CENWP-OD-NW 3 October 2016
Sediment Quality Team

Memorandum for the Record: Bonneville Dam, Bradford Island Fish Ladder, B-Branch Adult Fishway-erosion repair – no sediment testing required per the Clean Water Act section 404(b)(1) guidelines.

To: Ann B. Hodgson, Ph.D., Environmental Resource Specialist, Environmental Branch

Prepared by: James M. McMillan, Physical Scientist, Sediment Quality Team (SQT)

Introduction: This memorandum documents the Portland District's determination to not test project sediments associated with the erosion repair at the Bonneville Dam, Bradford Island Fish Ladder, B-Branch adult fishway. The District's determination was made in accordance with the 2016 *Sediment Evaluation Framework for the Pacific Northwest* (SEF) and the Clean Water Act section 404(b)1 guidelines. The SEF is used by the Portland District to evaluate the suitability of dredged material for unconfined, aquatic disposal, as required under the Clean Water Act section 404(b)(1) guidelines (see 40 CFR 230.60-230.61).

The Bonneville B-Branch Adult Fishway is one of the four fish ladder systems at the Bonneville Project that provide bypass routes for upstream migrating adult salmon, steelhead, lamprey and other fish species. It is also half of the Bradford Island fishway system, which includes the A-Branch. The B-Branch Fishway is located to the north of Bradford Island and south of the Spillway.

In 2011, unusually high summer flows with extended duration resulted in erosion under the B-Branch Fishway at the south shore of the spillway. This erosion resulted in an emergency repair contract which required the B-Branch to be dewatered to allow for repairs. The foundation of the fish ladder was compromised and the remedy involved grouting through holes in the bottom of the ladder. However, erosion was again discovered in June 2016 at the B-Branch Fishway at the south shore of the spillway.

Project Description: To repair erosion damage to the B-Branch Fishway, the District plans to excavate approximately 1,580 cubic yards of gravel, cobbles, and boulders that have accumulated at the toe of the slope below the adjacent spillway (Figure 1). The excavation area is approximately 150 ft. long by 35-50 ft. wide (0.15 acre).

The source of this material includes native rock from upstream (~20%) and rip rap from the 2011-2012 repair (~80%); Figure 2 illustrates the type of material that was excavated during the 2011-2012 repair. The selected contractor will excavate the rock, place it on a barge, and off-load the material at an approved upland location. The contractor will be responsible for the disposition of the material.

The B-Branch Fishway repair work area is 150 feet long, and approximately 40-50 feet wide on a 2:1 angle descending to the bottom of the channel. To protect the foundation of the Bradford Island fish ladder, rip rap will range in size from 1 ton to 7 tons (Figure 2). Rock will be keyed into the toe slope of the bank to stabilize the erosion protection measures.

Sediment Description: The erosion repair area is directly downstream of the Bonneville Dam spillway on the north bank of Bradford Island. The B-Branch excavation material consists of gravel, cobbles, and boulders (Figure 2). Current hydrographic surveys show that the accumulated material is similar to the material excavated in 2011-2012 (Figure 3). This rocky material is subject to highly energetic flows with maximum spill reaching 660,000 cfs and associated current speeds of 10-20 ft/s (Figure 4). As such, it is highly unlikely for fine-grained sediment (or associated contaminants) to accumulate below the spillway.

The rip rap to be used for the bank repair will be quarried from native basalt or a similarly resistant stone.

Site History Information: A description of potential sources of contamination appears in the Sediment Quality Team's 24 January 2014 "The Dalles Navigation Lock Sediment Quality Evaluation Report" (SQT, 2014) and the 28 January 2016 memorandum: "Bonneville Dam, Bradford Island Fish Ladder Exit Dredging Project – dredged material evaluation history and suitability determination" (SQT, 2016).

Though there are potential sources of contamination upstream of the project area, these would be associated with fine-grained material that is transported down the Columbia River as suspended sediment. Due to the highly energetic discharge at the Bonneville Dam spillway between Bradford and Cascades Islands, fine-grained material does not accumulate in the project area.

Regulatory Requirements for Sediment Evaluation: In accordance with section 404 of the Clean Water Act (40 CFR 260.60) and the 2016 SEF guidance, projects may be excluded from chemical testing if the following conditions are met:

1. Project sediments are composed of sand, gravel or other naturally occurring inert material in areas of high current with large bedloads or shifting bars and channels (>80% coarse-grained material and less than 0.5% total organic carbon [TOC] content); AND

2. The project area is sufficiently removed from sources of pollution to provide reasonable assurance that the proposed discharge material is not a carrier of contaminants.

The rock proposed for excavation meets both of these criteria. Though there are sources of contamination upstream of the project area, sediment-borne contaminants are associated with fine-grained sediment. Due to the highly energetic flows below the Bonneville spillway, fine-grained material does not accumulate in the project area. The figures included with this memorandum clearly show that the material in the project area is primarily rock (gravel, cobbles, and boulders).

Additionally, the excavated rock will be taken to an upland disposal location to be determined by the selected contractor, and so there is no aquatic discharge proposed for this material. Similarly, the quarried rock that will be placed to protect the bank meets the criteria listed above.

Suitability Determination: Both the excavation material and rip rap are suitable for unconfined, aquatic placement. Per the Clean Water Act section 404(b)(1) guidelines and the 2016 SEF, no additional chemical or physical testing is required.

