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Callville Bay Launch Ramp Relocation 401 Application & Attachments

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*Certified **SDVOSB***
Service-Disabled Veteran Owned Small Business

*Certified **WOSB***
Woman Owned Small Business

Attachment 1:

401 Application Form



A division of the
Nevada Department of Conservation & Natural Resources

STATE OF NEVADA
Joe Lombardo, Governor
Vinson Guthreau, Director
Jennifer L. Carr, Administrator

901 S. Stewart Street, Suite 4001
Carson City, Nevada 89701
p: 775-687-4670 f: 775-687-5856
ndep.nv.gov

Clean Water Act Section 401 Water Quality Certification Application

Please refer to the "[Clean Water Act Section 401 Water Quality Certification Application Guidance](#)" document for assistance with completing this application.

A. Pre-Filing Meeting	
Please provide the date that a pre-filing meeting was requested from Nevada Division of Environmental Protection (NDEP) Bureau of Water Quality Planning (BWQP).	July 17, 2026
<i>Note: If a pre-filing meeting has not been requested, please schedule a pre-filing meeting with NDEP BWQP.</i>	

B. Contact Information	
Project Proponent Information	
Company Name: Lake Mead National Recreation Area, National Park Service	Address: 601 Nevada Way
Applicant Name: Ed Clark	City: Boulder City
Phone: (702) 293-8721	Fax:
Email: ed_clark@nps.gov	State: NV
	Zip Code: 89005
Agent Information	
Company Name: AES Group, Inc.	Address: 11031 S Pikes Peak Dr
Agent Name: Dan Brown	City: Parker
Phone: (303) 841-3922	Fax:
Email: dan.brown@aes-grp.com	State: CO
	Zip Code: 80138

C. Project General Information	
Project Location	
Project/Site Name: Relocate Public Launch Ramp at Callville Bay	Name of receiving waterbody: Lake Mead
Address: 100 Callville Bay Rd (see site map for specific location at Callville Bay)	Type of waterbody present at project location (<i>select all that apply</i>):
City: Overton	☐ Perennial River or Stream
County: Clark	☐ Intermittent River or Stream
State: Nevada	☐ Ephemeral River or Stream
	☒ Lake/Pond/Reservoir
	☐ Wetland
	☐ Other: _____

Zip Code: 89005			
Latitude (UTM or Dec/Deg): 36.1255°N		Longitude (UTM or Dec/Deg): 114.7025°W	
Township: 21 S	Range: 65 E	Section: 15	¼ Section: NW ¼ of the SE ¼
Project Details			
Project purpose:		Construction of a new boat launch ramp to preserve public access to the lake on the North shore of Lake Mead as water levels continue to drop. This is the third boat launch ramp project conducted by the National Park Service (NPS) to preserve public access to the lake.	
Describe current site conditions: Attachments can include, but are not limited to, relevant site data, photographs that represent current site conditions, or other relevant documentation.		The project is on undisturbed, unvegetated sediments under open water in Lake Mead. Additional work for the launch ramp is on the shore of Lake Mead, also on undisturbed, unvegetated sediment.	
Describe the proposed activity including methodology of each project element:		Work includes excavation, grading, and replacement of aggregate bases within the water to prepare the site for the installation of pre-cast concrete launch ramp panels. Onshore work includes cast-in-place concrete for the sections of the boat ramp that are not within the water. Placement of a permanent riprap perimeter along the ramp and additional temporary erosion control elements will be included during construction. Attached construction drawings show the extent of the work, both onshore and within the water, for the entire launch ramp. Construction elements include but are not limited to: • Installation of temporary erosion and sediment control for the entire duration of the project • Installation and maintenance of a turbidity curtain around the construction area within the water • Excavation of lakebed sediment • Grading of the lakebed • Placement of fill material composed of an aggregate base and a riprap perimeter • Installation of cast-in-place concrete • Installation of pre-cast concrete panels Work may take place in water up to 52' deep. To create a stable base for the pre-cast concrete panels, excavation of soft lakebed will occur with an average depth of 24". A long-reach excavator will be used to install the pre-cast panels and perform excavation, with work in shallower water being performed on the cast-in-place section of the launch ramp for depths of 10' or less, with the remaining depths being achieved on a barge temporarily moored offshore.	
Estimate the nature, specific location, and number of discharge(s) expected to be authorized by the proposed activity:		All work described in this application will take place below the ordinary high water mark (OHWM) of Lake Mead. Based on interim guidance from the U.S. Army Corps of Engineers, the current OHWM is at an elevation of approximately 1,068.63 feet (as of June 2026) relative to the North American Vertical Datum of 1988 (NAVD88). This elevation can be seen on Sheet C39 in the attached construction drawing set. Specific work locations are shown in the construction drawings.	

	Materials placed below the OHWM will consist of base materials (aggregate and riprap) and precast concrete panels. Some cast-in-place portions of the launch ramp may be below the OHWM, but only if it is possible to prevent wet or uncured concrete from coming in contact with waters of the U.S. while installing those portions. See Attachment 11 – OHWM Quantities Technical Memo for complete information on quantities and calculations.	
Provide the date(s) on which the proposed activity is planned to begin and end and the approximate date(s) when any discharge(s) may commence:	Construction of the project's approaching roadways and utilities are anticipated to start in March of 2027, and to be completed within 2 years. Work on the Launch ramp will begin in April of 2028. Work is expected to be completed in a single season without demobilization, as it will occur during Spring and Summer. Please see attached Estimated Construction Schedule for additional details.	
Provide a list of the federal permit(s) or license(s) required to conduct the activity which may result in a discharge into regulated waters (see mandatory attachments):	In addition to Clean Water Act Section 401 water quality certification, the project will require authorization from the U.S. Army Corps of Engineers under Nationwide Permits 36 (Boat Ramps), and 13 (Bank Stabilization).	
Provide a list of all other federal, state, interstate, tribal, territorial, or local agency authorizations required for the proposed activity and the current status of each authorization:	A Temporary Permit for Working in Waters from the NDEP Bureau of Water Control, with an estimated application date of (4/1/2027). Before the completion of the two allowed extensions, an application for a Groundwater Discharge Permit for long-term work in waters will be submitted, dependent on the length of the construction and lake water levels.	
Does this activity require preparation of an Environmental Impact Statement (EIS) under the National Environmental Policy Act (33 U.S.C. § 4321, et seq.) by the U.S. Army Corps of Engineers (USACE) or another federal agency where USACE will rely on the EIS to make its permit decision.	Yes. This is Alternative A under the 2019 Low Water Plan. This project is a federal action that must undergo an environmental review.	
Total area of impact to regulated waterbodies (acres):	0.8994 acres	
Total linear distance of impact to regulated waterbodies (linear feet):	489.72'	
Quantity and nature of each discharge of fill material proposed within regulated waters (cubic yards):	Temporary:	Permanent:
	0 yd ³	Excavation: 32,570 yd ³ Embankment Fill: 6,209 yd ³ Agg Base Fill: 7,940 yd ³ Rip Rap Fill: 703 yd ³ Concrete (6" Thick): 5245 yd ²
Quantity and nature of each discharge of dredged material proposed within regulated waters (cubic yards):	Temporary:	Permanent:
	0 yd ³	0 yd ³
Describe the reason(s) why avoidance of temporary fill in regulated waters is not practicable (if applicable):	The nature of a boat launch ramp inherently requires fill in regulated waters, otherwise boat launch activities would not be possible as the boat launch ramp would not be within the water.	

Describe the Best Management Practices (BMPs) to be implemented to avoid and/or minimize impacts to regulated waters: Examples include sediment and erosion control measures, habitat preservation, flow diversions, dewatering, hazardous materials management, water quality monitoring, equipment or plans to treat, control, or manage discharges, etc.	Measures to avoid or minimize impacts to waters of the U.S. include the following: • Before project work begins, the construction contractor will install temporary erosion control measures, such as silt fence and/or straw wattles around any stored materials in staging areas. See 01 57 23 of the attached specification document. • Straw wattles will also be installed at the water's edge. • The construction contractor will supply and have readily available onsite a spill kit, including oil-absorbent booms. • All equipment that will be used off surfaced roadways will be steam-cleaned before entering the Park and will be visually inspected daily before entering or re-entering the water. • Tracked equipment will not be allowed to operate in water deep enough to submerge the top of the tracks. • Existing parking areas will be used for staging and existing roads will be used for access to launch ramps. • All staging and vehicle maintenance areas will be at least 100 feet from the water's edge. • The contractor will install a turbidity curtain to contain sediments stirred up by in-water work. See Section 35 01 01 of the attached specifications document. • Aggregate and riprap used as fill will be clean, hard, durable, and free from deleterious matter. • Aggregate and riprap placed in the water will have undergone additional screening to remove fines and reduce turbidity during placement. • No wet or uncured concrete will be allowed to enter waters of the State or waters of the U.S. • Lakebed sediments will be hauled offsite and disposed of at an approved upland facility, lakebed sediments will be stored and allowed to decant in the proposed new parking area, more than 100 feet from the water's edge. Silt fences, straw wattles, and rock check dams will prevent decanting water from entering the lake.
Describe how the activity has been designed to avoid and/or minimize adverse effects, both temporary and permanent, to regulated waters:	Placement of cast-in-place or pre-cast concrete on the sediment surfaces will not change the condition of the open water at the site, and modifications to the grade and lakebed are minimal. The placement of the launch ramp will not affect currents or reduce the area of the waters within the United States. The material chosen, concrete, does not leach oils or other harmful substances like asphalt, providing a durable and water-safe surface for boat access to the water. No wetlands are impacted, no dewatering is proposed, and no aquatic areas will be changed to dry land. The use of the waterbody will not change. The permits must be closed by the contractor before the final acceptance of project work. See 01 77 00 1.5 of the attached specification documents.
Describe any compensatory mitigation planned for this project (if applicable):	No mitigation measures are planned, and no direct or indirect environmental effects are anticipated.

D. Signature		
Name and Title (Print): Daniel Brown, LEED AP, BD+C, Senior Electrical Designer	Phone Number: 303-241-4527	Date: 08/26/2026
 Digitally signed by Dan Brown DN: C=US, E=dan.brown@aes-grp.com, O=AES, CN=Dan Brown Date: 2026.09.02 10:03:02-06'00' Signature of Responsible Official		

Mandatory Attachments:

- **Federal Permit or License Application** - A copy of the federal permit or license application and any readily available water quality-related materials that informed the development of the federal license or permit application.
- **Site Map** - A map or diagram of the proposed project site including project boundaries in relation to regulated waters, local streets, roads, and highways.
- **Engineered Drawings** - Engineered drawings are preferred to be submitted at the 70% design level. If only conceptual designs are available at the time of application, plans for construction should be submitted prior to the start of the project. Specific locations of the proposed activities and details of specific work elements planned for the project should be identified (e.g., staging areas, concrete washouts, perimeter controls, water diversions, or other BMPs).

Submit the completed application materials to NDEP (ndep401@ndep.nv.gov) with the appropriate U.S. Army Corps of Engineers Regulatory Office copied on the communication (<http://www.spk.usace.army.mil/Missions/Regulatory/Contacts/Contact-Your-Local-Office/>).

Attachment 2:

Drawings:

- 2.1. G2 Permitting Coordination Drawing
- 2.2. S1 Site Plan
- 2.3. G10-G15 – Erosion Control Plans

AERIAL IMAGE DATE: 10/04/2022
LAKE LEVEL=1047.2' (NAVD 88)

CALLVILLE BAY

PROPOSED MARINA PARKING AREA AND ACCESS ROAD (MARINA #3)
(BID OPTION #4: C6-SERIES SHEETS)

PROPOSED MARINA PARKING AREA AND ACCESS ROAD (MARINA #3)
(BID OPTION #4: C6-SERIES SHEETS)

OHWM ELEV=1068.63'

PROPOSED MAINTENANCE AREA
(BID OPTION #5: C7-SERIES SHEETS)

PROPOSED BURIED SEWER SYSTEM
(BID OPTION #2: C4-SERIES SHEETS)

PROPOSED BURIED WATER SYSTEM
(BID OPTION #2: C3-SERIES SHEETS)

NEW CALLVILLE BAY ROADWAY ALIGNMENT
(BASE BID: C-SERIES SHEETS)

PROPOSED BURIED POWER SYSTEM
(BID OPTION #2: E2-SERIES SHEETS)

NEW LAUNCH RAMP WITH MOVEABLE SOLAR LIGHTS
(BASE BID: C-SERIES SHEETS)

PROPOSED THREE (3) MOBILE RESTROOMS NEAR LAUNCH RAMP
(BID OPTION #1: C1-SERIES SHEETS)

PROPOSED HELIPAD
(BID OPTION #6: C8-SERIES SHEETS)

PROPOSED MARINA FUEL SYSTEM
(BID OPTION #3: V5-SERIES SHEETS)

PROPOSED MARINA PARKING AREA AND ACCESS ROAD (MARINA #1 AND #2)
(BID OPTION #4: C6-SERIES SHEETS)

NEW LAUNCH RAMP PARKING AREA
(BASE BID: C-SERIES SHEETS)

MARINA #3 (RELOCATED)

MARINA #1 (RELOCATED)

MARINA #2 (RELOCATED)

STORE/LOUNGE

EXIST NORTH PARKING LOT

ABANDONED LAUNCH RAMP PARKING AREA

EXIST LAUNCH RAMP

EXISTING CALLVILLE BAY MARINA LOCATION

NOTES:

1. THE UNITED STATES BUREAU OF RECLAMATION (BOR) RECORDS LAKE MEAD WATER LEVELS USING THE POWERHOUSE VERTICAL DATUM. WITHIN CALLVILLE BAY DEVELOPED AREA, PUBLISHED BOR ELEVATIONS ARE CALCULATED TO BE APPROXIMATELY 2.10' LOWER THAN NAVD88 ELEVATIONS.
2. CONTRACTOR STAGING AREA FOR NORTHERN PORTION OF PROJECT SHALL BE THE SOUTH WEST CORNER OF THE EXISTING NORTH PARK LOT. ACTUAL SIZE AND LOCATION SHALL BE COORDINATED WITH THE CO.



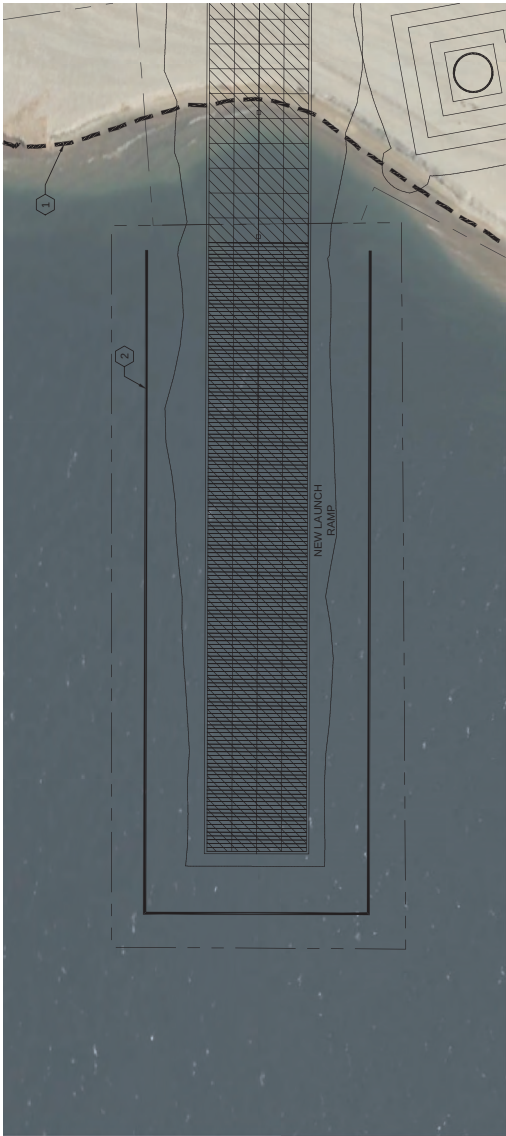
DESIGNED:	T. WOODS	SUB SHEET NO.	602	TITLE OF SHEET	PROJECT OVERVIEW AND SITE PLAN
CHECKED:	M. ROGERS	DRAWING NO.	179537		
TECH. REVIEW:	M. JOHNSON	PMS/PAC NO.	318673		
DATE:	08/13/2026	SHEET			
					3 OF 173

LEGEND:

W	UG POWER
PWR	UG WATER
FM	UG FOREMAIN



1 OVERALL SITE PLAN
SCALE: 1" = 500'



2 WORK IN WATERS SITE PLAN
SCALE: 1" = 50'

SHEET NOTES:

1. THE UNITED STATES BUREAU OF RECLAMATION RECORDS LAKE MEAD WATER LEVELS USING THE POWERHOUSE VERTICAL DATUM. WITHIN CALLVILLE BAY DEVELOPED AREA, PUBLISHED ELEVATIONS ARE CALCULATED TO BE APPROXIMATELY 2.10' LOWER THAN NAVD83 ELEVATIONS.
2. MARINA RELOCATION AND OTHER MARINA WORK IS NOT COVERED UNDER THIS DESIGN. IT IS THE RESPONSIBILITY OF THE USER TO OBTAIN NECESSARY PERMITS AND SERVICE TO COORDINATE MOVING THE MARINA TO THE SHORE.
3. ALL UTILITY WORK IS CONDUCTED ABOVE THE ORDINARY HIGH WATER MARK. ALL WORK FOR THE HELIPAD IS CONDUCTED ABOVE THE ORDINARY HIGH WATER MARK.
4. ALL ROAD WORK SHALL BE CONDUCTED WHEN THE WATER HAS DROPPED BELOW THE LOWEST ELEVATION OF ROADS. THIS WORK IS NOT WORKING IN WATERS. ALL ROAD WORK SHALL BE CONDUCTED WHEN THE WATER HAS DROPPED BELOW THE LOWEST ELEVATION OF ROADS OR CONCRETE IS USED IN THE CONSTRUCTION OF ROADS NEAR THE BOAT LAUNCH RAMP.

