

City of Logan, Utah  
Cache County

Erosion and Sediment Control Management Plan  
Condition No. 20



Logan Hydroelectric Project No. 2  
FERC Project No. P-4285

July 2017

Prepared by Stantec Consulting, Inc.



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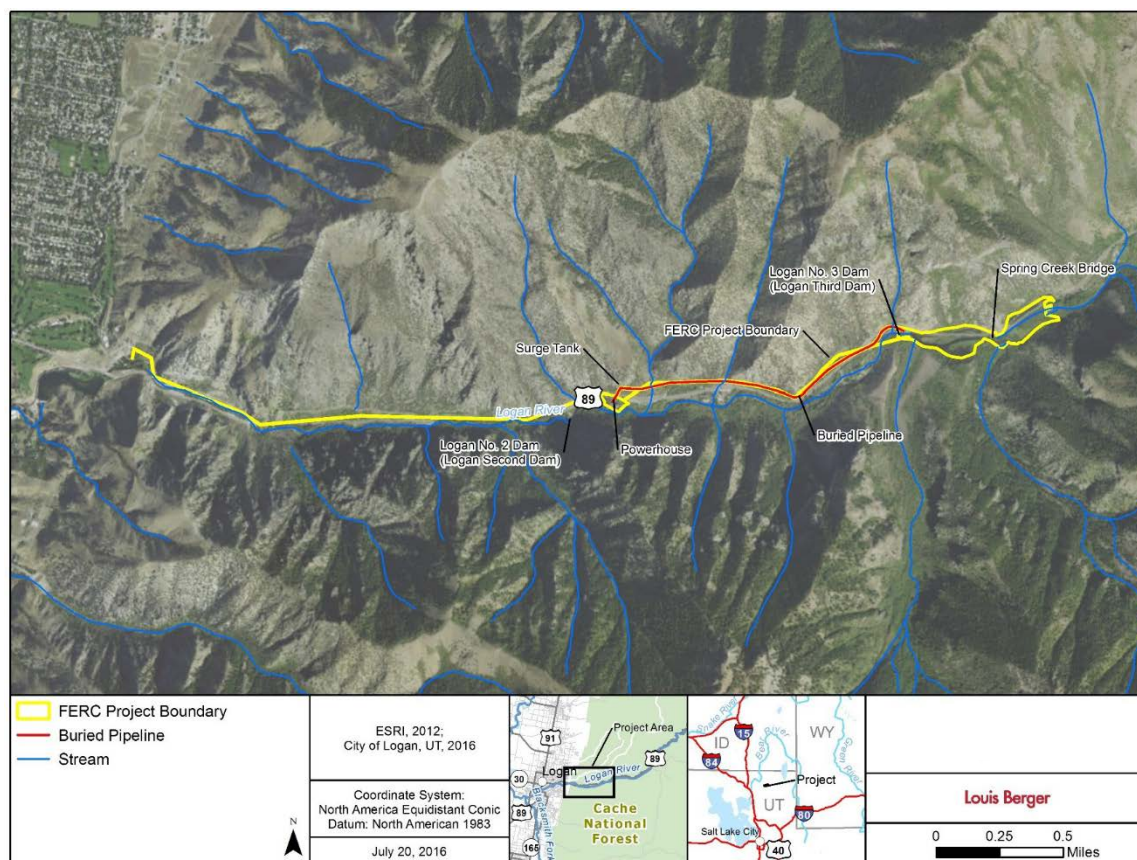
Stantec Specification Section 31 23 19 Dewatering Specification

## 1.0 INTRODUCTION

This Erosion and Sediment Control Management Plan (Plan) is to be implemented during and following construction activities at the Logan No. 2 Hydroelectric Project Site (Site). This plan addresses the US Forest (FS) Service 4(e) Condition No. 20 for Logan No. 2 Hydroelectric Project, Federal Energy Regulatory Commission (FERC) No. P-4285.

## 2.0 PROJECT LOCATION

The Site is located in primarily Sections 27 and 28 of Township 12 North, Range 2 East. Other Sections that have drainages that feed into the Logan River near the Site include 21, 22, 33 and 34, all within Township 12 North, Range 2 East. The Site is primarily located within the Uinta-Wasatch-Cache National Forest. Figure 1 shows the FERC Project boundary, Logan Second and Third Dams, existing buried pipeline, surge tank, and powerhouse.



**Figure 1: Location of the Logan No. 2 Hydroelectric Project, Second and Third Dam Facilities**  
(Source: City of Logan, 2015, as modified by staff)



### 3.0 PROJECT DESCRIPTION

The Third Dam facility is located on the Logan River, in Cache County, Utah, approximately 2.5 miles east of Logan City in the Bear River Range of the Rocky Mountains. The Third Dam facility includes the powerhouse, penstock, surge tank, dam, and the reservoir (see Figure 2). The facility and Project area are owned and have been operated by Logan City since 1901, and are covered by a FERC license re-issued in 1984 on federal land administered by the USDA-Forest Service (FS), Uinta-Wasatch-Cache National Forest, under FERC license No. P-4285.

The rehabilitation and repair of Third Dam will include replacement of the spillway abutment walls, resurfacing step surfaces, removal and replacement of deteriorated concrete as needed, replacement of the gatehouse/sluiceway walls, replacement of the intake structure, replacement of trash rack, replacement of gates in hoist house, replacement of the spillway crest gates with Obermeyer-type overflow weir gates, rehabilitation of an existing trash removal device, and repair or replacement of the low-level sluice gate. There is the potential of constructing, at a later date, a fish ladder to accommodate fishery agency requests if funding sources are confirmed.

The roof of the surge tank will be replaced. Repairs and upgrades to the system penstock were completed in 2013 and no further action is planned for the penstock.

Sediment removal from within the Third Dam Reservoir is planned as part of the Project, but will be performed in the subsequent years following the proposed improvements to Third Dam. Two large sediment bodies covering 1.7 acres exist between Third Dam and the bridge that extends from U.S. Highway 89 to the Spring Hollow Campground. Sediment is proposed to be removed with minimal disruption to the reservoir environment using suction dredging, and the extracted sediment will be dewatered onsite and then hauled to a location outside of Logan Canyon as permitted by the FS. Following sediment removal, a submerged weir will be installed downstream of the bridge from U.S. Highway 89 to the Spring Hollow Campground to help control future sedimentation in the reservoir. Future sediment collected upstream of the submerged weir will be regularly suctioned and dewatered for disposal outside of Logan Canyon as permitted by the FS.



Figure 2: Third Dam and Hydro No. 2 Main Components and Locations

## 4.0 MANAGEMENT PURPOSES

The purpose of this management plan is to provide direction for treating erosion and controlling sedimentation within the Project and Project-affected FS lands during the remaining term of license.

## 5.0 DESCRIPTION OF THE SITE

Logan Canyon is dominantly comprised of layers of ancient marine sedimentary rock (dolostone and limestone) that were formed in a large and shallow inland ocean. The marine rock formations are interbedded with siltstone and sandstone, which formed during sea level fluctuations. The rock formations are cliff-forming, as their bedding layers have been upturned due to tectonic faulting. Colluvium derived from these rocks is generally blocky, and through abrasion and chemical weathering can be reduced to sand-sized particles. Sandstone and siltstone interbeds are sources of fine grained sediments that can

be carried in suspension by river flow. Fine-grained sediments are also derived from terraces in the lower canyon that were formed by the shoreline of ancient Lake Bonneville. Mass wasting processes are likely the primary mechanism of colluvium transport to the Logan River and its tributaries.

