JOINT APPLICATION FOR PERMITS

U.S. ARMY CORPS OF ENGINEERS - IDAHO DEPARTMENT OF WATER RESOURCES - IDAHO DEPARTMENT OF LANDS

Authorities: The Department of Army Corps of Engineers (Corps), Idaho Department of Water Resources (IDWR), and Idaho Department of Lands (IDL) established a joint process for activities impacting jurisdictional waterways that require review and/or approval of both the Corps and State of Idaho. Department of Army permits are required by Section 10 of the Rivers & Harbors Act of 1899 for any structure(s) or work in or affecting navigable waters of the United States and by Section 404 of the Clean Water Act for the discharge of dredged or fill materials into waters of the United States, including adjacent wetlands. State permits are required under the State of Idaho, Stream Protection Act (Title 42, Chapter 38, Idaho Code and Lake Protection Act (Section 58, Chapter 13 et seq., Idaho Code). In addition the information will be used to determine compliance with Section 401 of the Clean Water Act by the appropriate State, Tribal or Federal entity.

Joint Application: Information provided on this application will be used in evaluating the proposed activities. Disclosure of requested information is voluntary. Failure to supply the requested information may delay processing and issuance of the appropriate permit or authorization. **Applicant will need to send a completed application, along with one (1) set of legible, black and white (8½"x11"), reproducible drawings that illustrate the location and character of the proposed project / activities to both the Corps and the State of Idaho.**

See Instruction Guide for assistance with Application. Accurate submission of requested information can prevent delays in reviewing and permitting your application. Drawings including vicinity maps, plan-view and section-view drawings must be submitted on 8-1/2 x 11 papers.

Do not start work until you have received all required permits from both the Corps and the State of Idaho

FOR AGENCY USE ONLY			
USACE NWW-	Date Received:	☐ Incomplete Application Returned	Date Returned:
Idaho Department of Water Resources No.	Date Received:	☐ Fee Received DATE:	Receipt No.:
Idaho Department of Lands No.	Date Received:	☐ Fee Received DATE:	Receipt No.:

INCOMPLETE APPLICANTS MAY NOT BE PROCESSED

1. **CONTACT INFORMATION - APPLICANT** Required:			2. **CONTACT INFORMATION - AGENT:**		
Name: Rick Collingwood, P.E.			Name: Jason Scott		
Company: Idaho Water Resource Board			Company: GeoEngineers, Inc.		
Mailing Address: P.O. Box 83720			Mailing Address: 523 East Second Avenue		
City: Boise	State: ID	Zip Code: 83720	City: Spokane	State: WA	Zip Code: 99202
Phone Number *(include area code)*: (208) 287-4835	E-mail: rick.collingwood@idwr.idaho.gov		Phone Number *(include area code)*: 509-209-2816	E-mail: jscott@geoengineers.com	

3. PROJECT NAME or TITLE: Priest Lake Outlet Dam Improvements			4. PROJECT STREET ADDRESS: N/A		
5. PROJECT COUNTY: Bonner	6. PROJECT CITY: Coolin		7. PROJECT ZIP CODE: 83856		8. NEAREST WATERWAY/WATERBODY: Priest Lake/Priest River
9. TAX PARCEL ID#: N/A	10. LATITUDE: 48°29'25.41"N LONGITUDE: -116°54'14.59"W		11a. 1/4: SW	11b. 1/4: NW	11c. SECTION: 6	11d. TOWNSHIP: 59 N	11e. RANGE: 4 W
12a. ESTIMATED START DATE: 10/15/2020	12b. ESTIMATED END DATE: 3/15/2021		13a. IS PROJECT LOCATED WITHIN ESTABLISHED TRIBAL RESERVATION BOUNDARIES? ☒ NO ☐ YES Tribe:		
13b. IS PROJECT LOCATED IN LISTED ESA AREA? ☐ NO ☒ YES			13c. IS PROJECT LOCATED ON/NEAR HISTORICAL SITE? ☒ NO ☐ YES		

14. DIRECTIONS TO PROJECT SITE: Include vicinity map with legible crossroads, street numbers, names, landmarks.

From Priest River, ID: Take State Highway 57 (ID-57N) for about 26 miles. Turn right on gated private driveway (just south of Kokanee Park Drive). Follow driveway southeast for about 675 feet to a flat bench that allows access to the outlet dam.

15. PURPOSE and NEED: ☐ Commercial ☐ Industrial ☒ Public ☐ Private ☐ Other

Describe the reason or purpose of your project; include a brief description of the overall project. Continue to Block 16 to detail each work activity and overall project.

The purpose of this project is to improve dam safety, preserve statutory requirements under Idaho Administrative Code (IC) 70-507 for water levels in Priest Lake at 3.0 feet on the outlet gage through the recreation season, and provide additional surface water storage (3.5 feet on the gage) during dry and/or low water seasons to provide operational flexibility and maintain a minimum discharge of 60 cubic feet per second (cfs) from the Outlet Dam into Priest River.

16. DETAILED DESCRIPTION OF EACH ACTIVITY WITHIN OVERALL PROJECT. Specifically indicate portions that take place within waters of the United States, including wetlands: Include dimensions; equipment, construction, methods; erosion, sediment and turbidity controls; hydrological changes: general stream/surface water flows, estimated winter/summer flows; borrow sources, disposal locations etc.:

The project will preserve lake level maintenance at 3.0 feet on the outlet gage for recreational purposes, allow for an additional 6 inches of storage (3.5 feet on the outlet gage) during drought/low-water years, and meet a minimum outflow discharge of 60 cfs during the summer recreation season. The 6-inch pool raise (drought years) will add additional forces on the Outlet Dam and increase erosion potential for the downstream apron, which requires improvements to ensure the dam meets structural standards for safety. Major improvements to the Outlet Dam include a scour apron extension (extending 15-feet downstream of dam), downstream rock armoring (extending 30-feet downstream of apron), and tainter gate extensions and strengthening. The new 15-foot concrete scour apron, with keyway and end sill, and rock armoring will replace existing riprap and will require 4,140 cy of riverbed excavation and 3,355 of replacement fill. 785 cy will be disposed at an upland site. A stone subbase with a geotextile fabric will be installed to provide a suitable bed for the concrete apron. A 3-foot thick stone subbase layer with a geotextile fabric separating the stone and native riverbed will be installed to provide a suitable bed for the armoring. A 6-foot thick rock armor layer will be installed over the subbase to provide adequate scour protection downstream of the proposed apron extension. Existing armor rock, downstream of the outlet structure, will need to be excavated and relocated for the proposed improvements. In addition to the excavated material, this armoring will be used to fill scour holes in the existing riverbed and excess material will be hauled offsite.
Trucks and excavators will transport concrete and riprap to the Project Area via an approximate 15-foot wide temporary access road. Temporary culverts will allow river flow to pass under the access road during construction.
Cofferdams, comprised of Supersacks, sheetpiles or Portadam® systems will be used to dewater the area upstream and downstream of the dam to perform construction in dry conditions. Fill used in Supersacks will be will disposed of offsite or used for stream restoration and fill, provided it meets the specifications for the stream restoration material. A temporary erosion and sedimentation control (TESC) plan will be developed and implemented by the contractor. Silt fences will be installed along the perimeter of the work areas to confine sediment and runoff. Straw bales staked straw wattles, or similar measures will be added to the silt fencing if surface water flow is observed.

17. DESCRIBE ALTERNATIVES CONSIDERED to AVOID or MEASURES TAKEN to MINIMIZE and/ or COMPENSATE for IMPACTS to WATERS of the UNITED STATES, INCLUDING WETLANDS: See Instruction Guide for specific details.

Alternatives were investigated to mitigate the potential increased risk of erosion of the downstream riprap scour apron, and to increase structure stability. Improvements considered included a concrete stilling basin, concrete apron, baffle blocks at the downstream edge of the existing concrete slab, gate modifications to improve discharge hydraulic flow regime, a larger size riprap apron, grouting the existing riprap apron, and installation of an end sill. A new downstream concrete/armored scour apron was determined to have the lowest risk of erosion/turbidity and highest potential for structural stability. Therefore, this alternative was selected.

Minimization measures and best management practices (BMPs) will be utilized during construction activities to avoid impacts to bull trout and designated critical habitat. Impacts to aquatic resources will be minimized by working in dewatered areas directly downstream from the dam. Flow will be manipulated by opening and closing the tainter gates, which will therefore, eliminate the need to redirect flow in the river. No wetlands will be impacted as a result of the proposed action.

18. PROPOSED MITIGATION STATEMENT or PLAN: If you believe a mitigation plan is not needed, provide a statement and your reasoning why a mitigation plan is NOT required. Or, attach a copy of your proposed mitigation plan.

The project will modify existing dam conditions but will not alter upstream habitat conditions in Priest Lake. Minor temporary and permanent downstream habitat conditions will be altered in Priest River to accommodate dam safety improvements. Minor habitat alteration from the temporary access road, culverts, and diversion structures will be mitigated by full removal the and restoration of the streambed to its original condition. The concrete section and larger armoring of the new scour apron represent permanent habitat impacts in Priest River. However, the 45-foot length of the impact downstream represents a small fraction of the 45-mile long river. Moreover, concrete and larger armoring rock will lower erosion risk, and reduce long-term turbidity.

