monitor and Report: MGD | NA | INF, 001, 002 | Continuous | Flow meter |
| **$BOD_5$ (uninhibited)** | 30 mg/L | 45 mg/L | 37,530 | 001, 002 | Daily | Composite |
| | Monitor and Report | Monitor and Report | NA | INF | | |
| **Total Suspended Solids** | 30 mg/L | 45 mg/L | 37,530 | 001, 002 | Daily | Composite |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS[3] | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type (3) |
| | Monitor and Report | Monitor and Report | NA | INF | | |
| **$BOD_5$ (uninhibited) &TSS** | The Permittee shall demonstrate that the 30 day average percentage removal rate is at least 85%. | | | NA | Monthly | Calculate |
| **PH** | Minimum 6.0 and maximum 9.0 SU, except as allowed in Parts I.A.3 and I.A.19. | | NA | 001, 002 | Daily | Discrete |
| **Fecal Coliform[1]** | Log mean 200 cfu or mpn/100ml | See footnote 1 | NA | 001, 002 | Daily | Discrete |
| **Total Residual Chlorine** | NA | 0.1 mg/L- except as allowed in Part I.A.19. | NA | 001, 002 | Daily | Discrete |
| **Total Phosphorus as P: mg/L** | See Part I.A.2 | | | 001, 002 | Daily | Composite |
| **Total Ammonia as N: mg/L** | See Part I.A.2 | | | 001, 002 | Daily | Composite |
| **Total Inorganic Nitrogen as N: mg/L** | See Part I.A.3 | | | 001, 002 | Weekly | Composite |
| **Total Dissolved Solids: mg/L** | See Part I.A.4 | | | 001, 002 | Weekly | Composite |
| **Priority Pollutants** | Monitor and Report, See Attachment A | | | 001, 002 | Per Part I.A.18.d. | Discrete or Composite |
| **WET testing** | See Part I.A.17. | | | 001, 002 | Monthly | Composite |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS[3] | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type (3) |
| **Receiving Water** | Monitor and Report | | | See Part I.A.21 | See Part I.A.21 | Discrete |
| **Temperature** | Monitor and Report | | NA | 001, 002 | Weekly | Discrete |
| **Dissolved Oxygen: mg/L** | Monitor and Report | | NA | 001, 002 | Weekly | Discrete |
| **Orthophosphorus as P: mg/L** | Monitor and Report | | | 001, 002 | Daily | Composite |
| **Nitrate + Nitrite as N: mg/L** | Monitor and Report | | | 001, 002 | Weekly | Composite |
| **Total Kjeldahl Nitrogen as N: mg/L** | Monitor and Report | | | 001, 002 | Weekly | Composite |

1. The discharge shall not exceed a log mean of 200 cfu or mpn per 100 ml over a 30 day period nor may more than 10 percent of the total samples taken exceed 400 cfu or mpn per 100 ml.
2. For monitor and report parameters, the Permittee shall report the maximum value, consistent with the measurement frequency, instead of the 7 day average.
3. Composite samples may be either physical or mathematical composites.
4. The 150 MGD limit applies to the sum of the Permittee's discharges through Outfalls 001, and 002.

**Attachment A** This attachment to the permit is the list of Priority Pollutants which are required to be sampled under the pretreatment permit requirements.

**IX.** **Proposed Technology Based Effluent Limitations:** Federal regulations at 40 CFR section 133 require publicly owned treatment works to achieve specified limits in discharged BOD, suspended solids, and pH. The permit includes these limits.

**X.** **Proposed Water Quality-Based Effluent Limitations:** The Nevada water quality standards require that point source discharges not cause a violation of any applicable water quality standards in the receiving water nor interfere with the attainment or maintenance of beneficial uses. The following requirements are included in the permit to ensure that the discharge does not cause water quality standards violations. In addition, the permit requires monitoring and reporting of constituents which

are present in the discharge and the subject of ambient water quality standards.

**Total Dissolved Solids.** The permit includes the goal of not more than a 400 mg/l increase in Total Dissolved Solids (TDS) over the drinking water supply, a goal established by the Colorado River Salinity Forum. The Permittee has implemented the salinity public education required by the permit. This activity is a continuing requirement of the proposed permit.

**Phosphorus and Ammonia.** Total Maximum Daily Loads (TMDLs) were developed for Total Ammonia as N and Phosphorus as P in 1989. The Permittee has been allocated a Waste Load for Total Ammonia as N and Total Phosphorus as P. This permit includes language which allows waste load allocation trading between the City of Las Vegas, Clark County Water Reclamation District, and City of Henderson (hereinafter Dischargers). The WLA applies to the combined loading from all outfalls. This permit condition constitutes a cooperative agreement between the Dischargers to allow discharge flexibility. Each facility has an **Individual Waste Load Allocation (IWLA)** and there is a **Sum of Waste Load Allocations (∑WLA)** defined below for the three facilities. The Permittee shall be considered in compliance if **either**:

i. The Permittee does not exceed the **IWLA** listed below or the **IWLA** in effect due to transfers, **or**

ii. The **Sum of the Waste Load Allocations (∑WLA)** listed below is not exceeded.

**Waste Load Allocation Table**

| Constituent | City of Las Vegas IWLA | Clark County Sanitation District IWLA | City of Henderson IWLA | ∑WLA |
|---|---|---|---|---|
| **Total Phosphorus as P** | 123 lb/day | 173 lb/day | 38 lb/day | 334 lb/day, Note: This WLA only applies March 1 - October 31; no limit applies the rest of the year. Non-point source load is 100 lb/day. |
| **Total Ammonia as N** | 358 lb/day | 502lb/day | 110 lb/day | 970 lb/day, Note: This WLA only applies April 1 - September 30; no limit applies the rest of the year. No non-point source load. |

**Fecal Coliform.** Water quality standards for Las Vegas Wash specify fecal coliform requirements to be imposed on discharges into the wash. Water quality standards for Lake Mead include fecal coliform standards. These standards have been imposed as effluent limits on discharges into the Wash and Lake Mead.

**Total Residual Chlorine.** Water quality standards for Las Vegas Wash prohibit the discharge of toxic substances in toxic amounts. The Permittee dechlorinates the effluent to remove free chlorine. An excess of the dechlorinating agent is used to ensure that no free chlorine remains. The effluent limit of 0.1 mg/l Total Residual Chlorine is included in the permit as an indicator that no free chlorine is present in the effluent.

**Acute WET Testing.** Acute whole effluent toxicity requirement have been imposed to prevent discharges of toxic substances in toxic amounts.

**XI. Special Conditions:** In addition to the technology based effluent limitations and the water quality based effluent limitations, the permit includes standard conditions required by 40 CFR section 122.41, including requirements on duty to comply, duty to reapply, need to halt or reduce activity not a defense, duty to mitigate, proper operation and maintenance, permit actions, property rights, duty to provide information, inspection and entry, monitoring and records, signatory requirement, reporting requirements (including planned change, anticipated noncompliance, transfers, monitoring reports, compliance schedules, 24 hour reporting, and other non-compliance), bypass requirements, and upset requirements. In addition, the permit includes the following special conditions.

**Total inorganic nitrogen and pH.** The Permittee is required to coordinate with the City of Las Vegas and the City of Henderson to determine whether Las Vegas Wash complies with its RMHQ criterion for total inorganic nitrogen, and for its beneficial use standard for pH. If the Permittee and other dischargers determine that the wash has exceeded these criteria, they must consider whether reasonable changes would result in compliance, and report to the Division.

**Chronic WET Testing.** The Permittee previously conducted a chronic whole effluent toxicity testing study and determined that there was no chronic whole effluent toxicity present in the effluent. The permit requires additional chronic WET testing to ensure that chronic toxicity does not appear.

**Cadmium, copper, hexavalent chromium, molybdenum, selenium, silver, sulfide.** The Permittee previous conducted studies to ascertain whether hardness levels above 400 mg/l provided additional protection against toxicity, and determined that Las Vegas Wash water, which contains 800 mg/l of hardness, had a protective effect. The permit requires annual data review to determine whether additional aquatic studies or other investigations are needed.

**Biosolids.** The permit includes requirements on the disposal or reuse of biosolids. No changes are proposed from existing requirements.

**Pretreatment.** The permit includes requirements for a pretreatment program, which the Permittee has established. No changes are proposed from existing requirements.

**Miscellaneous.** The permit includes miscellaneous requirements for odors, fencing, fees, operator qualifications, etc. No changes are proposed from existing requirements.

**Effluent Monitoring.** The permit includes extensive effluent monitoring requirements for all substances subject to effluent limitations or included in ambient water quality standards.

**Ambient Water Quality Monitoring.** The existing permit specifies locations and monitoring intervals for ambient water quality monitoring. The proposed permit would revise the provision by requiring the Permittee to submit a proposed monitoring plan annually, consistent with minimum requirements imposed by the permit. In the plan, the Permittee would identify locations and sampling schedules. The minimum permit requirements provide for monitoring at least as intensive as in the existing permit. The revisions allow for greater flexibility, including the moving of existing stations to areas of current interest, and the addition and deletion of stations to provide monitoring for specific issues and for limited times.

**XII. Reasonable Potential Analysis and Antidegradation Review.** EPA regulations require that "Limitations must control all pollutants or pollutant parameters (either conventional, non-conventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." (40 CFR § 122.44(d)(1)(i).) Before issuance of the permit in 2001, a detailed reasonable potential analysis was conducted on the potential for wastewater discharges from the City of Henderson, City of Las Vegas, and Clark County Water Reclamation District to cause or contribute to excursions above water quality standards. The conclusion from that analysis was that there was no reasonable potential, and no numeric effluent limits were imposed. Since that permit was issued, the Permittee, in coordination with the other Dischargers, have conducted aquatic life studies demonstrating that Las Vegas Wash, which has hardness concentrations of 800 mg/l, provides a protective effect beyond the protective effect associated with 400 mg/l of hardness, and that it is appropriate to use the concentrations of 800 mg/l in calculating hardness-based water quality criteria. The discharges are unlikely to exceed the ambient water quality metals criteria, and there is no reasonable potential for Las Vegas Wash.

In Nevada, antidegradation review is conducted through the criteria known as Requirements to Maintain Higher Quality (RMHQ). RMHQ criteria were reviewed and applied to this permit, and none of the discharges can reasonably be expected to exceed any RMHQ criterion.

**XIII. Flow: 150 MGD**

**XIV. Quantities**: At the 30 day average flow allowed by this permit, the discharge will consist of the following loadings:

| | **Outfalls 001 and 002** |
|---|---|
| **$BOD_5$** | **37,530 lb/day** |
| **Total Suspended Solids** | **37,530 lb/day** |

## XV. Discharges From Future Outfalls

As part of its application, the Permittee has submitted a request for a mixing zone and information on proposed discharges from future outfall 003 to lower Las Vegas Wash and from future outfall 004 to Lake Mead. These discharges will require the construction of a pipeline from the Permittee's plant along Las Vegas Wash to Lake Mead. This proposed pipeline will require approval of federal agencies, and is currently undergoing environmental review through the preparation of an environmental impact statement. The Division is holding the request for a mixing zone and the application for additional outfalls in abeyance at this time, pending a written request from the Permittee to proceed. When it receives a written request to proceed, the Division will prepare a major modification of the permit, which will be subject to public review and comment. No additional application will be required from the Permittee.

## XVI. Procedures for Public Comment

The Notice of the Division's intent to reissue a permit authorizing the facility to discharge to surface waters of the State of Nevada subject to the conditions contained within the permit, is being sent to the **Las Vegas Review Journal** for publication. The notice is being mailed to interested persons on our mailing list. Anyone wishing to comment on the proposed permit can do so in writing until 5:00 P.M. July 24, 2006, a period of 30 days following the date of the public notice. The comment period can be extended at the discretion of the Administrator.

A public hearing on the proposed determination can be requested by the applicant, any affected State, any affected interstate agency, the Regional Administrator of EPA Region IX or any interested agency, person or group of persons. The request must be filed within the comment period and must indicate the interest of the person filing the request and the reasons why a hearing is warranted. Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determined to be appropriate. All public hearings must be conducted to accordance with NAC 445A.238.

The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.650.

## XVII. Proposed Determination

The Division has made the tentative determination to re-issue the proposed 5-year permit.