Sediment bedload transport equations generally assume an unlimited supply of sediment of a given grain-size distribution, and so transport rates are thereby assumed to depend only on flow and sediment characteristics. Logan River, however, appears to be supply-limited in its basin upstream of the Logan City Hydro No. 3 Project and upstream of sediment terrace deposits formed by Lake Bonneville. Sediment of transportable sizes generally occurs in relatively small deposits along the stream, or where trapped by obstructions such as wood debris. Channel banks are relatively stable, there are few near-channel sources of readily transportable grain sizes, and the channel bed surface is armored by coarse sediment. Transportable gravel and sand sized sediments are available beneath the larger bed surface armor, and thin layers of silt deposits were observed along the channel margins during the low-flow channel reconnaissance. In contrast, channels with abundant sediment supply generally show little difference between grain size distributions of the bed-surface and subsurface layers. Particle sizes in the Logan River substrate beneath its bed surface armor were well graded down to medium- to fine-sand size (about 0.25 mm). The apparent absence of very fine- to fine-sized sand and silt in the subsurface layer is evidence that sediments of that size are more easily transported in suspension once mobilized by flows of sufficient magnitude.

## **6.0 SEDIMENT AND EROSION CONTROL REQUIREMENTS**

Soil and Water Conservation Practices (SWCP) are “the set of practices which, when applied during implementation of a project, ensures that soil productivity is maintained, soil loss and water quality impacts are minimized, and water-related beneficial uses are protected” (FS 2003). The Licensee’s contractor will implement site-specific temporary erosion control measures for each project to be approved by FS. These temporary measures will prevent erosion, stream sedimentation, dust, and soil mass movement during the period of ground disturbance until replaced by permanent measures.

Major ground disturbing construction activities will include excavation of accumulated sediment from the reservoir, laying out spoil areas, and contouring the land for final design grades. Other land disturbances will include minor excavation for the staging/laydown areas and Forest Service approved road modifications. The work to be performed by the Licensee’s contractor will be required to be planned and executed in a manner that will minimize the amount of soil particles reaching the Logan River, its tributaries, or any other



streams or water bodies. Work by the Licensee's Contractor in the area will not start until appropriate and effective sediment control devices have been designed, approved, installed, and placed into operation. The Licensee's Contractor will develop criteria for ranking and treating erosion sites including a risk rating and hazard assessment for scheduling erosion treatment measures and monitoring at each site. Sediment control will be in compliance with Forest Service regulations (FS 2003), including the standards and requirements of the UDOT Temporary Erosion and Sediment Control Manual (UDOT 2003), Utah's Nonpoint Source Management Plan for Hydrologic Modifications (NPSMP) (UDEQ 2013), and the Project 401 Water Quality Certification (Appendix A).

## 6.1 Erosion Control Measures

Temporary measures will be implemented to prevent erosion, stream sedimentation, dust, and soil mass movement during the period of ground disturbance until replaced by permanent measures. Erosion control measures will incorporate current standards, follow FS regulations and guidance, will be customized to site-specific conditions, and will be approved by FS. All erosion control structures will be maintained in good working condition throughout the duration of the construction project.

Sheets C-1 and C-6 (see Appendices B and C) depict conceptual erosion control measures that will be used by the Licensee's Contractor. These follow STANTEC Specification Sections 31 35 26 EROSION CONTROL BARRIER (Appendix D) and 31 35 28 EROSION CONTROL (VEGETATIVE) (Appendix E). The Contractor will abide by the conditions set forth in the 401 Water Quality Certification (see Appendix A) and Stream Alteration Permit (see Appendix F), as described in the following sections.

Topsoil storage areas will be protected from loss through wind and/or water erosion, especially during the rainy season. At drainages, stored soils will not block or enter flowing streams. All disturbed areas will be restored to within 6 inches of the original contours except where specified otherwise. Excess backfill material from below the topsoil layer will not be spread over any areas of existing topsoil in the right-of-way, but will be placed in areas where topsoil has been removed, after which it will be covered with topsoil, or it will be disposed of off-site in accordance with all local regulations. No excess material will be left in drainages. Topsoil will not be compacted during or after replacement, except where necessary to prevent erosion.



## **6.2 Contractor Awareness Training**

The Licensee's Contractor will ensure that all workers involved are continuously aware of the water quality protection measures before the start and during the dredging and construction period.

## **6.3 Maintenance and Inspection**

Any erosion control structures and stabilization practices will be inspected by the Contractor on a weekly basis at a minimum and after any storm event of ½ inch or greater, unless otherwise specified. If any areas of erosion are identified, the Contractor will develop and implement a schedule for treatment (e.g. repair, mitigate, monitor) of erosion sites, including a list of sites requiring immediate mitigation and schedule for their implementation. A copy of the inspection report will be available on-site for review.

## **6.4 Modifications and Corrective Measures**

If inspection determines that erosion control measures are not effective, Licensee will implement additional erosion control measures approved by FS and continue monitoring until the site has stabilized. Repair of damage to any erosion control structures will commence within 24 hours of discovery of the damage.

In locations where silt fences are used around catch basins, sediment trapped by the silt fence shall be removed by the Contractor when one-third of the height of the silt fence is covered by sediment.

## **6.5 Water Quality Monitoring**

The Licensee's Contractor will implement real-time turbidity monitoring (RTTM) continuously during Project sediment dredging and construction and will have a third party notification process in place. The third party will be responsible for notifying the on-site construction manager of any impairment readings for dissolved oxygen and turbidity to meet Class 3A Water Quality Standards along with specific conductance, temperature, flow and pH. All work will cease and desist until water quality readings meet Water Quality Standards. Project work in the Logan River will not be conducted if RTTM is not working properly at the start of each working day, and work will not continue past four hours continuous of downtime of the RTTM equipment.

Project work will not increase water turbidity by 10 NTUs in the Logan River or tributaries. If any exceedances are observed, the Utah Department of

Environmental Quality, Division of Water Quality (DWQ) will be immediately notified.

## **6.6 Dewatering**

A dewatering specification has been prepared and is included as an attachment to this plan (see Appendix G). The dewatering plan is to be determined by the Licensee's contractor and reviewed by the Engineer and various agencies prior to implementation. The Contractor will control the rate and effect of dewatering in such a manner as to avoid soil movement and erosion, and will maintain siltation protection during disposal of water from dewatering activities.

## **6.7 Monitoring**

Logan City will perform initial and periodic inventory and monitoring of the entire Project area and Project-affected FS lands to identify erosion sites and assess site condition for each. Periodic monitoring and inventory will include recording effectiveness of erosion treatment measures, and identification of new erosion sites for the term of the new license. Initial monitoring will occur prior to ground-disturbing activities, with daily monitoring occurring during ground-disturbing activities. Annual monitoring will occur after ground-disturbing activities are complete and all disturbed areas have been restored.

## **6.8 Site Restoration**

In accordance with the Vegetation Management Plan, following construction activities, revegetation will be implemented on all previously-vegetated areas that do not contain permanent structures or that will not be continue to be disturbed by Project-related activities. The revegetation goal will be to establish vegetation cover and stem density similar to pre-construction conditions. Revegetated areas will be monitored as outlined in the Vegetation Management Plan.

## **6.9 Reporting**

Reporting will be performed annually during years of active construction, and once every five years following the first year of construction and thereafter for the term of the license and any extensions or until a new license is issued, unless modified by Logan City and the agencies after review of monitoring results in Year 5 or beyond.

Documentation shall include a FS compatible GIS database for maps keyed to a narrative description of detailed, site-specific, erosion treatment measures and sediment monitoring results. Periodic plan review and revision will be implemented as appropriate.

## 7.0 REFERENCES

Forest Service (FS). 2003. Revised Forest Plan, Wasatch-Cache National Forest. USDA-Forest Service, Intermountain Region, Ogden, Utah. February 2003.