KEY NOTES:

1. THE ORDINARY HIGH WATER MARK AT AN ELEVATION OF 1088.63'. SEE CONSTRUCTION DRAWINGS FOR ADDITIONAL INFORMATION.
2. TURBIDITY CURTAIN FOR WORK WITHIN WATERS.

LEGEND

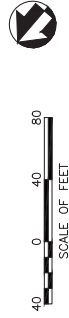
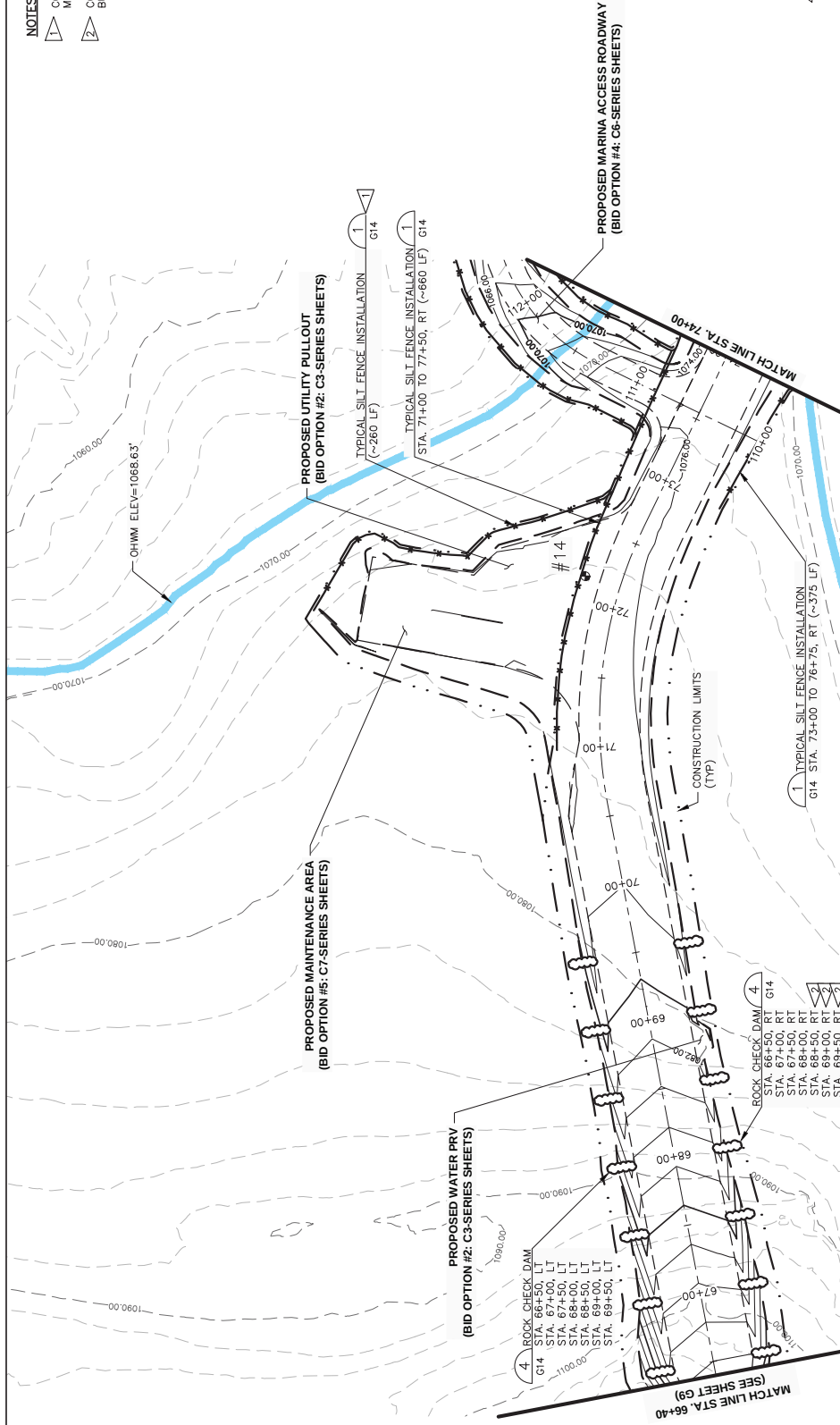
- LIMITS OF CONSTRUCTION ON LAND
- LIMITS OF CONSTRUCTION WITHIN WATERS
- ORDINARY HIGH WATER MARK



DESIGNED: BMW	SUB SHEET NO. S1	TITLE OF SHEET 401 SITE PLAN	DRAWING NO. 602
TECH. BMW	REVIEW: WBRI/DB	LAKE MEAD NATIONAL RECREATION AREA	PMS/PAC NO. 179537
DATE: 08/13/2026			SHEET 316673
			of 172

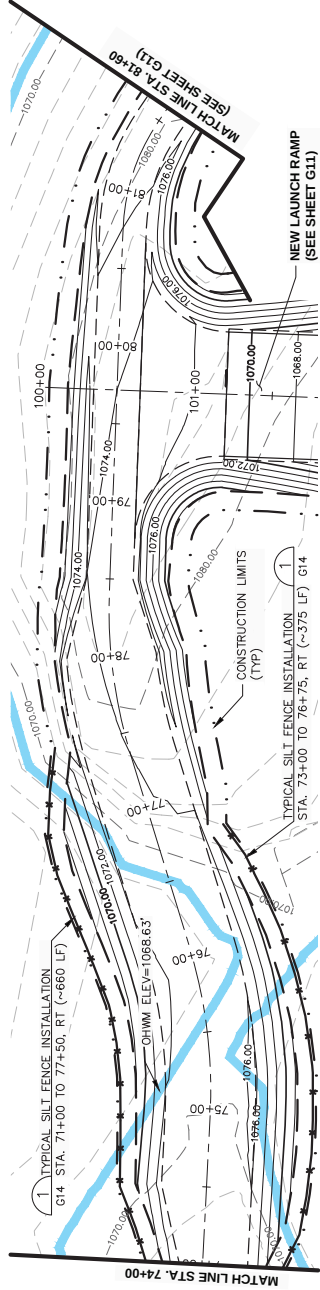
NOTES:

- △ CONTRACTOR SHALL ONLY INSTALL IF BID OPTION #5 MAINTENANCE YARD IS AWARDED.
- △ CONTRACTOR SHALL NOT INSTALL IF BID OPTION #2 BURIED UTILITIES IS AWARDED.

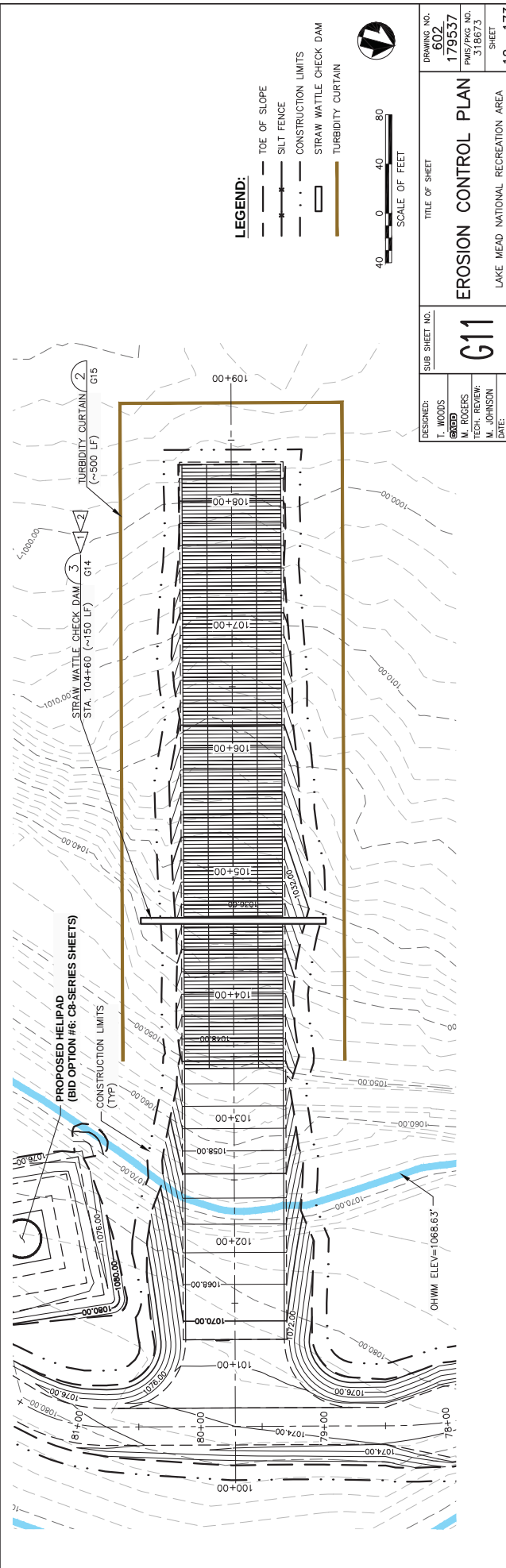
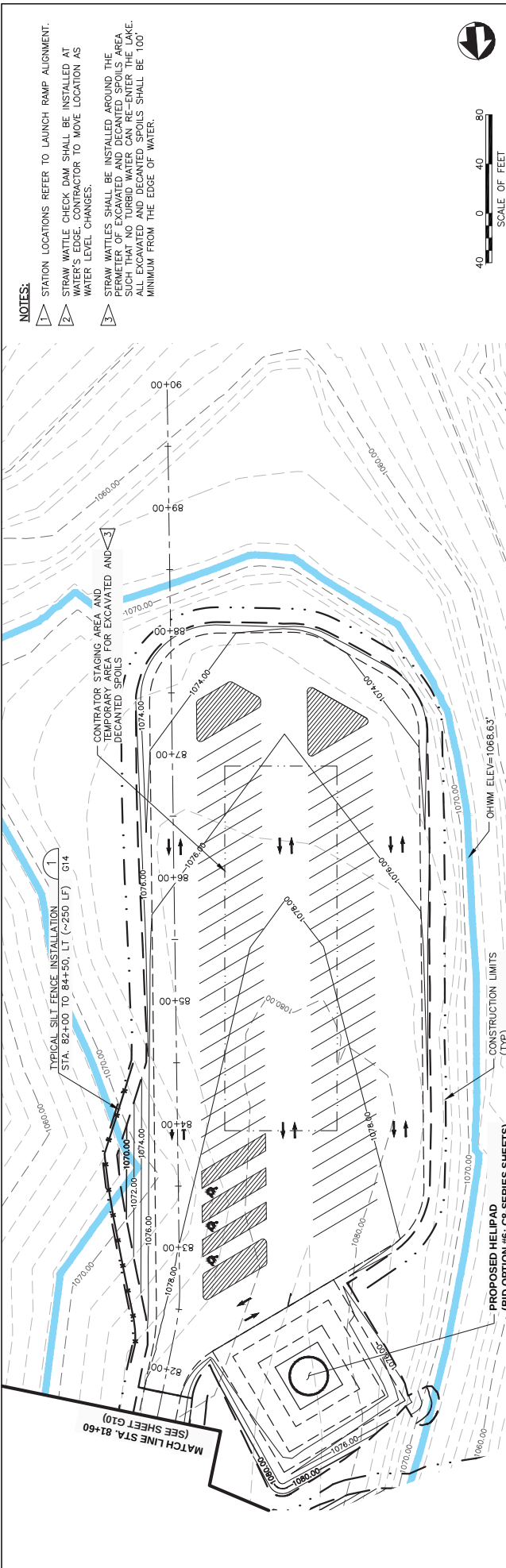


LEGEND:

- TOE OF SLOPE
 - SILT FENCE
 - CONSTRUCTION LIMITS
 - ROCK CHECK DAM
 - CONTROL POINT
- Scale of feet: 0, 40, 80. North arrow pointing towards the top right.



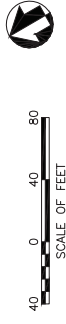
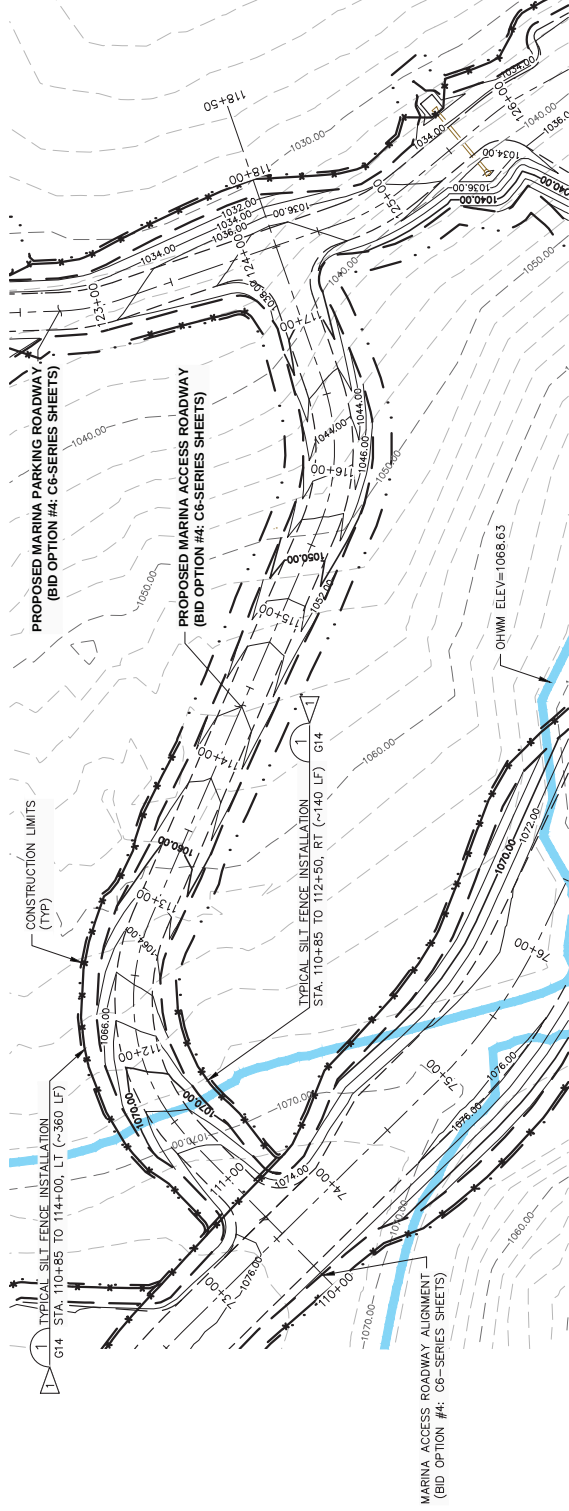
DESIGNED: T. WOODS	SUB SHEET NO. G10	TITLE OF SHEET EROSION CONTROL PLAN	DRAWING NO. 602
CHECKED: M. ROGERS			PMS/PAC NO. 179537
TECH. REVIEW: M. JOHNSON			SHEET 318673
DATE: 08/13/2026			11 of 173



DESIGNED: T. WOODS	SUB SHEET NO. G11	TITLE OF SHEET EROSION CONTROL PLAN	DRAWING NO. 602
CHECKED: M. ROGERS			179537
TECH. REVIEW: M. JOHNSON			PMS/PAG NO. 318673
DATE: 08/13/2026			SHEET 12 OF 173

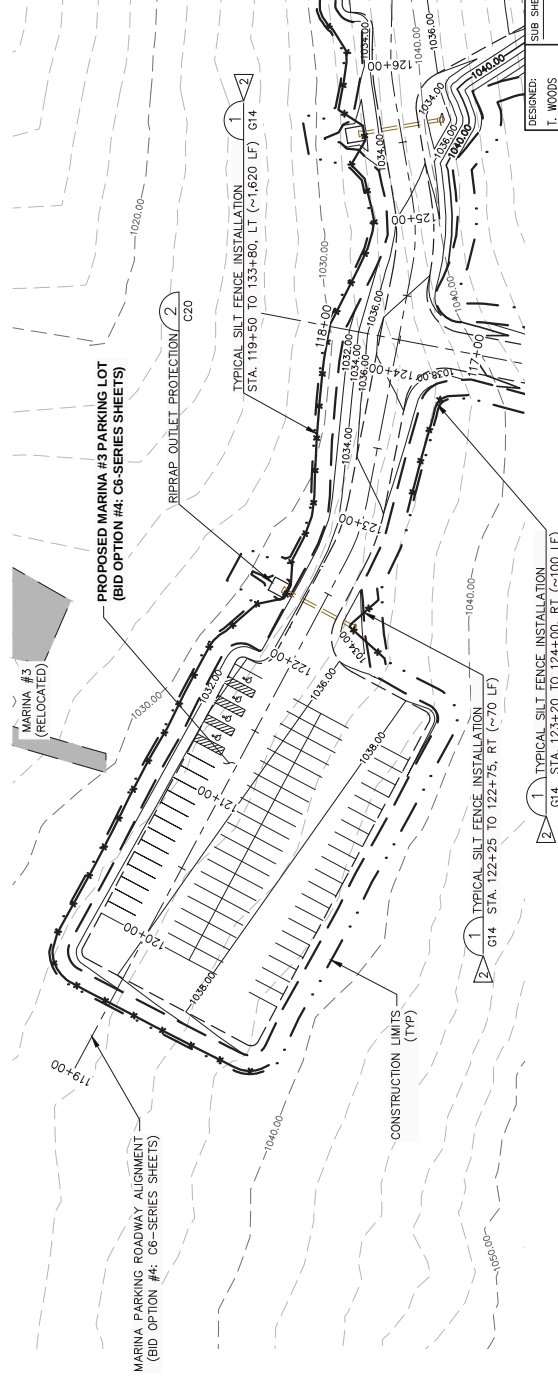
NOTES:

1. STATION LOCATIONS REFER TO MARINA ACCESS ROADWAY ALIGNMENT.
2. STATION LOCATIONS REFER TO MARINA PARKING ROADWAY ALIGNMENT.
3. EROSION CONTROL SHOWN ON THIS SHEET IS ONLY APPLICABLE IF BID OPTION #4 IS AWARDED.