Prepared by: Alan Tinney
May 23, 2006

# ATTACHMENT A
# PRIORITY POLLUTANTS

## BASE NEUTRAL EXTRACTIBLES

Acenaphthene
Benzidine
1,2,4-Trichlorobenzene
Hexachlorobenzene
Hexachloroethane
Bis(2-chloroethyl) ether
2-Chloronaphthalene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
3,3'-Dichlorobenzidine
2,4-Dinitrotoluene
2,6-Dinitrotoluene
1,2-Diphenylhydrazine
Fluoranthene
4-Chlorophenyl phenyl ether
4-Bromophenyl phenyl ether
Bis(2-Chloroisopropyl) ether
Bis(2-Chloroethoxy) methane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
N-Nitrosodi-n-propylamine
Bis(2-ethylhexyl) phthalate
n-Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Chrysene
Acenaphthylene
Antracene
Benzo(g,h,i)perylene
Fluorene
Phenanthrene
Dibenzo(a,h)anthracene
Indeno(1,2,3-cd)pyrene
Pyrene

## VOLATILE ORGANICS

Acrolein
Acrylonitrile
Benzene
Carbon tetrachloride
Chlorobenzene
1,2-Dichloroethane
1,1,1-Trichloroethane
1,1-Dichloroethane
1,1,2-Trichloroethane
1,1,2,2-Tetrachloroethane
Chloroethane
2-Chloroethylvinylether
Chloroform
1,1-Dichloroethene
Trans-1,2-Dichloroethene
1,2-Dichloropropane
1,3-Dichloropropane
Ethylbenzene
Dichloromethane
Chloromethane
Bromomethane
Bromoform
Bromodichloromethane
Dibromochloromethane
Tetrachloroethene
Toluene
Trichloroethene
Vinyl chloride

## PESTICIDES

Aldrin
Dieldrin
Chlordane (Technical)
4,4'-DDT
4,4'-DDE
4,4'-DDD
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
Alpha-BHC
Beta-BHC
Gamma-BHC (Lindane)
Delta-BHC
PCB 1016
PCB 1221
PCB 1232
PCB 1242
PCB 1248
PCB 1254
PCB 1260
Toxaphene

## ACID EXTRACTIBLES

2,4,6-Trichlorophenol
4-Chloro-3-methylphenol
2-Chlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2-Nitrophenol
4-Nitrophenol
2,4-Dinitrophenol
2-Methyl-4,6-dinitrophenol
Pentachlorophenol
Phenol

## METALS

Antimony
Arsenic
Beryllium
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Thallium
Zinc

## DIOXINS

TCDD

## OTHER

Cyanide
Asbestos

Note: Priority Pollutants to be analyzed using Environmental Protection Agency (EPA) Methods 200 Series, 353.3, 420.2, 624,625, 608, and/or an appropriate combination of these methods to verify compliance with permit-specified effluent discharge limitations.

**Permit No. NV0022098**

# Nevada Division of Environmental Protection

## AUTHORIZATION TO DISCHARGE

In compliance with the provisions of the Clean Water Act as amended, (33 U.S.C. 1251 et. seq; the "Act"), and Chapter 445A of the Nevada Revised Statutes,

City of Henderson
240 Water Street
Henderson, NV 89015

is authorized to discharge from a facility located at

| | | |
|---|---|---|
| 450 East Galleria Drive<br>Henderson, NV 89015<br>Las Vegas Wash at Pabco Road | and | 2610 St. Rose Parkway<br>Henderson, NV 89074<br>Southwest Water Reclamation Facility |

Outfall 001 (Las Vegas Wash at Pabco Road)
Latitude N36° 12' 26", Longitude W115° 15' 26"

Outfall 002 (Southwest Water Reclamation Facility)
Latitude N36° 01' 32", Longitude W115° 06' 10"

to receiving waters named Las Vegas Wash

in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Part I, II, and III hereof.

This permit shall become effective on July 31, 2006.

This permit and the authorization to discharge shall expire at midnight, July 31, 2011.

Signed this 31st day of July, 2006.

Alan Tinney, P.E., Supervisor
Permitting Branch
Bureau of Water Pollution Control

## PART I

### A. EFFLUENT LIMITATIONS, MONITORING REQUIREMENTS AND CONDITIONS

1. During the period beginning on the effective date of this permit, and lasting until the permit expires, the Permittee is authorized to discharge treated sanitary wastewater from

   - Outfall 001 (Las Vegas Wash at Pabco Road) and
   - Outfall 002 (Southwest Water Reclamation Facility) via the storm drain system to the Las Vegas Wash

   Effluent samples taken in compliance with the monitoring requirements specified below shall be taken downstream of the disinfection facilities, but prior to mixing with the receiving waters. Influent samples are to be taken at the headworks and are designated as **INF**. Sampling frequencies for Outfall 002 (Southwest Water Reclamation Facility) apply after the Permittee has discharged for a week to the storm drain system. The discharges for Outfall 001 (Las Vegas Wash at Pabco Road) shall be limited and monitored by the Permittee as specified in Table I.1 and for Outfall 002 (Southwest Water Reclamation Facility) as specified in Table I.2.

**TABLE I.1 (Outfall 001, Las Vegas Wash at Pabco Road)**

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS[2] | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30-Day Average | 7-Day Average | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Flow-001** | 40 MGD | Monitor and Report | NA | INF, 001 | Continuous | Flow meter |
| **$BOD_5$ (Uninhibited)** | 30 mg/L | 45 mg/L | 10,008 | 001 | Daily | Composite |
| | Monitor and Report | Monitor and Report | NA | INF | | |
| **Total Suspended Solids** | 30 mg/L | 45 mg/L | 10,008 | 001 | Daily | Composite |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS[2] | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30-Day Average | 7-Day Average | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| | Monitor and Report | Monitor and Report | NA | INF | | |
| **$BOD_5$ (Uninhibited) &TSS** | The Permittee shall demonstrate that the 30-day average percentage removal rate is at least 85%. | | | NA | Monthly | Calculate |
| **Fecal Coliform[1]** | Log Mean 200 cfu or mpn/100ml | See footnote 1 | NA | 001 | Daily | Discrete |
| **pH** | Minimum 6.0 and maximum 9.0 SU, except as allowed in Parts I.A.3 and I.A.19 | | NA | 001 | Daily | Discrete |
| **Total Residual Chlorine** | NA | 0.1 mg/L except as allowed in Part I.A.19 | NA | 001 | Daily | Discrete |
| **Total Phosphorus as P: mg/L** | See Part I.A.2 | | | 001 | Daily | Composite |
| **Total Ammonia as N: mg/L** | See Part I.A.2 | | | 001 | Daily | Composite |
| **Total Inorganic Nitrogen as N: mg/L** | See Part I.A.3 | | | 001 | Weekly | Composite |
| **Total Dissolved Solids: mg/L** | See Part I.A.4 | | | 001 | Weekly | Composite |
| **Priority Pollutants** | Monitor and Report, See Attachment A | | | 001 | Per Part I.A.18.d. | Discrete or Composite |
| **WET testing** | See Part I.A.17 | | | 001 | Monthly | Composite |
| **Receiving Water Monitoring** | Monitor and Report | | | See Part I.A.21 | See Part I.A.21 | Discrete |
| **Temperature: °C** | Monitor and Report | | NA | 001 | Weekly | Discrete |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS[2] | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30-Day Average | 7-Day Average | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Dissolved Oxygen: mg/L** | Monitor and Report | | NA | 001 | Weekly | Discrete |
| **Orthophosphorus as P: mg/L** | Monitor and Report | | | 001 | Daily | Composite |
| **Nitrate + Nitrite as N: mg/L** | Monitor and Report | | | 001 | Weekly | Composite |
| **Total Kjeldahl Nitrogen as N: mg/L** | Monitor and Report | | | 001 | Weekly | Composite |

1. The discharge shall not exceed a log mean of 200 cfu or mpn per 100 ml over a 30-day period nor may more than 10 percent of the total samples taken exceed 400 cfu or mpn per 100 ml.
2. For those parameters sampled weekly or less frequently, the Permittee shall report the single value instead of the 7-day or 30-day average.

**TABLE I.2 (Outfall 002, Southwest Water Reclamation Facility)**

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS[2] | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30-Day Average | 7-Day Average | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Flow-002** | 8 MGD | Monitor and Report | NA | 002 | Continuous | Flow Meter |
| **$BOD_5$ (Uninhibited)** | 30 mg/L | 45 mg/L | 2,002 | 002 | Daily | Composite |
| | Monitor and Report | Monitor and Report | NA | INF | | |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS[2] | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30-Day Average | 7-Day Average | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Total Suspended Solids** | 30 mg/L | 45 mg/L | 2,002 | 002 | Daily | Composite |
| | Monitor and Report | Monitor and Report | NA | INF | | |
| **$BOD_5$ (Uninhibited) &TSS** | The Permittee shall demonstrate that the 30-day average percentage removal rate is at least 85%. | | | NA | Monthly | Calculate |
| **Fecal Coliform[1]** | Log Mean 200 cfu or mpn/100ml | See footnote 1 | NA | 002 | Daily | Discrete |
| **pH** | Minimum 6.0 and maximum 9.0 SU, except as allowed in Parts I.A.3 and I.A.19 | | NA | 002 | Daily | Discrete |
| **Total Residual Chlorine** | NA | 0.1 mg/L except as allowed Part in I.A.19 | NA | 002 | Daily | Discrete |
| **Total Phosphorus as P: mg/L** | See Part I.A.2 | | | 002 | Daily | Composite |
| **Total Ammonia as N: mg/L** | See Part I.A.2 | | | 002 | Daily | Composite |
| **Total Inorganic Nitrogen as N: mg/L** | See Part I.A.3 | | | 002 | Weekly | Composite |
| **Total Dissolved Solids: mg/L** | See Part I.A.4 | | | 002 | Weekly | Composite |
| **Priority Pollutants** | Monitor and Report, See Attachment A | | | 002 | Per Part I.A.18.d. | Discrete or Composite |
| **WET testing** | See Part I.A.17 | | | 002 | Quarterly | Composite |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS[2] | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30-Day Average | 7-Day Average | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Temperature: °C** | Monitor and Report | | NA | 002 | Daily | Discrete |
| **Orthophosphorus as P: mg/L** | Monitor and Report | | | 002 | Daily | Composite |
| **Nitrate + Nitrite as N: mg/L** | Monitor and Report | | | 002 | Weekly | Composite |
| **Total Kjeldahl Nitrogen as N: mg/L** | Monitor and Report | | | 002 | Weekly | Composite |

1. The discharge shall not exceed a log mean of 200 cfu or mpn per 100 ml over a 30-day period nor may more than 10 percent of the total samples taken exceed 400 cfu or mpn per 100 ml.
2. For those parameters sampled weekly or less frequently, the Permittee shall report the single value instead of the 7-day or 30-day average.

I.A.2. **Waste Load Allocation (WLA) For Discharges Into Las Vegas Wash.** The Permittee is authorized to discharge the waste loads listed in Waste Load Allocation Table (WLA) for Total Phosphorus as P and Total Ammonia as N, to the Las Vegas Wash. The WLA applies to the combined loading from Outfalls 001 and 002. This permit condition constitutes a cooperative agreement between the City of Las Vegas, Clark County Water Reclamation District, and City of Henderson (hereinafter Dischargers) to allow discharge flexibility. Each facility has an **Individual Waste Load Allocation (IWLA)** and there is a **Sum of Individual Waste Load Allocations (∑IWLA)** defined below for the three facilities. Treatment facilities which are used to attain a waste load allocation are not required to be operated when not needed to meet that allocation.

a. The Permittee shall be considered in compliance if **either**:
   i. The Permittee does not exceed the **IWLA** listed below or the **IWLA** in effect due to transfers, **or**
   ii. The **Sum of the Individual Waste Load Allocations (∑WLA)** listed below is not exceeded.

**Waste Load Allocation Table**

| Constituent | City of Las Vegas IWLA | Clark County Water Reclamation District IWLA | City of Henderson IWLA | ∑WLA |
|---|---|---|---|---|
| **Total Phosphorus as P** | 123 lb/day | 173 lb/day | 38 lb/day | 334 lb/day, Note: This WLA only applies March 1 - October 31; no limit applies the rest of the year. |
| **Total Ammonia as N** | 358 lb/day | 502 lb/day | 110 lb/day | 970 lb/day, Note: This WLA only applies April 1 - September 30; no limit applies the rest of the year. |

b. **Annual Reallocation of IWLA** On an annual basis, the Permittee may modify the **IWLA** by either transferring or receiving waste load from another discharger. This reallocation shall become effective upon submittal of a notification signed by all three dischargers. The annual reallocation shall be **submitted by May 31st if applicable**. The notification of reallocation shall include the flow, waste load discharged, treatment plant removal efficiency in tabular and graphical format. The reallocation of **IWLA**s shall be considered a minor modification to the permit as long as the ∑**WLA** is not modified.

c. **Temporary Trading of IWLA:** The Permittee may temporarily trade **IWLA** upon submittal of a notification signed by all three dischargers describing the amount of **IWLA** transferred, the length of time the transfer is effective and the basis for the transfer. The basis for the transfer shall include the last monthly flows and waste load discharged for each discharger. The waste load transfer shall be effective on the date of the submittal to the Division. This transfer is binding on the parties and cannot be revoked without a notification signed by all three dischargers. The transferred **IWLA** shall revert back to the original Permittee at the end of the time specified on the notification. A copy of the latest **IWLA** agreement and any agreements made during the reporting period shall be **submitted with each quarterly report required by Part I.B.1.**

d. **Reporting:** The Permittee shall **submit quarterly reports** pursuant to Part I.B.1.b. the **IWLA** and the ∑**WLA** for Total Phosphorus as P and Total Ammonia as N, reported monthly as a 30 day average in lb day. The data for the ∑**WLA** shall be

provided to and obtained from the other dischargers. In the event the Permittee cannot obtain the $\sum$**WLA** information in time for submittal with the quarterly DMR, then an explanation shall be included with the report along with a schedule for timely submittal.

I.A.3. **Confirmation of Standards Compliance**

a. The Permittee shall coordinate with the other dischargers identified in Part I.A.2 to determine whether on an annual basis the 95$^{th}$ percentile of the monitoring data for Las Vegas Wash complies with the 20 mg/L total inorganic nitrogen (TIN) water quality standard at the control point, Las Vegas Wash 2 (LVW2, LW6.05).

b. The Permittee shall coordinate with the other dischargers identified in Part I.A.2 to determine whether the pH at LVW2 (LW6.05) complies with the water quality standard of 6.5-9.0 standard units.

c. The results of these determinations shall be reported in the annual report identified in Part I.B.1.a.

d. If the Permittee finds that Las Vegas Wash is not in compliance with the water quality standards identified in Part I.A.3. a. or b., the Permittee shall:
   i. Consider whether reasonable changes in the Permittee's discharge from any outfall would result in compliance;
   ii. Coordinate with the other dischargers identified in Part I.A.2 to consider whether coordinated reasonable changes would achieve compliance; and
   iii. Submit a report to the Division explaining the analytical process and conclusions.