Utah Department of Environmental Quality (UDEQ). 2013. Nonpoint Source Management Plan for Hydraulic Modifications. And Addendum to the Utah Nonpoint Source Management Plan. Prepared by the Utah Department of Environmental Quality in Cooperation with the Utah Water Quality Task Force. March 2013.

Utah Department of Transportation (UDOT). 2003. UDOT Temporary Erosion and Sediment Control Manual, A Guide for the Design, Installation, Inspection, and Maintenance of Temporary Erosion and Sediment Control Measures. Utah Department of Transportation. February 2003.



## ACRONYMS

Acronym	Definition
DWQ	Division of Water Quality
FERC	Federal Energy Regulatory Commission
FS	Forest Service
GIS	Geographic Information System
NPSMP	Nonpoint Source Management Plan
RTTM	real-time turbidity monitoring
SWCP	Soil and Water Conservation Practices
UDEQ	Utah Department of Environmental Quality
UDOT	Utah Department of Transportation
USDA	United States Department of Agriculture

**APPENDIX A**  
**UDEQ 401 WATER QUALITY CERTIFICATION**



## State of Utah

GARY R. HERBERT  
*Governor*

SPENCER J. COX  
*Lieutenant Governor*

## Department of Environmental Quality

Alan Matheson  
*Executive Director*

DIVISION OF WATER QUALITY  
Walter L. Baker, P.E.  
*Director*

**APR 06 2017**

H. Craig Petersen, Mayor  
Logan City's Mayor Office  
290 North 100 West  
Logan, UT 84321

**Subject:** **Approval 401 Water Quality Certification with Conditions.**  
401 Water Quality Certification No.: FERC-P-4258.  
FERC Amended License No.: P-4258-046  
USACE 404 NWP Permit No.: SPK 2015-00690-UO.

**Applicant:** Logan City.

**Project:** Logan Third Dam Rehabilitation – Logan No. 2 Project.

**Date of Application:** October 25, 2016.

**Requests:** (1) Replace the spillway crest gates with Obermeyer weirs; (2) replace spillway abutment walls; (3) armor the abutments of the dam, which may consist of a combination of riprap and/or roller compacted concrete; (4) replace the penstock isolation gate (radial gate) with an Obermeyer weir gate; (5) replace the trash rack at the intake structure; (6) replace the low level sluice gatehouse; (7) rehabilitate the upstream face of dam; (8) dredge about 100,000 cubic yards of sediment from the reservoir; (9) refurbish the electrical generating equipment, which includes replacing the existing runners, wicket gates, and associated parts that are damaged; (10) recoat the interior and exterior of the steel portion of the penstock to reduce corrosion potential; and (11) replace the roof and repair the walls of the existing surge tank.

**Purpose:** Based on the available information, the overall project purpose is to repair, rehabilitate and upgrade the Third Dam Facility in order to provide for safe and efficient operation.

**Location:** Approximately 6.5 miles east on Hwy 89 from Main Street in Logan, Utah . Project is located within Section 28, Township 12 North, Range 2 East, Salt Lake Meridian, Latitude 41.72°, Longitude -111.71°, Logan City, Cache County, Utah.

**Watercourse:** Logan River, Bear River Watershed Management Unit, Cache County, Utah.

**Public Comment Period:** 02/21/2017 – 03/22/2017.

**Comments and Inquiries Received:** None.

Dear Mayor Peterson:

Pursuant to Section 401 of the Federal Water Pollution Control Act, commonly known as the Clean Water Act (CWA), the Utah Department of Environmental Quality, Division of Water Quality (DWQ) certifies



that the Logan City Corporation has provided reasonable assurances that any discharge associated with the Logan Third Dam Rehabilitation – Logan No. 2 Project (Project) will not violate surface water quality standards, or cause additional degradation in surface waters not presently meeting water quality standards. In accordance with Section 401(a)(1) of the CWA [33 U.S.C. Sec. 1341(a)(1)], DWQ hereby issues this amended 401 Water Quality Certification provided the conditions outlined below are met and included in the FERC License Amendment Order for Project P-4285 and the U.S. Army Corps of Engineers (USACE) 404 Nationwide Permit SPK 2015-00690. The affected portions of the Bear River have the following beneficial uses as stated in Utah Administrative Code (UAC R317-2-6):

**Class 2B – Protected for infrequent primary contact recreation. Also protected for secondary contact recreation** where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water;

**Class 3A - Protected for cold water species of game fish and other cold water aquatic life,** including the necessary aquatic organisms in their food chain.

**Class 3D – Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C,** including the necessary aquatic organisms in their food chain.

**Class 4 - Protected for agricultural uses including irrigation of crops and stock watering.**

As documented in Utah's 2016 *Integrated Report*, the Logan River was assessed as being impaired for total phosphorous. The Cutler Reservoir TMDL addressed this impairment and was approved by U.S. EPA in 2010 (see link <https://deq.utah.gov/ProgramsServices/programs/water/watersheds/docs/2010/03Mar/BearRiverCutlerReservoirTMDLsFinalReportFeb2010.pdf>). The TMDL recommended a load reduction of total phosphorous to be obtained through a combination of animal waste management BMPs and pasture and rangeland improvements.

The FERC and USACE are requested to include all of the amended conditions of this 401 Water Quality Certification (Certification) in the FERC License Amendment Order for Project P-4258-046 and the USACE 404 Nationwide Permit SPK 2015-00690-UO.

Approval is hereby given to conduct the outlined Project requests as described in the 401 Water Certification Application dated Oct. 25, 2016, FERC-P-4258, under the following conditions.

1. Applicant should ensure that all workers involved are continuously aware of the water quality protection measures before the start and during the dredging and construction period.
2. Water quality standards in the Logan River and its tributaries could be violated unless appropriate Best Management Practices (BMPs) are incorporated to minimize the erosion-sediment and nutrient load to any adjacent waters during Project construction activities. Utah Administrative Code R317-2 requires that the Project and subcontractors cannot increase water turbidity by 10 NTUs in Logan River or tributaries and if violated shall immediately notify the DWQ. A fact sheet describing the Utah Department of Environmental Quality's (DEQ) recommended environmental BMPs for construction sites are located on our web site at: <http://www.deq.utah.gov/Permits/water/updes/docs/utrc00000.pdf>
3. Applicant should ensure that real-time turbidity monitoring (RTTM) is continuously available during Project sediment dredging and construction and have a third party notification process. The third party will be responsible to notify the on-site construction manager of any impairment readings for dissolved oxygen and turbidity to meet Class 3A Water Quality Standards along with specific conductance, temperature, flow and pH. All work will cease and desist until water