No riparian vegetation will be altered as a result of the project. Flow conditions downstream from the Outlet Dam will be maintained with the proposed upgrades. No long-term impacts to flow or riparian vegetation are anticipated.

19. TYPE and QUANTITY of MATERIAL(S) to be discharged below the ordinary high water mark and/or wetlands:

Dirt or Topsoil:		cubic yards
Dredged Material:		cubic yards
Clean Sand:		cubic yards
Clay:		cubic yards
Gravel, Rock, or Stone:	2,965	cubic yards
Concrete:	390	cubic yards
Other (describe): Temp Access Road	3,440	cubic yards
Other (describe: Supersacks (cofferdams)	1,970	cubic yards
TOTAL:	8,765	cubic yards

20. TYPE and QUANTITY of impacts to waters of the United States, including wetlands:

Filling:	0.43 acres	18,870 sq ft.	3,355 cubic yards
Backfill & Bedding:	acres	sq ft.	cubic yards
Land Clearing:	acres	sq ft.	cubic yards
Dredging:	acres	sq ft.	cubic yards
Flooding:	acres	sq ft.	cubic yards
Excavation:	0.43 acres	18,870 sq ft.	4,140 cubic yards
Draining:	acres	sq ft.	cubic yards
Other:	acres	sq ft.	cubic yards
TOTALS:	0.86 acres	37,740 sq ft.	7,495 cubic yards

21. HAVE ANY WORK ACTIVITIES STARTED ON THIS PROJECT? ☒ NO ☐ YES If yes, describe ALL work that has occurred including dates.

22. LIST ALL PREVIOUSLY ISSUED PERMIT AUTHORIZATIONS:

23. ☐ YES, Alteration(s) are located on Public Trust Lands, Administered by Idaho Department of Lands

24. SIZE AND FLOW CAPACITY OF BRIDGE/CULVERT and DRAINAGE AREA SERVED: 600 Square Miles

25. IS PROJECT LOCATED IN A MAPPED FLOODWAY? ☒ NO ☐ YES If yes, contact the floodplain administrator in the local government jsrisdiction in which the project is located. A Floodplain Development permit and a No-rise Certification may be required.

26a WATER QUALITY CERTIFICATION: Pursuant to the Clean Water Act, anyone who wishes to discharge dredge or fill material into the waters of the United States, either on private or public property, must obtain a Section 401 Water Quality Certification (WQC) from the appropriate water quality certifying government entity.
See Instruction Guide for further clarification and all contact information.

The following information is requested by IDEQ and/or EPA concerning the proposed impacts to water quality and anti-degradation:

☐ NO ☒ YES Is applicant willing to assume that the affected waterbody is high quality?
☐ NO ☒ YES Does applicant have water quality data relevant to determining whether the affected waterbody is high quality or not?
☒ NO ☐ YES Is the applicant willing to collect the data needed to determine whether the affected waterbody is high quality or not?

26b. BEST MANAGEMENT PRACTICTES (BMP's): List the Best Management Practices and describe these practices that you will use to minimize impacts on water quality and anti-degradation of water quality. All feasible alternatives should be considered - treatment or otherwise. Select an alternative which will minimize degrading water quality

BMPs will be incorporated into all project work as required, to minimize impacts to water quality, wildlife and habitat in the immediate area The contractor will comply with all specific mitigation measures required on this project listed in the project environmental permits, and additional measures that may be required by applicable local, state, and federal laws, orders, regulations, and water quality standards.

Flows will be managed to allow construction in isolated groundwater conditions to minimize the work areas exposed directly to surface waters. This will require the installation of cofferdams to divert flow and isolate work areas around the active work areas. Work sites will be restored to pre-project conditions after the completion of construction. The Contractor will be responsible for the preparation of an SPCC plan, compliance with construction meetings with IDWR, IWRB, and other regulatory agencies to discuss their work plan The contractor will limit turbidity by strategic location of equipment; for example, by working within isolated areas wherever possible. In general, the contractor should meet State of Idaho (IDAPA 58.01.02.250.02.e) DEQ turbidity criterion for water quality standards as follows: (1) Turbidity, below any applicable mixing zone set by DEQ shall not exceed background turbidity by more than 50 NTUs instantaneously or more than 25 NTUs for more than 10 consecutive days and/or for up to 3 continuous hours; (2) If 50 NTUs above background levels are detected, the contractor shall cease instream work; and (3) Activities will be allowed to proceed once the readings return to background levels or 10 NTUs. It should be noted, authorization of a mixing zone for dilution of pollutants in a discharge is not guaranteed and DEQ maintains the right to determine necessity and size.

Through the 401 Certification process, water quality certification will stipulate minimum management practices needed to prevent degradation.

27. LIST EACH IMPACT to stream, river, lake, reservoir, including shoreline: Attach site map with each impact location.

Activity	Name of Water Body	Intermittent Perennial	Description of Impact and Dimensions	Impact Length Linear Feet
Dewater river	Priest River	Perrenial	Minor turbidity during dewater (36,250 square feet)	40
Scour apron/rip rap install	Priest River	Perrenial	Minor turbidity during re-water (10,870 square feet)	45
Temporary Access Road	Priest River	Perrenial	Minor turbidity during re-water (10,830 square feet)	15
			TOTAL STREAM IMPACTS (Linear Feet):	100

28. LIST EACH WETLAND IMPACT include mechanized clearing, fill, excavation, flood, drainage, etc. Attach site map with each impact location.

Activity	Wetland Type: Emergent, Forested, Scrub/Shrub	Distance to Water Body (linear ft)	Description of Impact Purpose: road crossing, compound, culvert, etc.	Impact Length (acres, square ft linear ft
			TOTAL WETLAND IMPACTS (Square Feet):	

29. ADJACENT PROPERTY OWNERS NOTIFICATION REQUIREM: Provide contact information of ALL adjacent property owners below.

Name: State of Idaho (South) Mailing Address: 3284 W. Industrial Loop City: Coeur d'Alene State: ID Zip Code: 83815 Phone Number (include area code): 208-769-1525 E-mail:	Name: Lamb Creek Estates (North) Mailing Address: Not available City: Priest River State: ID Zip Code: 83856 Phone Number (include area code): Not avaialble E-mail:
Name: Anderson, Walt and Margie Mailing Address: 25821 Highway 57 City: Priest River State: ID Zip Code: 83856 Phone Number (include area code): Not available E-mail:	Name: Anwar, Saeed; Brisson, Carol Mailing Address: 56 S Kokanee Pk Lp City: Priest River State: ID Zip Code: 83856 Phone Number (include area code): Not Available E-mail:
Name: Myron, Renee D Mailing Address: 68 S Kokanee Pk Lp City: Priest River State: ID Zip Code: 83856 Phone Number (include area code): Not Available E-mail:	Name: Arave, Roger & Kimberly L Mailing Address: 28 S Kokanee Pk Lp City: Priest River State: ID Zip Code: 83856 Phone Number (include area code): Not Available E-mail:
Name: Gibson, Kenneth A Jr & Gayle J Mailing Address: 80 S Kokanee Pk Lp City: Priest River State: ID Zip Code: 83856 Phone Number (include area code): Not Available E-mail:	Name: Bendix, Henry E Mailing Address: 92 S Kokanee Pk Lp City: Priest River State: ID Zip Code: 83856 Phone Number (include area code): Not Available E-mail:

30. SIGNATURES: STATEMENT OF AUTHORIAZATION / CERTIFICATION OF AGENT / ACCESS

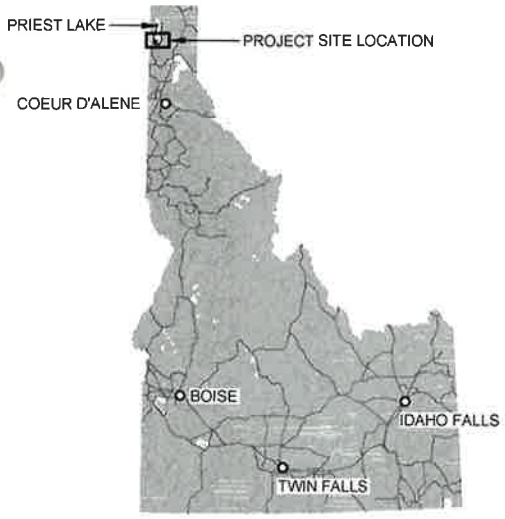
Application is hereby made for permit, or permits, to authorize the work described in this application and all supporting documentation. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein; or am acting as the duly authorized agent of the applicant (Block 2). I hereby grant the agencies to which this application is made, the right to access/come upon the above-described location(s) to inspect the proposed and completed work/activities.

Signature of Applicant: Rick Collingwood *Date:* 6/5/19

Signature of Agent: [signature] *Date:* 6/5/2019

This application must be signed by the person who desires to undertake the proposed activity AND signed by a duly authorized agent (see Block 1, 2, 30). Further, 18 USC Section 1001 provides that: "*Whoever, in any manner within the jurisdiction of any department 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*".