I.A.4. **Salinity Control**: The Permittee shall continue to implement the existing ordinances and public education programs for salinity control and identify and correct all identified infiltration/inflow problems which contribute to exceedance of the goal of more than 400 mg/l TDS increase above the Colorado River water supply. The Permittee shall provide the following information annually by May 31st:

a. Description of the municipal entity and facilities.

b. Description of significant salt sources of the municipal wastewater collection system, and identification of entities responsible for each source, if available.

c. Description of the wastewater discharge, covering location, receiving waters, quantity of salt load, and salinity concentration.

d. Description of alternative plans for minimizing salt contribution to the municipal discharge. Alternative plans should include:
   i. Description of system salt sources and alternative means of control.
   ii. Cost of alternative plans in dollars per ton, of salt removed from any new discharges to the municipality.

e. In order to calculate the net increase in salinity the Permittee shall obtain the concentration of TDS in the water supply at least quarterly. The Permittee may rely on data collected by any water purveyors, and shall identify the source of the data.

f. An evaluation of the impact of the discharge on the lower stem of the Colorado River system in terms of average annual average tons/day and concentration of TDS discharged.

I.A.5. **Narrative Standards** (*Nevada Administrative Code (NAC) 445A.121)*: Discharges shall not cause the following standards to be violated in any surface waters of the state. Waters must be free from:

a. Substances that will settle to form sludge or bottom deposits in amounts sufficient to be unsightly, putrescent or odorous;

b. Floating debris, oil, grease, scum, and other floating materials in amounts sufficient to be unsightly;

c. Materials in amounts sufficient to produce taste or odor in the water or detectable off-flavor in the flesh of fish or in amounts sufficient to change the existing color, turbidity or other conditions in the receiving stream to such a degree as to create a public nuisance;

d. High temperature, biocides, organisms pathogenic to human beings, toxic, corrosive or other deleterious substances at levels or combinations sufficient to be toxic to human, animal, plant or aquatic life;

e. Radioactive materials must not result in accumulations of radioactivity in plants or animals that result in a hazard to humans or harm to aquatic life;

f. Untreated or uncontrolled wastes or effluents that are reasonably amenable to treatment or control; and

g. Substances or conditions which interfere with the beneficial use of the receiving waters.

The narrative standards are not considered violated when the natural conditions of the receiving water are outside the established limits, including periods of high or low flow. Where effluents are discharged to such waters, the discharges are not considered a contributor to substandard conditions provided maximum treatment in compliance with permit requirements is maintained.

I.A.6. The Permittee shall annually review monitoring data, conduct aquatic life studies using water with a hardness representative of the Las Vegas Wash (e.g. 800 mg/l) or conduct other studies to evaluate the existing water quality standards or other data issues, for the following parameters: cadmium, copper, hexavalent chromium, molybdenum, selenium, silver, and sulfide. Results shall be included as part of the annual report required by Part I.B.1.a.i.

I.A.7. There shall be no objectionable odors from the collection system, treatment facility or disposal area, or biosolids treatment, use, storage or disposal area that the Permittee owns or operates.

I.A.8. There shall be no discharge of substances that would cause a violation of water quality standards of the State of Nevada as defined by the permit. The permit may be reopened, and additional limits imposed, if it is determined that the discharge is causing a violation of ambient water quality standards of the State of Nevada.

I.A.9. There shall be no discharge from the collection, treatment and disposal facilities except as authorized by this permit or in accordance with the Division's Spill Reporting Policy.

I.A.10. The treatment and disposal facility shall be fenced and posted.

I.A.11. The collection, treatment and disposal facilities shall be constructed in conformance with plans approved by the Administrator, as required by NAC 445A.284, except as provided in the Division's "Plan and Specification Review Policy for Collection and Treatment Systems in Clark County" latest edition.

I.A.12. The facility shall be operated in accordance with the Operations and Maintenance (O&M) manual which must be approved by the Administrator.

I.A.13. There shall be no discharge of floating solids or visible foam in other than trace amounts.

I.A.14. **Biosolids and Sewage Sludge**

a. **Disposal**: The Permittee shall comply with all applicable sections of the following regulations for biosolids which are disposed and inform any biosolids disposer of the requirement that they must comply with the following regulations as applicable.

i. 40 CFR 257 and 258: for biosolids disposed in municipal solid waste landfills as approved by the Administrator and the County;
ii. 40 CFR 261 for hazardous biosolids or 40 CFR 761 for biosolids with a PCB concentration greater than 50 mg/kg; or
iii. 40 CFR 503: placed in surface disposal sites (dedicated land disposal sites or monofills), or incinerated.

b. **Reuse**: The Permittee shall comply with any applicable sections of 40 CFR 503 for biosolids generated at the facility including solid waste screening and sewage sludge which is to be used, land applied, stored or treated in compliance with any applicable sections of the following regulations:
i. 40 CFR 503: for non-hazardous biosolids that are land applied;
ii. The Permittee is responsible for informing any biosolids preparer, applier, or disposer, of all requirements and the applicable regulations listed above.
iii. Facilities which are regulated under 40 CFR part 503 shall monitor parameters listed in Part I.A.18., and shall also monitor the pathogen density requirements in 40 CFR 503.32 (a) and (b)(2) through (4) and the vector attraction reduction requirements in 503.33(b)(1) through (8); at the frequencies listed below.

| **Dry Biosolids Disposal rate in metric tons/yr.** | **Frequency** |
|---|---|
| >0 - <290 | each year |
| 290 -<1500 | once a quarter |
| 1500 -<15000 | once every 2 months |
| 15000 | once a month |

iv. Biosolids to be land applied shall be tested for organic nitrogen as N, ammonia as N, nitrate as N, and Total Nitrogen as N on the frequency required above.
v. Biosolids which are to be land applied shall be characterized annually pursuant to 40 CFR 261 to determine if they are hazardous.

c. If biosolids are stored at any facility owned or operated by the Permittee for over two years from the time they are generated, the Permittee shall notify the Division within 30 days and shall ensure compliance with all the requirements of surface disposal 40 CFR 503 C, or must submit a written notification to the Division and EPA with the information listed at 40 CFR 503.20 (b), demonstrating the need for longer temporary storage.

d. Biosolids treatment or storage facilities owned or operated by the Permittee shall be designed to divert stormwater run-on for the 100-year storm event, and be designed

to prevent erosion which could cause biosolids to run-off.

e. The Permittee shall take all appropriate precautions to inform biosolids haulers that all necessary measures to contain the biosolids should be taken before leaving the treatment facility.

f. The Permittee shall comply with the following notification requirements either directly or through contractual arrangements with a biosolids management contractor:
   i. If biosolids are shipped to another state or to Indian lands, the Permittee shall send notice of the shipment to the state permitting authorities, the EPA Regional Office of the region receiving the biosolids or the Indian authorities.
   ii. For land application or unpermitted disposal sites, the Permittee shall notify the Division 180 days prior to shipping any biosolids to enable the site to obtain a permit.

g. **Biosolids Monitoring Report (BMR)**: The Permittee shall submit a BMR annually which shall be submitted by **May 31st** for the period covering the previous calendar year. The report shall contain all the required biosolids analytical data, the volume of biosolids generated that year, any volume accumulated from previous years, descriptions of pathogen and vector attraction reduction methods and the required certifications as required by 40 CFR 503.17 and 27, the names, mailing and street addresses and telephone numbers of all facilities which received biosolids for storage, disposal, use, treatment, land application or any other use or disposal methods not mentioned and the volume of biosolids taken to each facility.

I.A.15. **Annual Fee**: The Permittee shall remit an annual review and services fee in accordance with NAC 445A.232 starting **July 1, 2007** and every year thereafter until the permit is terminated.

I.A.16. The treatment facility shall be operated by a Nevada Certified Grade IV Wastewater Operator. The first DMR submitted under this permit must include the written designation of the authorized representative as required by Part III.A.2. If the certified operator in responsible charge changes, a new designation letter must be submitted.

I.A.17. **Whole Effluent Toxicity Testing**: Beginning with the effective date of this permit, the Permittee shall conduct monthly toxicity tests on 24-hour composite effluent samples as described below on the discharge from Outfall 001.

a. **Acute Toxicity Limit:** The effluent shall be deemed acutely toxic when there is a statistically significant difference at the 95th% confidence interval between the survival of the control (0% effluent) test organisms and the survival of the test

organisms in the 100% effluent at the following limits:

i. The survival of test organisms in the undiluted effluent sample is less than 90 percent in six (6) out of eleven (11) consecutive samples; or

ii. The survival rate of test organisms in the undiluted effluent sample is less than 70 percent in any two of eleven consecutive samples.

b. **Test Methods**

i. The acute flow through or static replacement tests shall be conducted in general accordance with the procedures set out in the latest revision of "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms," EPA/600/4-90/027. The Permittee shall conduct an acute 48-hour flow through or static replacement toxicity test using any Daphnid approved by the Division and an acute 96-hour flow through or static replacement toxicity test using fathead minnows, Pimephales promelas. After each 24-hours of the test period the dilutions shall be replaced with freshly prepared dilutions of the original effluent sample.

1. If more than 10 percent control mortality occurs, the test shall be repeated until satisfactory control survival is achieved.

2. The source of the dilution water shall be reported with the test results. The tests shall be run using 4 replicate chambers, with a minimum of 5 organisms per test chamber for the Daphnid and 2 replicate chambers with a minimum of 10 organisms per test chamber for the Pimephales promelas.

ii. **Alternative Species and Protocols:** The Permittee may undertake an investigation of alternative site specific toxicity test species and alternative site specific toxicity protocols. If alternative, site-specific toxicity test species or protocols are developed as a result of work by the Permittee, such species or protocols may be substituted for those specified in this permit on approval by the Division under 40 CFR Part 136. Alternative protocols must be compared to EPA protocols to demonstrate appropriateness and reliability.

c. **Testing Schedule**

i. *Routine Schedule*: The Permittee shall conduct an acute toxicity test monthly.

ii. *Accelerated schedule*: Whenever the effluent has been determined to be acutely toxic per Part I.A.17.a., the Permittee shall increase the frequency of acute toxicity testing to every other week. The accelerated testing shall also be conducted to determine an endpoint of either the LC50 or the No Observed Effects Concentration (NOEC) as defined in the above referenced method. When 4 (four) consecutive tests show greater than 70 percent survival of

undiluted effluent, the Permittee may resume its routine test schedule.

d. **Follow-up Responses**: Whenever the acute toxicity effluent limitation as defined under either Part I.A.17.a.i or ii has been exceeded, **and** one or more of the tests conducted under Part I.A.17.c ii. has a survival rate of less than 70% in an undiluted effluent sample, the Permittee shall:

i. In general accordance with EPA manuals and EPA/600/6-91/003, EPA/600/3-88/035, or any subsequent revisions and/or methods approved by the Division, initiate an identification investigation within 24 hours of the exceedance to identify the cause(s) of the toxicity. After the initiation of the investigation phase pursuant to this condition, the Permittee may suspend the accelerated testing required by Part I.A.17.c.ii. as long as the routine testing required by Part I.A.17.c.i. is resumed.

ii. In general accordance with EPA manuals and EPA/600/R-92/081, or any subsequent revisions and/or methods approved by the Division, conduct an evaluation of findings where appropriate; and

iii. Notify the Division within fifteen (15) days of becoming aware of the exceedance and provide the following:

1. Times and dates when the limitation was exceeded;
2. The findings of the identification investigation or other investigations to identify the cause(s) of the toxicity or a plan for continuing the identification investigation if it was not conclusive;
3. The actions the Permittee has taken or will take to mitigate the impact of the discharge, to correct the noncompliance and prevent the recurrence of toxicity; and
4. Where corrective actions have not been completed, an expeditious schedule under which the corrective actions will be implemented.

e. In no event shall the discharger cause any impairment of the receiving water or of the beneficial uses, nor cause a violation of any other provision of this permit, the Clean Water Act and State or local regulation or law.

f. **Toxicity Testing Reopener**: This permit may be reopened and modified by the Division to include effluent limits, additional testing and/or other appropriate actions to address demonstrated effluent toxicity. This permit may also be reopened and modified by the permitting authority to incorporate alternative permit conditions reflecting State Water Quality Standards revisions related to effluent toxicity.

g. In addition to the quarterly DMR submittals, the Permittee shall submit an annual summary which provides a review of the survival rates of both the control and the 100% effluent. The summary shall be submitted by **May 31st of each year**.

h. **Chronic Toxicity**: The Permittee shall conduct chronic toxicity study using *Ceriodaphnia dubia* to confirm existing nontoxic conditions identified in studies conducted during the previous permit cycle and, if toxicity is found, to identify pollutants that may require additional controls under the pretreatment program, Part I.A.18.

i. The Permittee shall submit a study plan and schedule within one hundred eighty (180) days from the date of issuance of this permit for concurrence by the Division.

ii. The study will include the following:

1. Chronic toxicity testing to be conducted at least once per quarter over a one year period following concurrence of the study plan by the Division.
2. Samples of wastewater shall be taken at the same location as the effluent compliance samples, unless otherwise approved in writing by the Division.
3. If chronic toxicity is identified, using appropriate statistical procedures or other evaluation methods acceptable to the Division, the Permittee may either increase testing frequency to monthly or conduct a Toxicity Identification Evaluation (TIE). If after two additional months of testing the chronic toxicity has abated, the Permittee may return to quarterly testing. If it has not, the Permittee shall continue accelerated testing, conduct a TIE, or submit an alternate proposal to the Division for approval.
4. Chronic toxicity testing shall be conducted in accordance with procedures specified in 40 CFR Part 136.
5. TIEs shall be conducted in accordance with procedures set forth in *Toxicity Identification Evaluations: Characterization of Chronically Toxic Effluents, Phase I,* EPA/600/6-91/003, USEPA, 1991A; and *Toxicity Reduction Evaluation Protocol for Municipal Wastewater Treatment Plants,* EPA/600/2-88/062, USEPA, 1989A, as appropriate.

iii. The Permittee shall take appropriate actions to address any pollutant of concern identified through this study.

iv. A report on the study shall be submitted to the Division within the time provided for in the study plan and schedule. The Permittee and the Division will review the information and any subsequent actions taken by the Permittee to assess the results and determine what actions, e.g., additional chronic toxicity testing, are necessary and appropriate.

v. The data collected through this study, and through the chronic toxicity testing and TIE procedures, are for informational purposes only and shall not be used to assess compliance or in an enforcement action against the Permittee.