- quality readings meet Water Quality Standards. Project work in the Logan River will not be conducted if RTTM is not working properly at the start of each working day and work will not continue past four hours continuous of downtime of the RTTM equipment.
4. Adhere to the minimum flow requirements outlined on page 29 Table 2 entitled "*Seasonal minimum flow requirements as specified in license Article 105 and Forest Service 4C Condition No. 26*" found in the FERC Environmental Assessment dated Sept 2, 2016 (FERC EA).
  5. Before construction or ground-disturbing activities begin, the Project must receive DWQ Approval for the following plans:
    - a) Reservoir Sediment Maintenance (dredging, disposal, re-suspension, dewatering and fish rescue);
    - b) Instream Flow and Turbidity Measurement, Monitoring and Notification;
    - c) Spoils Management and Hazardous Materials (spoils contamination and accidental spills);
    - d) Method for passage of river flow cofferdams in consultation with US Forest Service;
    - e) Wetland Mitigation and Monitoring Plan in consultation with USACE.
  6. Project construction should not preclude the addition of a fish ladder at some future date.
  7. Refueling equipment and storage of lubricants and fuels will occur at designated staging areas and in state approved containers. The storage and refueling areas will be at least 500 feet from the edge of the nearest water body (including wetlands), at least 200 feet from the nearest private water supply well, and at least 100 feet from the nearest municipal water supply well.
  8. Utah Code Annotated 19-5-114 requires that any spill or discharge of oil or other substances which may cause pollution to the waters of the State, including wetlands, must be immediately reported to the Utah DEQ Spill Hotline at (801) 536-4123, a 24-hour phone number. Logan City agrees to fully remediate any spill or discharge in accordance with all applicable regulations.
  9. Logan City must acquire all necessary easements, access authorizations and permits to ensure they are able to implement the Project, including the Utah Department of Transportation.
  10. The legislatively-mandated fee for 2017 is \$90.00/hour, for review and issuance of the §401 Water Quality Certification  
<http://www.deq.utah.gov/FeesGrants/fees/docs/2016/DEQFEEDOC17.pdf>, per: (see page 174). An invoice will be sent to you once all plans have been approved. Your payment is due within 30 days.
  11. Logan City shall not use any fill material which may leach organic chemicals (e.g., discarded asphalt) or nutrients (e.g., phosphate rock) into waters of Utah.
    - a. Construction activities that disturb one acre or more, or are part of a common plan of development, are required to obtain coverage under the Utah Pollutant Discharge Elimination System (UPDES) Storm Water General Permit for Construction Activities, Permit No. UTRC00000. The permit requires the development of a storm water pollution prevention plan (SWPPP) to be implemented and updated from the commencement of any soil disturbing activities at the site until final stabilization of the project. A fact sheet describing the permit application procedures are located on our web site at: [www.deq.utah.gov/Permits/water/updes/updes\\_f.htm](http://www.deq.utah.gov/Permits/water/updes/updes_f.htm)
    - b. Dewatering activities, if necessary during the construction, may require coverage under the UPDES General Permit for Construction Dewatering, Permit No. UTG070000. The permit requires water quality monitoring every two weeks to ensure that the pumped water is meeting permit effluent limitations, unless the water is managed on the construction site. For more dewatering information refer to DEQ's website at: <http://www.deq.utah.gov/Permits/water/updes/docs/utrc00000.pdf>
  12. §401 Certification Modification: Without limiting DWQ's discretion to take other actions in accordance with UAC R317-15, and, as applicable, 33 USC 1341, DWQ may modify the Certification to add, delete, or modify the conditions in this Certification as necessary and feasible to address:

- a) Adverse or potentially adverse Project effects on water quality or designated beneficial uses that did not exist or were not reasonably apparent when this Certification was issued;
  - b) TMDLs;
  - c) Changes in water quality standards;
  - d) Any failure of Certification conditions to protect water quality or designated beneficial uses when the Certification was issued; or
  - e) Any change in the Project or its operations that will not adversely affect water quality or designated beneficial uses when this Certification was issued.
- 

Please contact Mr. Bill Damery at (801) 536-4354, [wdamery@utah.gov](mailto:wdamery@utah.gov) with any questions you may have concerning this 401 Water Quality Certification with Conditions.

Sincerely,



Walter L. Baker, P.E.  
Director

WLB/WD/blj

cc: Hollis Jencks, USACE, via mail  
Peter Yarrington, FERC, via email  
Stan Postma, via email