LEGEND:

- TOE OF SLOPE
- SILT FENCE
- CONSTRUCTION LIMITS



DESIGNED:	T. WOODS
CHECKED:	M. ROGERS
TECH. REVIEW:	M. JOHNSON
DATE:	08/13/2026

G12

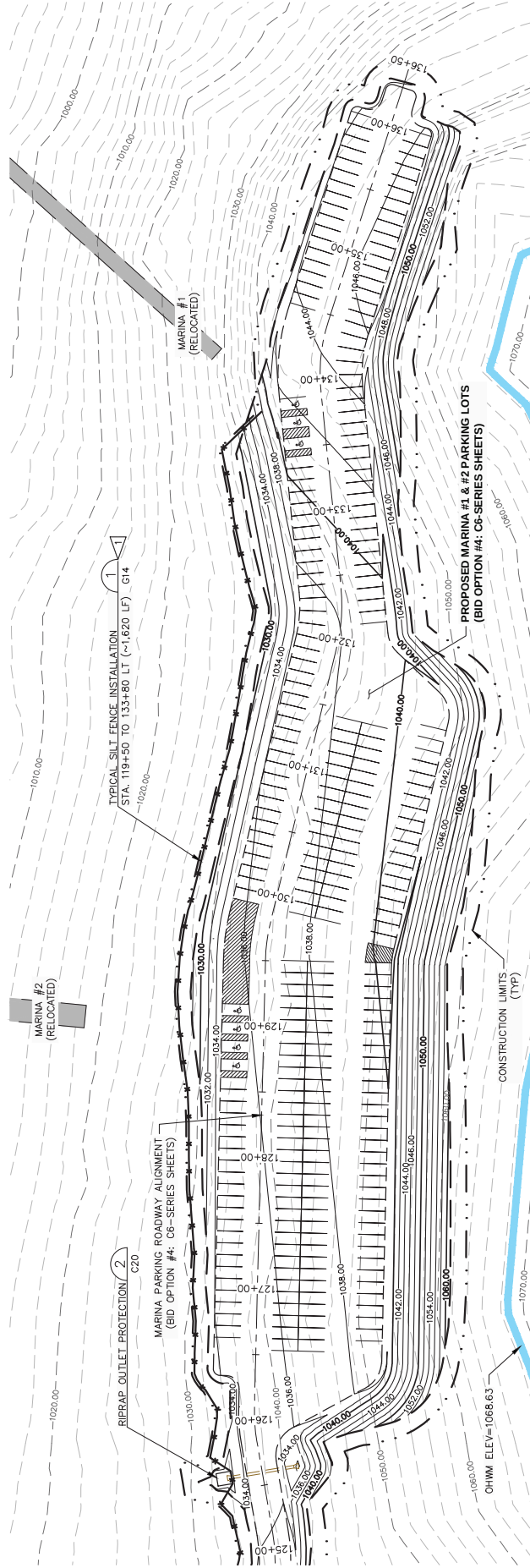
SUB SHEET NO.	602
DRAWING NO.	179537
PMS/PAG NO.	318673
SHEET	13 of 173

EROSION CONTROL PLAN

LAKE MEAD NATIONAL RECREATION AREA

NOTES:

1. STATION LOCATIONS REFER TO MARINA PARKING ROADWAY ALIGNMENT.
2. EROSION CONTROL SHOWN ON THIS SHEET IS ONLY APPLICABLE IF BID OPTION #4 IS AWARDED.



LEGEND:

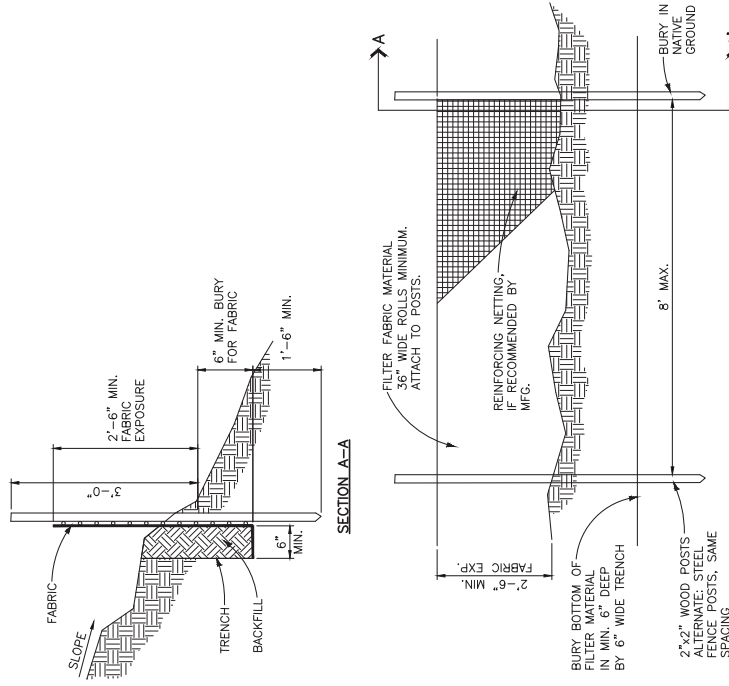
- TOE OF SLOPE
- SILT FENCE
- CONSTRUCTION LIMITS



DESIGNED: T. WOODS	SUB SHEET NO. G13	TITLE OF SHEET EROSION CONTROL PLAN	DRAWING NO. 602
BY: M. ROGERS			PMS/PKG NO. 179537
TECH. REVIEW: M. JOHNSON			SHEET 318673
DATE: 08/13/2026		LAKE MEAD NATIONAL RECREATION AREA	14 OF 173

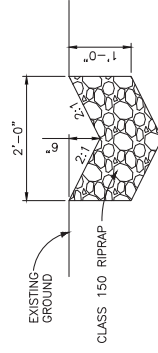
NOTES:

1. INSTALLATION SHALL FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
2. POSTS SHALL BE INSTALLED SO THAT A MIN. OF 3'-0" EXTENDS ABOVE THE GROUND WITH A MIN. OF 2'-0" EMBEDMENT.
3. SPLICE JOINTS AT SUPPORT POSTS ONLY, WITH A MIN. 6" OVERLAP.



1 TYPICAL SILT FENCE INSTALLATION

NO SCALE

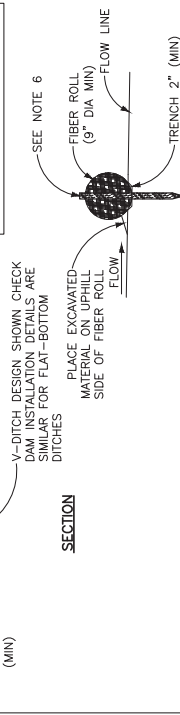
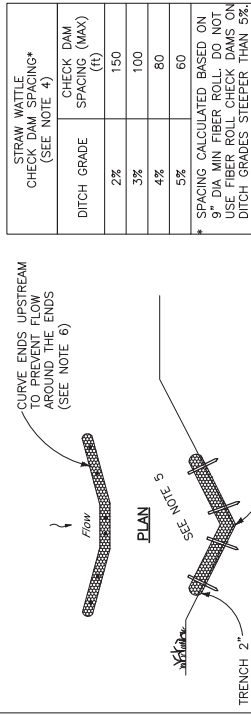


2 RIPRAP ARMORED CHANNEL

NO SCALE

- NOTES:

1. CHECK DAMS OF FIBER ROLLS, RIPRAP OR GRAVEL BAGS MAY BE USED AS APPROVED BY THE CO, TO MEET FUNCTIONAL REQUIREMENTS OF THE CHECK DAM DEVICES.
2. REPAIR ALL RILLS OR GULLIES AND PROPERLY COMPACT PRIOR TO INSTALLATION.
3. INSTALL CHECK DAMS IN DITCHES PERPENDICULAR TO THE FLOWLINE.
4. STAKE FIBER ROLLS IN PLACE WITH 1/8"x1/8" WOOD STAKES. DRIVE STAKES AT EACH END OF FIBER ROLL AND AT 2' (MAX) SPACING.
5. DRIVE STAKES INTO UNDISTURBED SOIL OF TRENCH BOTTOM 16" (MIN), EXPOSE STAKES 2" (MIN) ABOVE TOP OF FIBER ROLL.
6. PROVIDE SUFFICIENT LENGTH TO PREVENT WATER FROM FLOWING AROUND THE ENDS OF THE FIBER ROLL.



STAKING DETAIL

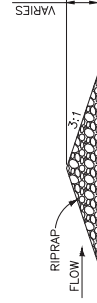


NO SCALE STRAW



FLAT-BOTTOM DITCH SECTION

V-DITCH SECTION



CROSS SECTION

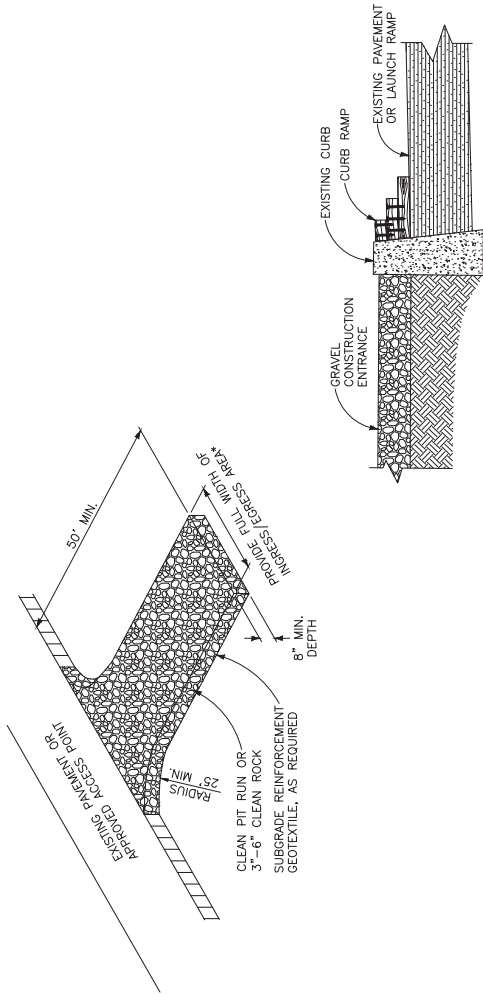


NO SCALE

DESIGNED: T. WOODS 	SUB SHEET NO. G14	TITLE OF SHEET EROSION CONTROL DETAILS LAKE MEAD NATIONAL RECREATION AREA	DRAWING NO. 602 179537 PMS/PKG. NO. 31867/3	SHEET 15 OF 173
CHECKED BY: M. JOHNSON DATE: 08/13/2026				

NOTES:

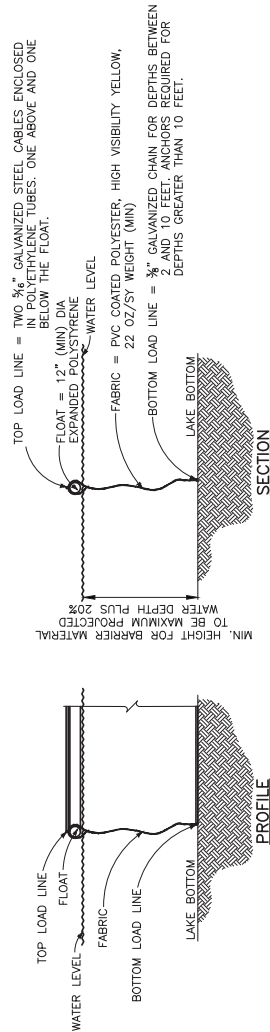
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. WHERE RUNOFF CONTAINING SEDIMENT LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM.
5. DIMENSIONS: 50' LONG BY 20' WIDE MINIMUM 3"-6" CLEAN ROCK.
6. GOVERNING AUTHORITY MAY REQUIRE GEOTEXTILE FABRIC TO PREVENT SUB-SOIL PUMPING.



1 STABILIZED CONSTRUCTION ENTRANCE
NO SCALE

NOTES:

1. THIS IS A SAMPLE DESIGN ONLY FOR A TYPE III TURBIDITY CURTAIN, REPRESENTING A MINIMUM LEVEL OF EFFORT. ACTUAL DESIGN SHALL BE RESPONSIBILITY OF CONTRACTOR.
2. TURBIDITY CURTAIN SHALL BE MAINTAINED AS SPECIFIED IN SECTION 35 01 01.



2 TURBIDITY CURTAIN
NO SCALE

DESIGNED: T. WOODS	SUB SHEET NO. G15	TITLE OF SHEET EROSION CONTROL DETAILS	DRAWING NO. 602
DATE: 08/13/2026	TECH. REVIEW: M. JOHNSON	LAKE MEAD NATIONAL RECREATION AREA	PMS/PAG NO. 179537
			SHEET 318673
			16 OF 173

Attachment 3:

Specification Excerpts:

- 3.1. 01 11 00 - Summary of Work
- 3.2. 01 57 23 - Temporary Storm Water Pollution Prevention
- 3.3. 01 77 00 – Closeout Procedures
- 3.4. 35 01 01 – Turbidity Curtain

- E. Working Hours: Regular work hours shall be from Dawn to Dusk, Monday through Friday, **excluding government holidays**. Work outside regular hours requires approval from the contracting officer.

1. January 1, New Year's Day

i. January 1 on Saturday, New Year's Day observed on Friday

ii. January 1 on Sunday, New Year's Day observed on Monday

2. 3rd Monday in January, Martin Luther King, Jr Birthday

3. 3rd Monday in February, Washington's Birthday (Presidents' Day)

4. 4th Monday in May, Memorial Day

5. June 19, Juneteenth

i. June 19 on Saturday, Juneteenth observed on Friday

ii. June 19 on Sunday, Juneteenth observed on Monday

6. July 4, Independence Day

i. July 4 on Saturday, Independence Day observed on Friday

ii. July 4 on Sunday, Independence Day observed on Monday

7. 1st Monday in September, Labor Day

8. 2nd Monday in October, Columbus Day

9. November 11, Veterans Day

i. November 11 on Saturday, Veterans Day observed on Friday

ii. November 11 on Sunday, Veterans Day observed on Monday

10. 4th Thursday in November, Thanksgiving Day

11. December 25, Christmas Day

i. December 25 on Saturday, Christmas observed on Friday

ii. December 25 on Sunday, Christmas observed on Monday

- F. No Smoking Policy: Smoking is prohibited inside or outside within 25 feet of any buildings in the park. This applies to existing buildings, buildings under construction, and buildings under renovation. Discarding of tobacco products or debris anywhere other than into designated tobacco receptacles is considered littering and subject to fines.

- G. Staging and Storage: **Confine storage of equipment and materials to the staging / lay-down / storage areas identified in the construction drawings or as established at the preconstruction meeting. Per NDEP, all staging areas and vehicle maintenance areas shall be at least 100 feet from the water's edge.**

- H. Parking: The contractor shall park vehicles and heavy equipment in designated areas for contractor use or as established at the preconstruction meeting. Vehicles are not permitted within long-term or overnight parking along roads or in associated overlooks / pull-outs.

- I. Driveways and Entrances: The contractor shall keep driveways and entrances serving the premises clear and available to the government, government employees, and emergency vehicles at all times.

- J. Preservation of Natural Features: Prevent damage to natural surroundings. Restored damaged areas and replace damaged trees, vegetation, and grass at no expense to the government.
- K. Refer also to Section 01 11 40 Work Restrictions and Section 01 50 00 Temporary Facilities & Controls.

1.6 SPECIAL CONSTRUCTION REQUIREMENTS

- A. Clean and wash all construction equipment of any debris prior to entering the park property.
 - i. Equipment washing is required to preclude entry of the seeds of non-native plants and weed species.
 - ii. Therefore, all equipment that will be used off surfaced roadways shall be thoroughly pressure washed and cleaned outside of the Park before entering the Park.
 - iii. Equipment leaving the park for any reason must be re-washed before re-entering the Park.
- B. The Contractor shall clean all equipment that will be used off surfaced roadways, or approved roads, prior to the equipment entering Lake Mead National Recreation Area.
 - i. Cleaning shall be accomplished by pressure washing using water only.
 - ii. All equipment surfaces shall be cleaned, with special emphasis given to the undercarriage.
 - iii. This includes, but is not limited to: wheel wells, bumpers, radiator grills, springs, shock absorbers, wire harnesses, skid plates, oil plans, axles, frame ledges, buckets, tracks, etc.
 - iv. Cleaning shall also include all dirt and debris inside the cab, or operator area.
 - v. A Shop-Vac or commercial car wash vacuum system may be used for operator compartments, provided the method used effectively removes all visible debris.
 - vi. Cleaning shall be performed in a manner that will reasonably remove all visible soil, plant and other foreign material larger than 1/4 IN DIA.
 - vii. All equipment that requires washing is subject to inspection by the government personnel, or Contractor/Partners assigned to this duty, to ensure compliance.
- C. Equipment that requires washing is defined as track or rubber-tired machinery intended for use primarily off-road.
 - i. Examples include backhoes, loaders, earthmovers, graders, rollers, bulldozers, water trucks, etc; or four-wheel drive or passenger vehicles that show evidence of being driven in off-road areas.
 - ii. Equipment may also be stationary, such as a material screening plant, or a mobile office (mobile offices may be cleaned in the same manner as operator compartments as outlined above.