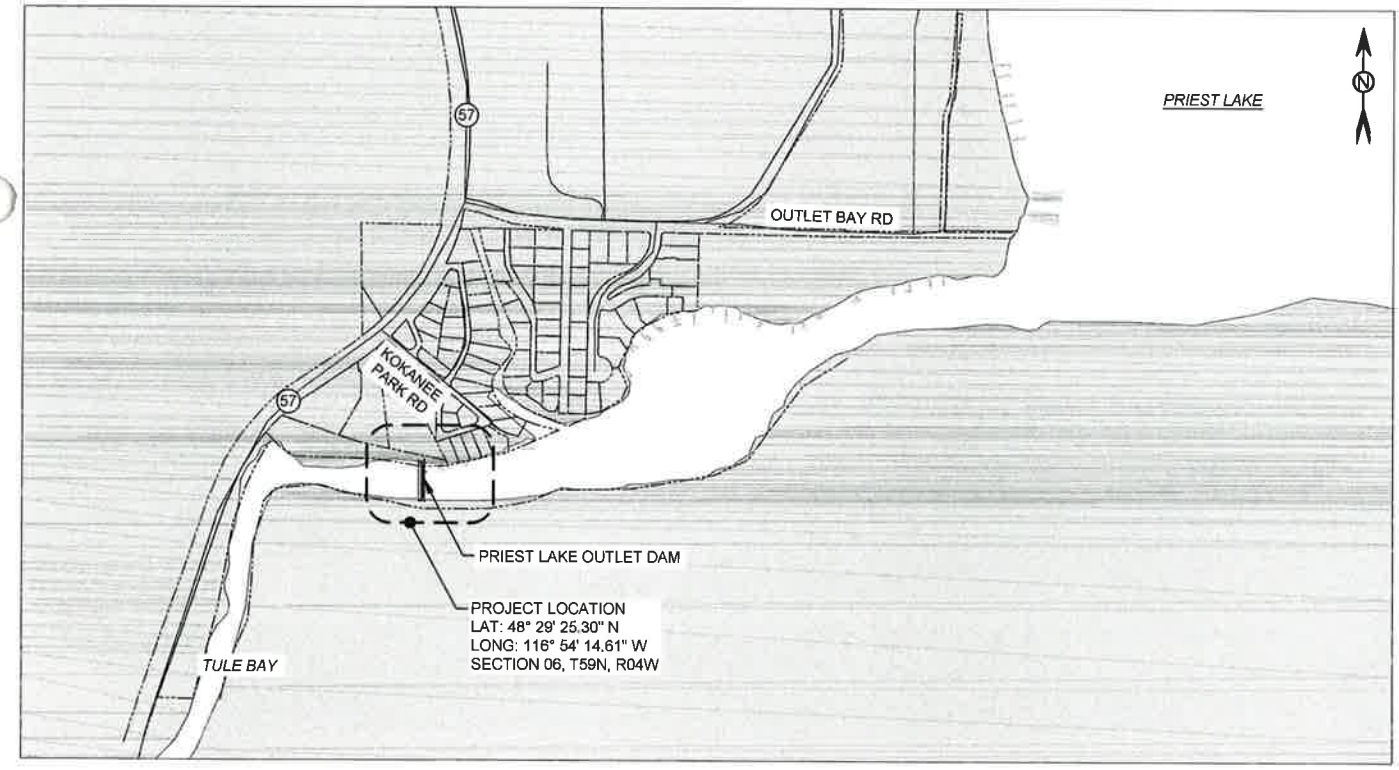
S06 T59N R04W



IDAHO KEY MAP

SHEET INDEX

SHEET NO.	TITLE
1	COVER SHEET
2	EXISTING SITE PLAN
3	PROPOSED SITE PLAN
4	SECTION - EXISTING
5	SECTION - PROPOSED
6	TAINTER GATES - 1
7	TAINTER GATES - 2
8	ACCESS AND TEMPORARY STRUCTURES



LOCATION MAP

0 500 1,000

SCALE IN FEET

PURPOSE: GATE EXTENSION AND SCOUR PROTECTION

TUM: NAVD88

ADJACENT PROPERTY OWNERS:

Priest Lake Water Management Project Outlet Dam Modifications

COVER SHEET

APPLICATION BY:
IDAHO DEPARTMENT OF WATER RESOURCES

PROPOSED: OUTLET DAM STRUCTURAL IMPROVEMENTS

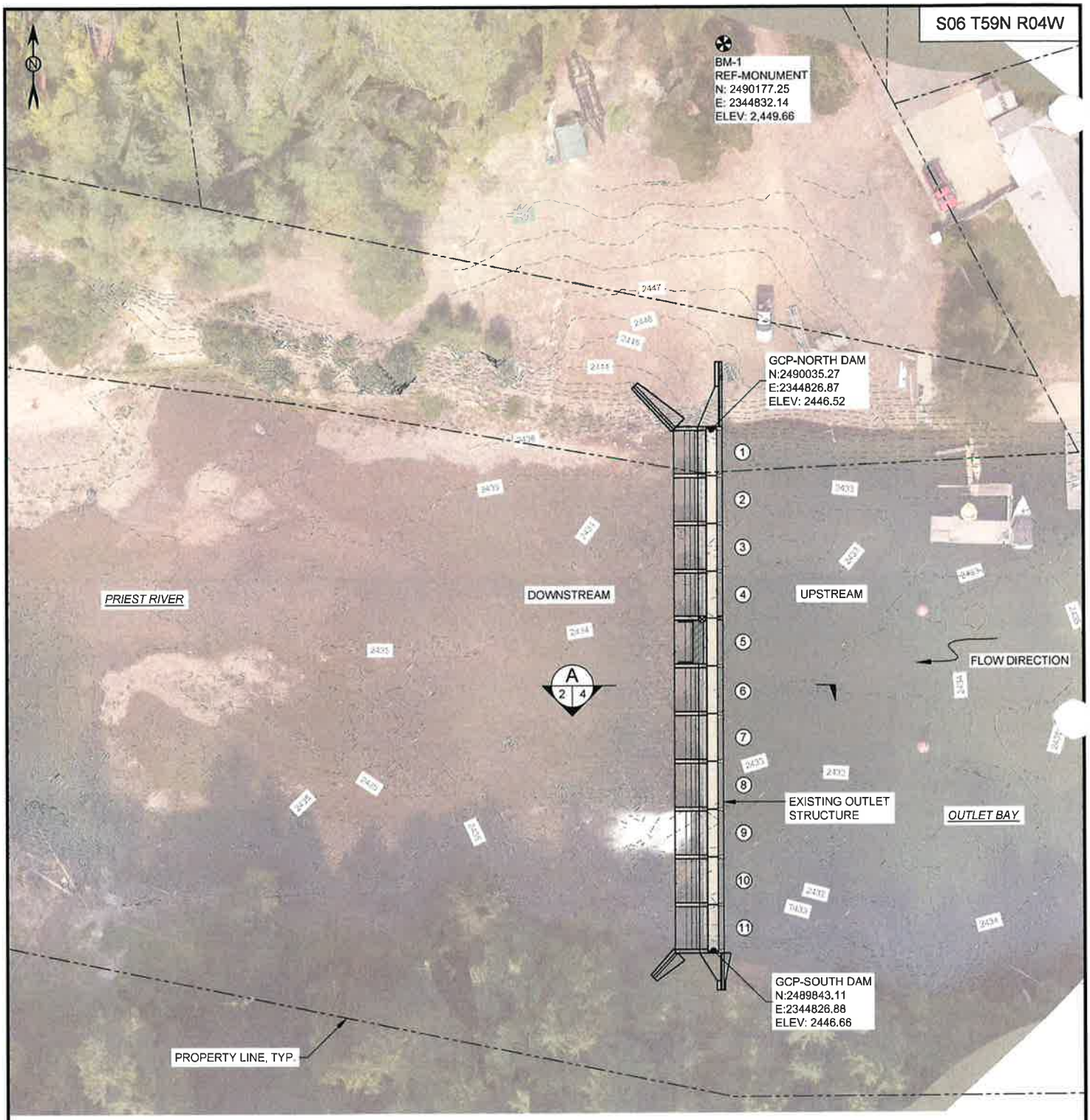
IN: PRIEST RIVER

AT: PRIEST LAKE

COUNTY: BONNER

SHEET 1 OF 8

DATE: 3/29/19



NOTES

1. TOPOGRAPHIC AND BATHYMETRY SOURCE, MOTT MACDONALD DATA COLLECTION, AUGUST-SEPTEMBER 2018.
2. HORIZONTAL DATUM: NAD83, IDAHO STATE PLANE, WEST ZONE
3. VERTICAL DATUM: NAVD88
4. AERIAL SOURCE: DELPHIS, AUGUST 2018, UAV AERIAL PHOTOGRAMMETRY

EXISTING SITE PLAN

0 25 50

SCALE IN FEET

LEGEND

- BENCHMARK
- (#) BAY NUMBER
- PROPERTY LINES

PURPOSE: GATE EXTENSION AND SCOUR PROTECTION

DATUM: NAVD88

ADJACENT PROPERTY OWNERS:

Priest Lake Water Management Project Outlet Dam Modifications

EXISTING SITE PLAN

APPLICATION BY:
IDAHO DEPARTMENT OF WATER RESOURCES

PROPOSED: OUTLET DAM STRUCTURAL IMPROVEMENTS

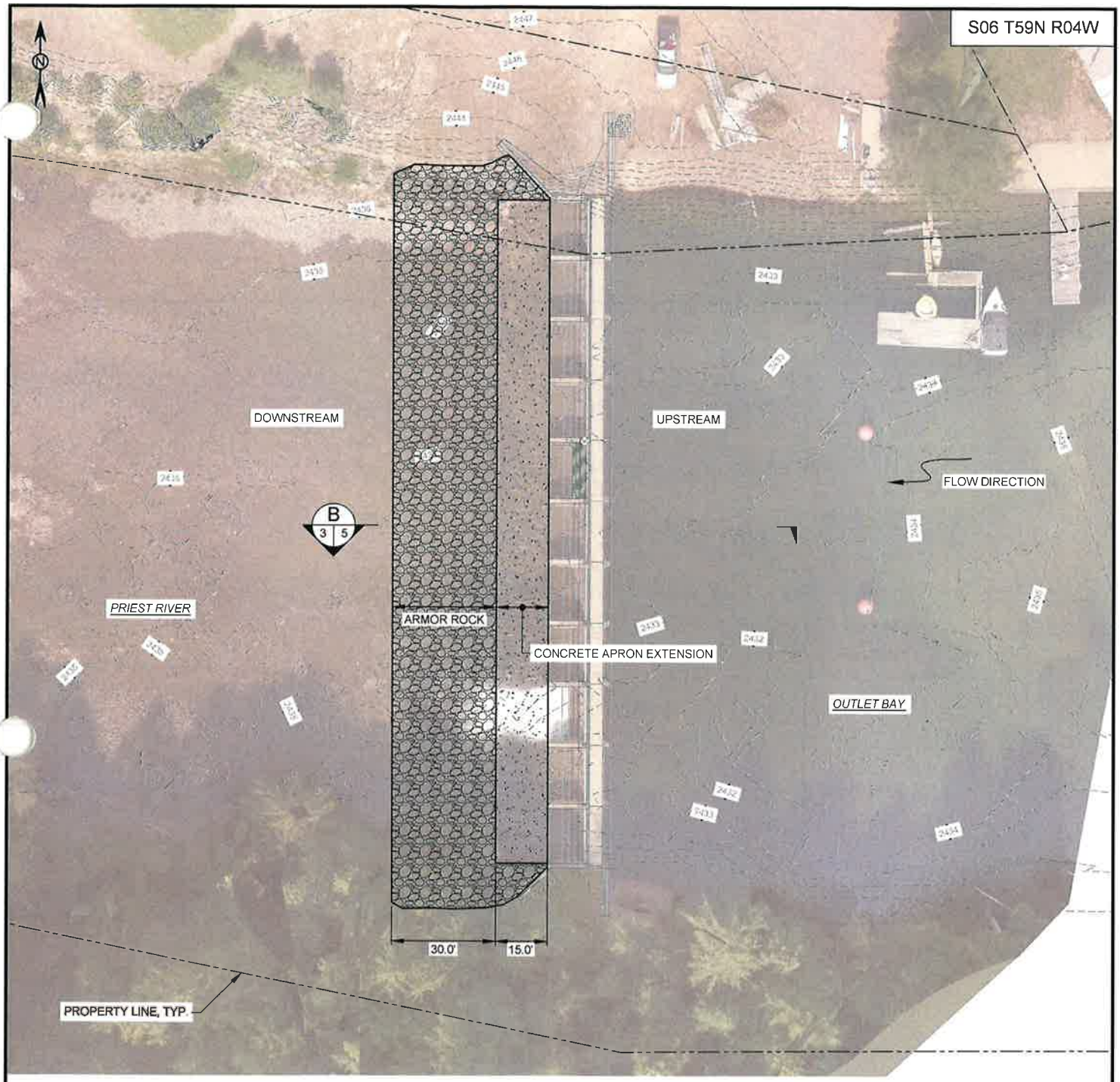
IN: PRIEST RIVER

AT: PRIEST LAKE

COUNTY: BONNER

SHEET 2 OF 8

DATE: 3/29/19



PROPOSED SITE PLAN

0 20 40

SCALE IN FEET

LEGEND

- ARMOR ROCK
- CONCRETE APRON
- PROPERTY LINES

PURPOSE: GATE EXTENSION AND SCOUR PROTECTION

TUM: NAVD88

JACENT PROPERTY OWNERS:

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PROPOSED SITE PLAN

APPLICATION BY:
IDAHO DEPARTMENT OF WATER RESOURCES

PROPOSED: OUTLET DAM STRUCTURAL IMPROVEMENTS

IN: PRIEST RIVER

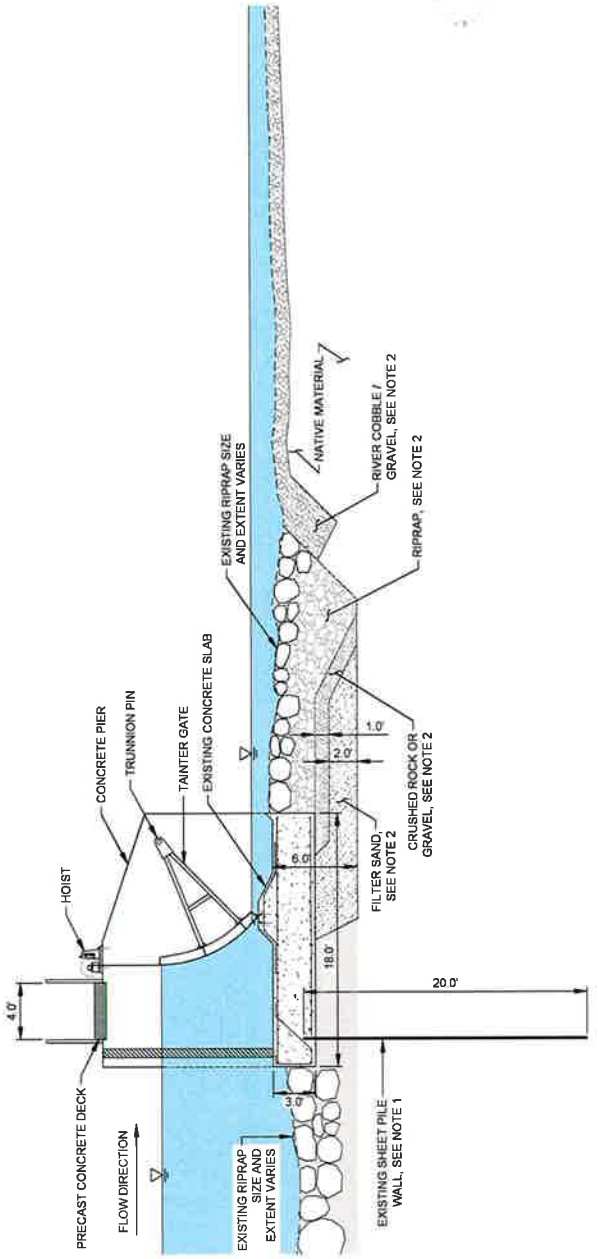
AT: PRIEST LAKE

COUNTY: BONNER

SHEET 3 OF 8

DATE: 3/29/19

S06 T59N R04W



A 2/4 TYPICAL SECTION
EXISTING

0 5 10
SCALE IN FEET

NOTES
1. SHEET PILE WALL IS SHOWN PER 1976 DESIGN DRAWINGS.
2. DOWNSTREAM RIPRAP AND ROCK UNDERLAYER LIMITS ARE SHOWN PER TECHNICAL SECTION DESIGN DRAWINGS.

PURPOSE: GATE EXTENSION AND SCOUR PROTECTION

DATUM: NAVD88

ADJACENT PROPERTY OWNERS:

Priest Lake Water Management Project Outlet Dam Modifications

SECTION - EXISTING

APPLICATION BY:
IDAHO DEPARTMENT OF WATER RESOURCES

PROPOSED: OUTLET DAM STRUCTURAL IMPROVEMENTS

IN: PRIEST RIVER

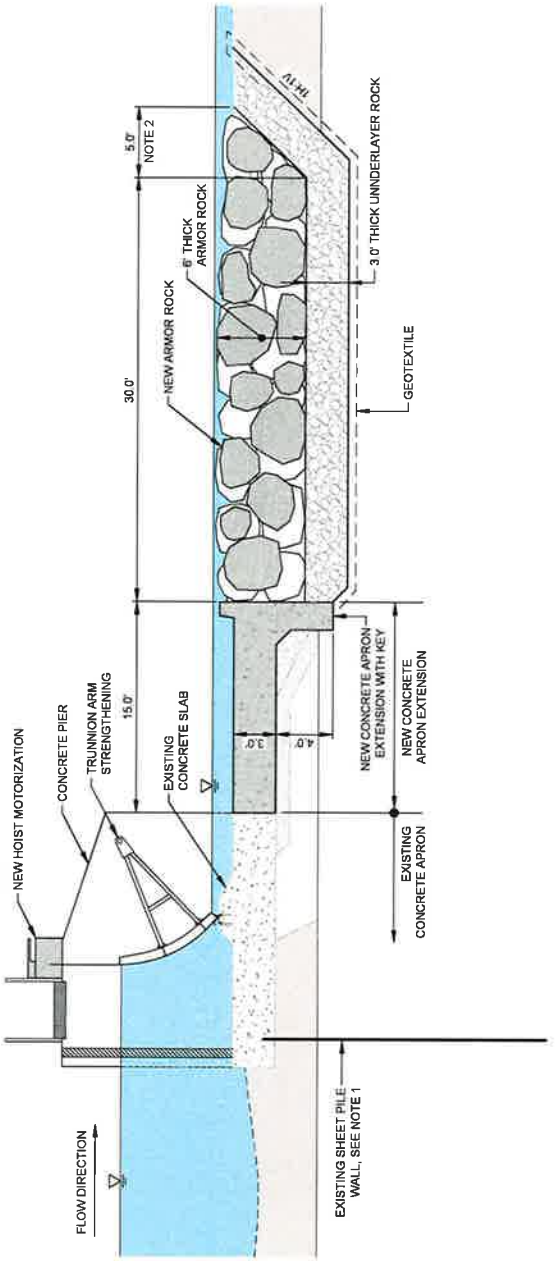
AT: PRIEST LAKE

COUNTY: BONNER

SHEET 4 OF 8

DATE: 3/29/19

S06 T59N R04W



B 3/5 TYPICAL SECTION
PROPOSED MODIFICATIONS

0 5 10
SCALE IN FEET

NOTES
1. SHEET PILE WALL IS SHOWN PER 1978 DESIGN DRAWINGS.
2. SLOPE OF ARMOR ROCK SURFACE VARIES TO MEET EXISTING.

PURPOSE: GATE EXTENSION AND SCOUR PROTECTION

DATUM: NAVD88

ADJACENT PROPERTY OWNERS:

Priest Lake Water Management Project Outlet Dam Modifications

SECTION - PROPOSED

APPLIC Y:
IDAHO DEPARTMENT O R RESOURCES

PROPOSED: OUTLET DAM STRUCTURAL IMPROVEMENTS

IN: PRIEST RIVER

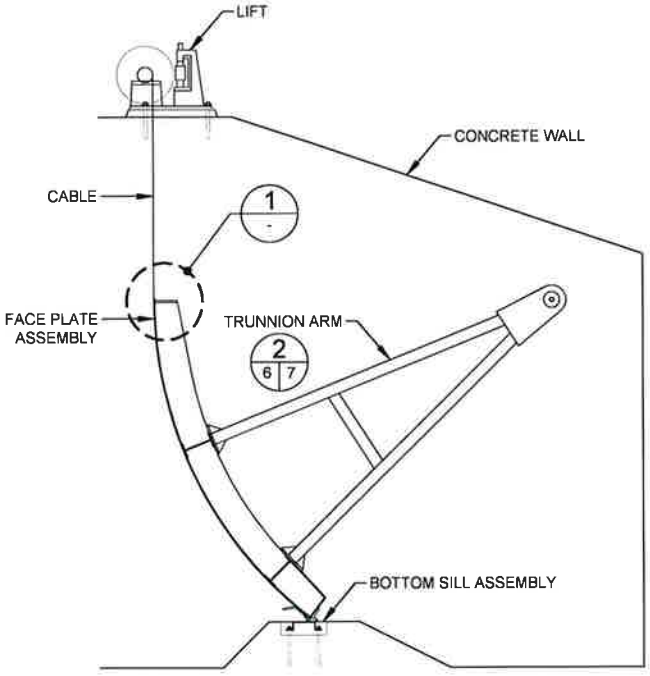
AT: PRIEST LAKE

COUNTY: BONNER

SHEET 5 OF 8

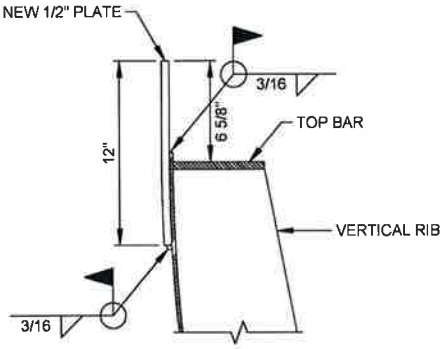
DATE: 3/29/19

S06 T59N R04W

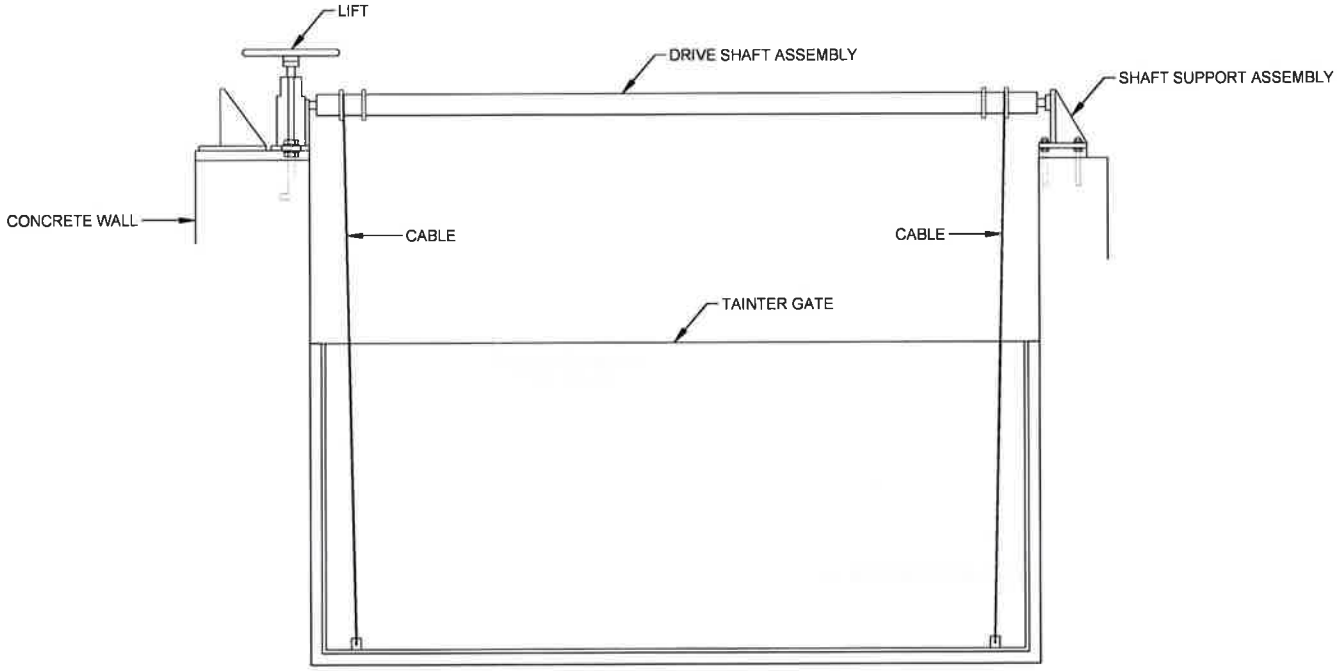


A 3 6 SECTION
TAINTER GATE

0 2 4
SCALE IN FEET



1 - DETAIL
TAINTER GATE TOP PLATE



B 3 6 PROFILE
TAINTER GATE

0 2 4
SCALE IN FEET

PURPOSE: GATE EXTENSION AND SCOUR PROTECTION

DATUM: NAVD88

ADJACENT PROPERTY OWNERS:

Priest Lake Water Management Project Outlet Dam Modifications

TAINTER GATES - 1

APPLICATION BY:
IDAHO DEPARTMENT OF WATER RESOURCES

PROPOSED: OUTLET DAM STRUCTURAL IMPROVEMENTS

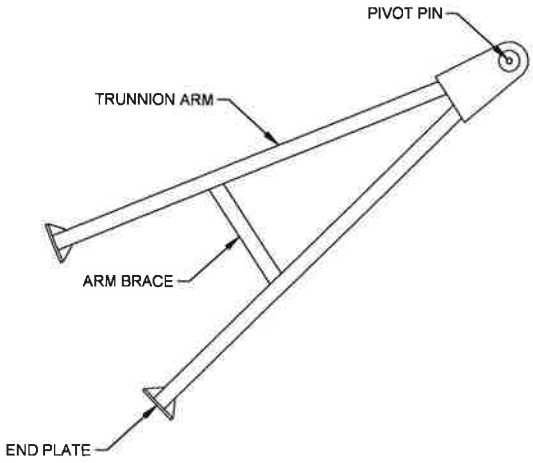
IN: PRIEST RIVER

AT: PRIEST LAKE

COUNTY: BONNER

SHEET 6 OF 8

DATE: 3/29/19



2 / 6 7 DETAIL
TRUNNION ARM

PURPOSE: GATE EXTENSION AND SCOUR PROTECTION

TUM: NAVD88

JACENT PROPERTY OWNERS:

Priest Lake Water Management Project Outlet Dam Modifications

PROPOSED SITE PLAN

APPLICATION BY:
IDAHO DEPARTMENT OF WATER RESOURCES

PROPOSED: OUTLET DAM STRUCTURAL IMPROVEMENTS

IN: PRIEST RIVER

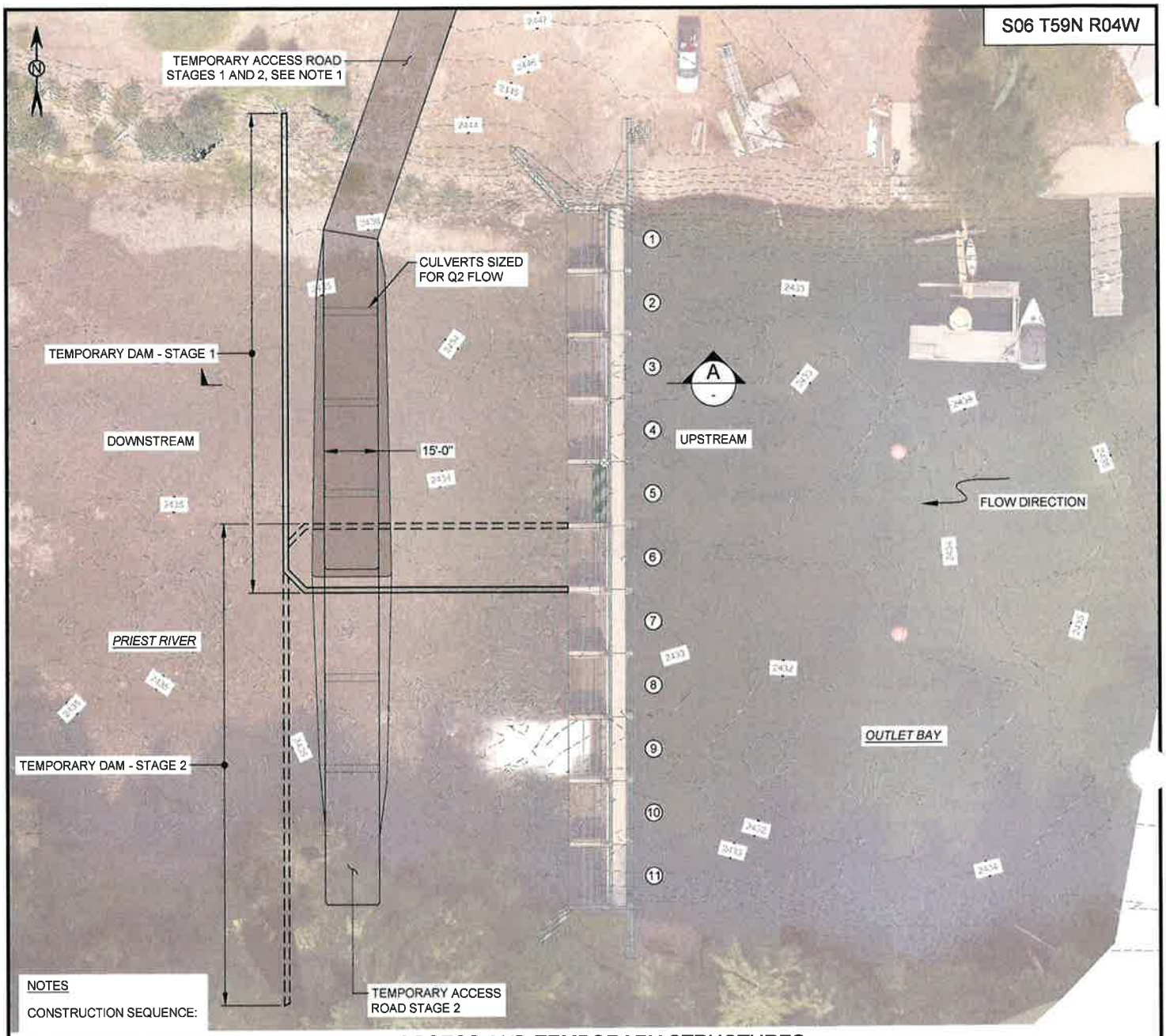
AT: PRIEST LAKE

COUNTY: BONNER

SHEET 7 OF 8

DATE: 3/29/19

S06 T59N R04W



NOTES

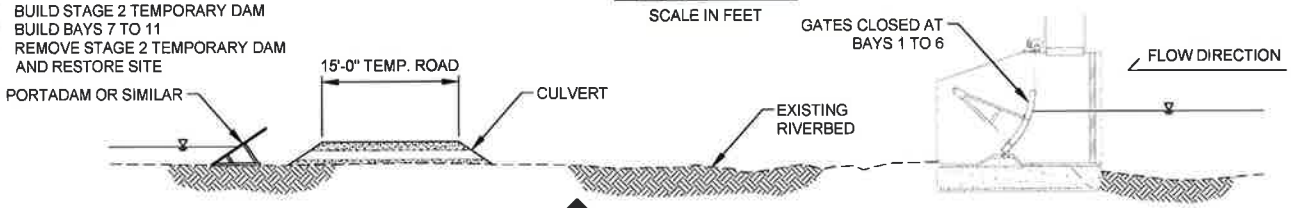
CONSTRUCTION SEQUENCE:

1. BUILD STAGE 1 TEMPORARY DAM
2. DEWATER
3. BUILD BAYS 1 TO 6
4. REMOVE STAGE 1 TEMPORARY DAM
5. BUILD STAGE 2 TEMPORARY DAM
6. BUILD BAYS 7 TO 11
7. REMOVE STAGE 2 TEMPORARY DAM AND RESTORE SITE

ACCESS AND TEMPORARY STRUCTURES

0 20 40

SCALE IN FEET



A - SECTION

STAGE 1 DEWATERING

0 10 20

SCALE: 1" = 10'

PURPOSE: GATE EXTENSION AND SCOUR PROTECTION

DATUM: NAVD88

ADJACENT PROPERTY OWNERS:

Priest Lake Water Management Project Outlet Dam Modifications

ACCESS AND TEMP STRUCTURES

APPLICATION BY:
IDAHO DEPARTMENT OF WATER RESOURCES

PROPOSED: OUTLET DAM STRUCTURAL IMPROVEMENTS

IN: PRIEST RIVER

AT: PRIEST LAKE

COUNTY: BONNER

SHEET 8 OF 8

DATE: 3/29/19

MOTT MACDONALD

Memo

Project	Priest Lake Water Management Project – Phase 2	**MM Project No.**	376997
Date	May 20th, 2019		
Prepared by	Shem Kobialka, Mott MacDonald		
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Subject	Outlet Structure Structural Improvements – Technical Narrative		

Contents

1. Introduction

This memo is a technical description of the Outlet Dam's proposed structural improvements to support the development of regulatory permit application documents. The project is located on the Priest River, south of Priest Lake in Bonner County, Idaho. The project is funded by the Idaho Water Resource Board (IWRB) in partnership with Bonner County and the local community. Mott MacDonald is a consultant to the IWRB and designed the project with help from sub-consultants, including Geoengineers.

The Priest Lake Water Management Study was initiated by the IWRB to evaluate means of improving operation of the Priest Lake and Priest River system to meet long-term water management goals. The project purpose includes better meeting the required minimum water levels in the lake during the summer recreation season, meeting the minimum flow requirements in Priest River downstream of the dam, and improved navigation in the Thorofare. The objectives of the Outlet Dam improvements include modifications that will facilitate a higher water level, while meeting dam stability and dam safety requirements.

2. Project Site Background

Priest Lake

Priest Lake is located in northern Idaho and is regulated to benefit tourism and recreation, both of which add to the economic benefit of Bonner County. Lower Priest Lake (a.k.a. Priest Lake) is approximately 18 miles long with a maximum depth greater than 300 feet. The active storage volume is approximately 76,000 acre-feet. Upper Priest Lake is approximately 3.3 miles long and connected to Priest Lake by a three-mile channel known as the "Thorofare". The Thorofare is primarily used by the public for recreation and access to the upper lake. A 1,400 feet timber breakwater at the southern outlet of the Thorofare helps maintain navigable depths by channeling flow. It also provides wave and erosion protection to landowners at the north end of Priest Lake.

The area is known for the clear and clean water, recreational opportunities, and wildlife. In 2015, limited water supply and drought conditions in northern Idaho made maintaining the required summer lake levels and downstream flow in the river very difficult. This situation, coupled with concerns about the breakwater structure and Thorofare access issues, increased interest in developing both operational and engineered improvements to the system.

In response to area stakeholders' concerns, the IWRB authorized funding to perform an evaluation of strategies and options that could meet the long-term water management solutions for the Priest Lake system. The Phase 1 study identified feasible alternatives and was completed in 2018.

Outlet Dam

The original Priest Lake Outlet Dam was constructed in 1951. This structure was replaced by the existing dam, which was constructed in 1978 to replace the deteriorating original structure. The Outlet Dam is not intended for irrigation, power or flood control. It is mostly operational during the recreational season to retain water and maintain a minimum 3 feet pool level at the existing USGS gage. At the end of the

recreational season, the gates are opened out of the water, above the maximum spring and winter pool level, and are only operational when the minimum 0.1 feet at the USGS gage is not met.