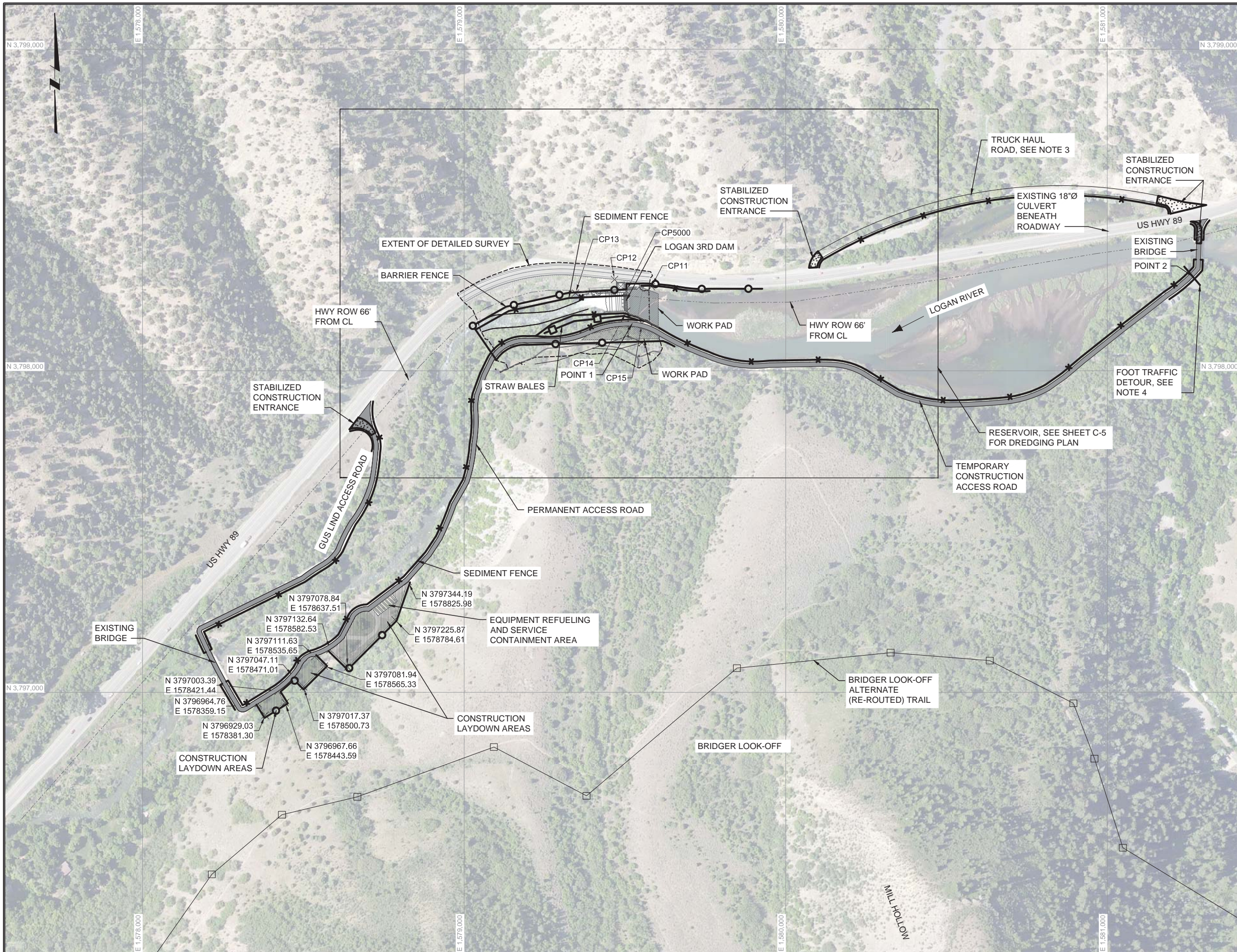
DWQ-2017-000866



**APPENDIX B**  
**DRAWING SHEET C-1**



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### GENERAL SHEET NOTES

1. TOPOGRAPHIC INFORMATION OUTSIDE OF BORDER INDICATED IS APPROXIMATE. CONTRACTOR SHALL REFER TO SPECIFICATION 31 10 00 - SITE PREPARATION AND 31 35 28 - EROSION CONTROL (VEGETATIVE) FOR INFORMATION PERTAINING TO ADDITIONAL SITE PREPARATION REQUIREMENTS. CONTRACTOR SHALL SUBMIT A TEMPORARY EROSION AND SEDIMENT PLAN (SIMILAR TO SHOWN ON THIS SHEET) FOR REVIEW AND APPROVAL BY THE US FOREST SERVICE AND ENGINEER.
2. DETAILED SURVEY TOPOGRAPHY PROVIDED BY MCNEIL ENGINEERING  
8610 SANDY PARKWAY, SUITE 200  
SANDY, UT 84070  
THE HORIZONTAL DATUM IS NAD83 AND THE VERTICAL DATUM IS NAVD 88.
3. TRUCK HAUL ROAD TO BE USED FOR SEDIMENT DEWATERING AND LOADING OF MATERIALS DREDGED FROM THE RESERVOIR.
4. AS NEEDED DURING CONSTRUCTION. CONTRACTOR TO POST SIGNAGE TO DETOUR FOOT TRAFFIC TO BRIDGER LOOK-OFF TRAIL.
5. A TEMPORARY CONSTRUCTION ACCESS ROAD SHALL BE CONSTRUCTED BETWEEN POINTS 1 AND 2 AS SHOWN ON THIS DRAWING. THE TEMPORARY ROADWAY SHALL BE USED FOR CONSTRUCTION ACCESS ONLY AND SHALL BE COMPLETELY REMOVED AND REVEGETATED FOLLOWING CONSTRUCTION. IMPROVEMENTS MADE THROUGH THE GUS LIND CAMPING AREA (BETWEEN HWY 89 AND LOGAN 3RD DAM) FOR CONSTRUCTION ACCESS ARE CONSIDERED PERMANENT FEATURES AND SHOULD NOT BE REMOVED FOLLOWING CONSTRUCTION. TYPICAL SECTIONS FOR EACH ACCESS ROADWAY ARE PROVIDED IN THE CONTRACT DRAWINGS.

### LEGEND

- SEDIMENT FENCE DETAIL C-204/GC-2
- STRAW BALES DETAIL C-212/GC-3
- BARRIER FENCE DETAIL C-203/GC-2
- STABILIZED CONSTRUCTION ENTRANCE

### SURVEY CONTROL POINTS

POINT	NORTHING	EASTING	ELEVATION (FT)	DESCRIPTION
11	3798261.76	1579582.57	5026.75	CP11
12	3798284.01	1579467.74	5026.89	CP12
13	3798241.58	1579346.19	5011.62	CP13
14	3798185.52	1579505.81	5024.61	CP14
15	3798147.38	1579553.26	5026.78	CP15
5000	3798247.81	1579504.15	5024.74	CP5000

REV	DATE	BY	DESCRIPTION

SCALE

1" = 150'

WARNING  
0 1/2 1  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED G. CLARK  
DRAWN D. WEEKS  
CHECKED T. ARNOLD

ISSUED FOR CONSTRUCTION - JUNE 2017

ANY PRINT NOT BEARING THIS STAMP MAY CONTAIN DATA THAT IS POTENTIALLY INACCURATE OR INCOMPLETE AND IS NOT TO BE RELIED UPON WITHOUT THE EXPRESS WRITTEN CONSENT OF THE PREPARER.

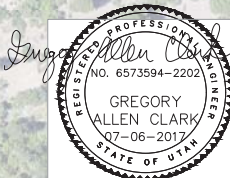


HYDRO NO. 2  
LOGAN 3RD DAM AND SURGE TANK  
IMPROVEMENT PROJECT

LOGAN CITY  
CIVIL  
LOGAN 3RD DAM  
LOGAN THIRD DAM IMPROVEMENTS OVERALL SITE PLAN  
CONSTRUCTION ACCESS PLAN

SHEET

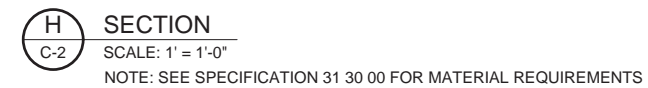
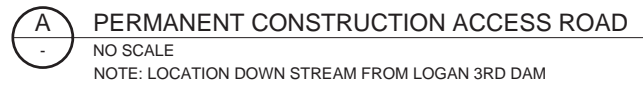
C-1





**APPENDIX C**  
**DRAWING SHEET C-6**

1. TEMPORARY CONSTRUCTION ACCESS ROAD SHALL BE RECLAIMED WHEN CONSTRUCTION IS COMPLETE. TENSAR GRID AND ROADBASE MATERIAL SHALL BE REMOVED.



REV	DATE	BY	DESCRIPTION

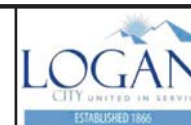
**WARNING**

0  $\frac{1}{2}$  1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED S. RADFORD  
DRAWN S STARK  
CHECKED T ARNOLD

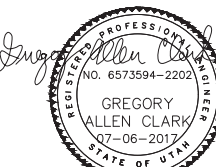
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AND IS NOT TO BE RELIED UPON WITHOUT THE  
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LOGAN CITY  
CIVIL  
LOGAN 3RD DAM  
CIVIL DETAILS

HEET

C-6





**APPENDIX D**  
**STANTEC SPECIFICATION SECTION 31 35 26 EROSION CONTROL**  
**BARRIER (SILT FENCE)**

## SECTION 31 35 26 - EROSION CONTROL BARRIER (SILT FENCE)

### PART 1 -- GENERAL

#### 1.1 THE SUMMARY

- A. The CONTRACTOR shall submit an Erosion and Sediment Control Plan to the US Forest Service and Project ENGINEER for approval prior to construction. The plan may include BMP measures including erosion control barriers, revegetation, straw-waddles, straw bales, etc.

#### 1.2 CONTRACTOR SUBMITTALS

- A. Submittals shall be in accordance with Section 01 33 00 – CONTRACTOR SUBMITTALS.
- B. Product Data: Manufacturer's catalog sheets on geotextile fabrics.

### PART 2 -- PRODUCTS

#### 2.1 FABRIC

- A. Fabric may be woven or non-woven, made from polypropylene, polyethylene, or polyamid, and shall contain sufficient UV inhibitors so that it will last for 2 years in outdoor exposure.
- B. Fabric shall have the following properties:

Parameter	Standard Method	Value
Grab tensile strength	ASTM D 4632	100 lb
Burst strength	ASTM D 3786	200 psi
Apparent opening size	ASTM D 4751	Between 200 and 70 sieve size

- C. Fabric Manufacturer, or equal

##### 1. **Mirafi**

#### 2.2 POSTS

- A. Posts shall be wood, at least 2-inches by 2-inches, at least 6-feet long.

#### 2.3 FENCING

- A. Woven wire fabric fencing shall be galvanized, mesh spacing of 6-inches, maximum 14- gauge, at least 30-inches tall.

## 2.4 FASTENERS

- A. Fasteners to wood posts shall be steel, at least 1-1/2 inches long.

## PART 3 -- EXECUTION

### 3.1 PREPARATION

- A. Provide erosion control barriers at the indicated locations and as required to prevent erosion and silt loss from the Site.
- B. CONTRACTOR shall not commence clearing, grubbing, earthwork, or other activities which may cause erosion until barriers are in place.

### 3.2 INSTALLATION

- A. Barrier systems shall be installed in such a manner that surface runoff will percolate through the system in sheet flow fashion and allow sediment to be retained and accumulated.
- B. Attach the woven wire fencing to the posts that are spaced a maximum of 6 feet apart and embedded a minimum of 12-inches. Install posts at a slight angle toward the source of the anticipated runoff.
- C. Trench in the toe of the filter fabric barrier with a spade or mechanical trencher so that the downward face of the trench is flat and perpendicular to the direction of flow. Lay fabric along the edges of the trench. Backfill and compact.
- D. Securely fasten the fabric materials to the woven wire fencing with tie wires.
- E. Reinforced fabric barrier shall have a height of 18-inches.
- F. Provide the filter fabric in continuous rolls and cut to the length of the fence to minimize the use of joints. When joints are necessary, splice the fabric together only at a support post with a minimum 6-inch overlap and seal securely.