- iii. The equipment is generally under the direct control of the Contractor or subcontractors, is likely to remain on the construction site for an extended period of time and may contain adhered soil and seed from other projects sites.
- D. Equipment/Vehicles that do not require washing are defined as those normally used for highway driving only and travel primarily on paved surfaces and well-maintained service roads and parking areas (this includes approved staging areas).
 - i. Examples include semi-tractor trailers, dump trucks, concrete trucks, pickup trucks, fuel trucks, service trucks, etc.
 - ii. These delivery and passenger vehicles are generally not under the direct control of the Contractor, have no earth-moving function, and do not remain on the project site.
 - iii. These vehicles have a low probability of carrying adhered soil and seed from other Projects.
- E. Equipment inspections:
 - i. All equipment that will be used off surfaced roadways may be inspected by government, or other authorized personnel prior to entering the Park.
 - ii. Equipment determined to be free of soil or mud based on visual examination by government personnel will be cleared to enter the Park.
 - iii. The Contractor shall notify the NPS inspection office no less than 24 HRS prior to the time the Contractor wishes to move equipment into the Park that will be used off surfaced roadways.
 - iv. Equipment not passing initial inspection must be rewashed outside the park at no additional expense to the government.
 - v. All equipment that will be entering the water shall be inspected daily and documented. The inspection should check for leaks, and other contaminants that may occur from damage to the vehicle.

1.7 SOILS INVESTIGATION REPORT

- A. A Geotechnical Report dated **February 9, 2021, Revised March 9, 2021**, by Kleinfelder, Inc. has been prepared for this project. A copy of the report is available to all plan holders upon request.
- B. If conflicts occur between the report and drawings or specifications, the drawings and specifications govern.

1.8 MILESTONES / LIMITATIONS ON WORK

- A. The Contractor shall schedule construction of the boat launch ramp during the period when the Lake is at its lowest level. Predicted Lake levels are published on the following web site <https://www.usbr.gov/lc/riverops.html>. The Contractor shall coordinate with the NPS to determine expected lake levels during the construction period and plan work in and near the water

accordingly. It is anticipated that all work can be completed with standard, long-reach excavators for this project.

1.9 CONSTRUCTION MATERIALS

The work includes the excavation of in-situ material to construct the boat launch ramp. All excavated material including debris, vegetation and other deleterious surface material shall be removed and disposed of outside the Park. Other construction materials shall be as described below:

- A. Aggregate base required for the construction of the project shall be obtained from offsite commercial sources outside the Park.
- B. Riprap required for the construction of the project shall be obtained from offsite commercial sources outside the Park.
- C. Concrete required for the construction of the project shall be obtained from offsite commercial sources outside the Park.
- D. Asphalt required for the construction of the project shall be obtained from offsite commercial sources outside the Park.
- E. Borings and seismic surveys indicate that the material sampled in areas of excavation are rippable. However, material requiring rock excavation methods during construction may be present.
- F. Organic material included in clearing and grubbing shall be stockpiled and re-used or disposed of outside the Park. Disposal shall be in accordance with local regulations.

1.10 PERMITS

The Contractor shall prepare and implement a Dust Control Permit with Clark County, Nevada for land-disturbing activities greater than 1/4 acre or mechanized trenching activity exceeding 100 feet, if required.

The Contractor shall prepare and implement a Temporary Storm Water Pollution Prevention Plan in accordance with Section 01 57 23. The Contractor shall be responsible for drafting, applying for, and obtaining a construction stormwater NPDES permit for any area of disturbance greater than 1-acre. The permit application will include, as a minimum, the erosion control measures included in the drawings and in Section 01 57 23 and such Best Management Practices appropriate to the proposed construction activities. The Contractor shall coordinate with the Nevada Department of Environmental Protection (NDEP) in obtaining the permit, if required, as well as in constructing, maintaining and closing out the project subject to the permit.

Per the Nevada Department of Environmental Protection (NDEP), the Contractor is **not** required to replace equipment hydraulic fluid with biodegradable fluid when working within waterways. If the contractor chooses to replace the hydraulic fluid, it shall be at no additional cost to the owner.

1.12 VERIFICATION OF EARTH MOVING QUANTITIES

The Contractor shall be responsible for verifying the quantities of excavation, fill, aggregate base and riprap required for the project. AutoCAD files are available upon request and will be provided to the Contractor for information only. Fill quantities shall allow for potential shrink.

SECTION 01 57 23

TEMPORARY STORM WATER POLLUTION PREVENTION

PART 1 - GENERAL

1.1 SUMMARY

- A. The work of this section consists of implementing measures to prevent Storm Water Pollution during construction activities, in accordance with the Clean Water Act, the National Pollution Discharge Elimination System (NPDES) permit program, and all Federal, State, and local regulations, and in accordance with the Storm Water Pollution Prevention Plan (SWPPP) to be prepared for this project.

1.2 DEFINITIONS

- A. Definitions pertaining to sustainable development: As defined in ASTM E2114.
- B. Environmental pollution and damage: The presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances; or degrade the utility of the environment for aesthetic, cultural, or historical purposes.

1.3 SUBMITTALS

- A. Storm Water Pollution Prevention Plan: Submit Storm Water Pollution Prevention Plan after contract award and before the pre-construction conference.
 - 1. Show that the Storm Water Pollution Prevention Plan satisfies all Federal and State NPDES permit requirements including, but not limited to, the Nevada Stormwater General Permit for Construction Activity (NVR100000) and Arizona Stormwater General Permit for Construction Activity (AZR100000).
- B. Inspection Schedule: Submit schedule for inspection and monitoring of all storm water pollution prevention measures.
- C. Erosion Control Products: Submit manufacturer's product information and installation recommendations for turbidity curtain, silt fence, filter fabric, erosion control blanket, straw bales, straw wattles and any other materials proposed for use on this project.

1.4 QUALITY ASSURANCE

- A. Orientation Meeting: The Contractor shall be responsible for arranging and conducting an Erosion and Sediment Control meeting/briefing to inform all parties scheduled to be on-site during the project of the measures to be implemented for proper erosion and sediment control (may be included as part of the Pre-Construction

Meeting).

1. Installation of silt fences, straw wattles, rock check dams, turbidity curtains, erosion control mat, storm drain protection, and all other forms of erosion and sediment control shall not begin until after this meeting has occurred.
- B. Erosion Control Supervisor: The Contractor shall designate the Erosion Control Supervisor who will be responsible for implementing the SWPPP.
 1. The Erosion Control Supervisor shall be familiar with the SWPPP procedures and practices and shall ensure that emergency procedures and the SWPPP are updated as needed and available for inspection.

PART 2 - PRODUCTS

2.1 STORM WATER POLLUTION PREVENTION PLAN

- A. Provide SWPPP which includes the following information and forms:
 1. Site description.
 2. Identification and contract information for Erosion Control
 3. Expected sequencing of operations and construction schedule.
 4. Weather monitoring procedure.
 5. Descriptions and details of erosion controls, including dust
 6. Erosion control plans.
 7. Controls for other potential onsite storm water pollutants.
 8. Applicable specifications.
 9. Maintenance and inspection procedures and forms.
 10. Description of potential non-storm water discharges at site.
 11. Notice of Intent (NOI) form.
 12. Notice of Termination (NOT) form.
 13. Contractor and Sub-contractor Certification forms.
 14. Other record keeping forms and procedures.
 15. Housekeeping Best Management Practices, including vehicle wash-down areas, protection of equipment storage and maintenance areas and sweeping of roadways related to hauling activities.

PART 3 - EXECUTION

3.1 ENVIRONMENTAL PROTECTION

- A. Protection of Natural Resources: Comply with applicable regulations and these specifications. Preserve the natural resources within the Project boundaries and outside the limits of permanent Work performed under this Contract in their existing condition or restore to an equivalent or improved condition as approved by the Contracting Officer.
- B. Construction Zone: Arrange construction activities to minimize

erosion to the maximum practical extent.

1. Clearing, excavation, and grading shall be limited to those areas of the project site necessary for construction. Minimize the area exposed and unprotected.
2. Clearly mark and delineate the limits of work activities.
3. Equipment shall not be allowed to operate outside the limits of work or to disturb existing vegetation.
4. Excavation and grading shall be completed during the dry season to the maximum extent possible

3.2 REGULATORY REQUIREMENTS

- A. Permits: The Contractor shall obtain all required NPDES permits in a manner that results in no impacts to scheduled work. The Contractor shall account for the possibility of significant lead time in scheduling and executing the work.
 1. Implement the requirements of the NPDES permit for erosion control due to storm water runoff during construction.
 2. Implement all good housekeeping practices, inspections and record keeping.
 3. Prior to construction, the Contractor and all subcontractors shall sign certifications (included in the SWPPP) that they understand the requirements of the NPDES permit.
 4. All subcontractors shall comply with the requirements of the NPDES under the supervision of the Contractor.
 5. The accepted SWPPP must comply with the terms and conditions of the EPA permit.
- B. Notice of Intent (NOI): The Contractor shall file a Notice of Intent (NOI) and implement the accepted SWPPP during construction.
- C. Notice of Termination (NOT): After Substantial Completion of the construction project, file a Notice of Termination (NOT).
- D. CO Notification: The Contractor shall notify the Contracting Officer in writing and by telephone of the following events:
 1. The required erosion and sediment control meeting/briefing.
 2. Following installation of required sediment control structures.
 3. Prior to removal of or modification to sediment control structures.
 4. Prior to removal of all sediment control structures.

3.3 STORM WATER POLLUTION PREVENTION PLAN

- A. Review and Acceptance: The Contractor and the Contracting Officer (CO) will jointly review the draft SWPPP and agree to any needed revisions. The Contractor shall incorporate all revisions, sign, and submit the final SWPPP to the Contracting Officer. The final SWPPP will be the document enforced on the project.
 1. The accepted SWPPP will describe and ensure implementation of the practices which will be used to reduce the pollutants in storm water discharges.

2. The Contractor shall maintain a current copy of the SWPPP and all associated records and forms at the jobsite throughout the duration of the project.
 3. The SWPPP shall be available at all times for public inspection and for the inspection and use of the CO.
 4. Approval of Contractor's Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations.
- B. Implementation: Implement the SWPPP as required throughout the construction period and maintain all erosion control elements in proper working order.
1. Do not perform clearing and grubbing or earthwork until the SWPPP has been implemented.
- C. The SWPPP (including inspection forms) and all data used to complete the NOI shall be provided to the CO after Substantial Completion of the project.

3.4 SITE INSPECTIONS AND SWPPP REVISIONS

- A. Inspections: The Contractor and the CO will perform a weekly inspection of the site and within 24-hours of the end of a storm event of 0.5 inches or greater.
1. The inspection shall include disturbed areas that have not been completely stabilized, areas used for storage of materials, locations where vehicles enter or exit the site, and all other erosion and sediment controls that are included in the Plan.
 2. Inspections shall be documented on forms provided in the Plan.
 3. The inspection forms shall be retained onsite in the Plan notebook throughout the construction period.
- B. SWPPP Revisions: It may be necessary to revise the Plan during construction to make necessary improvements, revisions, or to respond to unforeseen conditions noted during construction or site inspections.
1. The Plan shall specify the mechanism whereby revisions may be proposed by the Contractor or the CO.
 2. The Contractor and the CO will jointly review each revision to the SWPPP before changes are incorporated and implemented. The Contractor will then provide a revised copy of the SWPPP to the Contracting Officer.
 3. Accepted modifications will be implemented within 7 calendar days following the date of the inspection when deficiencies or necessary corrections are first noted.
- C. Negligence: Provide additional temporary erosion and pollution controls made necessary by Contractor's errors or negligence at no additional cost to the Government.

3.5 EROSION CONTROL MEASURES

- A. Erosion control measures shall consist of any and all Best Management

Practices (BMP's) for storm water discharges in accordance with the Nevada Department of Transportation Construction Site Best Management Practices Manual.

- B. Erosion control measures shall be used to contain only direct precipitation in the construction zone. The contained water shall be allowed to percolate into the ground or drain slowly through the drainage filter sediment traps.
- C. Earthen sediment traps or holding ponds shall not be used unless accepted by the Contracting Officer.
- D. Construct berms to reduce runoff velocity as well as direct surface runoff around and away from all fuel containment, storage, and borrow areas.
- E. Divert surface runoff around and away from cut and fill slopes by constructing berms or ditches at the base of disturbed slopes. Provide conveyance for the runoff in temporary pipes or protected channels to temporary sediment traps.
- F. Place drainage filters around all catch basins to create sediment traps to control run-off from the construction area.
- G. Excess water used for dust control shall be contained within the construction areas by the erosion control measures.
- H. Temporary Measures: Temporary erosion and pollution control measures shall be used to correct conditions that develop during construction that were not foreseen during design.
 - 1. Temporary silt fences shall be installed around any stockpiles and/or excavated material that cannot be backfilled during the same day in which it was excavated.
 - 2. Silt fences, storm drain protection, and all other forms of erosion and sediment control shall be installed, inspected, and accepted by the Contracting Officer before beginning any utility excavation.
 - 3. Silt fences shall be placed immediately downstream of any utility trench that has not been backfilled at the end of the working day.
 - 4. Silt fences shall be installed prior to leaving the work site for the day.
 - 5. Silt fences and storm drain protection shall be inspected by the Contractor weekly. Repairs to these devices shall be completed prior to leaving the work site for the day.
 - 6. Failure to maintain silt fences and storm drain protection shall be cause for an immediate stop-work order.
 - 7. Silt fences shall be removed with permission of the Contracting Officer within 20 working days after final acceptance of the project and/or after the establishment of permanent stabilization of all excavations and fill areas.
- I. The Contractor shall prevent the deposition of materials onto paved areas. The Contractor shall inspect the paved areas for deposited materials weekly and remove the materials immediately.
- J. Furnish, install, maintain, and operate necessary control measures

and other equipment necessary to prevent erosion. Temporary measures shall be to Contractor's own design and Contractor shall be solely responsible for risks related to the management of erosion control during construction.

- K. Before the work begins, sufficient equipment shall be available on the site to assure that the operation and adequacy of the erosion control system can be maintained.

3.6 EROSION CONTROL PRODUCTS

- A. Provide erosion control products such as silt fence, clean rock, straw wattles, rock check dams, erosion control mat and turbidity curtains.
- B. Clean rock used for the stabilized construction entrance shall be imported from an off-site source and installed as a first item of work.
- C. Turbidity curtains shall be constructed of the materials shown in the drawings.

3.7 INSTALLATION OF EROSION CONTROL MEASURES

A. SILT FENCE

- 1. The silt fence shall be installed as shown on the drawings and per manufacturer's specifications.

B. STRAW WATTLES

- 1. The straw wattles shall be installed as shown on the drawing and per manufacturer's specifications.

C. ROCK CHECK DAMS

- 1. The rock check dams shall be installed as shown on the drawing and per manufacturer's specifications.

D. EROSION CONTROL MAT

- 1. The erosion control mat shall be installed as shown on the drawing and per manufacturer's specifications.

E. TURBIDITY CURTAIN

- 1. The top of the curtain should consist of flexible floatation buoys, and the bottom shall be held down by a load line incorporated into the curtain fabric. The fabric shall be a brightly colored PVC-coated polyester.
- 2. The curtain shall be held in place by ballast chain or anchors placed per manufacturer's specifications.
- 3. Tow the fabric out in a furled condition, and connect to the anchors, if applicable. The anchors should be connected per manufacturer's specifications. Once in place, cut the furling lines, and allow the bottom of the curtain to sink.
- 4. Sediment that has been deflected and settled out by the curtain should be removed; however, consideration must be given to the probable outcome of the removal procedure. Removal of the curtain

may create more of a sediment problem through re-suspension of the particles or by accidental dumping of material during removal. The soil particles accumulated by the turbidity curtain should be removed only if it is deemed necessary by the Contracting Officer.

5. Check manufacturer's requirements when installing turbidity curtains.
6. The curtain should be inspected daily for holes or other problems and any repairs needed should be made promptly.
7. Allow sediment to settle prior to its removal or removal of the curtain. After removing sediment, wait at least 6-12 hours before removing the curtain.
8. To remove, install furling lines along the curtain, detach from anchors, and tow out of the water.

3.8 MAINTENANCE OF TEMPORARY FACILITIES

- A. Ensure erosion and sediment control structures remain effective throughout excavation and grading operations. Relocate structures as necessary.
- B. Inspect control structures after each significant rainfall. Promptly repair breaches which occur.
- C. The Contractor shall remove entrapped sediment from behind excelsior drainage filter after each storm.

3.9 SEDIMENT DISPOSAL

- A. Sediment excavated from temporary sediment control structures shall be reused on site as fill to flatten slopes. Sediment shall be allowed to dry out as required before reuse.
- B. Contractor shall place the sediment removed from traps and other structures where it will not enter a storm drain or watercourse and where it will not immediately reenter the basin.

3.10 REMOVAL OF TEMPORARY STORM WATER POLLUTION CONTROL MEASURES

- A. All temporary control measures shall be removed with permission of the Contracting Officer within 20 working days after final acceptance of the project, and/or once grading is completed and slopes have stabilized.

END OF SECTION 01 57 23

operation, lubrication, shut-down, safety precautions, procedures in the event of equipment failure, and other items of instruction recommended by the manufacturer.

4. Deliver tools, spare parts, extra materials, and similar items to location designated by Contracting Officer. Label with manufacturer's name and model number where applicable.
5. Instruct NPS personnel in the basic operation, adjustment, and maintenance of products, equipment, and systems.