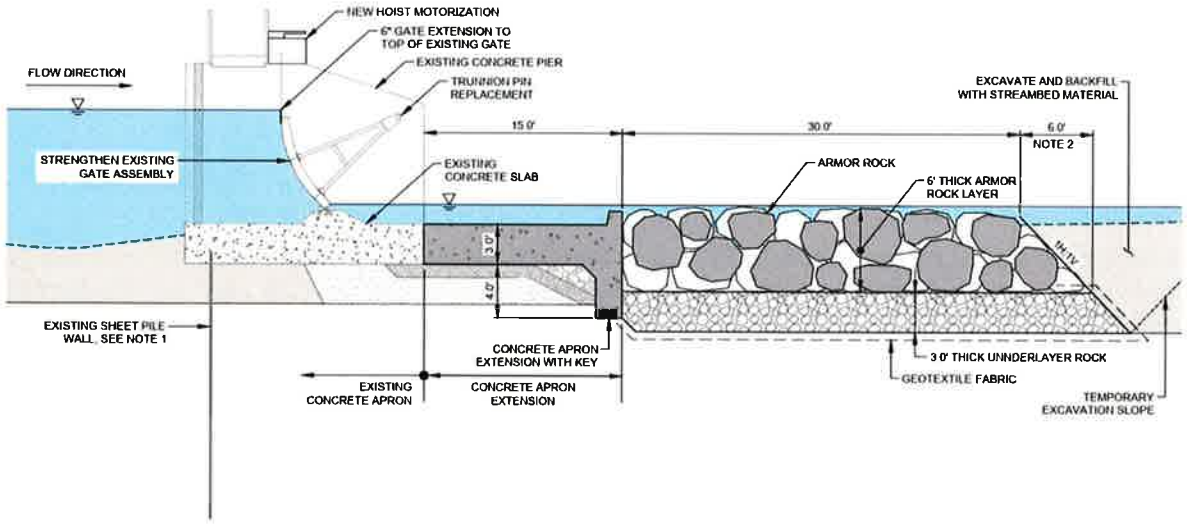
The dam was constructed as a cast in place concrete gravity structure with a series of gates to maintain the minimum pool level in Priest Lake and manage downstream flows into Priest River. The dam is owned by IWRB and operated by a contractor on behalf of IWRB. The dam is approximately 12 feet high with 11 Tainter gates that regulate discharge with no emergency spillway.

Water levels in the lake are measured at USGS gage No. 12393000. Lake levels typically rise in April and May during spring runoff, reaching a maximum level of 3 to 5.6 feet in late May to early June. The level recedes to approximately 3 feet in July, and this level is typically maintained during the summer recreational season. Storage releases commonly start during the second week of October but have started as early as October 4th and as late as October 16th. Storage releases normally end sometime in November. The gates typically remain open through the fall, winter, and early spring season, allowing unregulated flows into the Priest River unless there is a need to retain a minimum lake pool level of 0.1' for water management.

3. Proposed Improvements

During the first phase of the Priest Lake Water Management study, an evaluation was performed to determine potential improvements to the operations of Priest Lake and the Priest River system in order to meet long term water management objectives. It was determined a 0.5 foot (6 inch) raise in water level at the USGS gauge would provide a sufficient dry year contingency to the lake storage capacity and water level management within the system. To facilitate the raised pool level and to ensure that the dam meets structural standards for safety, the following improvements to the outlet structure are proposed.

Figure 1: Proposed Outlet Dam Structural Improvements – Schematic



Gate Extension

To achieve the 0.5-foot pool raise determined in Phase 1 of the study, the existing dam would require a radial extension to the top of the existing curved gates (See Figure 1). A 0.55' long radial extension bolted or welded to the top of the existing gates and constructed of galvanized steel sections, is proposed to

achieve this increase in storage capacity. The extension doesn't accommodate for any high pool freeboard.

Gate Improvements

As a result of this extension, the dead weight and hydrostatic loading on the gates will increase, warranting a structural evaluation for the proposed changes. The structural evaluation of the Tainter gate assembly determined that the existing gates do not meet the requirements of current standards for the proposed operational improvements. The following improvements are recommended to be made to the existing Tainter Gates to accommodate the proposed pool raise:

- Locally strengthen the lower portion of the existing skin plate by adding new stiffeners.
- Strengthen the vertical ribs with a steel angle or channel that will be attached locally to the areas were the flexural demand exceeds its capacity.
- Replace the existing trunnion pins with new pins that meet the current standards.
- Replace the existing vertical J-seals on the sides of the gates as part of the proposed water management improvements.

Apron Extension

A new concrete apron with rock armoring of the downstream riverbed is proposed to reduce scour risk and enhance the structure stability. A keyway at the end of the of the apron extension embedded approximately 7 feet below the top of proposed apron is planned to improve the overall stability of the dam. The armor rock scour protection will be a multi-layer design a total of 9 feet thick (6 feet of armor rock overlaying 3 feet of underlayer rock) with a geotextile between the rock and native sediments. The end of the concrete apron will include an upturned sill (upstand), which will be 1 foot high at the downstream end of the concrete apron, and can reduce the likelihood that a hydraulic jump extends beyond the armor rock apron.

4. Access and Use of Site

The Outlet Structure is located on land owned by the Idaho Department of Lands. The Idaho Water Resource Board has an easement to perform maintenance and operations on the dam.

A designated site access point on the north side of the river will allow land-based equipment to access the project site. Trucking operations in September and October are preferred, after the peak summer recreation season and prior to adverse winter weather conditions. A temporary laydown area may be needed on the plot of land adjacent to the river access point to allow for temporary storage of equipment and material re-handling. Trucks and excavators will transport concrete and rip rap to the site by way of a temporary access road (see Section 5).

A temporary use easement would need to be secured from the property owners and homeowners association for the land-based access scheme and staging area.

5. Construction Methods and Schedule

General

Construction will be performed with land-based equipment operating at low water levels. Materials will be trucked to the site during the fall. If an easement is granted, a temporary staging area will be used for

stockpiling materials adjacent to the designated river access point on the north side of the river near the Kokanee Park Loop community.

Time of Year

Construction related to dam improvements will commence after the fall drawdown period in mid-October when the Outlet Bay and Tailwater levels have equalized. The worst-case water depth anticipated during construction activity is 4 feet. Cold winter temperatures may complicate construction, and winter enclosures or other cold weather measures will be needed to continue construction operations, such as, but not limited to, structural steel welding and placing concrete through the winter. Construction must be completed before high-flow events typically observed during the spring season (around March). The following cold weather criteria must be followed where applicable:

- American Concrete Institute, Cold Weather Concreting (ACI 306R-10)
- American Welding Society, Structural Welding Code – Steel (AWS D1.1)

Water Diversion

Cofferdams consisting of Supersacks or Portadam® systems will be used to dewater both upstream and downstream of the dam, such that construction can be done in dry conditions. To allow for continued flow, a section of the outlet structure will be isolated and dewatered for construction, while river flow is diverted to the other side of the river (see Figure 2). The cofferdam system will be designed by the Contractor and submitted to the Owner for review. Any scour improvements required on the upstream side will be addressed both in the dewatered area and in water.

If a Supersack cofferdam system is used by the contractor they will be filled with a granular fill material, consisting of cobbles, gravel and sand. This fill material will either be taken from the excavated riverbed material or be imported from offsite. This material will either be disposed of offsite or used for stream restoration and fill if it meets the specifications for the stream restoration material.

Construction Sequence

The sequence of construction activity will occur as follows:

Stage 1

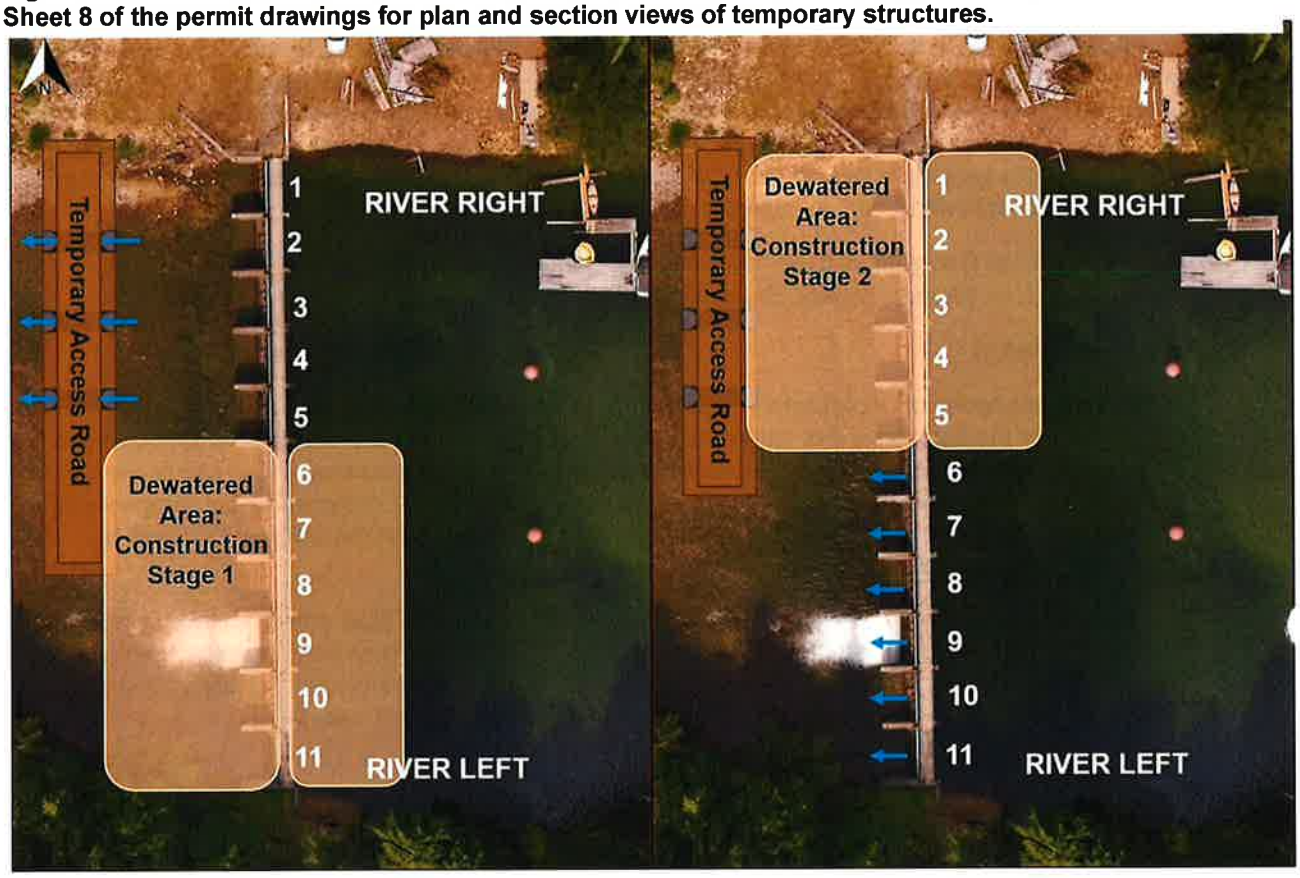
- A temporary access road will be constructed from imported sand and gravel material and will connect the north bank access location to the south side of the river. Temporary culverts will allow river flow to pass under the access road during this stage of construction (see Figure 2).
- A temporary cofferdam system will be constructed around the south half of the Outlet Structure on the upstream and downstream sides at bays 6-11 for dewatering.
- Winter enclosures will be installed around stage 1 work area (see Figure 2).
- Gate improvement and apron extension work for the south half of the Outlet Structure will be completed.