I.A.18. **Pretreatment of Industrial Wastewaters:** The Permittee shall implement and enforce a pretreatment program under 40 CFR Part 403 (hereinafter 403), including any subsequent

regulatory revisions to 403 and be responsible for and liable for the performance of all Control Authority pretreatment requirements contained in 403. Where 403 or subsequent revision places mandatory actions upon the Permittee as Control Authority but does not specify a timetable of completion of the actions, the Permittee shall complete the required actions within 6 months from the issuance date of this permit or the effective date of the 403 revisions, whichever comes later. For violations of pretreatment requirements, the Permittee shall be subject to enforcement actions, penalties, fines, and other remedies by the U.S. EPA or other appropriate parties, as provided in the Act. EPA may initiate enforcement action against a nondomestic user for noncompliance with applicable standards and requirements as provided in the Act and as provided by the Division and EPA in the enforcement agreement.

a. The Permittee will comply with the Pretreatment Program as submitted to and approved by the Division and EPA. This program shall include written agreements, with all sewage agencies who contribute flows to the treatment facility, that provide the Permittee with the legal authority to enforce the pretreatment program. The Permittee shall comply with all parts of the schedule listed below, Pretreatment of Industrial Wastewaters.

b. The Permittee shall enforce the requirements promulgated under sections 307(b) through (d) and 402(b) of the Act with timely, appropriate and effective enforcement actions. The Permittee shall cause all nondomestic users subject to federal categorical standards to achieve compliance no later than the date specified in those requirements or in the case of a new nondomestic user, upon commencement of the discharge.

c. The Permittee shall perform the pretreatment functions as required in 403 including but not limited to:
   i. Implement the necessary legal authorities as provided in 403.8(f)(1);
   ii. Enforce the pretreatment requirements under 403.5 and 6;
   iii. Implement the programmatic functions as provided in 403.8(f)(2); and
   iv. Provide the requisite funding and personnel to implement the pretreatment program as provided in 403.8(f)(3).

d. The Permittee shall submit annually a report to the Division and EPA describing its pretreatment activities over the previous year. In the event the Permittee is not in compliance with any conditions or requirements of this permit, then the Permittee shall also include reasons for non-compliance and state how and when the Permittee shall comply with such conditions and requirements. This annual report shall cover operations for the previous calendar year and is due **May 31st** of each year. The report shall contain, but is not limited to, the following information:
   i. A summary of the analytical results from representative, flow proportioned, 24-hour composite sampling of the Publicly Owned Treatment Works'

(POTWs) influent and effluent for those pollutants EPA has identified under section 307(a) of the Act which are known or suspected to be discharged by nondomestic users. This will consist of an annual full priority pollutant scan, with quarterly samples analyzed only for those pollutants detected in the full scan.

ii. Sludge shall be sampled during the same 24-hour period and analyzed for the same pollutants as the influent and effluent. The sludge analyzed shall be a composite sample of a minimum of twelve discrete samples taken at equal time intervals over a 24-hour period or a composite of discreet samples every two hours when the sludge production period is less than 24 hours. Wastewater and sludge sampling and analysis shall be performed a minimum of once per quarter. The Permittee shall also provide any influent or effluent monitoring data for non-priority pollutants which the Permittee believes may be causing or contributing to interference, pass through, or adversely impacting sludge quality. Sampling and analysis shall be performed with the techniques prescribed in 40 CFR 136;

iii. A discussion of upset, interference, or pass through incidents, if any, at the treatment plant which the Permittee knows or suspects were caused by nondomestic users of the POTW system. The discussion shall include the reasons why the incidents occurred, the corrective actions taken and, if known, the name and address of the non-domestic user responsible. The discussion shall also include a review of the applicable pollutant limitations to determine whether any additional limitations, or changes to existing requirements, may be necessary to prevent pass through or interference;

iv. An update of the Permittee's significant industrial users (SIUs) including their names and addresses, and a list of deletions, additions and SIU name changes keyed to the previously submitted list. The Permittee shall provide a brief explanation for each change. The list shall identify the SIUs subject to federal categorical standards by specifying which set(s) of standards are applicable to each SIU. The list shall also indicate which SIUs are subject to local limitations;

v. The Permittee shall characterize the compliance status of each SIU by providing a list or table which includes the following information:

1. Name of the SIU;
2. Category, if subject to federal categorical standards;
3. The type of wastewater treatment or control process in place;
4. The number of samples taken by the POTW during the year;
5. The number of samples taken by the SIU during the year;
6. For an SIU subject to discharge requirements for total toxic organics, whether all required certifications were provided;
7. A list of the standards violated during the year. Identify whether the violations were for categorical standards or local limits;

8. Whether the facility is in significant noncompliance (SNC) as defined at 403.12(f)(2)(vii) at any time during the year; and
9. A summary of enforcement or other actions taken during the year to return the SIU to compliance. Describe the type of action, final compliance date, and the amount of fines and penalties collected, if any. Describe any proposed actions for bringing the SIU into compliance;

vi. A brief description of any programs the POTW implements to reduce pollutants from nondomestic users that are not classified as SIUs;

vii. A brief description of any significant changes in operating the pretreatment program which differ from the previous year including, but not limited to, changes concerning the program's administrative structure, local limits, monitoring program or monitoring frequencies, legal authority, enforcement policy, funding levels, or staffing levels;

viii. A summary of the annual pretreatment budget, including the cost of the pretreatment program functions and equipment purchases; and

ix. A summary of activities to involve and inform the public of the program including a copy of the newspaper notice, if any, required under 403.8(f)(2)(vii).

e. The Permittee shall submit quarterly SIU compliance status reports to EPA, Region 9 and the Division. The reports shall cover the periods of January 1 through March 31, April 1 through June 30, July 1 through September 30, and October 1 through December 31. Each report shall be submitted by the end of the month following the quarter except the report for October 1 through December 31, which may be included in the annual report. The reports, which may be submitted in outline form, shall contain:

i. The name and address of all SIUs which violated any discharge or reporting requirements during the quarter;

ii. A description of the violations including whether any discharge violations were for categorical standards or local limits;

iii. A description of the enforcement or other actions that were taken to remedy the noncompliance; and

iv. The status of active enforcement and other actions taken in response to SIU noncompliance identified in previous reports.

I.A.19. **Chlorine Residual and pH Effluent Limitation**

a. The Permittee may determine compliance with chlorine residual and pH either by grab sampling or by continuous monitoring.

b. If the Permittee chooses continuous monitoring, the Permittee shall maintain the

chlorine residual and pH of such effluent within the range set forth in the applicable effluent limitations guidelines, except excursions from the range are permitted subject to the following limitations:

i. The total time during which the chlorine residual and pH values are outside the required range shall not exceed 7 hours and 26 minutes in any calendar month;

ii No individual excursion from the range of chlorine and pH shall exceed 60 minutes; and

iii. If the continuous monitoring equipment fails, estimates derived from historical or contemporary data may be used.

c. The Division may allow the Permittee to discontinue monitoring for chlorine upon approval of a submittal which demonstrates that there is no reasonable potential for the chlorine concentrations to be toxic.

I.A.20. **Schedule of Compliance**: The Permittee shall implement and comply with the provisions of the schedule of compliance after approval by the Administrator, including in said implementation and compliance, any additions or modifications which the Administrator may make in approving the schedule of compliance.

a. The Permittee shall achieve compliance with the effluent limitations upon issuance of the permit.

b. The Permittee shall submit a report in accordance with Part I.B.1.c. within 14 days of a compliance date detailing compliance or noncompliance with that date.

c. Within six (6) months of the completion of the plant expansion and/or modification, the Permittee shall submit a revised O&M manual to the Division for review and approval.

I.A.21. **Lake Mead and Las Vegas Wash Monitoring:** By **November 1st** of each year, the Permittee shall jointly submit, with the Clark County Water Reclamation District and the City of Las Vegas, an annual plan for monitoring ambient water quality in Lake Mead and Las Vegas Wash during the following year. Following approval by the Division, the Permittee shall implement its portion of the plan beginning **January 1st** of each year. The joint monitoring plan shall include, as a minimum, the following:

a. The identification of at minimum three locations in Las Vegas Wash at which water quality will be routinely monitored.

b. The identification of at minimum five locations within Lake Mead at which water quality will be routinely monitored, including at least one station near the mouth of Las Vegas Wash.

c. An identification of the depths at which each station will be sampled.

d. An explanation of why the station locations and depths were chosen.

e. A schedule for monitoring water quality at the selected stations, at minimum biweekly in Las Vegas Wash and, during April through September, in Lake Mead.

f. A list of parameters to be monitored, including at minimum chlorophyll (in epilimnetic samples), total phosphorus, ortho phosphorus, nitrate, ammonia, dissolved oxygen, conductivity, temperature, pH, and fecal coliforms or E. coli.

g. If the Permittee is unable to reach agreement with the other dischargers, the Permittee shall submit an explanation and a proposed individual monitoring plan.

## I.B. MONITORING AND REPORTING

### I.B.1. Reporting

a. **Annual Reports**

i. On or before **May 31st** of each year, the Permittee shall submit a plot of concentration (y-axis) versus date (x-axis) for each analyzed constituent which has been detected greater than 25% of the time. The plot shall include data from the preceding five years, if available. Any data point from the current year detected at concentrations greater than the limits in Part I.A.1 or the applicable water quality standard must be explained by a narrative.

ii. The BMR required by Part I.A.14., the pretreatment annual report required by Part I.A.18.d., the Lake Mead and Las Vegas Wash Annual Report required by Part I.A.21, the TIN annual report required by Part I.A.3, the Salinity Control Report required by Part I.A.4 and WET annual reports required by Part I.A.17 are due each **May 31st**.

b. **Quarterly Reporting:** Monitoring results obtained pursuant to Part I.A of the permit for the previous three (3) month period shall be summarized for each month and reported on a Discharge Monitoring Report (DMR) form. The DMR is to be received in this office no later than the 28th day of the month following the completed reporting period. The Permittee shall also submit the data in an electronic format provided by the Division. The first report is due on October 28, 2006. Summaries of laboratory results for analyses conducted by outside laboratories must accompany the DMR, and the full data package provided by the laboratory must be provided if requested in writing by the Division. If at any time the Permittee concludes that submitted data were incorrect, the Permittee shall notify the Division in writing, identify the incorrect data, and replace the incorrect data with corrected

data, which shall thereafter be used for determining compliance with this permit.

c. **Compliance Report:** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

d. **Other information:** Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Administrator, it shall promptly submit such facts or information.

e. **Planned changes:** The Permittee shall give notice to the Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition to a permitted facility;

i. May meet one of the criteria for determining whether a facility is a new source (40 CFR 122.29(b));

ii. Could significantly change the nature or increase the quantity of pollutants discharged; or

iii. Results in a significant change to the Permittee's sludge management practice or disposal sites.

f. **Anticipated non-compliance:** The Permittee shall give advance notice to the Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

g. An original signed copy of these, and all other reports required herein, shall be submitted to the State at the following address:

Division of Environmental Protection
Bureau of Water Pollution Control
ATTN: Compliance Coordinator
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701

h. A signed copy of all Discharge Monitoring Reports and any other reports shall be submitted to the Regional Administrator at the following address:

U.S. Environmental Protection Agency, Region IX
NPDES/DMR WTR-7-1
75 Hawthorne Street
San Francisco, CA 94105

I.B.2 **Monitoring**

a. **Representative Samples:** Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

b. **Test Procedures:** Monitoring for the analysis of pollutants shall be conducted according to test procedures approved under 40 CFR 136 published pursuant to Section 304(h) of the Act, or SW-846, or in the case of sludge disposal, approved under 40 CFR 503, or other procedures as approved by the Administrator. Analysis shall be performed by a State of Nevada certified laboratory.

c. **Recording the Results:** For each measurement or sample taken pursuant to the requirements of this permit, the Permittee shall record the following information:
   i. The exact place, date, and time of sampling;
   ii. The dates the analyses were performed;
   iii. The person(s) who performed the analyses;
   iv. The analytical techniques or methods used; and
   v. The results of all required analyses.