1.4 SUBSTANTIAL COMPLETION AND FINAL INSPECTION

- A. When project, or designated portion of project, is substantially complete, request in writing a final inspection. Upon receipt of written request that project is substantially complete, the Contracting Officer will proceed with inspection within ten (10) days of receipt of request or will advise the Contractor of items that prevent the project from being designated as substantially complete.
- B. If, following final inspection, the work is determined to be substantially complete, Contracting Officer will prepare a Punch List to be corrected before final acceptance and issue a Letter of Substantial Completion. Contractor shall complete the work described on the Punch List within thirty (30) calendar days, as weather permits. If the Contractor fails to complete the work within this time frame, the Contracting Officer may either replace or correct the work with an appropriate reduction in the contract price or charge for re-inspection costs in accordance with the Inspection of Construction clause of the contract.
- C. If, following final inspection, the work is not determined to be substantially complete; Contracting Officer will notify Contractor in writing. After completing work, Contractor shall request a new final inspection. All re-inspection costs may be charged against the Contractor in accordance with the Inspection of Construction clause of the contract.

1.5 FINAL ACCEPTANCE OF THE WORK

- A. All permits must be closed by the contractor prior to final acceptance of project work.
- B. After all deficiencies have been corrected and permits closed, a Letter of Final Acceptance will be issued.

1.6 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Contracting Officer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

SECTION 35 01 01

TURBIDITY CURTAIN

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Turbidity curtain for containment of suspended in-water sediments during construction.

1.3 PERFORMANCE REQUIREMENTS

- A. Turbidity curtain must be in compliance with requirements of the Clean Water Act, National Pollution Discharge Elimination System (NPDES) and any other state and local regulations.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Qualification Data: For Installer and fabricator.
- C. Material Certificates: For the following, from manufacturer:
 - 1. Fabric
 - 2. Floats
 - 3. Ballast Chain(s)
 - 4. Float Cables
- D. The Contractor shall provide a detailed operations and maintenance schedule for proper installation of the turbidity curtain.

1.5 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Inspect curtain after shipment for visible damage.

- B. Store curtain to prevent contact with soil and sharp rocks. While storing, keep out of direct sunlight to prevent distortion, warping or other physical damage from UV rays.
- C. Handle and transport curtain in a position consistent with their shape and design to avoid excessive stresses that would cause damage.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Barriers should be a bright color (yellow or "international" orange are recommended) that will attract the attention of nearby boaters.
- B. The curtain fabric shall meet manufacturer's recommendations for the application.
- C. Seams in the fabric shall be either vulcanized welded or sewn and shall develop the full strength of the fabric.
- D. Floatation devices shall be flexible, buoyant units contained in an individual floatation sleeve or collar attached to the curtain. Buoyancy provided by the floatation units shall be sufficient to support the weight of the curtain and maintain a freeboard of at least 3 inches above the water surface level.
- E. Load lines must be fabricated into the bottom of all floating turbidity curtains. Type II and Type III must have load lines also fabricated into the top of the fabric. The top load line shall consist of woven webbing or vinyl-sheathed steel cable and shall have a break strength in excess of 10,000 pounds. The supplemental (bottom) load line shall consist of a chain incorporated into the bottom hem of the curtain of sufficient weight to serve as ballast to hold the curtain in a vertical position. Additional anchorage shall be provided as necessary. The load lines shall have suitable connecting devices which develop the full breaking strength for connection to load lines in adjacent sections as shown in the detail.
- F. External anchors may consist of wooden or metal stakes (2- x 4-inch or 2-1/2-inch minimum diameter wood or 1.33 lbs/linear foot steel) when Type I installation is used; when Type II or Type III installations are used, bottom anchors should be used.
- G. Bottom anchors must be sufficient to hold the curtain in the same position relative to the bottom of the watercourse without interfering with the action of the curtain. The anchor may dig into the bottom (grappling hook, plow or fluke-type) or may be weighted (mushroom type) and should be attached to a floating anchor buoy via an anchor line. The anchor line should then run from the buoy to the to load line of the curtain. When used with Type III installations, these lines must contain enough slack to allow the buoy and curtain to float freely with tidal changes without pulling the buoy or curtain down and must be checked regularly to make sure they do not become entangled with debris. As previously noted, anchor spacing

will vary with current velocity and potential wind and wave action; manufacturer's recommendations should be followed. See detail for orientation of external anchors and anchor buoys for tidal installations.

- H. Skirt height may be tapered to conform to the bottom of the lake.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine curtain for damage or holes. Damage curtains shall be fixed per manufacturer recommendations prior to being installed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. In the calm water of lakes or ponds (Type I installation) it is usually sufficient to set the curtain end stakes or anchor points (using anchor buoys if bottom anchors are employed), then tow the curtain in the furled condition out and attach it to the stakes or anchor points. Following this, any additional stakes or buoyed anchors required to maintain the desired location of the curtain may be set and these anchor points made fast to the curtain. Only then shall the furling lines be cut to allow the curtain skirt to drop.
- B. In rivers or in other moving waters (Type II and Type III installations) it is important to set all curtain anchor points. Care must be taken to ensure that anchor points are of sufficient holding power to retain the curtain under the existing current conditions, prior to putting the furled curtain into the water. Anchor buoys should be employed on all anchors to prevent the current from submerging the flotation at the anchor points. If the curtain is being installed into tidal areas which would be subject to currents in both directions, anchors should be provided on both sides of the curtain. This will minimize curtain movement and prevent the curtain from overrunning the anchors during tide reversals. After the anchors have been secured, the furled curtain should be secured to the upstream anchor point and then sequentially attached to each next downstream anchor point until the entire curtain is in position. Before unfurling, the "lay" of the curtain should be assessed and any necessary adjustments made to the anchors. Once the location has been deemed adequate, the furling lines may be cut to allow the skirt to drop.
- C. Anchor lines should be attached to the flotation device, not to the bottom of the curtain. The anchoring line attached to the flotation device on the downstream side will provide support for the curtain. Attaching the anchors to the bottom of the curtain could cause premature failure of the curtain due to the stresses imparted on the middle section of the curtain.
- D. Turbidity curtain shall not be installed across channel flows unless

there is a danger of causing sediment deposition to occur in the middle of a watercourse, thereby blocking access or creating a sand bar. In such situations, the curtain may be installed so as to form a long-sided, sharp "V" to deflect clean water around a work site, confining most of the silt-laden water to the work area inside the "V" and directing it to the shoreline. In no case shall the curtain be installed perpendicular to the channel flow.

3.3 MAINTENANCE

- A. The individual(s) identified on the plan as responsible for daily maintenance of the curtain shall do so for the duration of the project in order to ensure the continuous protection of the watercourse.
- B. When the curtain is no longer required as determined by the inspector, the curtain and related components shall be removed in such a manner as to minimize turbidity. Remaining sediment shall be sufficiently settled before removing the curtain. Sediment may be removed and the original depth (or plan elevation) restored. Any spoils must be taken to an approved upland disposal area and stabilized in accordance with the approved plan.

3.4 REMOVAL

- A. Care shall be taken to protect the skirt from damage as the turbidity curtain is dragged from the watercourse.
- B. Remove excess sediment from the turbidity curtain and allow to settle 6-12 hours prior to removing the curtain.
- C. The site selected to bring the curtain ashore should be free of sharp rocks, broken cement, debris, etc. so as to minimize damage when hauling the curtain over the area.
- D. If the curtain has a deep skirt, it can be further protected by running a small boat along its length with a crew installing furling lines before attempting to remove the curtain from the water.

3.5 REPAIRS

- A. Should repairs to the geotextile fabric become necessary, repair kits are generally available from the manufacturer. The manufacturer's instructions must be followed to ensure the adequacy of the repair.

END OF SECTION 35 01 01



Certified **SDVOSB**
Service-Disabled Veteran Owned Small Business

Certified **WOSB**
Woman Owned Small Business

Attachment 4:

- Anticipated Construction Schedule

**EXTEND PUBLIC LAUNCH RAMP AT CALLVILLE
CONSTRUCTION SCHEDULE
OVERTON, NV**

[illegible]



Certified **SDVOSB**
Service-Disabled Veteran Owned Small Business

Certified **WOSB**
Woman Owned Small Business

Attachment 5:

- Preconstruction Notice (Eng Form 6082)

U.S. Army Corps of Engineers (USACE)
NATIONWIDE PERMIT PRE-CONSTRUCTION NOTIFICATION (PCN)

For use of this form, see 33 CFR 330; the proponent agency is CECW-CO-R.

Form Approved -
OMB No. 0710-0003
Expires: 08-31-2023

DATA REQUIRED BY THE PRIVACY ACT OF 1974

Authority Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Regulatory Program of the Corps of Engineers (Corps); Final Rule 33 CFR 320-332.

Principal Purpose Information provided on this form will be used in evaluating the nationwide permit pre-construction notification.

Routine Uses This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of the agency coordination process.

Disclosure Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued.

The public reporting burden for this collection of information, 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PLEASE DO NOT RETURN YOUR RESPONSE TO THE ABOVE EMAIL.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see *sample drawings and/or instructions*) and be submitted to the district engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE
--------------------	----------------------	------------------	------------------------------

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME First - Ed Middle - W. Last - Clark Company - National Park Service, Lake Mead NRA Company Title - Acting Superintendent E-mail Address - ed_w_clark@nps.gov	8. AUTHORIZED AGENT'S NAME AND TITLE (<i>agent is not required</i>) First - Daniel Middle - Eric Last - Brown Company - AES Group E-mail Address - dan.brown@aes-grp.com
6. APPLICANT'S ADDRESS Address- 601 Nevada Way City - Boulder City State - NV Zip - 89005 Country -	9. AGENT'S ADDRESS Address- 11031 South Pikes Peak Drive, Suite 202 City - Parker State - CO Zip - 80138 Country -
7. APPLICANT'S PHONE NOs. with AREA CODE a. Residence b. Business c. Fax d. Mobile 702-293-8721 702-293-8936	10. AGENT'S PHONE NOs. with AREA CODE a. Residence b. Business c. Fax d. Mobile 303-841-3922 303-241-4527

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Dan Brown to act in my behalf as my agent in the processing of this nationwide permit pre-construction notification and to furnish, upon request, supplemental information in support of this nationwide permit pre-construction notification.



Digitally signed by EDWARD
CLARK
Date: 2026.09.09 10:28:22 -07'00'

SIGNATURE OF APPLICANT

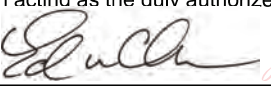
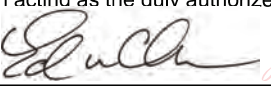
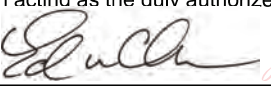
DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME or TITLE (*see instructions*)
Relocate Callville Bay Public Launch Ramp and Marina Infrastructure

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

13. NAME OF WATERBODY, IF KNOWN <i>(if applicable)</i> Lake Mead	14. PROPOSED ACTIVITY STREET ADDRESS <i>(if applicable)</i> 100 Callville Bay Road										
15. LOCATION OF PROPOSED ACTIVITY <i>(see instructions)</i> <table style="width:100%;"> <tr> <td>Latitude</td> <td align="center">°N</td> <td>Longitude</td> <td align="center">°W</td> </tr> <tr> <td></td> <td align="center">36.1255</td> <td></td> <td align="center">-114.7025</td> </tr> </table>	Latitude	°N	Longitude	°W		36.1255		-114.7025	City: Overton State: Zip: Nevada 89040		
Latitude	°N	Longitude	°W								
	36.1255		-114.7025								
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN <i>(see instructions)</i> <table style="width:100%;"> <tr> <td style="width:50%;">State Tax Parcel ID</td> <td style="width:50%;">Municipality</td> </tr> <tr> <td></td> <td align="center">Unincorporated Clark County</td> </tr> </table> <table style="width:100%;"> <tr> <td style="width:33%;">Section</td> <td style="width:33%;">Township</td> <td style="width:33%;">Range</td> </tr> <tr> <td align="center">15</td> <td align="center">21S</td> <td align="center">65E</td> </tr> </table>		State Tax Parcel ID	Municipality		Unincorporated Clark County	Section	Township	Range	15	21S	65E
State Tax Parcel ID	Municipality										
	Unincorporated Clark County										
Section	Township	Range									
15	21S	65E									
17. DIRECTIONS TO THE SITE From Las Vegas, Head East on NV-167, turn right at Calville Bay Road, continue 4 miles to the end of the road.											
18. IDENTIFY THE SPECIFIC NATIONWIDE PERMIT(S) YOU PROPOSE TO USE NWP 13, NWP 36											
19. DESCRIPTION OF PROPOSED NATIONWIDE PERMIT ACTIVITY <i>(see instructions)</i> See attachment											
20. DESCRIPTION OF PROPOSED MITIGATION MEASURES <i>(see instructions)</i> See attachment											
21. PURPOSE OF NATIONWIDE PERMIT ACTIVITY <i>(Describe the reason or purpose of the project, see instructions)</i> See attachment											
22. QUANTITY OF WETLANDS, STREAMS, OR OTHER TYPES OF WATERS DIRECTLY AFFECTED BY PROPOSED NATIONWIDE PERMIT ACTIVITY <i>(see instructions)</i> <table style="width:100%;"> <tr> <td style="width:33%;">Acres</td> <td style="width:33%;">Linear Feet</td> <td style="width:33%;">Cubic Yards Dredged or Discharged</td> </tr> <tr> <td colspan="3">See attachment</td> </tr> </table> Each PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site.		Acres	Linear Feet	Cubic Yards Dredged or Discharged	See attachment						
Acres	Linear Feet	Cubic Yards Dredged or Discharged									
See attachment											
23. List any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. <i>(see instructions)</i> N/A											
24. If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and requires pre-construction notification, explain how the compensatory mitigation requirement in paragraph (c) of general condition 23 will be satisfied, or explain why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required for the proposed activity. Minimal adverse environmental effects are anticipated because all work will occur in areas of unvegetated, unconsolidated substrate surfaces. The project will not change the existing conditions of the open water.											

25. Is any portion of the nationwide permit activity already complete? ☐ Yes ☒ No If Yes, describe the completed work:								
26. List the name(s) of any species listed as endangered or threatened under the Endangered Species Act that might be affected by the proposed NWP activity or utilize the designated critical habitat that might be affected by the proposed NWP activity. <i>(see instructions)</i> See attached documentation of ESA Section 7 compliance.								
27. List any historic properties that have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic property or properties. <i>(see instructions)</i> See attached documentation of NHPA Section 106 compliance.								
28. For a proposed NWP activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, identify the Wild and Scenic River or the "study river": Not applicable: Project site is not in a component of the National Wild and Scenic River System, nor is in an officially designated "study river."								
29. If the proposed NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, have you submitted a written request for section 408 permission from the Corps district having jurisdiction over that project? ☐ Yes ☒ No If "yes", please provide the date your request was submitted to the Corps district:								
30. If the terms of the NWP(s) you want to use require additional information to be included in the PCN, please include that information in this space or provide it on an additional sheet of paper marked Block 30. <i>(see instructions)</i> N/A - Neither NWP13 or NWP 36 is on the list of NWPs requiring additional information.								
31. Pre-construction notification is hereby made for one or more nationwide permit(s) to authorize the work described in this notification. I certify that the information in this pre-construction notification is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant. <table style="width: 100%; border: none;"> <tr> <td style="width: 40%; text-align: center; vertical-align: bottom;">  Digitally signed by EDWARD CLARK Date: 2026.09.28 15:19:00 -07'00' </td> <td style="width: 20%; text-align: center; vertical-align: bottom;"> Dan Brown </td> <td style="width: 20%; text-align: center; vertical-align: bottom;">  Digitally signed by Dan Brown DN: cn=US, E=dan.brown@ace-grp.com, c=US, cn=Dan Brown Date: 2026.09.02 10:17:39-06'00' </td> <td style="width: 20%; text-align: center; vertical-align: bottom;"> 9/2/26 </td> </tr> <tr> <td style="text-align: center;">SIGNATURE OF APPLICANT</td> <td style="text-align: center;">DATE</td> <td style="text-align: center;">SIGNATURE OF AGENT</td> <td style="text-align: center;">DATE</td> </tr> </table>	 Digitally signed by EDWARD CLARK Date: 2026.09.28 15:19:00 -07'00'	Dan Brown	 Digitally signed by Dan Brown DN: cn=US, E=dan.brown@ace-grp.com, c=US, cn=Dan Brown Date: 2026.09.02 10:17:39-06'00'	9/2/26	SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE
 Digitally signed by EDWARD CLARK Date: 2026.09.28 15:19:00 -07'00'	Dan Brown	 Digitally signed by Dan Brown DN: cn=US, E=dan.brown@ace-grp.com, c=US, cn=Dan Brown Date: 2026.09.02 10:17:39-06'00'	9/2/26					
SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE					
The pre-construction notification must be signed by the person who desires to undertake the proposed activity (applicant) and, if the statement in Block 11 has been filled out and signed, the authorized agent. 18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.								

**Instructions for Preparing a
Department of the Army
Nationwide Permit (NWP) Pre-Construction Notification (PCN)**

Blocks 1 through 4. To be completed by the Corps of Engineers.

Block 5. Applicant's Name. Enter the name and the e-mail address of the responsible party or parties. If the responsible party is an agency, company, corporation, or other organization, indicate the name of the organization and responsible officer and title. If more than one party is associated with the preconstruction notification, please attach a sheet of paper with the necessary information marked Block 5.

Block 6. Address of Applicant. Please provide the full address of the party or parties responsible for the PCN. If more space is needed, attach an extra sheet of paper marked Block 6.

Block 7. Applicant's Telephone Number(s). Please provide the telephone number where you can usually be reached during normal business hours.

Blocks 8 through 11. To be completed, if you choose to have an agent.

Block 8. Authorized Agent's Name and Title. Indicate name of individual or agency, designated by you, to represent you in this process. An agent can be an attorney, builder, contractor, engineer, consultant, or any other person or organization. Note: An agent is not required.