Stage 2

- The cofferdam system will be removed and river flow through bays 6-11 will be restored.
- The cofferdam system will be used to isolate the north half of the Outlet Structure on the upstream and downstream sides at bays 1-5 for dewatering.
- The temporary road can be reduced to the extent needed to access the newly dewatered area.
- Winter enclosures will be installed around stage 2 work area (see Figure 2).
- Gate improvement and apron extension work for the north half of the Outlet Structure will be completed.

- The access road will be removed, and the streambed will be restored to its original condition. The cofferdam system will be deconstructed, restoring river flow through all 11 gates.

Figure 2: Outlet Structure construction sequence schematic; Stage 1 (south) and Stage 2 (north). See Sheet 8 of the permit drawings for plan and section views of temporary structures.



Gate Improvements

A radial extension will be field bolted or welded to the existing gates by the contractor to raise the elevation of the top of gate by 0.5 feet. This work will be performed on site at the dam over the waterway, while the gates remain in the open position. To field bolt the extension, predrilling holes in the existing galvanized steel gates will need to be performed over the waterway. To field weld the extension, the existing galvanizing on the steel gates would need to be ground off, exposing the surface of the existing steel. The skin plate surface shall be prepared in accordance with the temperature requirements specified in Chapter 3.5 of AWS D1.1 before the extension plate can be field welded to the skin plate. After the extension is field welded to the top of the existing gates, the galvanizing in these areas would be reapplied to the exposed surface.

Apron Extension

After the work area has been dewatered and the winter enclosure has been installed, the existing rip rap will need to be removed and the ground surface shall be prepared by the contractor. As part of the surface

preparation for the apron extension and keyway an estimated 860 cubic yards of existing armor rock and riverbed will need to be excavated and either be disposed of or reused as fill for stream restoration. A stone subbase with a geotextile fabric separating the stone and native riverbed will be installed to provide a suitable bed for the concrete apron to rest on. Concrete forms for the apron shall be installed, and the ground surface in contact with the concrete shall be prepared in accordance with the cold weather requirements specified in Chapter 6 ACI 306R-10. Concrete shall be poured in place through trucking or field batching. The concrete shall be finished and cured in accordance with the requirements specified in Chapter 10 of ACI 306R-10. Concrete forms may be removed once concrete meets the requirements specified in Chapter 8.9 of ACI 306R-10.

After the forms are removed, rock armoring can be placed at the downstream end of the concrete apron extension. As part of the surface preperation for the rock armoring an estimated additional 3,280 cubic yards of riverbed will need to be excavated and either be disposed of or reused as fill for stream restoration. A 3' thick stone subbase layer with a geotextile fabric separating the stone and native riverbed will be installed to provide a suitable bed for the armoring to rest on. A 6' thick rock armor layer will be installed over this to provide adequate scour protection downstream of the proposed apron extension.

Excavated Material

Excavated streambed material may be placed as fill or hauled offsite as necessary. Existing armor rock downstream of the outlet structure remaining from the original 1978 construction and 1979 repair will need to be excavated and relocated for the proposed improvements. This armoring in addition to the excavated material will be used to fill scour holes in the existing riverbed and any excess material not used will be hauled off site.

6. Best Management Practices

Standard construction and earthwork conservation measures will be employed during the execution and construction work. The following Best Management Practices (BMPs) will be employed to reduce or eliminate any potential adverse impacts from excavation, construction, and beneficial use operations throughout the duration of the project:

General

- Construction Entrance. Construction entrance protection will be provided at each of the access locations to the river to prevent tracking of sediment onto the local streets and roads.

Concrete

- Cleaning out of concrete trucks will be done at an upland location.
- An upland storage area will be designated and used for temporary storage of any concrete waste prior to disposal. A silt curtain and construction fencing will prevent contamination beyond the extents of the upland storage site.

Water Diversion and Dewatering

- Water diversion and dewatering methods will be employed such that construction can be done in dry conditions. This will mitigate the risk of negatively impacting water quality by reducing the potential for elevated turbidity levels and dispersion of suspended sediments.
- Temporary cofferdams will be constructed using supersacks or Portadam® equipment to dewater one side of the outlet structure at a time. River flow will be diverted to the side of the river without

construction activity. Water will be collected and pumped from inside the cofferdam to aid in dewatering the work area. A filtering system will be employed with a primary system collecting clean incoming water which can be directly pumped into the river. The secondary system within the excavated area will require treatment prior to discharge back into the river. Treatment will be conducted above OHW and could include a settling tank or area of infiltration to screen suspended sediment prior to returning into the river surface waters.

Temporary Construction

- Temporary fill will be used to construct an access road connecting the river access point to the construction site. The access road will consist of angular material, which will not disperse or elevate turbidity levels in the project vicinity or downstream. The site will be restored to pre-project condition after the completion of construction.

Water Quality

- A water quality protection plan will be developed based on the proposed construction methods and project site conditions. The Contractor is responsible for developing a water quality monitoring plan for submittal and review prior to construction.
- Turbidity and other water quality parameters will be monitored at an upstream reference point and downstream of the project site to ensure construction activities are in conformance with State Surface Water Quality Standards.

Metal Fabrication

- Metal work will be pre-fabricated to the greatest extent possible. Any fabrication work will be executed within the dewatered area to prevent metal waste from entering the Priest River.
- Galvanization methods will be chosen to minimize the risk of negative environmental impacts. Gate components will be hot-dip galvanized with field welds and hot-stick repairs at welds. At locations where the existing steel is in contact with new steel, the existing galvanizing coating must be removed. A galvanizing spray will need to be reapplied to those surfaces after the proposed connections are made.
- All paint, solvent, grease, and residue will be removed from a surface prior to welding.
- All scrap metals, spent welding rods, and materials removed during surface preparation will be disposed upland at an offsite, permitted disposal facility.
- BMP's will be installed to ensure metal and coating work is captured for removal offsite. BMP's could be tarps or other systems for collecting construction materials.

7. Quantities

Table 1 lists the areas impacted by improvements and the volumes of new material above and below Ordinary High Water (OHW). The elevations of the OHW contours upstream and downstream of the dam are assumed to be:

- $OHW_{UPSTREAM}$ = 2441.6' NAVD88 = 3.0' Lake Datum
- $OHW_{DOWNSTREAM}$ = 2438.7' NAVD88 = 0.1' Lake Datum

Table 1: Project Components - Quantities

Element	Item	Above OHW Volume (CY)	Below OHW Volume (CY)	Area (SF)	Existing Substrate → Proposed Material
Apron Extension (15')					
	Excavation		860		
	Concrete		390	2,870	Riprap → Concrete
Rock Armouring					
	Excavation		3,280		
	Armor Rock	140	1,900	8,000	Streambed → New Armor Rock
	Underlayer Rock	85	1,065	8,000	
	Geotextile Fabric			10,430	
Temporary Structures					
	Downstream Access Road	370	1,790	5,530	
	Upstream Access Road	490	1,650	5,300	
	Coffer Dam (Stage 1)			2,740	
	Dewatered Area (Stage 1)			18,020	
	Coffer Dam (Stage 2)			3,160	
	Dewatered Area (Stage 2)			18,230	

Note: All earthwork quantities include a 20% contingency.