d. **Additional Monitoring by Permittee:** If the Permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form. Such increased frequency shall also be indicated on the DMR. If a Permittee monitors more often than once per day, the Permittee shall compute the 7-day average or 30-day average by first averaging the samples for each day, and then averaging the daily averages or discrete samples representing all sampled days within the period; provided, however, that the Permittee may instead average all samples taken within the period if it notifies the Division that it will use this method.

e. **Records Retention:** All records and information resulting from the monitoring activities, permit application, reporting required by this permit, including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation, shall be retained for a minimum of five years, or longer if required by the Administrator. Records of monitoring information required by this permit related to the Permittee's sewage sludge use and or disposal activities shall be retained for a period of at least 5 years or longer as required by 40 CFR 503.

f. **Detection Limits:** All laboratory analysis conducted in accordance with this

discharge permit must meet the following criteria:

i. All methods used must be specified or approved in either 40 CFR 136, SW-846 or otherwise approved by the Division. All analytical results must be generated by analytical laboratories certified by the state of Nevada laboratory certification program;

ii. The reporting limit for each metal monitored in accordance with this permit shall be less than or equal to the water quality standards for metals which apply to the Las Vegas Wash on the effective date of the permit, except for mercury. This requirement does not apply if a water quality standard is lowered after the issuance of this permit; however, the Permittee shall review methods used and by letter notify the division if the reporting limit will exceed the new criterion, and if so the Division may reopen the permit to impose new monitoring requirements;

iii. The Permittee shall determine whether any laboratories certified by the State of Nevada are analyzing mercury using EPA Method 1631 and achieving results within acceptable limits. If so, the Permittee shall provide a sample for analysis using EPA Method 1631 once per year. If not, the Permittee, acting individually or with other Permittees, shall initiate a dialog with its contract laboratories or other laboratories that might be interested in providing service to the Permittee to inform them of the opportunity to provide additional testing services to the Permittee, and to provide information on current sampling and analytical practices and procedures that might assist the laboratories in their determinations about whether to institute the use of the method; and

iv. All priority pollutant data reported by contract laboratories shall be submitted to the Division.

g. **Modification of Monitoring Frequency and Sample Type:** After considering monitoring data, stream flow, discharge flow and receiving water conditions, the Administrator, may for just cause, modify the monitoring frequency and/or sample type by issuing an order to the Permittee.

I.B.3. **Definitions**

a. The "30-day average discharge" means the total discharge during a month divided by the number of samples in the period for that discharge facility. Where less than daily sampling is required by this permit, the 30-day average discharge shall be determined by the summation of all the measured discharges divided by the number of samples during the period when the measurements were made.

b. The "7-day average" concentration means the arithmetic mean of measurements made during a week. If there is more than one measurement per day, the measurements may be averaged in accordance with Part I.B.2.d.

c. The "daily maximum" is the highest measurement during the monitoring period.

d. The "30-day average concentration", other than for fecal coliform bacteria, means the arithmetic mean of measurements made during a month. If there is more than one measurement per day, the measurements may be averaged in accordance with Part I.B.2.d. The "30-day average concentration" for fecal coliform bacteria means the geometric mean of measurements made during a month. The geometric mean is the "$n^{th}$" root of the product of "n" numbers. Geometric mean calculations where there are non-detect results for fecal coliform shall use one half the detection limit as the value for the non-detect results.

e. A "discrete" sample means any individual sample collected in less than 15 minutes.

f. For flow-rate measurements a "composite" sample means the arithmetic mean of no fewer than six individual measurements taken at equal time intervals for 24 hours, or for the duration of discharge, whichever is shorter. For other than flow-rate a "composite" sample means a combination of no fewer than six individual flow-weighted samples obtained at equal time intervals for 24 hours, or for the duration of discharge, whichever is shorter. Flow-weighted sample means that the volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling.

g. "Acute toxicity" is defined in the whole effluent testing procedures presented in this permit in Part I.A.17.

h. "Biosolids" are non-hazardous sewage sludge or domestic septage as these terms are defined in 40 CFR 503.9.

## PART II

### A. MANAGEMENT REQUIREMENTS

II.A.1. **Change in Discharge**: All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, or treatment modifications which will result in new, different, or increased discharges of pollutants must be reported by submission of a new application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes.
Any changes to the permitted treatment facility must comply with Nevada Administrative Code (NAC) 445A.283 to 445A.285. Pursuant to NAC 445A.263, the permit may be modified to specify and limit any pollutants not previously limited.

II.A.2. **Facilities Operation-Proper Operation and Maintenance**: The Permittee shall at all times maintain in good working order and properly operate all treatment and control facilities, collection systems and pump stations installed or used by the Permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance/quality control procedures.

II.A.3. **Adverse Impact-Duty to Mitigate**: The Permittee shall take all reasonable steps to minimize releases to the environment resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge. The Permittee shall carry out such measures, as reasonable, to prevent significant adverse impacts on human health or the environment.

II.A.4. **Noncompliance, Unauthorized Discharge, Bypassing and Upset**

a. Any diversion, bypass, spill, overflow or discharge of treated or untreated wastewater from wastewater treatment or conveyance facilities under the control of the Permittee to navigable waters is prohibited except as authorized by this permit or in accordance with the Division's Spill Reporting Policy. The Division may take enforcement action for a diversion, bypass, spill, overflow, or discharge of treated or untreated wastewater to waters of the state except as authorized by this permit or in accordance with the Division's Spill Reporting Policy. In the event the Permittee has knowledge that a diversion, bypass, spill, overflow or discharge not authorized by this permit or in accordance with the Division's Spill Reporting Policy is probable, the Permittee shall notify the Administrator immediately.

b. The Permittee shall notify the Administrator within twenty-four (24) hours of any diversion, bypass, spill, upset, overflow or release of treated or untreated discharge from wastewater treatment or conveyance facilities under the control of the Permittee other than that which is authorized by the permit or in accordance with the Division's Spill Reporting Policy. A written report shall be submitted to the Administrator within five (5) days of diversion, bypass, spill, overflow, upset or discharge, detailing the entire incident including:
   i. Time and date of discharge;
   ii. Exact location and estimated amount of discharge;
   iii. Flow path and any bodies of water which the discharge reached;
   iv. The specific cause of the discharge; and
   v. The preventive and/or corrective actions taken.

c. The following shall be included as information which must be reported within 24 hours:
   i. Any unanticipated bypass which exceeds any effluent limitation in the permit;
   ii. Any upset which exceeds any effluent limitation in the permit;
   iii. Violation of a limitation for any toxic pollutant or any pollutant identified as the method to control a toxic pollutant.

d. The Permittee shall report all instances of noncompliance not reported under Part II.A.4.b. at the time monitoring reports are submitted. The reports shall contain the information listed in Part II.A.4.b.

e. A "**bypass**" means the intentional diversion of waste streams from any portion of a treatment facility.
   i. **Bypass not exceeding limitations:** The Permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts II.A.4.a, II.A.4.b, and II.A.4.f.
   ii. **Anticipated bypass**: If the Permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of bypass.

f. **Prohibition of Bypass**: Bypass is prohibited, and the Administrator may take enforcement action against a Permittee for bypass, unless:
   i. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage.
   ii. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment down time. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
   iii. The Permittee submitted notices as required under Part II.A.4.e.

g. The Administrator may approve an anticipated bypass, after considering its adverse effects, if the Administrator determines that it will meet the three conditions listed in Part II.A.4.f.

h. An "**upset**" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include

noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

i. **Effect of an upset:** An upset constitutes an affirmative defense to an action brought for non-compliance with such technology-based permit effluent limitations if the requirements of Part II.A.4.j are met.

j. **Conditions necessary for a demonstration of an upset:** A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
   i. An upset occurred and that the Permittee can identify the cause(s) of the upset;
   ii. The permitted facility was at the time being properly operated;
   iii. The Permittee submitted notice of the upset as required under paragraph c of this section; and
   iv. The Permittee complied with any remedial measures required under Part II.A.3.

k. In selecting the appropriate enforcement option, the Administrator shall consider whether or not the noncompliance was the result of an upset. The burden of proof is on the Permittee to establish that an upset occurred.

II.A.5. **Removed Substances:** Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of waste waters shall be disposed of in a manner such as to prevent any pollution from such materials from entering any navigable waters.

II.A.6. **Safeguards to Electric Power Failure:** In order to maintain compliance with the effluent limitations and prohibitions of this permit the Permittee shall either:

a. Provide at the time of discharge an alternative power source sufficient to operate the wastewater control facilities; or

b. Halt or reduce all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

## II.B. RESPONSIBILITIES

II.B.1. **Right of Entry and Inspection:** The Permittee shall allow the Administrator and/or his authorized representatives, upon the presentation of credentials, to:

a. Enter at reasonable times upon the Permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit;

b. Have access to and copy any records required to be kept under the terms and conditions of this permit at reasonable times;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations required in this permit; and

d. Perform any necessary sampling or monitoring to determine compliance with this permit at any location for any parameter.

II.B.2. **Transfer of Ownership or Control:** In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the Permittee shall notify the succeeding owner or controller of the existence of this permit, by letter, a copy of which shall be forwarded to the Administrator. The Administrator may require modification or revocation and reissuance of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary. ALL transfer of permits shall be approved by the Administrator.

II.B.3. **Availability of Reports:** Except for data determined to be confidential under NRS 445A.665, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of the Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NRS 445A.710.

II.B.4. **Furnishing False Information and Tampering with Monitoring Devices:** Any person who intentionally or with criminal negligence makes any false statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained by the provisions of NRS 445A.300 to 445A.730, inclusive, or by any permit, rule, regulation or order issued pursuant thereto, or who falsifies, tampers with or knowingly renders inaccurate any monitoring device or method required to be maintained under the provisions of NRS 445A.300 to 445A.730, inclusive, or by any permit, rule, regulation or order issued pursuant thereto, is guilty of a gross misdemeanor and shall be punished by a fine of not more than $10,000 or by imprisonment. This penalty is in addition to any other penalties, civil or criminal, provided pursuant to NRS 445A.300 to 445A.730, inclusive.

II.B.5. **Penalty for Violation of Permit Conditions:** Nevada Revised Statutes (NRS) 445A.675 provides that any person who violates a permit condition is subject to administrative and judicial sanctions as outlined in NRS 445A.690 through 445A.705.

II.B.6. **Permit Modification, Suspension or Revocation**

a. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

i. Violation of any terms or conditions of this permit;
ii Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;
iii. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge;
iv. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination;
v. There are material and substantial alterations or additions to the permitted facility or activity;
vi. The Administrator has received new information;
vii. The standards or regulations have changed; or
viii. The Administrator has received notification that the permit will be transferred.

b. **Minor Modifications:** With the consent of the Permittee and without public notice, the Administrator may make minor modifications in a permit to:

i. Correct typographical errors;
ii. Clarify permit language;
iii. Require more frequent monitoring or reporting;
iv. Change an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the permit and does not interfere with attainment of the final compliance date;
v. Allow for change in ownership;
vi. Change the construction schedule for a new discharger provided that all equipment is installed and operational prior to discharge;
vii. Delete an outfall when the discharge from that outfall is terminated and does not result in discharge of pollutants from other outfalls except in accordance with permit limits; or
viii. Reallocation of the waste load allocation as long as the sum of the allocations does not change.

II.B.7. **Toxic Pollutants:** Notwithstanding Part II.B.6 , if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic

effluent standard or prohibition and the Permittee so notified.

II.B.8. **Liability:** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable Federal, State or local laws, regulations, or ordinances. However, except for any toxic effluent standards and prohibitions imposed under section 307 of the Clean Water Act or toxic water quality standards set forth in NAC 445A.144, compliance with this permit constitutes compliance with Clean Water Act sections 301, 302, 306, 307, 318, 403, 405(a) and (b), and with NRS 445A.300 through 445A.730.

II.B.9. **Property Rights:** The issuance of this permit does not convey any property rights, in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

II.B.10. **Severability:** The provisions of this permit are severable, and if any provision of this permit, or the application of any provisions of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

II.B.11. **Duty to Comply:** The Permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination; revocation and reissuance, or modification; or denial of a permit renewal application.

II.B.12. **Need to Halt or Reduce Activity Not a Defense:** It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this permit.

II.B.13. **Duty to Provide Information:** The Permittee shall furnish to the Administrator, within a reasonable time, any relevant information which the Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this permit. The Permittee shall also furnish to the Administrator, upon request, copies of records required to be kept by this Permit.

## PART III

### III.A. OTHER REQUIREMENTS

III.A.1. **Reapplication**: If the Permittee desires to continue to discharge, he shall reapply not later than 180 days before this permit expires on the application forms then in use. POTWs

with NPDES permits shall submit the sludge information listed at 40 CFR 501.15(a)(2) with the renewal application. The renewal application shall be accompanied by the fee required by NAC 445A.232.

III.A.2. **Signatures, certification required on application and reporting forms**

a. All applications, reports, or information submitted to the Administrator shall be signed and certified by making the following certification.

**"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."**

b. All applications, reports or other information submitted to the Administrator shall be signed by one of the following:

i. A principal executive officer of the corporation (of at least the level of vice president) or his authorized representative who is responsible for the overall operation of the facility from which the discharge described in the application or reporting form originates;

ii. A general partner of the partnership;

iii. The proprietor of the sole proprietorship; or

iv. A principal executive officer, ranking elected official or other authorized employee of the municipal, state or other public facility.

c. **Changes to Authorization:** If an authorization under paragraph b. of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph b. of this section must be submitted to the Administrator prior to or together with any reports, information, or applications to be signed by an authorized representative.