Blocks 9 and 10. Agent's Address and Telephone Number. Please provide the complete mailing address of the agent, along with the telephone number where he / she can be reached during normal business hours.

Block 11. Statement of Authorization. To be completed by the applicant, if an agent is to be employed.

Block 12. Proposed Nationwide Permit Activity Name or Title. Please provide a name identifying the proposed NWP activity, e.g., Windward Marina, Rolling Hills Subdivision, or Smith Commercial Center.

Block 13. Name of Waterbody. Please provide the name (if it has a name) of any stream, lake, marsh, or other waterway to be directly impacted by the NWP activity. If it is a minor (no name) stream, identify the waterbody the minor stream enters.

Block 14. Proposed Activity Street Address. If the proposed NWP activity is located at a site having a street address (not a box number), please enter it in Block 14.

Block 15. Location of Proposed Activity. Enter the latitude and longitude of where the proposed NWP activity is located. Indicate whether the project location provided is the center of the project or whether the project location is provided as the latitude and longitude for each of the "corners" of the project area requiring evaluation. If there are multiple sites, please list the latitude and longitude of each site (center or corners) on a separate sheet of paper and mark as Block 15.

Block 16. Other Location Descriptions. If available, provide the Tax Parcel Identification number of the site, Section, Township, and Range of the site (if known), and / or local Municipality where the site is located.

Block 17. Directions to the Site. Provide directions to the site from a known location or landmark. Include highway and street numbers as well as names. Also provide distances from known locations and any other information that would assist in locating the site. You may also provide a description of the location of the proposed NWP activity, such as lot numbers, tract numbers, or you may choose to locate the proposed NWP activity site from a known point (such as the right descending bank of Smith Creek, one mile downstream from the Highway 14 bridge). If a large river or stream, include the river mile of the proposed NWP activity site if known. If there are multiple locations, please indicate directions to each location on a separate sheet of paper and mark as Block 17.

Block 18. Identify the Specific Nationwide Permit(s) You Propose to Use. List the number(s) of the Nationwide Permit(s) you want to use to authorize the proposed activity (e.g., NWP 29).

Block 19. Description of the Proposed Nationwide Permit Activity. Describe the proposed NWP activity, including the direct and indirect adverse environmental effects the activity would cause. The description of the proposed activity should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal. Identify the materials to be used in construction, as well as the methods by which the work is to be done.

Provide sketches when necessary to show that the proposed NWP activity complies with the terms of the applicable NWP(s). Sketches usually clarify the activity and result in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed NWP activity (e.g., a conceptual plan), but do not need to be detailed engineering plans.

The written descriptions and illustrations are an important part of the application. Please describe, in detail, what you wish to do. If more space is needed, attach an extra sheet of paper marked Block 19.

Block 20. Description of Proposed Mitigation Measures. Describe any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed NWP activity. The description of any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or additional mitigation measures.

Block 21. Purpose of Nationwide Permit Activity. Describe the purpose and need for the proposed NWP activity. What will it be used for and why? Also include a brief description of any related activities associated with the proposed project. Provide the approximate dates you plan to begin and complete all work.

Block 22. Quantity of Wetlands, Streams, or Other Types of Waters Directly Affected by the Proposed Nationwide Permit Activity. For discharges of dredged or fill material into waters of the United States, provide the amount of wetlands, streams, or other types of waters filled, flooded, excavated, or drained by the proposed NWP activity. For structures or work in navigable waters of the United States subject to Section 10 of the Rivers and Harbors Act of 1899, provide the amount of navigable waters filled, dredged, or occupied by one or more structures (e.g., aids to navigation, mooring buoys) by the proposed NWP activity.

For multiple NWPs, or for separate and distant crossings of waters of the United States authorized by NWPs 12 or 14, attach an extra sheet of paper marked Block 21 to provide the quantities of wetlands, streams, or other types of waters filled, flooded, excavated, or drained (or dredged or occupied by structures, if in waters subject to Section 10 of the Rivers and Harbors Act of 1899) for each NWP. For NWPs 12 and 14, include the amount of wetlands, streams, or other types of waters filled, flooded, excavated, or drained for each separate and distant crossing of waters or wetlands. If more space is needed, attach an extra sheet of paper marked Block 22.

Block 23. Identify Any Other Nationwide Permit(s), Regional General Permit(s), or Individual Permit(s) Used to Authorize Any Part of Proposed Activity or Any Related Activity. List any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. For linear projects, list other separate and distant crossings of waters and wetlands authorized by NWPs 12 or 14 that do not require PCNs. If more space is needed, attach an extra sheet of paper marked Block 23.

Block 24. Compensatory Mitigation Statement for Losses of Greater Than 1/10-Acre of Wetlands When Pre-Construction Notification is Required. Paragraph (c) of NWP general condition 23 requires compensatory mitigation at a minimum one-for-one replacement ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation is more environmentally appropriate or the adverse environmental effects of the proposed NWP activity are no more than minimal without compensatory mitigation, and provides an activity-specific waiver of this requirement. Describe the proposed compensatory mitigation for wetland losses greater than 1/10 acre, or provide an explanation of why the district engineer should not require wetland compensatory mitigation for the proposed NWP activity. If more space is needed, attach an extra sheet of paper marked Block 24.

Block 25. Is Any Portion of the Nationwide Permit Activity Already Complete? Describe any work that has already been completed for the NWP activity.

Block 26. List the Name(s) of Any Species Listed As Endangered or Threatened under the Endangered Species Act that Might be Affected by the Nationwide Permit Activity. If you are not a federal agency, and if any listed species or designated critical habitat might be affected or is in the vicinity of the proposed NWP activity, or if the proposed NWP activity is located in designated critical habitat, list the name(s) of those endangered or threatened species that might be affected by the proposed NWP activity or utilize the designated critical habitat that might be affected by the proposed NWP activity. If you are a Federal agency, and the proposed NWP activity requires a PCN, you must provide documentation demonstrating compliance with Section 7 of the Endangered Species Act.

Block 27. List Any Historic Properties that Have the Potential to be Affected by the Nationwide Permit Activity. If you are not a Federal agency, and if any historic properties have the potential to be affected by the proposed NWP activity, list the name(s) of those historic properties that have the potential to be affected by the proposed NWP activity. If you are a Federal agency, and the proposed NWP activity requires a PCN, you must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

Block 28. List the Wild and Scenic River or Congressionally Designated Study River if the Nationwide Permit Activity Would Occur in such a River. If the proposed NWP activity will occur in a river in the National Wild and Scenic River System or in a river officially designated by Congress as a "study river" under the Wild and Scenic Rivers Act, provide the name of the river. For a list of Wild and Scenic Rivers and study rivers, please visit <http://www.rivers.gov/>.

Block 29. Nationwide Permit Activities that also Require Permission from the Corps Under 33 U.S.C. 408. If the proposed NWP activity also requires permission from the Corps under 33 U.S.C. 408 because it will temporarily or permanently alter, occupy, or use a Corps federal authorized civil works project, indicate whether you have submitted a written request for section 408 permission from the Corps district having jurisdiction over that project.

Block 30. Other Information Required For Nationwide Permit Pre-Construction Notifications. The terms of some of the Nationwide Permits include additional information requirements for preconstruction notifications:

- * NWP 3, Maintenance –information regarding the original design capacities and configurations of the outfalls, intakes, small impoundments, and canals.
- * NWP 31, Maintenance of Existing Flood Control Facilities –a description of the maintenance baseline and the dredged material disposal site.
- * NWP 33, Temporary Construction, Access, and Dewatering –a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions.
- * NWP 44, Mining Activities –if reclamation is required by other statutes, then a copy of the final reclamation plan must be submitted with the pre-construction notification.
- * NWP 45, Repair of Uplands Damaged by Discrete Events –documentation, such as a recent topographic survey or photographs, to justify the extent of the proposed restoration.
- * NWP 48, Commercial Shellfish Aquaculture Activities –(1) a map showing the boundaries of the project area, with latitude and longitude coordinates for each corner of the project area; (2) the name(s) of the species that will be cultivated during the period this NWP is in effect; (3) whether canopy predator nets will be used; (4) whether suspended cultivation techniques will be used; and (5) general water depths in the project area (a detailed survey is not required).
- * NWP 49, Coal Remining Activities –a document describing how the overall mining plan will result in a net increase in aquatic resource functions must be submitted to the district engineer and receive written authorization prior to commencing the activity.
- * NWP 50, Underground Coal Mining Activities –if reclamation is required by other statutes, then a copy of the reclamation plan must be submitted with the pre-construction notification.

If more space is needed, attach an extra sheet of paper marked Block 30.

Block 31. Signature of Applicant or Agent. The PCN must be signed by the person proposing to undertake the NWP activity, and if applicable, the authorized party (agent) that prepared the PCN. The signature of the person proposing to undertake the NWP activity shall be an affirmation that the party submitting the PCN possesses the requisite property rights to undertake the NWP activity (including compliance with special conditions, mitigation, etc.).

DELINEATION OF WETLANDS, OTHER SPECIAL AQUATIC SITES, AND OTHER WATERS

Each PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current wetland delineation manual and regional supplement published by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. The 45 day PCN review period will not start until the delineation is submitted or has been completed by the Corps.

DRAWINGS AND ILLUSTRATIONS

General Information.

Three types of illustrations are needed to properly depict the work to be undertaken. These illustrations or drawings are identified as a Vicinity Map, a Plan View or a Typical Cross-Section Map. Identify each illustration with a figure or attachment number. For linear projects (e.g. roads, subsurface utility lines, etc.) gradient drawings should also be included. Please submit one original, or good quality copy, of all drawings on 8½x11 inch plain white paper (electronic media may be substituted). Use the fewest number of sheets necessary for your drawings or illustrations. Each illustration should identify the project, the applicant, and the type of illustration (vicinity map, plan view, or cross-section). While illustrations need not be professional (many small, private project illustrations are prepared by hand), they should be clear, accurate, and contain all necessary information.

ADDITIONAL INFORMATION AND REQUIREMENTS

For proposed NWP activities that involve discharges into waters of the United States, water quality certification from the State, Tribe, or EPA must be obtained or waived (see NWP general condition 25). Some States, Tribes, or EPA have issued water quality certification for one or more NWPs. Please check the appropriate Corps district web site to see if water quality certification has already been issued for the NWP(s) you wish to use. For proposed NWP activities in coastal states, state Coastal Zone Management Act consistency concurrence must be obtained, or a presumption of concurrence must occur (see NWP general condition 26). Some States have issued Coastal Zone Management Act consistency concurrences for one or more NWPs. Please check the appropriate Corps district web site to see if Coastal Zone Management Act consistency concurrence has already been issued for the NWP(s) you wish to use.



*Certified **SDVOSB***
Service-Disabled Veteran Owned Small Business

*Certified **WOSB***
Woman Owned Small Business

Attachment 6:

- 2018 Biological Opinion



United States Department of the Interior
Fish and Wildlife Service
Arizona Ecological Services Office
9828 North 31st Avenue, C3
Phoenix, Arizona 85051
Telephone: (602) 242-0210 Fax: (602) 242-2513

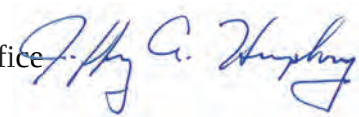


In Reply Refer to:
AESO/SE02-21-01F-0263-R
1-5-05-F-417-R

December 07, 2018

Memorandum

To: Superintendent, Lake Mead National Recreation Area, National Park Service,
Boulder City, Nevada

From: Field Supervisor, Arizona Ecological Service Field Office 

Subject: Reinitiation of Lake Mead National Recreation Area Lake Management Plan for
Low Water General Management Plan Amendment

Thank you for your request for consultation with the U.S. Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request for reinitiation of consultation dated August 22, 2018, was received by us on September 4, 2018; with all needed information being received on October 30, 2018. At issue are impacts that may result from the National Park Service's (NPS) proposed amendment to the Lake Mead National Recreation Area Lake Management Plan (LMP) for Low Water General Management in Mohave County, Arizona and Clark County, Nevada. In 2002, the Service issued a Biological Opinion (BO) for the LMP, and further issued an amended BO in 2005 when NPS requested reinitiation because the proposed actions had changed. In these former BO, the species of concern were the endangered southwestern willow flycatcher (*Empidonax traillii extimus*), bonytail chub (*Gila elegans*), razorback sucker (*Xyrauchen texanus*) and threatened desert tortoise (*Gopherus agassizii*); for which there were "may affect, likely to adversely affect" determinations made. Additionally, the former requests determination that the action of the LMP may affect, but was not likely to adversely affect the Yuma clapper rail (*Rallus obsoletus yumanensis*) and the bald eagle (*Haliaeetus leucocephalus*, at the time listed as endangered). With the exception of the bald eagle, which is no longer listed as endangered and therefore does not require section 7 consultation under the ESA; the impact analyses, determinations, and coverage of the other listed species are still valid and remain in place

under the 2002 and 2005 BOs. In the current 2018 amended LMP and request, NPS is requesting reinitiation for the razorback sucker and associated critical habitat only, due to the specific actions, affected habitats, and the amendment to the plan only occurring in Lake Mead. Consequently, NPS has made “no effect determinations for bonytail chub (*Gila elegans*) and yellow-billed cuckoo (*Coccyzus americanus*). Federal agencies are not required to consult with the Service if a no effect determination has been made, and therefore we will not address these species further in this BO. We offer this supplemental BO to address additional impacts to razorback suckers for adjustments to activities under the Low Water General Management Plan amendment. This amended BO does not preclude or negate any minimization or conservation actions or the analyses of potential take of listed species associated with the previous consultations; but instead supplements these previous consultations.

This BO is based on information provided in the admin record for the 2002 and 2005 BOs, including those BOs, the August 22, 2018 amended Low Water General Management Plan Biological Assessment (BA), and meetings and correspondence between staff. Literature cited in the BO is not a complete bibliography of all literature available on the species of concern or other subjects considered in this BO. A complete administrative record of the 2002, 2005, and this consultation are on file in this office.

Consultation History

October 7, 2002	The Service issues a BO for NPS’s Lake Mead LMP.
May 27, 2005	The Service issues a BO for NPS’s Amended LMP.
September 4, 2018	The Service receives request to reinitiate consultation for the amended LMP for Low Water General Management Plan Amendment.
November 1, 2018	Draft BO is provided to NPS for review.
November 12, 2018	NPS Draft BO comments received.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Lake Mead National Recreation Area (NRA) contains 1,501,216 acres of land in Nevada and Arizona, of which 1,484,159 acres are in Federal ownership administered by the NPS. The LMP encompasses two constructed reservoirs on the Colorado River in Arizona and Nevada including the 157,900 surface acres and over 700 miles of shoreline of Lake Mead and 28,260 surface acres and 150 miles of shoreline of Lake Mohave.

The project area also includes new extensions of existing roads within the NRA in order to maintain access to the shoreline of the lake. The LMP supplemented the General Management Plan finalized in 1986. To date, the LMP has guided recreational use, facilities development and operation, monitoring needs and other management actions as described in the Environmental Impact Statement (EIS) (NPS 2002a). The full text of the proposed action is contained in the EIS and is incorporated into this BO by reference. Some minor changes to the proposed action were documented in the July 31, 2002, NPS memorandum to the FWS (NPS 2002b). An additional amendment and BO was issued in 2005, which outlined changes to the action, and BO coverage are still valid.

The current amendment to include actions under the Low Water General Management Plan adds, modifies, and supplements actions in the 2002 and 2005 BOs. Although elements of the 2005 plan will remain valid, the 2005 plan did not foresee the current and predicted drought condition and did not fully consider the effects to greater fluctuations in the lake's water level on the operations of launch ramps and marinas. Should the lake level drop below 1,050 feet in elevation, not all actions in the 2005 BO will be applicable regarding actions related to launch ramps and marinas and public access to the lake would be reduced, in that actions will happen at lower lake elevations than what was previously analyzed. The current action proposes activities that would occur at lower lake elevations should lake elevations drop below 1,050 feet and are planned for lake elevations as low as 950 feet. Bureau of Reclamation (Reclamation) water level projections indicate there is a 25% chance the lake level will decline below 1,050 by the year 2022 and a 50% chance by 2028, should current water management strategies remain as they are currently. Amendments to this plan and modifications to infrastructure are not anticipated to increase recreational use within the action area, but rather to facilitate the existing use level should lake elevation levels drop to such a point that existing facilities are not functional. Modifications to site specific locations are the focus of the BO and are outlined below.

The proposed amendment would change the configurations and locations of marinas and/or boat launch ramps at: Hemenway Harbor, Callville Bay, Temple Bar, Echo Bay, and South Cove. Additional maintenance would occur at Government Wash, Kingman Wash, and Stewarts Point to facilitate small personal watercraft such as paddleboats, camping, swimming, and picnicking. Maintenance of shoreline access below the current lake elevation at underdeveloped launch areas around the lake may be needed. Methods of maintenance in these areas would remain the same as outlined in the previous BOs, but would occur at a lower lake elevations (between 1,050' and 950'). The elevations cited in this action are approximate, but it is assumed that approximately 5 feet of water depth is needed for boat launching and approximately 10 feet is needed for marina operations. These management actions are integral to the effective and safe operation of lake access infrastructure and facilities.

The size of floating marinas that require relocation will not be substantially changed, however, anchoring systems will be relocated. To accommodate these changes, walkways and

courtesy docks will be extended, marina configurations will be adjusted, and breakwater structures will be modified. Where site conditions are appropriate, extension of launch ramps will occur by paving to water line, or temporary structure placement such as concert planks, rock/gravel, piping, or temporary coffer dams.

Existing parking and traffic circulation facilities will also be modified in areas below the high waterline, when those areas are out of the water and above the current lake elevation. This includes the current methods of grading, paving, or addition of stabilizing base materials. Additional actions such as grading and paving walkways, walkway entrances, and vehicle parking pads will also be maintained near modified boat launch and marina areas.