### 3.3 MAINTENANCE

- A. Regularly inspect and repair or replace damaged components of the barrier. Unless otherwise directed, maintain the erosion control system until final acceptance; then remove erosion and sediment control systems promptly.
- B. Remove sediment deposits when silt reaches a depth of 6-inches or 1/2 the height of the barrier, whichever is less. Dispose of sediments on the Site, if a location is indicated on the Drawings, or at a site arranged by the CONTRACTOR which is not in or adjacent to a stream or floodplain.

- END OF SECTION -

**APPENDIX E**  
**STANTEC SPECIFICATION SECTION 31 35 28 EROSION CONTROL**  
**BARRIER (VEGETATIVE)**



## SECTION 31 35 28 - EROSION CONTROL (VEGETATIVE)

### PART 1 -- GENERAL

#### 1.1 THE SUMMARY

- A. The CONTRACTOR shall provide erosion protection including fertilizing, seeding, and mulching for all disturbed areas that are not to be paved or otherwise treated in accordance with the Contract Documents. CONTRACTOR shall provide a list of seed and fertilizer types to the Logan District, US Forest Service office, and ENGINEER for final approval. Additional information pertaining to Erosion Control measures is provided on Drawing C-1 of the Contract Drawings.
- B. The CONTRACTOR shall submit an Erosion and Sediment Control Plan, including the use of BMP's other than vegetation, to be reviewed and approved by the US Forest Service and project ENGINEER prior to construction.

### PART 2 -- PRODUCTS

#### 2.1 MATERIALS

- A. Fertilizer: Fertilizer shall be a commercial, chemical type, uniform in composition, free-flowing, conforming to state and federal laws and suitable for application with equipment designed for that purpose. Fertilizer shall have a guaranteed analysis showing not less than 11 percent nitrogen, 8 percent available phosphoric acid, and 4 percent water soluble potash.
- B. Seed: Seed shall be delivered in original unopened packages bearing an analysis of the contents. Seed shall be guaranteed 95 percent pure with a minimum germination rate of 80 percent. CONTRACTOR shall submit information on seed type to the Logan District, US Forest Service office and ENGINEER for approval.
  - 1. Seed mix shall be equal parts by weight of fescue and perennial ryegrass or perennial ryegrass and barley.
- C. Mulch: Mulch shall be a fibrous, wood cellulose product produced for this purpose. It shall be dyed green and shall contain no growth or germination inhibiting substances, and shall be manufactured so that when thoroughly mixed with seed, fertilizer, and water, in the proportions indicated it will form a homogenous slurry which is capable of being sprayed. The mulch shall be Silva Fiber as manufactured by **Weyerhaeuser Company**; Conwood Fiber as manufactured by **Consolidated Wood Conversion Corp.**; or equal.
- D. Erosion Control Fabric:
  - 1. Materials: As provided by supplier.
  - 2. Anchorage Devices: Nine-inch, 2-legged staples from the manufacturer or staples of the proper length as recommended by the manufacturer for specific soil condition.
- E. Manufacturers, or Equal
  - 1. **North American Green**
  - 2. **Synthetic Industries**

## **PART 3 -- EXECUTION**

### **3.1 GENERAL**

- A. Weather Conditions: Fertilizing, seeding, or mulching operations will not be permitted when wind velocities exceed 15 miles per hour or when the ground is frozen, unduly wet, or otherwise not in a tillable condition.
- B. Soil Preparation: The ground to be seeded shall be graded in conformance with the Drawings and shall be loose and reasonably free of large rocks, roots, and other material which will interfere with the work.
- C. Method of Application: Fertilizer, seed, and mulch may be applied separately (Dry Method), or they may be mixed together with water and the homogeneous slurry applied by spraying (Hydraulic Method), except that all slopes steeper than 3 units horizontal to 1 unit vertical shall be stabilized by the Hydraulic Method.

### **3.2 DRY METHOD**

- A. Fertilizing: The fertilizer shall be spread uniformly at the rate of 800 lbs per acre (approximately 1 lb per 55 square feet). The fertilizer shall be raked in and thoroughly mixed with the soil to a depth of approximately 2-inches prior to the application of seed or mulch.
- B. Seeding: The seed shall be broadcast uniformly at the rate of 60 lbs/acre (approximately 1 lb per 730 sq ft). After the seed has been distributed it shall be incorporated into the soil by raking or by other approved methods.
- C. Mulch Application: Mulch shall be applied at the rate of 1,500 lb (air dried weight) per acre (approximately 1 lb per 30 sq ft).

### **3.3 HYDRAULIC METHOD**

- A. The hydraulic method consists of the uniform application by spraying of a homogeneous mixture of water, seed, fertilizer, and mulch. The slurry shall be prepared by mixing the ingredients in the same proportions as indicated above. The slurry shall have the proper consistency to adhere to the earth slopes without lumping or running. Mixing time of materials shall not exceed 45 minutes from the time the seeds come into contact with the water in the mixer to the complete discharge of the slurry onto the slopes, otherwise the batch shall be recharged with seed. The mixture shall be applied using equipment containing a tank having a built-in, continuous agitation and recirculation system, and a discharge system which will allow application of the slurry to the slopes at a continuous and uniform rate. The application rates of the ingredients shall be the same as those specified for the Dry Method. The nozzle shall produce a spray that does not concentrate the slurry nor erode the soil.

### **3.4 WATERING**

- A. Upon completion of the erosion control seeding, the entire area shall be soaked to saturation by a fine spray. The new planting shall be kept watered by a sprinkling system on the Site during dry weather or whenever necessary for proper establishment of the planting until final project acceptance. At no time shall the planting be allowed to dry out. Care shall be taken to avoid excessive washing or puddling on the surface and any such damage caused thereby shall be repaired by the CONTRACTOR.

### 3.5 MAINTENANCE PRIOR TO FINAL ACCEPTANCE

- A. The CONTRACTOR shall maintain the planted areas in a satisfactory condition until final acceptance of the project. Such maintenance shall include the filling, leveling, and repairing of any washed or eroded areas, as may be necessary, and sufficient watering to maintain the plant materials in a healthy condition. The ENGINEER may require replanting of any areas in which the establishment of the vegetative ground cover does not appear to be developing satisfactorily.

### 3.6 MAINTENANCE AFTER FINAL ACCEPTANCE

- A. The CONTRACTOR shall water the permanently planted areas sufficiently to maintain the plant materials in a healthy condition during the 1 year correction period.

- END OF SECTION -

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**APPENDIX F**  
**UDNR STREAM ALTERATION PERMIT**





GARY R. HERBERT  
Governor

SPENCER J. COX  
Lieutenant Governor

# State of Utah

## DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER  
Executive Director

### Division of Water Rights

KENT L. JONES  
State Engineer/Division Director

## ORDER OF THE STATE ENGINEER

FOR STREAM ALTERATION APPLICATION NUMBER **15-25-10SA**  
IN THE NAME OF CITY OF LOGAN (3<sup>RD</sup> DAM REHABILITATION) FOR ALTERATION  
TO THE LOGAN RIVER IN CACHE COUNTY, UTAH

This **ORDER** is issued pursuant to statute and in accord with the statutory criteria for approval of a stream alteration application that are described at UTAH CODE ANN. § 73-3-29. The State Engineer has determined that this application does meet the necessary legal criteria to **ORDER** the approval of the application based upon the following information and reasoning set forth in the Findings of Fact and Discussion.