III.A.3. **Holding Pond Conditions:** If any wastewater from the Permittee's facility is placed in ponds owned or operated by the Permittee, such ponds shall be located and constructed so as to:

a. Contain with no discharge the once-in-the twenty-five year, 24 hour storm at said

location;

b. Withstand with no discharge the once-in-one-hundred year flood of said location; and

c. Prevent escape of wastewater by leakage other than as authorized by this permit;

Unless otherwise approved by the Division.

III.A.4. **Flow Rate Notification:** The Permittee shall notify the Administrator, by letter, not later than ninety (90) days after the 30-day average daily influent flow rate first equals or exceeds 85% of the design treatment capacity of the Permittee's facility given in Part I.A. above. The letter shall include:

a. The 30-day average daily influent flow rate;

b. The maximum 24-hour flow rate during the 30-day period reported above and the date the maximum flow occurred;

c. The Permittee's estimate of when the 30-day average influent flow rate will equal or exceed the design treatment capacity of the Permittee's facility;

d. A status report on the treatment works which will outline but not be limited to past performance, remaining capacity of the limiting treatment and disposal units or sites, past operational problems and improvements instituted, modifications to the treatment works which are needed to attain the permitted flow rate due to changing site specific conditions or design criteria; and

e. The Permittee's schedule of compliance to provide additional treatment capacity before the 30-day average daily influent flow rate equals the present design treatment capacity of the Permittee's facility.

III.A.5. **Publicly Owned Treatment Works [40 CFR 122.42(b)]:** All POTWs must provide adequate notice to the Administrator of the following:

a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the Act if it were directly discharging those pollutants; and

b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

c. For the purposes of this part, adequate notice shall include information on: (1) the quality and quantity of effluent introduced into the POTW and (2) any anticipated impact of the change on the quantity or quality of effluent to be discharge from the POTW.

# ATTACHMENT A
# PRIORITY POLLUTANTS

## BASE NEUTRAL EXTRACTIBLES

Acenaphthene
Benzidine
1,2,4-Trichlorobenzene
Hexachlorobenzene
Hexachloroethane
Bis(2-chloroethyl) ether
2-Chloronaphthalene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
3,3'-Dichlorobenzidine
2,4-Dinitrotoluene
2,6-Dinitrotoluene
1,2-Diphenylhydrazine
Fluoranthene
4-Chlorophenyl phenyl ether
4-Bromophenyl phenyl ether
Bis(2-Chloroisopropyl) ether
Bis(2-Chloroethoxy) methane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
N-Nitrosodi-n-propylamine
Bis(2-ethylhexyl) phthalate
n-Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Chrysene
Acenaphthylene
Antracene
Benzo(g,h,i)perylene
Fluorene
Phenanthrene
Dibenzo(a,h)anthracene
Indeno(1,2,3-cd)pyrene
Pyrene

## VOLATILE ORGANICS

Acrolein
Acrylonitrile
Benzene
Carbon tetrachloride
Chlorobenzene
1,2-Dichloroethane
1,1,1-Trichloroethane
1,1-Dichloroethane
1,1,2-Trichloroethane
1,1,2,2-Tetrachloroethane
Chloroethane
2-Chloroethylvinylether
Chloroform
1,1-Dichloroethene
Trans-1,2-Dichloroethene
1,2-Dichloropropane
1,3-Dichloropropane
Ethylbenzene
Dichloromethane
Chloromethane
Bromomethane
Bromoform
Bromodichloromethane
Dibromochloromethane
Tetrachloroethene
Toluene
Trichloroethene
Vinyl chloride

## PESTICIDES

Aldrin
Dieldrin
Chlordane (Technical)
4,4'-DDT
4,4'-DDE
4,4'-DDD
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
Alpha-BHC
Beta-BHC
Gamma-BHC (Lindane)
Delta-BHC
PCB 1016
PCB 1221
PCB 1232
PCB 1242
PCB 1248
PCB 1254
PCB 1260
Toxaphene

## ACID EXTRACTIBLES

2,4,6-Trichlorophenol
4-Chloro-3-methylphenol
2-Chlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2-Nitrophenol
4-Nitrophenol
2,4-Dinitrophenol
2-Methyl-4,6-dinitrophenol
Pentachlorophenol
Phenol

## METALS

Antimony
Arsenic
Beryllium
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Thallium
Zinc

## DIOXINS

TCDD

## OTHER

Cyanide
Asbestos

Note: Priority Pollutants to be analyzed using Environmental Protection Agency (EPA) Methods 200 Series, 353.3, 420.2, 624,625, 608, and/or an appropriate combination of these methods to verify compliance with permit-specified effluent discharge limitations.

# NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

## FACT SHEET

(pursuant to NAC 445A.236)

I. **Permittee Name**: City of Henderson
240 Water Street
Henderson, NV 89015

II. **Permit Number**: NV0022098 – Renewal

III. **Location**: 450 East Galleria Drive
Henderson, NV 89015
And
2610 St. Rose Parkway
Henderson, NV 89074

IV. **General**: The Permittee has applied for a National Pollutant Discharge Elimination System (NPDES) permit renewal to extend the authorization to discharge to the Las Vegas Wash.

The discharge is from a 32 million gallons per day (MGD) wastewater treatment plant located at 450 East Galleria, Henderson, NV 89015. Preliminary treatment at the plant consists of by step screens and grit removal. Biological nutrient removal basins are in the process of being added to the aeration basins, which currently achieve BOD removal and nitrification of ammonia. Phosphorus removal is accomplished through biological phosphorus removal, coagulation and precipitation in solids contact clarifiers, and filtration. Disinfection is achieved through chlorination, followed with dechlorination prior to discharge. Ultraviolet disinfection facilities are also under construction. Sludge removed from the activated sludge process is dewatered for final disposal in a landfill. The plant also has a separate aerated wastewater lagoon plant (WWTP#3) which is regulated by a groundwater discharge permit (NEV80003).

This permit also covers the 8 MGD Southwest Water Reclamation Facility (SWRF). This plant is under design and is projected to be in operation in mid-2009. The SWRF will produce reclaimed water that will be used for irrigation. Treatment at the plant will consist of bar and band screens, activated sludge with biological nutrient removal, membrane bio-reactors, and ultraviolet light for primary disinfection. Odor control will be used throughout the plant. Sludge from the plant will be returned to the sanitary sewers and treated at the main plant. Reclaimed water will also be chlorinated for distribution to the City's reclaimed water customers. Reclaimed water from the SWRF will be regulated under a state groundwater discharge

permit. Effluent that is not needed for irrigation will be transmitted via pipeline to the central Water Reclamation Facility described above for discharge to Las Vegas Wash. During an emergency, the SWRF may discharge up to 8 MGD of fully treated effluent from Outfall 002 through the storm-sewer system to Las Vegas Wash.

The majority of the flow into the plants is domestic wastewater. There is a small percentage of flow from industry in the service area and there is a pretreatment program which regularly samples the effluent from the industrial dischargers. The pretreatment program is authorized through the United States Environmental Protection Agency (USEPA).

The existing permit was issued on July 20, 2001, and expires on July 20, 2006. During that time, the plant has consistently been in compliance with the permit. The proposed permit is based on a completed permit application submitted by the Permittee, plant monitoring data, ambient water quality data, and a request for a mixing zone.

**V. Discharge Characteristics:** Discharges from the main plant have the following characteristics:

| Parameter | Long-Term Average, 2005 |
|---|---|
| Flow | 21 MGD |
| $CBOD_5$ | <2 mg/L |
| $BOD_5$ | <2 mg/L |
| pH | 6.5-8.9 SU |
| Chlorine Residual | <0.1 mg/L |
| Total Dissolved Solids | 1360 mg/L |
| TSS | <2 mg/L |
| Ammonia as N | 1.04 mg/L |
| Nitrate as N | 10.70 mg/L |
| Total Kjeldahl nitrogen | <2 mg/L |
| Phosphorus as P | 0.18 mg/L |
| Orthophosphate as P | 0.13 mg/L |
| Dissolved oxygen | 7.1 mg/L |
| Fecal coliforms | <2 MPN/100 ml |

The Southwest Water Reclamation Facility is currently under design. The effluent design criteria for the SWRF are as follows:

| Parameter | Monthly Average |
|---|---|
| Flow | 8 MGD |
| $BOD_5$ | 30 mg/L |
| TSS | 30 mg/L |

| | |
|---|---|
| Ammonia as N | 0.5 mg/L |
| Nitrate as N | 10 mg/L |
| Phosphorus as P | 0.2 mg/L (Phase I) |
| | 0.1 mg/L (Phase II) |
| Fecal Coliforms | |
| 30-day geometric mean | 2.2 MPN/100 ml |
| Daily Maximum | 23 MPN/100 ml |

**VI. Receiving Water:** The receiving water is the Las Vegas Wash. The standards applicable to the Las Vegas Wash are attached to this fact sheet as Attachment A. Pursuant to NAC 445A.198, the designated beneficial uses for the appropriate reach of Las Vegas Wash are:

Irrigation
Watering of livestock
Recreation not involving contact with the water
Maintenance of a freshwater marsh
Propagation of wildlife
Propagation of aquatic life, excluding fish. This does not preclude the establishment of a fishery.

This reach of the Las Vegas Wash also has an established goal of the propagation of aquatic life, including, without limitation, fish by the next triennial review. This goal may be reevaluated in the near future considering the construction of the grade control structures in the Las Vegas Wash.

Las Vegas Wash has been included on the 303(d) list because of suspended solids and iron. The exceedances identified were not attributed to the Permittee or other publicly owned treatment works in Southern Nevada, but instead were attributable to erosion resulting from high velocity streamflows produced by steep gradients and from loose unconsolidated soils. Several erosion-control structures have been installed in the affected area, and additional structures are planned, along with streambank protection, revegetation, and other control measures. These measures have achieved compliance, and de-listing is expected.

## VII. Summary of Changes From Previous Permit:

The main changes from the previous permit are:

| Item | Change |
|---|---|
| Ambient Water Quality Monitoring | Replace 2 fixed-location monitoring stations in Las Vegas Wash and 5 fixed-location monitoring stations in Lake Mead with annual plan in which Permittee proposes and the Division approves locations of at minimum 3 stations in Las Vegas Wash and 5 in Lake Mead. Revision improves flexibility of monitoring |

| | |
|---|---|
| | program so that stations at locations no longer considered necessary can be moved to locations that provide representative data. |

**VII. Proposed Effluent Limitations:** The Permittee is required to meet the following permit limits. Note: The load limits are calculated using the 30 day average flow and the permit limit expressed as a concentration. If higher flows are allowed in future permits, the load limits will increase accordingly.

**TABLE I.1 (Outfall 001, WATER POLLUTION CONTROL FACILITY)**

| **PARAMETERS** | **EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS** | | | **MONITORING REQUIREMENTS** | | |
|---|---|---|---|---|---|---|
| | **30 Day Average[2]** | **7 Day Average[2]** | **30-Day Average (lb/day)** | **Sample Location** | **Measurement Frequency** | **Sample Type** |
| **Flow-001** | 40 MGD | Monitor and Report: MGD | NA | INF, 001 | Continuous | Flow meter |
| **$BOD_5$ (Uninhibited)** | 30 mg/L | 45 mg/L | 10,008 | 001 | Daily | Composite |
| | Monitor and Report | Monitor and Report | NA | INF | | |
| **Total Suspended Solids** | 30 mg/L | 45 mg/L | 10,008 | 001 | Daily | Composite |
| | Monitor and Report | Monitor and Report | NA | INF | | |
| **$BOD_5$ (Uninhibited) &TSS** | The Permittee shall demonstrate that the 30-day average percentage removal rate is at least 85%. | | | NA | Monthly | Calculate |
| **pH** | Minimum 6.0 and maximum 9.0 SU. except as allowed in Parts I.A.3 and I.A.19. | | NA | 001 | Daily | Discrete |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Fecal Coliform[1]** | Log mean 200 cfu or mpn/100ml | See footnote 1 | NA | 001 | Daily | Discrete |
| **Total Residual Chlorine** | NA | 0.1 mg/L- except as allowed in Part I.A.19. | NA | 001 | Daily | Discrete |
| **Total Phosphorus as P: mg/L** | See Part I.A.2 | | | 001 | Daily | Composite |
| **Total Ammonia as N: mg/L** | See Part I.A.2 | | | 001 | Daily | Composite |
| **Total Inorganic Nitrogen as N: mg/L** | See Part I.A.3 | | | 001 | Weekly | Composite |
| **Total Dissolved Solids: mg/L** | See Part I.A.4 | | | 001 | Weekly | Composite |
| **Priority Pollutants** | Monitor and Report, See Attachment A | | | 001 | Per Part I.A.18.d. | Discrete or Composite |
| **WET testing** | See Part I.A.17. | | | 001 | Monthly | Composite |
| **Receiving Water Monitoring** | Monitor and Report | | | See Part I.A.21 | See Part I.A.21 | Discrete |
| **Temperature: °C** | Monitor and Report | | NA | 001 | Weekly | Discrete |
| **Dissolved Oxygen: mg/L** | Monitor and Report | | NA | 001 | Weekly | Discrete |
| **Orthophosphorus as P: mg/L** | Monitor and Report | | | 001 | Daily | Composite |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | **30 Day Average[2]** | **7 Day Average[2]** | **30-Day Average (lb/day)** | **Sample Location** | **Measurement Frequency** | **Sample Type** |
| **Nitrate + Nitrite as N: mg/L** | Monitor and Report | | | 001 | Weekly | Composite |
| **Total Kjeldahl Nitrogen as N: mg/L** | Monitor and Report | | | 001 | Weekly | Composite |

1. The discharge shall not exceed a log mean of 200 cfu or mpn per 100 ml over a 30 day period nor may more than 10 percent of the total samples taken exceed 400 cfu or mpn per 100 ml.
2. For those parameters sampled weekly or less frequently, the Permittee shall report the single value instead of the 7-day or 30 day average.