Utilities infrastructure necessary for water, sewer, power, telephone, cable, and fuel service will be extended below the high waterline as lake levels recede to maintain service at each marina. All current methods of maintenance for these facilities will be constructed as is currently outlined in the 2002 and 2005 BOs, but they would extent to lower lake elevations.

Only portable shoreline amenities will be provided as needed, including; temporary restrooms, shade shelters, picnic facilities, fish cleaning stations, and informational kiosks. No permanent facilities will be constructed below the designated high water elevation because those facilities could be damaged if, and when, reservoir levels raise.

Site Specific Actions

Hemenway Harbor

The marinas in Hemenway Harbor are collectively one of the countries largest inland marinas with 1,400 boat slips, and includes; Las Vegas Boat Harbor, Lake Mead Marina, and Lake Mead Cruises. In response to the dropping lake levels, the boat launch ramp and marina will continue to be pushed out farther into the lake, to a lake elevation of approximately 1,000 feet. Additionally, for elevations between 1,000 and 950 feet, the boat launch ramp and marina will be adjusted closer to the Hemenway Wall. Existing roads and parking lots will either be extended or relocated closer to the in-water structures. The number of parking places and boat slips will not increase beyond existing numbers.

Callville Bay

Callville Bay has two boat launch ramps, one of which is not functional since lake elevation level has dropped below 1,087 feet. At their current locations, these boat launch ramps can be extended only down to an elevation of 1,050 feet. There are several operating concessionaires at this location, including campground, restaurant, store, and trailer village. These facilities are anticipated to maintain function until the lake level drops to approximately 1,070 feet.

Should lake levels drop below this water elevation these facilities may be relocated to the nearby Swallow Bay. A new road to Swallow bay and a parking lot will be constructed below the high water line, down to a lake elevation of 950 feet should those environmental conditions arise. The number of parking places and boat slips will not increase from beyond existing numbers.

Echo Bay

Echo Bay is the northernmost public access point to the lake. The floating marina and original boat launch ramp were closed in 2013 and modifications were made as the lake elevation dropped below 1,100 feet. During this time a new public launch ramp and accompanying access road and parking lots were constructed. The current boat launch ramp will be extended down to the lake until a water elevation of approximately 1,050 feet. Below 1,050 feet the ramp would be relocated and moved further downwash to maintain functionality to an elevation of 1,000 feet. Should the lake elevation recede below an elevation of 1,000 feet, this facility will be closed. The number of parking places and boat slips will not increase from beyond existing numbers.

Temple Bar

The Temple Bar facility includes concession operated land facilities (e.g. motel, campground, restaurant, store), one boat launch ramp, and a floating marina. The boat ramp is located in an inlet at the southwest end of the cove and extends down to the water level of 1,080 feet. The existing ramp can extend approximately another 400 feet before it loses its function. The floating marina continues to be pushed out to follow lake elevation trends and will remain functional until lake elevations drop to 1,030 feet. Should lake elevations drop below 1,050 feet, the boat launch ramp will be moved to a new location within this cove and the Marina will continue to be relocated farther out into the lake. A new road will be built to provide access to the ramp and marina. The number of parking places and boat slips will not increase from beyond existing numbers.

South Cove

Extension of the existing South Cove boat launch will occur down to a lake elevation of 1,050 feet; after which point this area will be closed. There are no marina or utility facilities at this location. The number of parking places will not increase from beyond existing numbers.

Conservation Measures

The following conservation measures were proposed for this amended LMP plan. Additional Conservation Measures, Reasonable and Prudent Measures, and Terms and Conditions are included in the 2002 and 2005 BOs, and those actions are still valid and included in this BO by reference. The following conservation measures include, but are not limited to, the below;

1. Surveys of areas within Lake Mead known to have razorbacks, including Echo Bay, will continue.
2. Boat use during the spawning period of coves identified as native fish spawning areas will be monitored. If boat use increases dramatically or if the Native Fish Work Group recommends action, closures of the coves to boat use during the spawning period will be implemented.
3. Information about native fish in the lakes will be provided at marinas and with boat rentals. Information will encourage boaters not to use the spawning areas during the spawning season.
4. All marinas will operate under the Lake Mead National Recreation Area Best Management Practices, Watercraft and Marina Operations, and Dry Boat Storage and Boat Repair Services” or subsequent revised versions of the existing document. This document provides for management that reduces the risk of toxic spills into the lakes by fueling and other marina operations.

Additional conservation measures will also be implemented, and include;

1. Pre-activity surveys will be conducted for evidence of razorback spawning in areas where spawning habitat could potentially be disturbed due to construction or marina relocation activities.
2. In areas around known spawning beds, construction activities will not occur during the spawning season.
3. Should new spawning locations be discovered, NPS will contact the Arizona Ecological Services Office (AESO) prior to in-water construction at those locations.
4. An annual report of construction and monitoring activities will be provided to AESO so that baseline information and species status information can be maintained.

Description of the Action Area

The Lake Mead National Recreation Area (NRA) contains a total of 1,501,216 acres of land, the majority of which is under Federal ownership administered by the NPS. The LMP includes Lake Mead and Lake Mohave, and this amended, supplemental BO, focuses on activities that will occur around and within Lake Mead. The project area also includes new extensions of existing roads within the NRA in order to maintain access to the shoreline of the lake. The LMP guides recreational use, facilities development and operation, monitoring needs and other management actions as described in the Environmental Impact Statement (EIS) (NPS 2002a) the 2005 amended plan.

This current amended plan pertains to the same action area within Lakes Mead, but includes actions that will occur below the high water level, down to a lake elevation of 950 feet. Site specific actions have been identified in the Lake Mead area and include; Hemenway Harbor, Callville Bay, Temple Bar, Echo Bay, South Cove, Government Wash, Kingman Wash, and Stewarts Point.

STATUS OF THE SPECIES AND CRITICAL HABITAT

The information in this section summarizes the rangewide status of each species that is considered in this BO. Further information on the status of these species can be found in the administrative record for this project, documents on our web page ([Arizona Ecological Services Office Documents by Species](#)), and in other references cited in each summary below. An additional summarized review of the current status of the razorback sucker can be found in the Species Status Assessment report for the Razorback Sucker (*Xyrauchen texanus*) (Service, 2018).

Razorback sucker

Description

The razorback sucker is the only representative of the genus *Xyrauchen* and was described from specimens taken from the “Colorado and New Rivers” (Abbott 1861). This native sucker is distinguished from all others by the sharp-edged, bony keel that rises abruptly behind the head. The body is robust with a short and deep caudal peduncle (Bestgen 1990). The razorback sucker may reach lengths of 3.3 feet (1.0 m) and weigh 11 to 13 pounds (5.0 to 5.9 kilograms [kg]) (Minckley 1973). Adult fish in Lake Mohave reached about half this maximum size and weight (Minckley 1991). Razorback suckers are long-lived, reaching the age of at least 40 years (Minckley et al. 1991).

The razorback sucker is somewhat sedentary; however, considerable movement over a year has been noted in several studies (Service 1998, 2018). Spawning migrations have been observed or inferred in several locales (Jordan 1891, Minckley 1973, Osmundson and Kaeding 1989, Bestgen 1990, Tyus and Karp 1990). During the spring spawning season, razorback suckers may travel

long distances in both lacustrine and riverine environments, and exhibit some fidelity to specific spawning areas (Service 1998, 2018). Since 1997, significant new information on recruitment of the wild razorback sucker population in Lake Mead has been developed (Albrecht et al. 2008, Kegerries et al 2017) that indicate some degree of reproduction is occurring at three locations in Lake Mead, and another spawning group was documented in 2010 at the Colorado River inflow area of the lake (Albrecht et al. 2010, Kegerries and Albrecht 2013).

Listing and critical habitat

The razorback sucker was first proposed for listing under the ESA on April 24, 1978 (43 FR 17375), as a threatened species. The proposed rule was withdrawn on May 27, 1980 (45 FR 35410), due to changes to the listing process included in the 1978 amendments to the ESA. In March 1989, the Service was petitioned by a consortium of environmental groups to list the razorback sucker as an endangered species. The proposed rule to list the species as endangered was published on May 22, 1990 (55 FR 21154), and the final rule published on October 23, 1991, (56 FR 54957), with an effective date of November 22, 1991. The Razorback Sucker Recovery Plan was released in 1998 (Service 1998). Recovery Goals were approved in 2002 (Service 2002). Critical habitat was designated in 15 river reaches in the historical range of the razorback sucker on March 21, 1994 (59 FR 13374). Critical habitat included portions of the Colorado, Duchesne, Green, Gunnison, San Juan, White, and Yampa rivers in the Upper Colorado River Basin, and the Colorado, Gila, Salt, and Verde rivers in the Lower Colorado River Basin. The primary constituent elements are water (a quantity of sufficient quality that is delivered to a specific location in accordance with a hydrologic regime that is required for the particular life stage), physical habitat (areas of the Colorado River system that are inhabited or potentially habitable by the sucker for use in spawning, nursery, feeding, and rearing, or corridors between these areas), and biological environment (food supply, predation, and competition) that influence all life stages. In addition, areas and habitats considered essential for reproduction and recruitment were specifically included.

Reasons for listing

The range and abundance of the razorback sucker has been severely impacted by water manipulations, habitat degradation, and invasion of non-native aquatic species. Construction of dams, reservoirs, and diversions destroyed, altered, and fragmented habitats needed by razorback suckers. Channel modifications have reduced habitat diversity, and caused degradation of riparian and altered upland area stream morphology and hydrology. Finally, invasion of these degraded habitats by a host of non-native, predacious and competitive species has created a hostile environment for razorback sucker larvae and juveniles. Although razorback suckers spawn each year and produce large numbers of larvae, the larvae are preyed on by non-native fish species (Minckley et al. 1991) and recruitment to reproductive age is not occurring in most populations (Service 2002).

Habitat

Adult razorback suckers use most of the available riverine habitats, although there may be an avoidance of whitewater type habitats. Main channel habitats used tend to be of low velocity such as pools, eddies, nearshore runs, and channels associated with sand or gravel bars (Bestgen 1990). Adjacent to the main channel, backwaters, oxbows, sloughs, and flooded bottomlands are also used. From studies conducted in the upper Colorado River basin, habitat selection by adult razorback suckers changes seasonally. They move into pools and slow eddies from November through April, runs and pools from July through October, runs and backwaters during May, and backwaters, eddies, and flooded gravel pits during June. In early spring, adults move into flooded bottomlands. They use relatively shallow water (ca. three feet [0.9 m]) during spring and deeper water (five to six feet [1.5-1.8 m]) during winter (Service 2002). Razorback suckers also use reservoir habitat, where the adults may survive for many years. In reservoirs, they use all available habitat types, but prefer backwaters and main impoundment areas (Service 1998). Much of the information on spawning behavior and habitat comes from fishes inhabiting reservoirs where observations can readily be made. Habitat needs of larval and juvenile razorback suckers are reasonably well known. In reservoirs, larvae are found in shallow backwater coves or inlets (Service 1998). In riverine habitats, captures have occurred in backwaters, creek mouths, and wetlands. These environments provide quiet, warm water where there is a potential for increased food availability. During higher flows, flooded bottomland and tributary mouths may provide these types of habitats.

Rangewide distribution and abundance

The historical range of the razorback sucker included the main stem Colorado River and its tributaries from northern Mexico through Arizona and Utah into Wyoming, Colorado, and New Mexico. Distribution and abundance of the razorback sucker declined during the last century throughout the known range, and the species now exists only in 8 small populations, the majority of which are reliant on stocking to maintain presence. The razorback sucker inhabiting the large reservoirs of the Lower Colorado River have maintained populations long after dams changed the river to a string of impoundments. The populations existed almost solely by virtue of the species' longevity, not by documented recruitment to reproductive age into existing populations. Razorback sucker populations rely on the Lower Colorado River Multi-Species Conservation Program's (LCR MSCP) augmentation, which is expected to release 660,000 razorback suckers throughout its historical range over the program's 50-year period (2005 through 2055).

Past Consultations

The lower Colorado River has been subject to the effects of Federal, State, and private activities for over 120 years. The greatest changes have come in the last 80 years, with the construction of large dams. Impacts of these human activities to the river have had profound effects on the river itself, associated riparian and floodplain areas, and the river's aquatic fauna. Significant changes to seasonal flow and water quality have resulted from the storage of water behind Hoover, Davis, and Parker dams. Water diversions and return flows, flood control projects that stabilized river banks and prevented natural meandering by the river, agricultural and urban development,

recreational activities, along with changes in seasonal flows have impaired the ability of aquatic habitats to support native fish. In addition to physical changes to the river system, introductions of nonnative fish species to the Colorado River Basin were made for commercial and recreational purposes. An assemblage of nonnative fish species now exists along nearly all sections of the Colorado River.

For the most part, early Federal activities along the Colorado River did not undergo section 7 consultations because many were completed prior to the inception of ESA, and fish were not listed at this time. Earlier section 7 consultations focused mainly on sport fish enhancement programs. Currently, in the lower Colorado River, the LCR MSCP addresses effects of water management and provides conservation to offset effects of water operations; and is largely responsible for the current existence of razorback suckers in the lower basin. The LCR MSCP funds and maintains the majority of restoration efforts of the razorback sucker in the mainstem of the Colorado River below Lake Mead. Several Statewide consultations have occurred including the Land and Resource Management Program with the Forest Service and the intra-Service consultation on Sport Fish Restoration Funding which evaluated the sport fish stocking program funded by the Service (Service 2011). Smaller site specific consultations addressing channelization, recreational development, recreational sport fishing, and implementing recovery actions have also occurred. All prior consultations have reached non-jeopardy and non-adverse modification conclusions.

Biological opinions on actions potentially affecting the razorback sucker in Arizona may be found at our website www.fws.gov/southwest/es/arizona in the Section 7 Biological Opinion page of the Document Library.

Critical Habitat

Critical habitat for razorback sucker was designated in 1994 which included Lake Mead within the action area. Critical habitat was designated for the four big river fishes (Colorado Pikeminnow (*Ptychocheilus Lucius*), humpback chub (*Gila cypha*), bonytail chub (*Gila elegans*), and razorback sucker concurrently in 1994, and the primary constituent elements (PCEs) were defined for the four species as a group (Service 1994). However, the PCEs vary somewhat for each species on the ground, particularly with regard to physical habitat, because each of the four species has different habitat preferences. The PCEs are:

- Water: Consists of water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity, etc.) that is delivered in sufficient quantity to a specific location in accordance with a hydrologic regime that is required for the particular life stage for each species.
- Physical Habitat: This includes areas of the Colorado River system that are inhabited by fish or potentially habitable for use in spawning, nursery, feeding, or corridors between these areas. In addition to river channels, these areas include bottomlands, side channels, secondary channels, oxbows, backwaters, and other areas in the 100-year floodplain, which when inundated provide spawning, nursery, feeding, and rearing habitats, or access

to these habitats.

- **Biological Environment:** Food supply, predation, and competition are important elements of the biological environment and are considered components of this constituent element. Food supply is a function of nutrient supply, productivity, and availability to each life stage of the razorback sucker. Predation, although considered a normal component of this environment, is out of balance due to introduced fish species in some areas. This is also true of competition from nonnative fish species.
- The PCEs are all integrally related and must be considered together. For example, the quality and quantity of water affect the food base directly because changes in water chemistry, turbidity, temperature, and flow volume all affect the type and quantity of organisms that can occur in the habitat that are available for food. Likewise, river flows and the river hydrograph have a significant effect on the types of physical habitat available. Changes in flows and sediment loads caused by dams may have affected the quality of nearshore habitats utilized as nursery areas for young razorback suckers. Increasingly the most significant PCE seems to be the biological environment, and in particular predation and competition, from nonnative species. It is likely that the future conservation of razorback suckers may depend on our ability to control nonnative species, and manipulating the water and physical PCEs of critical habitat to disadvantage nonnatives may play an important role.

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions that are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

Lake Mead was formed by the construction of Hoover Dam in the 1930s. Water stored in Lake Mead is managed by Reclamation in accordance with the Law of the River and flood control requirements. Lake Mead constitutes the sum of Glen Canyon Dam releases (which are under Federal control), inflows from tributaries in the Grand Canyon, and the Virgin/Muddy Rivers. Lake Mead water levels are managed in conjunction with Lake Powell water levels. Water is released from Lake Mead to meet downstream water orders for Federal, Tribal and State water users and the releases are also planned to generate hydropower under existing contracts. Existing flood control requirements and water and power contracts will continue to affect water releases from Lake Mead, which affects the water surface elevations of the lake.

Status of the Species within the Action Area and Critical Habitat

The razorback sucker population in Lake Mead is the only population in the Lower Colorado River Basin in which there is consistent evidence of natural recruitment (Rogers *et al.* 2017, Rosen *et al.* 2012, Service 2018). The population apparently benefited from abundant habitat during the initial filling of the reservoir prior to a rapid decline that began in the 1970s (Albrecht *et al.* 2010). Based on data obtained from aging of 509 adults and subadults captured during 1996-2016, recruitment occurred in pulses during the 1980's (Mohn *et al.* 2017). Recruitment of wild origin razorback sucker was documented annually in Lake Mead between the 1970's and the 1990's (Mohn *et al.* 2015). Reproduction and natural recruitment has been documented annually in turbid inflow areas (i.e., Las Vegas Bay, Echo Bay, and the inflow area of the Virgin and Muddy rivers) since the 1990s (Albrecht *et al.* 2010). Razorback sucker in the Lake Mead population migrate to and from upstream portions of the Colorado River, as evidenced by larvae captured and telemetry data collected during recent monitoring surveys in the Grand Canyon (Kegerries *et al.* 2017).