### FINDINGS OF FACT

1. The application was received by the Division of Water Rights ("Division") on December 22, 2015, and made available for comment on the Division's webpage, provided to pertinent governmental agencies, and to other entities as warranted, for a period of 20 calendar days, said period concluding prior to January 11, 2016.
2. The application contains the following information:
  - The stated description of the proposed project is: Rehabilitation of dam (Logan 3<sup>rd</sup> Dam) associated with the Logan River in Cache County.
  - The stated purpose of the proposed project is: To facilitate safety concerns.
3. The Division received comments or objections on the proposed project from:
  - State Floodplain Manager - Kathy Holder
  - Trout Unlimited - James DeRito
  - USACE - U.S. Army Corps of Engineers (Corps) - Hollis Jencks

The comments or objections received by the Division are summarized as follows:

- Kathy Holder indicates that she requires the Applicant to get a floodplain permit from their local Floodplain Administrator (FPA) and to make sure they are in compliance with the NFIP with the local FPA. For additional information, Kathy Holder can be contacted at 801-538-3332 or at [kcholder@utah.gov](mailto:kcholder@utah.gov).
- James DeRito of Trout Unlimited expressed concern regarding replacement of vegetation with the roller-compacted concrete and extended riprap as well as downstream dewatering and sediment mobilization.
- The Corps has indicated that they are requiring separate permitting. For more information, Hollis Jencks can be reached at 801-295-8380 extension 18.



### DISCUSSION

1. Based on a review of the Division's water rights records and/or a review of the application by personnel of the Division's regional office, it is the opinion of the State Engineer that the project will not impair vested water rights.
2. It is the opinion of the State Engineer that the project will not unreasonably or unnecessarily affect recreational use or the natural stream environment.
3. It is the opinion of the State Engineer that the project will not unreasonably or unnecessarily endanger aquatic wildlife.
4. It is the opinion of the State Engineer that the project will not unreasonably or unnecessarily diminish the natural channel's ability to conduct high flows.
5. Other comments or concerns submitted by interested persons or parties are not believed to be within the purview of the State Engineer in evaluating an Application to Alter a Natural Stream.
6. Care should be taken to limit impacts from vegetation removal, dewatering, and sediment mobilization.

### ORDER

Stream Alteration Application No. **15-25-10SA**, submitted in the name of City of Logan (3<sup>rd</sup> Dam Rehabilitation), applicant, in order to complete rehabilitation of dam (Logan 3<sup>rd</sup> Dam) associated with the Logan River, a natural stream located in Cache County, Utah, is hereby **APPROVED**, as a **STATE ONLY PERMIT**, contingent upon the conditions outlined in this **ORDER**. The applicant is hereby authorized to conduct the work detailed in the application and supporting documentation, as described in this **ORDER**. Any modification or addition to the work may require additional authorization and/or application resubmittal.

1. The expiration date of this order is **March 10, 2018**. Work affecting the bed and/or banks of the stream may not be conducted after the expiration date. A request for extension must be submitted in writing to the Division and include an explanation for project delay. The request must be submitted at least 30 days prior to expiration of the order.
2. A copy of this order must be kept onsite at any time the work authorized under this order is in progress.
3. We suggest that you coordinate with potentially impacted landowners.
4. Photos must be taken before and after project construction and submitted to this office.

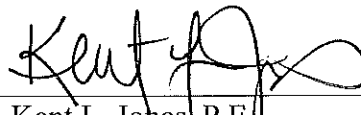
5. Disturbed areas must be planted with a variety of appropriate vegetation (especially woody vegetation where feasible) to help hold the soil around riprap, prevent excessive erosion, and to help maintain other riverine functions. Successful revegetation efforts must be monitored and reported to this office.
6. Best Management Practices should be implemented and maintained during any streamside or instream work to minimize sedimentation, temporary erosion of stream banks, and needless damage or alteration to the streambed.
7. Approval of this application does not authorize trespass, easements, rights-of-way, or any other access and land use permits. It is the responsibility of the applicant to obtain any such authorizations as may be necessary for this proposal.
8. Excavated material and construction debris may not be wasted in any stream channel or placed in flowing waters, this will include material such as grease, oil, joint coating, or any other possible pollutant. Excess materials must be wasted at an upland site well away from any channel. Construction materials, bedding material, excavated material, etc. may not be stockpiled in riparian or channel areas.
9. Erosion control, revegetation, and noxious weed control must be implemented and monitored until revegetation becomes well established. Success of these measures must also be reported prior to the compliance inspection. This is especially important for all disturbed areas, including fill, in order to prevent sediments from entering flowing water. Particular attention is required to assure that silt fencing is properly installed and left in place until after revegetation becomes established at which time the silt fence can then be carefully removed.
10. Ingress and egress access should be kept to a minimum.
11. Machinery must be properly cleaned and fueled offsite.
12. Riprap must consist of only clean, properly sized angular rock, which must be keyed deeply into the streambed to prevent undercutting. A filter must be placed behind if necessary (i.e., if soils are fine grained, non-cohesive, and/or erodible). Demolition debris or refuse will not be allowed, nor material such as bricks, concrete, asphaltic material [either natural (tar sand, oil shale, etc.) or man-made].
13. Cement is toxic to aquatic organisms, and its introduction into waters of the United States would constitute a violation of the Clean Water Act. Cement or concrete may not be allowed to enter stream flows. Water must be excluded from areas where concrete or cement is used until it has set. Contaminated water pumped from the construction area may not be discharged in a manner that will allow it to enter flows. Equipment used during this type of work must be washed well away from the channel.

14. Work must be accomplished during a period of low flow. Sediment introduced into stream flows during construction must be controlled to prevent increases in turbidity downstream. Flows must be diverted away from the construction area using a non-erodible cofferdam or other means of bypass.
15. Care should be taken to limit impacts from vegetation removal, dewatering, and sediment mobilization. Coordination with the Division of Wildlife Resources and the Division of Water Quality would help to address these issues.
16. Rehabilitation of the dam needs to be coordinated with the office of Dam Safety. Dave Marble can be contacted at 801-538-7376 for more information.

Your contact with the Division is Daren Rasmussen, who can be reached at telephone number 801-538-7377.

This **ORDER** is subject to the provisions of UTAH ADMIN. CODE R. 655-6-17 of the Division of Water Rights and to UTAH CODE ANN. §§ 63G-4-302 and 73-3-14, which provide for persons or parties with legal standing to file either a Request for Reconsideration with the State Engineer or an appeal with the appropriate District Court. A Request for Reconsideration must be filed with the State Engineer within 20 days of the date of this **ORDER**. However, a Request for Reconsideration is not a prerequisite to filing a court appeal. A court appeal must be filed within 30 days after the date of this **ORDER**, or if a Request for Reconsideration has been filed, within 30 days after the date the Request for Reconsideration is denied. A Request for Reconsideration is considered denied when no action is taken within 20 days after the Request is filed.

Dated this 10<sup>th</sup> day of March, 2016.