**TABLE I.2 (Outfall 002, SOUTHWEST WATER RECLAMATION FACILITY)**

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | **30 Day Average[2]** | **7 Day Average[2]** | **30-Day Average (lb/day)** | **Sample Location** | **Measurement Frequency** | **Sample Type** |
| **Flow-002** | 8 MGD | Monitor and Report: MGD | NA | 002 | Continuous | Flow Meter |
| **$BOD_5$ (Uninhibited)** | 30 mg/L | 45 mg/L | 2,002 | 002 | Daily | Composite |
| | Monitor and Report | Monitor and Report | NA | INF | | |
| **Total Suspended Solids** | 30 mg/L | 45 mg/L | 2,002 | 002 | Daily | Composite |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| | Monitor and Report | Monitor and Report | NA | INF | | |
| **$BOD_5$ (Uninhibited) &TSS** | The Permittee shall demonstrate that the 30-day average percentage removal rate is at least 85%. | | | NA | Monthly | Calculate |
| **Fecal Coliform[1]** | Log mean 200 cfu or mpn/100ml | See footnote 1 | NA | 002 | Daily | Discrete |
| **pH** | Minimum 6.0 and maximum 9.0 SU, except as allowed in Parts I.A.3 and I.A.19 | | NA | 002 | Daily | Discrete |
| **Total Residual Chlorine** | NA | 0.1 mg/L Except as allowed in Part I.A.19 | NA | 002 | Daily | Discrete |
| **Total Phosphorus as P: mg/L** | See Part I.A.2 | | | 002 | Daily | Composite |
| **Total Ammonia as N: mg/L** | See Part I.A.2 | | | 002 | Daily | Composite |
| **Total Inorganic Nitrogen as N: mg/L** | See Part I.A.3 | | | 002 | Weekly | Composite |
| **Total Dissolved Solids: mg/L** | See Part I.A.4 | | | 002 | Weekly | Composite |
| **Priority Pollutants** | Monitor and Report. See Attachment A | | | 002 | Per Part I.A.18.d. | Discrete or Composite |
| **WET testing** | See Part I.A.17 | | | 002 | Quarterly | Composite |

| PARAMETERS | EFFLUENT DISCHARGE LIMITATIONS or REPORTING REQUIREMENTS | | | MONITORING REQUIREMENTS | | |
|---|---|---|---|---|---|---|
| | 30 Day Average[2] | 7 Day Average[2] | 30-Day Average (lb/day) | Sample Location | Measurement Frequency | Sample Type |
| **Temperature: °C** | Monitor and Report | | NA | 002 | Daily | Discrete |
| **Orthophosphorus as P: mg/L** | Monitor and Report | | | 002 | Daily | Composite |
| **Nitrate + Nitrite as N: mg/L** | Monitor and Report | | | 002 | Weekly | Composite |
| **Total Kjeldahl Nitrogen as N: mg/L** | Monitor and Report | | | 002 | Weekly | Composite |

1. The discharge shall not exceed a log mean of 200 cfu or mpn per 100 ml over a 30 day period nor may more than 10 percent of the total samples taken exceed 400 cfu or mpn per 100 ml.
2. For those parameters sampled weekly or less frequently, the Permittee shall report the single value instead of the 7-day or 30 day average.

**Attachment A** This attachment to the permit is the list of Priority Pollutants which are required to be sampled under the pretreatment permit requirements.

**IX. Proposed Technology Based Effluent Limitations:** Federal regulations at 40 CFR section 133 require publicly owned treatment works to achieve specified limits in discharged BOD, suspended solids, and pH. The permit includes these limits.

**X. Proposed Water Quality-Based Effluent Limitations:** The Nevada water quality standards require that point source discharges not cause a violation of any applicable water quality standards in the receiving water nor interfere with the attainment or maintenance of beneficial uses. The following requirements are included in the permit to ensure that the discharge does not cause water quality standards violations. In addition, the permit requires monitoring and reporting of constituents which are present in the discharge and the subject of ambient water quality standards.

**Total Dissolved Solids:** The permit includes the goal of not more than a 400 mg/l increase in Total Dissolved Solids (TDS) over the drinking water supply, a goal established by the Colorado River Salinity Forum. The Permittee has implemented the salinity public education required by the permit. This activity is a continuing requirement of the proposed permit.

**Phosphorus and Ammonia:** Total Maximum Daily Loads (TMDLs) were developed for Total Ammonia as N and Phosphorus as P in 1989. The Permittee has been allocated a Waste Load for Total Ammonia as N and Total Phosphorus as P. This permit includes language which allows waste load allocation trading between the City of Las Vegas, Clark County Sanitation District, and City of Henderson (hereinafter Dischargers). The WLA applies to the combined loading from all outfalls. This permit condition constitutes a cooperative agreement between the Dischargers to allow discharge flexibility. Each facility has an **Individual Waste Load Allocation (IWLA)** and there is a **Sum of Waste Load Allocations (∑WLA)** defined below for the three facilities. The Permittee shall be considered in compliance if **either**:

i. The Permittee does not exceed the **IWLA** listed below or the **IWLA** in effect due to transfers, **or**

ii. The **Sum of the Waste Load Allocations (∑WLA)** listed below is not exceeded.

**Waste Load Allocation Table**

| **Constituent** | **City of Las Vegas IWLA** | **Clark County Sanitation District IWLA** | **City of Henderson IWLA** | **∑WLA** |
|---|---|---|---|---|
| **Total Phosphorus as P** | 123 lb/day | 173 lb/day | 38 lb/day | 334 lb/day, Note: This WLA only applies March 1 - October 31; no limit applies the rest of the year. Non-point source load is 100 lb/day. |
| **Total Ammonia as N** | 358 lb/day | 502lb/day | 110 lb/day | 970 lb/day, Note: This WLA only applies April 1 - September 30; no limit applies the rest of the year. No non-point source load. |

**Fecal Coliform.** Water quality standards for Las Vegas Wash specify fecal coliform requirements to be imposed on discharges into the wash. Water quality standards for Lake Mead include fecal coliform standards. These standards have been imposed as effluent limits on discharges into the wash and Lake Mead.

**Total Residual Chlorine.** Water quality standards for Las Vegas Wash prohibit the discharge of toxic substances in toxic amounts. The Permittee dechlorinates the effluent to remove free chlorine. An excess of the dechlorinating agent is used to ensure that no free chlorine remains. The effluent limit of 0.1 mg/l Total Residual Chlorine is included in the permit as an indicator that no free chlorine is present in the effluent.

**Acute WET Testing.** Acute whole effluent toxicity requirement have been imposed to prevent discharges of toxic substances in toxic amounts.

**XI. Special Conditions:** In addition to the technology based effluent limitations and the water quality based effluent limitations, the permit includes standard conditions required by 40 CFR section 122.41, including requirements on duty to comply, duty to reapply, need to halt or reduce activity not a defense, duty to mitigate, proper operation and maintenance, permit actions, property rights, duty to provide information, inspection and entry, monitoring and records, signatory requirement, reporting requirements (including planned change, anticipated noncompliance, transfers, monitoring reports, compliance schedules, 24 hour reporting, and other non-compliance), bypass requirements, and upset requirements. In addition, the permit includes the following special conditions.

**Total inorganic nitrogen and pH.** The Permittee is required to coordinate with the Clark County Water Reclamation District and the City of Henderson to determine whether Las Vegas Wash complies with the RMHQ criterion for total inorganic nitrogen, and for the beneficial use standard for pH. If the Permittee and other dischargers determine that the wash has exceeded these criteria, they must consider whether reasonable changes would result in compliance, and report to the Division.

**Chronic WET Testing.** The Permittee previously conducted a chronic whole effluent toxicity testing study and determined that there was no chronic whole effluent toxicity present in the effluent. The permit requires additional chronic WET testing to ensure that chronic toxicity does not appear.

**Cadmium, copper, hexavalent chromium, molybdenum, selenium, silver, sulfide.** The Permittee previous conducted studies to ascertain whether hardness levels above 400 mg/l provided additional protection against toxicity, and determined that Las Vegas Wash water, which contains 800 mg/l of hardness, had a protective effect. The permit requires annual data review to determine whether additional aquatic studies or other investigations are needed.

**Biosolids.** The permit includes requirements on the disposal or reuse of biosolids. No changes are proposed from existing requirements.

**Pretreatment.** The permit includes requirements for a pretreatment program, which the Permittee has established. No changes are proposed from existing requirements.

**Miscellaneous.** The permit includes miscellaneous requirements for odors, fencing, fees, operator qualifications, etc. No changes are proposed from existing requirements.

**Effluent Monitoring.** The permit includes extensive effluent monitoring requirements for all substances subject to effluent limitations or included in ambient water quality standards.

**Ambient Water Quality Monitoring.** The existing permit specifies locations and monitoring intervals for ambient water quality monitoring. The proposed permit would revise the provision by requiring the Permittee to submit a proposed monitoring plan annually, consistent with minimum requirements imposed by the permit. In the plan, the Permittee would identify locations and sampling schedules. The minimum permit requirements provide for monitoring at least as intensive as in the existing permit. The revisions allow for

greater flexibility, including the moving of existing stations to areas of current interest, and the addition and deletion of stations to provide monitoring for specific issues and for limited times.

**XII. Reasonable Potential Analysis and Antidegradation Review.** EPA regulations require that "Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." (40 CFR § 122.44(d)(1)(i).) Before issuance of the permit in 2001, a detailed reasonable potential analysis was conducted on the potential for wastewater discharges from the City of Henderson, City of Las Vegas, and Clark County Water Reclamation District to cause or contribute to excursions above water quality standards. The conclusion from that analysis was that there was no reasonable potential, and no numeric effluent limits were imposed. Since that permit was issued, the Permittee, in coordination with the other Permittees, have conducted aquatic life studies demonstrating that Las Vegas Wash, which has hardness concentrations of 800 mg/l, provides a protective effect beyond the protective effect associated with 400 mg/l of hardness, and that it is appropriate to use the concentrations of 800 mg/l in calculating hardness-based water quality criteria. The discharges are unlikely to exceed the ambient water quality metals criteria, and there is no reasonable potential for Las Vegas Wash.

In Nevada, antidegradation review is conducted through the criteria known as Requirements to Maintain Higher Quality (RMHQ). RMHQ criteria were reviewed and applied to this permit, and none of the discharges can reasonably be expected to exceed any RMHQ criterion.

**XIII. Flow**: **40 MGD** - Galleria
8 MGD - Southwest Water Reclamation Facility

**XIV. Quantities**: At the 30 day average flow allowed by this permit, the discharge from Outfalls 001 and 002 combined will consist of the following loadings:

| | **Outfall 001** | **Outfall 002** |
|---|---|---|
| **$BOD_5$** | 10,008 lb/day | 2,002 lb/day |
| **Total Suspended Solids** | 10,008 lb/day | 2,002 lb/day |

**XV. Discharges From Future Outfalls**

As part of its application, the Permittee has submitted information on proposed discharges from future outfall 003 to lower Las Vegas Wash and from future outfall 004 to Lake Mead. These discharges will require the construction of a pipeline from the Permittee's plant along Las Vegas Wash to Lake Mead. This proposed pipeline will require approval of federal agencies, and is currently undergoing environmental review through the preparation of an environmental impact statement. The Division is holding the application for additional outfalls in abeyance at this time, pending a written request from the Permittee to proceed. When it receives a written request to proceed, the Division will prepare a major modification of the permit, which will be subject to public review and comment. No additional application will be required from the Permittee.

## XVI. Procedures for Public Comment

The Notice of the Division's intent to reissue a permit authorizing the facility to discharge to surface waters of the State of Nevada subject to the conditions contained within the permit, is being sent to the **Las Vegas Review Journal** for publication. The notice is being mailed to interested persons on our mailing list. Anyone wishing to comment on the proposed permit can do so in writing until 5:00 P.M. July 24, 2006, a period of 30 days following the date of the public notice. The comment period can be extended at the discretion of the Administrator.

A public hearing on the proposed determination can be requested by the applicant, any affected State, any affected interstate agency, the Regional Administrator of EPA Region IX or any interested agency, person or group of persons. The request must be filed within the comment period and must indicate the interest of the person filing the request and the reasons why a hearing is warranted. Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determined to be appropriate. All public hearings must be conducted to accordance with NAC 445A.238.

The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.650.

## XVII. Proposed Determination

The Division has made the tentative determination to re-issue the proposed 5-year permit.