The construction of large mainstem dams has altered water temperatures throughout the Lower Colorado River Basin. This water warms to over 20 °C as it flows downstream into Lake Mead. Lake Mead water temperatures ranged from 10.4 to 31.2 °C in 2010 in the Temple Basin just downstream of the Colorado River inflow (U.S. Geological Survey 2016). Razorback sucker appear to be opportunistic and successful at spawning in a variety of water temperatures, but water temperature does play an important role in hatching, growth, and survival of larvae (Marsh 1985; Bozek *et al.* 1990; Bestgen 2008). Some annual variation in reservoir stage is thought to support various life stages, but dramatic increases or decreases in reservoir stage can have deleterious effects, especially during spawning season when eggs may be dried by falling water levels (McCall *et al.* 2017).

Research related to the abundance and availability of food for razorback sucker in the Lower Colorado River Basin is relatively limited, but nonetheless food supply is thought to be adequate to support growth and survival in all lower basin reservoirs, including Lake Mead. One study on Lake Mohave and nearby backwaters showed abundance of food items and similarities in food availability for larval razorback sucker in both habitats. Since Lake Mohave is the nearest location to Lake Mead that has information pertaining to food for razorback suckers, we assume the status of food availability is similar within the action area and sufficient since the Lake Mead population is recruiting.

Aquatic nonnatives species that prey on or compete with razorback suckers remains one of the largest threats to survival, reproduction and persistence of populations of this species. Despite the dominance of nonnative fish in Lake Mead, razorback sucker continue to reproduce and recruit naturally on an annual basis (Albrecht *et al.* 2010; Mohn *et al.* 2015; Kegerries *et al.* 2015). Although documented predation of juvenile razorback sucker by nonnative fish has occurred (Kegerries *et al.* 2015), predation and competition do not appear to completely limit recruitment and survival in the Lake Mead razorback sucker population, but it may limit the

population size. Cover in the form of turbidity and submerged vegetation in inflow areas seems to be the key feature of Lake Mead that provides necessary conditions for survival and recruitment of larvae and juveniles despite the presence of a robust suite of nonnative fishes (Albrecht *et al.* 2017). Lake Mead has a sizeable nonnative fish presence, currently dominated by gizzard shad, common carp, striped bass, largemouth bass, smallmouth bass, black crappie and bluegill (Mohn *et al.* 2017).

The Lake Mead population of razorback suckers has access to Colorado River in Western Grand Canyon, providing additional diverse habitat. When Lake Powell filled in the mid-1960's, Lake Mead elevations were dramatically decreased, allowing for the establishment of near-shore vegetation. From 2012-2015, water level drawdown associated with drought has allowed terrestrial vegetation to colonize in a downslope direction, which when coupled with annual elevation increases during spring may be providing cover in coves and other habitats that allow for the recruitment occurring there (Mohn *et al.* 2017). Complex aquatic vegetation structure, coupled with high levels of turbidity near the inflows may cause recruitment success, especially in the Virgin River/Muddy River inflow and Las Vegas Bay (Mohn *et al.* 2017). Within the Lake Mead inflow areas 59% of individuals (325 adults) captured between 2010 and 2016 were new, wild, untagged fish (Albrecht *et al.* 2017). Recent research shows movement of telemetered fish from Lake Mead into the lower Grand Canyon and limited captures of adult razorback sucker (Bunch *et al.* 2012; Albrecht *et al.* 2014; Rogowski and Wolters 2014; Kegerries *et al.* 2015). It is unclear whether razorback sucker in the Grand Canyon are an extension of the Lake Mead population, but connectivity does exist between the two.

In Lake Mead, the Colorado River inflow below the Grand Canyon, Virgin/Muddy River inflow area, and Las Vegas Wash provide spawning and recruitment habitat for razorback sucker. Las Vegas Bay and Echo bay are particularly sensitive areas, with spawning and recruitment occurring at these locations. Reproduction is occurring annually and larval razorback sucker are being captured at all three locations (Kegerries *et al.* 2015; Mohn *et al.* 2015). Reproduction occurring upstream of Lake Mead in the Colorado River inflow supplies additional larvae to the reservoirs via larval drift (Kegerries *et al.* 2015; Farrington *et al.* 2018). In Lake Mead, razorback sucker movement among spawning areas during the spawning season and between years has been documented. More interesting still is movement into and out of Lake Mead by telemetered razorback sucker. From 2010 to 2012, three of five sonic-tagged razorback sucker moved from the lake proper at the mouth of the Colorado River inflow upstream into the mainstem river (Albrecht *et al.* 2010; Kegerries and Albrecht 2011; Kegerries and Albrecht 2013). Additional sonic-tagged razorback sucker released both in the river and within the lake moved upstream and downstream, with some utilizing both the river and the lake annually.

Trammel netting data from 2010-2017 yielded estimates between 400 and 600 individuals in the Lake Mead and the Colorado River inflow areas (Albrecht *et al.* 2013; Albrecht *et al.* 2014; Mohn *et al.* 2017). The Lake Mead razorback sucker population, although recruiting, is not as genetically diverse as the Lake Mohave population and shows variability in diversity and relatedness by spawning location and years. Persistent low population numbers are causing concern over genetic diversity and augmentation from Lake Mohave is being considered as a management action.

In summary, Lake Mead is the only location where wild razorback sucker recruitment is occurring despite an abundance of nonnative fish. Spawning grounds are present and commonly used in Lake Mead (Kesner *et al.* 2014; Mohn *et al.* 2017; Kesner *et al.* 2017; McCall *et al.* 2017). The population remains small, estimated around 500 fish, which is causing concern about its long-term persistence and the potential development of genetic bottlenecks. The LCR MSCP and Native Fish Workgroup members monitors the Lake Mead population regularly.

Critical habitat

Critical habitat for razorback suckers is designated in 15 reaches of the Colorado River System, totaling 2,776 km (1,724 mi). Lake Mead is designated Critical Habitat for razorback suckers. The current condition of critical habitat within Lake Mead is dissimilar to historical conditions because this area is now a reservoir and has lost its riverine qualities. However many of the PCEs described in Critical Habitat remain to some degree, and maintain some function as habitat for razorback sucker.

The PCEs, as described in the Status of the Species section, are: Water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity) that is delivered to a specific location in accordance with a hydrologic regime required for the particular life stage for each species; Physical Habitat, areas for use in spawning, nursery, feeding, and movement corridors between these areas; and Biological Environment, food supply, predation, and competition. In summary, the conditions of the PCEs in the Action Area are:

- The physical PCE for spawning and recruitment is present within Lake Mead, where regular spawning occurs in Las Vegas Bay and Echo Bay (Kesner *et al.* 2014; Mohn *et al.* 2017; Kesner *et al.* 2017; McCall *et al.* 2017). Growth rates and body condition of adults in LCRB reservoirs are high; indicating the abiotic features formed by reservoirs can be diverse and alone may be beneficial to adults of the species.
- Nursery habitat for juvenile razorback suckers is maintained to some degree in Lake Mead because there is continued documentation of recruitment of juveniles to adult size. The complex vegetation community coupled with high levels of turbidity near the inflows makes recruitment successful, especially in the Virgin River/Muddy River inflow and Las Vegas Bay, despite having a robust nonnative species composition in the action area (Mohn *et al.* 2017). Lake Mead contains the only population of naturally recruiting razorback suckers with the presence of this nonnative fish assemblage.
- Although razorback suckers experience restricted movement throughout the Colorado River due to reservoirs, movement corridors appear to be adequate in Lake Mead based on movements of razorback suckers among different areas within Lake Mead, and between Lake Mead and lower portions of Grand Canyon.
- Food supply is a function of nutrient supply, productivity, and availability to each life stage of the razorback sucker. Research related to the abundance and availability of food

for razorback sucker in Lake Mohave is limited, but nonetheless food supply is thought to be adequate to support growth and survival in this reservoir.

- Nonnative fish species that prey on and compete with razorback suckers affect the PCEs of the biological environment aspect of critical habitat. Nonnative species that may harm razorback suckers are present in Lake Mead and managed as sport fish. However, Lake Mead is the only population of razorback suckers that successfully spawn and recruit to adult size and reproductive age. This evidence has lead managers to believe that cover, in the form of vegetation and perhaps turbidity, in the bays and inflows to the lake may be providing sufficient cover to maintain this population at a low level.
- The water quality and quantity PCEs in Lake Mead appears to be abundant and of sufficient temperature to maintain this population of razorback suckers. Pollutants, in the form of petroleum products or urban runoff/effluent, may have effects to habitat quality in shallow areas where recreational use is this or developed facilities exist near know feeding, spawning, or nursery areas. The size of Lake Mead does not provide conditions that would result in high lake-wide levels of these concentrated pollutants. Build-up of endocrine disrupting compounds from human effluents may be present, but it is unknown if these compounds have impacts to razorback sucker reproduction and larval development.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of the proposed action in the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

Razorback Suckers

Direct and Indirect Effects

The proposed action is to amend the existing 2002 and 2005 Lake Mead National Recreation Area LMP for needed modifications to address low lake elevations; summarized in the Low Water General Management Plan and the conservation measures listed in this opinion. These actions provided a certain level of recreational facilities and recreational use levels including shoreline zoning for Lake Mead and Lake Mohave. The current proposed action contains provisions for existing recreational facilities to continue to operate and for the modification of some existing facilities and construction of new ones at lake elevations in Lake Mead due to drought conditions that will decrease the water elevation of Lake Mead. This plan includes

all action listed in the 2002 and 2005 BOs but allows for actions to occur to lake elevations down to 950 feet. It also includes new modifications to specific locations and facilities listed in this BO. The Service maintains that effects to razorback suckers are anticipated to include effects as previously considered under the 2002 and 2005 BOs but these impacts will likely occur at lower lake elevations. These anticipated effects are outlined below.

Recreational opportunity zoning for the NRA in the Urban Natural and Urban Park categories comprises 51% of Lake Mead and 84% of Lake Mohave. These zones contain most of the recreational use allowed for in the proposed action. Effects to threatened and endangered species or designated critical habitat are greatest in these zones. Where recreational activity is high enough to require additional shoreline zoning to designate different activity areas, habitat for species may be significantly disturbed or eliminated.

Within the zones, a component of activities in the LMP involves access facilities (boat ramps, parking lots, marinas) for recreational use within the various shoreline zones. New construction, either at existing or totally new facilities, has effects to shorelines as well as in-lake habitats. Clearing sites for ramps, parking lots, and other buildings increases dust and may introduce sediments into the lake at the construction site. For properly designed sites, these effects do not last long after completion of construction. Placement of launch ramps sufficiently near the lake will allow for use during lower water levels. Placement of such structures converts natural substrates to artificial ones (concrete, metal mesh, or other materials) which could locally reduce habitat for submerged plants and invertebrates when lake levels rise. Fish spawning habitat at these sites is anticipated to be lost. Shoreline vegetation, either riparian (along the shore or in the lower portions of desert washes near the shore) or emergent, may also be eliminated to provide space for the facilities. Roads are also away from the shoreline, but drainage off the roads may cause localized erosion that increases sediment inflow to the lake.

Operation of boat launch and marina facilities also have effects to fish and wildlife habitats in the vicinity of the facility. Noise from operations and nighttime lighting affect local conditions. Human activity is high and may be disruptive to wildlife. Fish could be affected by noise from boat engines and other mechanical devices and may abandon an area. This is not always the case since fish, especially carp, are abundant around launch areas and marinas. This may be a response to additional cover provided by docks, enhanced food resources from visitors feeding the fish, or other factors. Water quality around boat launch or marina facilities may be an issue for fish health.

Petroleum products and other potential pollutants are introduced to the lakes in a variety of locations including runoff from roads. Day to day operations likely input low levels of these materials to the lakes over a long period of time that allows for dispersal and dilution within the water. At marinas, there is the potential for spills from gas docks and boat maintenance operations that may input significant amounts of pollutants to a small area. These types of incidents may cause injury or death to fish in the vicinity of the facility.

Recreational zoning in the known areas of razorback spawning habitat are in the Urban Park zones of Lake Mead. Both of the Lake Mead razorback spawning groups use habitat in the immediate vicinity of Las Vegas Bay and Echo Bay. The level of existing recreational use at these sites has not had any documented effects to the razorback sucker populations.. Intensive monitoring has shown razorback use of the areas consistent over decades. Since spawning, and the highest concentration of use by individual razorbacks is during the lower visitor use periods, the amount of boat noise is less as is the amount of overall human disturbance during these critical periods. During the summer months, the razorbacks are more dispersed along the shorelines away from the marinas and are still in areas of high visitor use in the larger Las Vegas Bay area and Overton Arm.

Continued effects to razorbacks are likely to be in the form of harassment from boat noise, fuel and other pollution events, and reduction in undisturbed shoreline habitats. The razorback habitat near Echo Bay will be closed to boat access during the spawning period, which would reduce the potential for effects to this area.

Potential construction of facilities could cause impacts if it occurs in areas used by spawning razorbacks. During construction activities, there may be increased sedimentation into the lake and greater turbidity in the water. Although turbidity barriers will be used, these effects would be temporary and would cease when construction was completed. Avoidance of construction activities in areas where razorback suckers are actively spawning is anticipated to reduce this impact. Increased launching activities may result in localized reductions in water quality from fuel and other pollutants.

The amount of petroleum products and other pollutants introduced into Lake Mead from operations of marinas and illegal fueling actions outside of approved areas is unknown. Efforts by NPS to restrict illegal actions through enforcement and education is part of the proposed action, as are guidelines for marina operators providing for best management practices to reduce the potential for toxic materials to enter the lake. Expansion of the number of boats using the lake and its facilities is not anticipated under the amended proposed action but risk of a major spill or the amount of material accidentally or incidentally introduced to the lake remains. The existing degree of risk remains unknown. Use of best management practices will help reduce the risk of contaminants entering the water.

Activities that concentrate predacious fish species near razorback spawning and nursery habitats may affect the potential for future recruitment events. The necessary distance between spawning and nursery habitats and such concentrations of carp and other fish species needed to eliminate any effect to recruitment is unknown. Given the numbers of carp and other predacious fish in Lake Mead, the actual effect of creating localized concentrations is not known. Should placing additional fish attractors near razorback spawning and nursery areas in near Las Vegas Bay and Echo Bay become necessary, managers are discouraged in future planning for these activities. Because these are programmatic projects, additional consultation will be needed at the time of implementation.

The proposed action provides for existing operations at, or near, existing recreational areas with no net increase in those facilities. Additional actions, and impacts, to razorback suckers in Lake Mohave are not anticipated. Actions and effects to fish are anticipated to remain the similar to analyses completed as part of the 2002 and 2005 BOs and these regulatory documents are still valid for these reservoirs.

Critical Habitat Effects

The amount of petroleum products and other pollutants introduced into Lake Mead from operations of marinas and illegal fueling actions outside of approved areas is unknown. Efforts by the NPS to restrict illegal actions through enforcement and education is part of the proposed action, as are guidelines for marina operators providing for best management practices to reduce the potential for toxic materials to enter the lake. The current number of boats using the lake and its facilities under the proposed action continues the risk of a major spill or the amount of material accidentally or incidentally introduced to the lake. The existing degree of risk is not known and has not been quantified. Use of best management practices will help reduce the risk of contaminants entering the water. Water quality, a constituent element of the razorback suckers designated critical habitat could be affected through increased boat traffic and other human related events; however, use of best management practices will help reduce this risk. Any actions that increase the number of aquatic nonnative species has the potential to impact PCEs in part. The overall impact of this amendment to Critical Habitat is not anticipated to rise above the level that was anticipated in the 2002 and 2005 BOs and adverse modification of Critical Habitat is not anticipated.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the future in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The action area is Federal land and no future State, Tribal, local or private recreational or other types of development is anticipated to occur along the shorelines without Federal approvals. Reclamation manages the water and power operations in conjunction with water rights holders downstream and contracts to provide power. There are current efforts for Drought Contingency planning among State water-user groups. The focus of these groups are to plan for changes in point of diversion below Hoover Dam that may affect lake water elevations of Lake Mead. These water and power operations will continue into the future and have effects similar to those seen in the environmental baseline.

JEOPARDY AND ADVERSE MODIFICATION ANALYSIS

Our jeopardy analysis relies on the following:

“Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). The following analysis relies on four components: (1) Status of the Species, which evaluates the range-wide condition of the listed species addressed, the factors responsible for that condition, and the species’ survival and recovery needs; (2) Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) Effects of the Action (including those from conservation measures), which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the species; and (4) Cumulative Effects, which evaluates the effects of future, non-federal activities in the action area on the species. The jeopardy analysis in this biological opinion emphasizes the range-wide survival and recovery needs of the listed species and the role of the action area in providing for those needs. We evaluate the significance of the proposed Federal action within this context, taken together with cumulative effects, for the purpose of making the jeopardy determination.

CONCLUSION

After reviewing the current status of razorback sucker and the environmental baseline for the action area, the effects of the proposed amendment to the Lake Mead National Recreation Area Lake Management Plan (LMP) for Low Water General Management, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the razorback sucker and is not likely to destroy or adversely modify associated designated critical habitat. We base this conclusion on the following:

1. All Conservation Measures, Reasonable and Prudent Measures, and Terms and Conditions in the 2002 and 2005 BOs will still take place and the findings in those documents are still valid.
2. Conservation measures will be taken to avoid in-water work during the spawning season at known razorback spawning aggregation locations. Harassment of fish from the action will be minimal.
3. Take in the form of harm and death of adult razorback suckers is anticipated to be at low numbers, and an overall small percentage of the population.
4. Razorback sucker habitat will not be greatly modified and remaining habitat in the area will remain intact and functional as cover and spawning areas.
5. This area is highly managed and fish are closely monitored. Exceedance of take will be closely monitored, should it occur.
6. Conservation measures to decrease the long-term impacts of development will be implemented through the LMP and public education.