  
\_\_\_\_\_  
Kent L. Jones, P.E.  
State Engineer

Page 5  
15-25-10SA  
March 10, 2016

Mailed a copy of the foregoing Order this 10<sup>th</sup> day of March, 2016, to:

CITY OF LOGAN  
233 NORTH MAIN STREET  
LOGAN UT 84321

Corps of Engineers  
Will Atkin - Regional Engineer  
Richard Clark - EPA  
Scott Walker - Regional Wildlife Habitat Manager  
Dave Marble - Division of Water Rights, Dam Safety  
James DeRito - Trout Unlimited, [JDeRito@tu.org](mailto:JDeRito@tu.org)  
Kathy Holder - Division of Emergency Management, [kcholder@utah.gov](mailto:kcholder@utah.gov)  
MWH Americas

By: Tiffany Gonzales  
Tiffany Gonzales  
Secretary

**APPENDIX G**  
**STANTEC SPECIFICATION SECTION 31 23 19**  
**DEWATERING SPECIFICATION**



## SECTION 31 23 19 - DEWATERING

### PART 1 -- GENERAL

#### 1.1 THE SUMMARY

- A. The CONTRACTOR shall dewater trench and structure excavations, in accordance with the Contract Documents. The CONTRACTOR shall secure all necessary permits to complete the requirements of this Section of the Specifications.
- B. During the construction of the facilities authorized by this license, the CONTRACTOR shall maintain, immediately below the point of diversion in the Logan River, the following continuous minimum flows or the natural flows, whichever are less, as measured immediately below the point of proposed diversion:

January through March	33 cfs
April	31 cfs
May through June	30 cfs
July	31 cfs
August through November	33 cfs
December	36 cfs

cfs = cubic feet per second

#### 1.2 CONTRACTOR SUBMITTALS

- A. Furnish submittals in accordance with Section 01 33 00 – CONTRACTOR SUBMITTALS.
- B. Prior to commencement of excavation, the CONTRACTOR shall submit to the ENGINEER, State of Utah Division of Water Rights – Dam Safety and the State of Utah Division of Wildlife Resources, a detailed plan and operation schedule for dewatering of excavations and lowering of the upstream reservoir at Logan 3<sup>rd</sup> Dam (dam). The detailed plan shall include the design basis, drawings, and specifications as well as mitigation measures to prevent settlement of nearby structures (including Highway 89), maintaining minimum instream flows past the dam, reservoir dewatering rates (drawdown rate), fish capture and release program, and a contingency plan for restoring nearby structures if settlement is observed as a result of the CONTRACTOR's dewatering operations. The CONTRACTOR shall coordinate work activities with the Utah Division of Wildlife Resources (DWR) to minimize stress and mortality rate on fish living in the reservoir. DWR has agreed to work with the CONTRACTOR by providing necessary field personnel to monitor fish habitat and perform electric shocking and relocation of fish as necessary to mitigate mortality and minimize biological stress. It is the CONTRACTOR's responsibility to report construction activities (two-weeks prior) to DWR and coordinate efforts for DWR to perform their work. The CONTRACTOR's dewatering plan is subject to review by the ENGINEER, State of Utah Division of Water Rights – Dam Safety, and Utah Division of Wildlife Resources.

### 1.3 QUALITY CONTROL

- A. It shall be the sole responsibility of the CONTRACTOR to control the rate and effect of the dewatering in such a manner as to avoid all objectionable settlement and subsidence of structures and the adjacent roadway, and to not strand fish within water pockets in the reservoir during drawdown or pools downstream from the dam.
- B. All dewatering operations shall be adequate to assure the integrity of the finished project and livelihood of aquatic resources within the reservoir and shall be the responsibility of the CONTRACTOR.
- C. All structures or facilities that are located within the radius of influence of the CONTRACTOR's dewatering operation shall have reference points established and observed at frequent intervals to detect any settlement which may develop. The responsibility for conducting the dewatering operation in a manner which will protect adjacent structures and facilities rests solely with the CONTRACTOR. The CONTRACTOR shall survey, record and report the reference points on a daily basis, and submit the written log to the ENGINEER at the completion of construction. The ENGINEER shall be immediately notified should any sign of settlement is observed. The cost of repairing any damage to adjacent structures and restoration of facilities shall be the responsibility of the CONTRACTOR.
- D. Dewatering shall also consider potential soil movement (migration of materials) within the embankment foundation for the roadway. Drawdown of the reservoir shall be performed at a rate that is agreed to by DWR and does not cause potential for soil movement and erosion.
- E. Discharge from any dewatering operation shall be continuously monitored for turbidity in accordance with the State of Utah, Department of Environmental Quality - 401 Water Quality Certification attached as Appendix A to these specifications.

## PART 2 -- PRODUCTS

### 2.1 EQUIPMENT

- A. Dewatering, where required, may include the use of well points, sump pumps, temporary pipelines for water disposal, rock or gravel placement, and other means. Standby pumping equipment shall be maintained on the Site. Pumping units shall be equipped with necessary screening to prevent the entrainment of fish or other related aquatic resources.

## PART 3 -- EXECUTION

### 3.1 GENERAL REQUIREMENTS

- A. The CONTRACTOR shall provide all equipment necessary for dewatering. It shall have on hand, at all times, sufficient pumping equipment and machinery in good working condition and shall have available, at all times, competent workmen for the operation of the pumping equipment. Adequate standby equipment shall be kept available at all times to insure efficient dewatering and maintenance of dewatering operation during power failure.

- B. The CONTRACTOR shall provide all necessary equipment and perform continuous monitoring for turbidity at dewatering discharge locations in accordance with State of Utah Department of Environmental Quality, 401 Certification.
- C. Groundwater must be maintained two-feet below the bottom of the excavation before excavation work is to begin.
- D. Dewatering for structures and pipelines shall commence when groundwater is first encountered, and shall be continuous until such times as water can be allowed to rise in accordance with the provisions of this Section or other requirements.
- E. At all times, site grading shall promote drainage. Surface runoff shall be diverted from excavations. Water entering the excavation from surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps, and be pumped or drained by gravity from the excavation to maintain a bottom free from standing water.
- F. Dewatering shall at all times be conducted in such a manner as to prevent the removal of fines and preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation. Dewatering and associated drawdown of the reservoir shall be performed at a rate that is agreed upon with the ENGINEER, State of Utah Division of Wildlife Resources, State of Utah Division of Water Rights, and does not result in migration of soils (fines) within the embankment of the roadway or adjacent soils.

Contact: Clint Brunson  
[clintbrunson@utah.gov](mailto:clintbrunson@utah.gov)  
Northern Region Fisheries Biologist  
(385) 389-4624

- G. If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with drain rock.
- H. The CONTRACTOR shall maintain the water level below the bottom of excavation in all work areas where groundwater occurs during excavation construction, backfilling, and up to acceptance.
- I. Flotation shall be prevented by the CONTRACTOR by maintaining a positive and continuous removal of water. The CONTRACTOR shall be fully responsible and liable for all damages which may result from failure to adequately keep excavations dewatered.
- J. The CONTRACTOR shall provide two week (minimum) notification to DWR prior to any lower the reservoir and shall provide DWR with the opportunity to shock and remove fish as necessary for safe handling and transport. The CONTRACTOR shall be aware of any potential actions resulting in mortality of fish or other aquatic resources and shall be in continuous communication with DWR for prevention of mortality.
- K. If well points or wells are used, they shall be adequately spaced to provide the necessary dewatering and shall be sandpacked and/or other means used to prevent pumping of fine sands or silts from the subsurface. A continual check by

the CONTRACTOR shall be maintained to ensure that the subsurface soil is not being removed by the dewatering operation.

- L. The CONTRACTOR shall dispose of water from the WORK in a suitable manner without damage to adjacent property. CONTRACTOR shall be responsible for obtaining any permits that may be necessary to dispose of water. No water shall be drained into WORK built or under construction without prior consent of the ENGINEER. Water shall be filtered using an approved method to remove sand and fine-sized soil particles before disposal into any drainage system.
- M. The release of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill and prevent flotation or movement of structures, pipelines, and sewers.
- N. Dewatering of trenches and other excavations shall be considered as incidental to the construction of the WORK and all costs thereof shall be included in the various contract prices in the Bid Forms, unless a separate bid item has been established for dewatering.

- END OF SECTION -