Prepared by: Alan Tinney
April 24, 2006

# ATTACHMENT A
# PRIORITY POLLUTANTS

## BASE NEUTRAL EXTRACTIBLES

Acenaphthene
Benzidine
1,2,4-Trichlorobenzene
Hexachlorobenzene
Hexachloroethane
Bis(2-chloroethyl) ether
2-Chloronaphthalene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
3,3'-Dichlorobenzidine
2,4-Dinitrotoluene
2,6-Dinitrotoluene
1,2-Diphenylhydrazine
Fluoranthene
4-Chlorophenyl phenyl ether
4-Bromophenyl phenyl ether
Bis(2-Chloroisopropyl) ether
Bis(2-Chloroethoxy) methane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
N-Nitrosodi-n-propylamine
Bis(2-ethylhexyl) phthalate
n-Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Chrysene
Acenaphthylene
Antracene
Benzo(g,h,i)perylene
Fluorene
Phenanthrene
Dibenzo(a,h)anthracene
Indeno(1,2,3-cd)pyrene
Pyrene

## VOLATILE ORGANICS

Acrolein
Acrylonitrile
Benzene
Carbon tetrachloride
Chlorobenzene
1,2-Dichloroethane
1,1,1-Trichloroethane
1,1-Dichloroethane
1,1,2-Trichloroethane
1,1,2,2-Tetrachloroethane
Chloroethane
2-Chloroethylvinylether
Chloroform
1,1-Dichloroethene
Trans-1,2-Dichloroethene
1,2-Dichloropropane
1,3-Dichloropropane
Ethylbenzene
Dichloromethane
Chloromethane
Bromomethane
Bromoform
Bromodichloromethane
Dibromochloromethane
Tetrachloroethene
Toluene
Trichloroethene
Vinyl chloride

## PESTICIDES

Aldrin
Dieldrin
Chlordane (Technical)
4,4'-DDT
4,4'-DDE
4,4'-DDD
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
Alpha-BHC
Beta-BHC
Gamma-BHC (Lindane)
Delta-BHC
PCB 1016
PCB 1221
PCB 1232
PCB 1242
PCB 1248
PCB 1254
PCB 1260
Toxaphene

## ACID EXTRACTIBLES

2,4,6-Trichlorophenol
4-Chloro-3-methylphenol
2-Chlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2-Nitrophenol
4-Nitrophenol
2,4-Dinitrophenol
2-Methyl-4,6-dinitrophenol
Pentachlorophenol
Phenol

## METALS

Antimony
Arsenic
Beryllium
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Thallium
Zinc

## DIOXINS

TCDD

## OTHER

Cyanide
Asbestos

Note: Priority Pollutants to be analyzed using Environmental Protection Agency (EPA) Methods 200 Series, 353.3, 420.2, 624,625, 608, and/or an appropriate combination of these methods to verify compliance with permit-specified effluent discharge limitations.

# Appendix N

PBS&J Disclosure Statement

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# N.0 No Conflict-of-interest Disclosure Statement

**National Environmental Policy Act (NEPA) Disclosure Statement**
**U.S. Bureau of Reclamation and National Park Service**
**Environmental Impact Statement**
**Systems Conveyance and Operations Program**

The President's Council on Environmental Quality (CEQ) regulations at 40 CFR 1506.5(c) require that consultants preparing an environmental impact statement (EIS) execute a disclosure specifying they have no financial or other interest in the outcome of the project. The term "financial interest or other interest in the outcome of the project" for the purposes of this disclosure is defined in the March 23, 1981, guidance "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," 46 FR 18026-18038 at Questions 17a and 17b.

"Financial or other interest in the outcome of the project" includes "any financial benefit such as a promise of future construction or design work in the project, as well as indirect benefits the contractor is aware of (e.g., if the project would aid proposals sponsored by the firm's other clients)" (46 FR 18031).

In accordance with the above-referenced regulatory requirements, PBS&J will prepare the EIS for the Systems Conveyance and Operations Program on behalf of the U.S. Bureau of Reclamation and National Park Service and declares no financial or other interest in the outcome of the proposed project.

Certified by:

Mary B. Peters — 7 aug 03

Mary Peters, Environmental Program Manager — Date

PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074

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# Appendix O

Acronym List

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# O.0 Acronyms and Abbreviations

| | |
|---|---|
| $^{o}$C | degrees Celsius |
| °F | degrees Fahrenheit |
| ACEC | Area of Critical Environmental Concern |
| ADST | Alternate Discharge Study Team |
| AF | acre-feet or acre-foot |
| AFY | acre-feet per year |
| aggregate plant | aggregate-classification plant |
| AIRFA | American Indian Religious Freedom Act |
| AMP | Adaptive Management Plan |
| AMSWTF | Alfred Merritt Smith Water Treatment Facility |
| APE | area of potential effect |
| AQRV | air quality related values |
| AR | approved road |
| ARPA | Archaeological Resources Protection Act |
| AST | above-ground storage tank |
| AWT | Advanced Wastewater Treatment |
| BBMI | Boulder Basin Management Indices |
| BEA | Bureau of Economic Analysis |
| BIA | Bureau of Indian Affairs |
| BINDP | Boulder Islands North Diffuser Pipeline |
| BISDP | Boulder Islands South Diffuser Pipeline |
| BISOP | Boulder Islands South Outfall Pipeline |
| BLM | U.S. Bureau of Land Management |
| BMI | Basic Management, Inc. |
| BMP | Best Management Practice |
| BNR | biological nutrient removal |
| BPR | biological phosphorus removal |
| CAA | Clean Air Act |
| CAEDYM | Computational Aquatic Ecosystem Dynamic Model |
| CAMP | Las Vegas Wash Comprehensive Adaptive Management Plan |
| CCC | Civilian Conservation Corps |
| CCHD | Clark County Health District |
| CCRFCD | Clark County Regional Flood Control District |
| CCWRD | Clark County Water Reclamation District |
| CEQ | Council on Environmental Quality |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| cf | cubic feet |
| CFR | Code of Federal Regulations |

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|---|---|
| cfs | cubic feet per second |
| CLV | City of Las Vegas |
| cm | centimeter(s) |
| cms | cubic meters per second |
| CMT | Core Management Team |
| CNLV | City of North Las Vegas |
| CO | carbon monoxide |
| COH | City of Henderson |
| CP | Central Plant |
| CRIT | Colorado River Indian Tribe |
| CWA | Clean Water Act |
| CWC | Clean Water Coalition |
| CWCCAC | Clean Water Coalition Citizens Advisory Committee |
| DAQEM | Department of Air Quality and Environmental Management |
| dBA | A-weighted decibels |
| dBC | C-weighted decibels |
| DM | department manual |
| DO | dissolved oxygen |
| DOI | Department of Interior |
| ECS | erosion control structures |
| EDC | endocrine-disrupting compound |
| EI | Effluent Interceptor |
| EIS | Environmental Impact Statement |
| ELCOM | Estuary and Lake Computer Model |
| EO | Executive Order |
| EPA | U.S. Environmental Protection Agency |
| ESA | Endangered Species Act |
| FC | fecal coliform |
| FEMA | Federal Emergency Management Agency |
| F/M | foreground - middleground |
| FDA | U.S. Food and Drug Administration |
| fps | feet per second |
| ft | foot/feet |
| $ft^2$ | square ft |
| $gpd/ft^2$ | gallons per day per square ft |
| $gpm/ft^2$ | gallons per minute per square ft |
| HAP | hazardous air pollutant |
| HC | hydrocarbons |
| HDPE | high density polyethylene |
| hp | horsepower |
| HPRS | hydroelectric/pressure regulating station |
| HRT | hydraulic retention time |

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|---|---|
| Hz | hertz |
| IMPLAN | IMPLAN Professional (Version 2.0) |
| I-O | input - output |
| IRPAC | Integrated Resources Planning Advisory Committee |
| ITA | Indian Trust Assets |
| kg/day | kilograms per day |
| km | kilometer(s) |
| KOP | key observation point |
| lbs / day | pounds per day |
| LCR MSCP | Lower Colorado River Multi-species Conservation Program |
| LCS | Lake Conveyance System |
| LMNRA | Lake Mead National Recreation Area |
| LMWQF | Lake Mead Water Quality Forum |
| LOS | level of service |
| $Lpd/m^2$ | liters per day per meters squared |
| LVBT1 | Las Vegas Bay Tunnel Phase 1 |
| LVBT2 | Las Vegas Bay Tunnel Phase 2 |
| LVVWD | Las Vegas Valley Water District |
| LVWCC | Las Vegas Wash Coordination Committee |
| µg/L | microgram per liter |
| $µg/m^3$ | microgram per cubic meter |
| µS/cm | microsiemens per centimeter |
| m | meter(s) |
| MAP | Management Action Plan |
| MF/UF | microfiltration/ultrafiltration |
| mg/L | milligrams per liter |
| mgd | million gallons per day |
| mph | miles per hour |
| MPN/100mL | most probable number per 100 milliliters |
| mps | meters per second |
| MSA | Metropolitan Statistical Area |
| MSHCP | Multiple Species Habitat Conservation Plan |
| msl | mean sea level |
| mW | megawatt |
| MWD | Metropolitan Water District of Southern California |
| NAAQS | National Ambient Air Quality Standards |
| NAC | Nevada Administrative Code |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NAICS | North American Industry Classification System |
| ND | no data |
| NDEP | Nevada Division of Environmental Protection |
| NDMA | N-nitrosodimethylamine |

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|---|---|
| NDOT | Nevada Department of Transportation |
| NDOW | Nevada Department of Wildlife |
| Needs Assessment Study | Las Vegas Valley Watershed Needs Assessment Study |
| NEPA | National Environmental Policy Act |
| $NH_3$ | un-ionized ammonia |
| $NH_3$-N | ammonia-nitrogen |
| $NH_{4+}$ | ionized ammonia |
| $NH_4$-N | total ammonia |
| NHPA | National Historic Preservation Act |
| NOA | Notice of Availability |
| $NO_2$ | nitrogen dioxide |
| $NO_3$ | nitrate |
| $NO_3$-N | nitrate-nitrogen |
| NOI | Notice of Intent |
| NOx | nitrogen oxides |
| NNHP | Nevada Natural Heritage Program |
| NPDES | National Pollutant Discharge Elimination System |
| NPL | National Priority List |
| NPS | National Park Service |
| NRHP | National Register of Historic Places |
| NRMT3 | North River Mountains Tunnel No. 3 |
| NRS | Nevada Revised Statutes |
| NTU | Nephelometric Turbidity Unit |
| $O_3$ | ozone |
| O&M | operations and maintenance |
| OC | organochlorine |
| OHV | off-highway vehicle |
| Operations Group | Integrated Water Managers Operations Group |
| OSHA | Occupational Safety and Health Administration |
| OTC | over the counter |
| Pb | lead |
| PCB | polychlorinated biphenyls |
| PhAC | pharmaceutically active chemicals |
| PL | Public Law |
| PM | particulate matter |
| $PM_{10}$ | particulate matter with a diameter less than 10 microns |
| $PM_{2.5}$ | particulate matter with a diameter less than 2.5 microns |
| ppb | parts per billion |
| PPCP | pharmaceuticals and personal care products |
| ppm | parts per million |
| PRS | pressure regulating station |
| PSD | Prevention of Significant Deterioration |
| PWC | personal watercraft |

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|---|---|
| RCRA | Resource Conservation and Recovery Act |
| REC | recognizable environmental conditions |
| Reclamation | Bureau of Reclamation |
| RMHQ | requirements to maintain existing higher quality |
| RMP | Resources Management Plan |
| RMS | root mean square |
| RO | reverse osmosis |
| ROD | Record of Decision |
| ROW | right-of-way |
| SARA | Superfund Amendments & Reauthorization Act |
| SBCM | San Bernardino County Museum |
| SCIRR | Six Companies, Inc., Railroad |
| SCOP | Systems Conveyance & Operations Program |
| SCC | solids contact clarifier |
| SHPO | State Historic Preservation Officer |
| SIC | Standard Industrial Classification |
| SIP | State Implementation Plan |
| SMA | Sunrise Management Area |
| SNRPC | Southern Nevada Regional Planning Coalition |
| SNWA | Southern Nevada Water Authority |
| SNWS | Southern Nevada Water System |
| SO | Secretarial Order |
| $SO_2$ | sulfur dioxide |
| SOC | species of concern |
| SPR | supplemental phosphorus removal |
| SR | state route |
| SRMT3 | South River Mountains Tunnel No. 3 |
| SRT | sludge (or solids) retention time |
| TCP | traditional cultural property |
| TDS | total dissolved solids |
| TIN | total inorganic nitrogen |
| TMDL | total maximum daily load |
| TOC | total organic carbon |
| TP | total phosphorus |
| TRB | Transportation Research Board |
| TSD | Treatment, Storage, and Disposal |
| TSS | total suspended solids |
| UNLV | University of Nevada, Las Vegas |
| U.S. | United States |
| US 93 | U.S. Highway 93 |
| US 95 | U.S. Highway 95 |
| US 515 | U.S. Highway 515 |
| USACE | U.S. Army Corps of Engineers |

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|---|---|
| USBOC | U.S. Census Bureau |
| USC | United States Code |
| USCRR | U.S. Construction Railroad |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |
| UST | underground storage tank |
| V/C | volume to capacity ratio |
| Valley | Las Vegas Valley |
| VFA | volatile fatty acid |
| VOC | volatile organic compounds |
| VRM | visual resource management |
| Wetlands Park | Clark County Wetlands Park |
| WLA | waste load allocations |
| WPCF | Water Pollution Control Facility |
| WQCAC | Water Quality Citizens Advisory Committee |
| WRF | Water Reclamation Facility |
| WWTP | wastewater treatment plant |