Disposition of Excavated Rock: The selected contractor shall excavate the native rock and previous repair material (from the 2011-2012 repair) and place the excavated material on a barge. The excavated material will be offloaded at a facility to be determined by the contractor. Potential options for disposal of the excavated rock include the following:

1. Transport to an aggregate processing facility to be crushed and used as road base or other construction fill material. It will be the selected contractor's responsibility to determine the salability of the material.

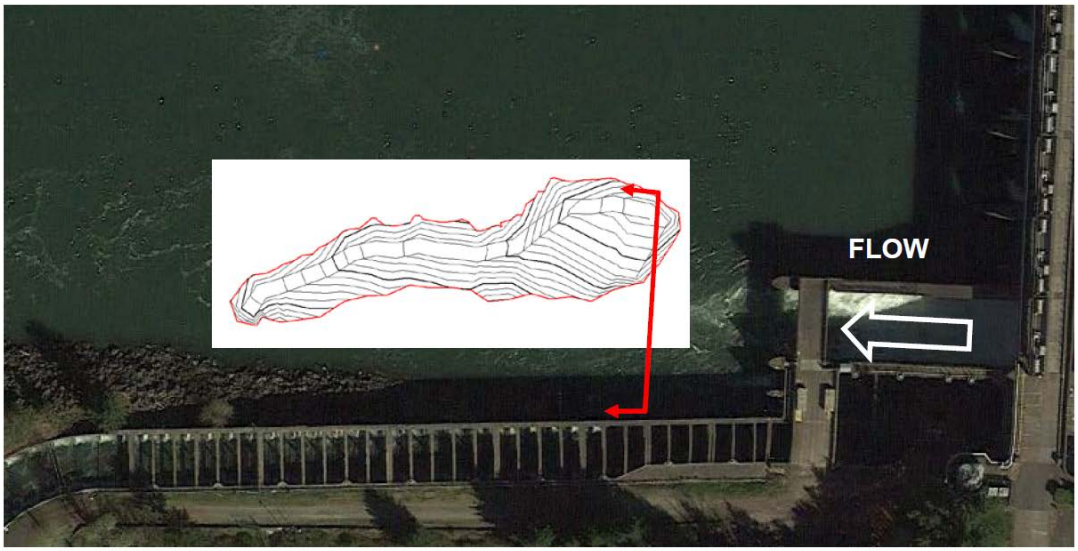
2. Transport to a state-permitted landfill to be determined by the contractor. It will be the selected contractor's responsibility to ensure that the material meets the landfill's acceptance criteria.

Contact: Questions regarding this memorandum should be addressed to James McMillan, Physical Scientist, SQT, either by telephone (503.808.4376) or email (james.m.mcmillan@usace.army.mil).

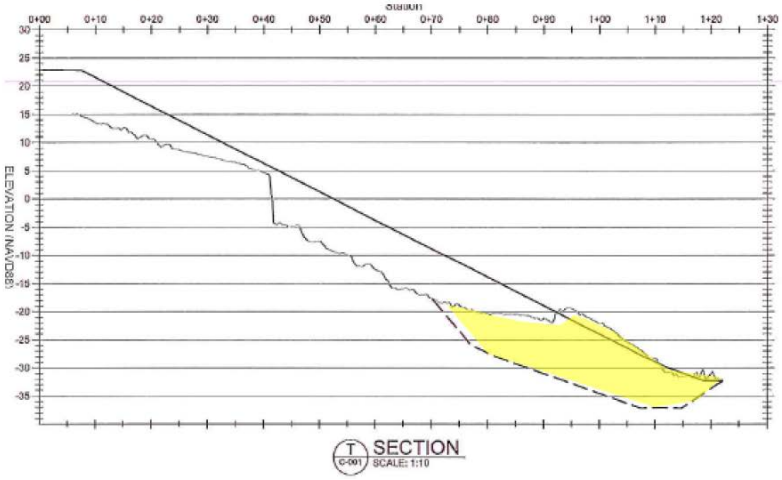
References:

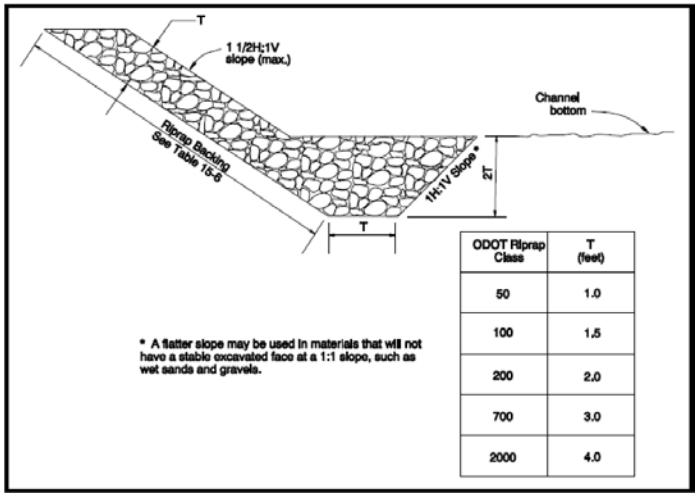
SQT. 2014. The Dalles Navigation Lock Sediment Quality Evaluation Report. *Prepared by* SQT, 24 January 2014, 7 pp. + figures and attachments.

SQT. 2016 (memorandum). "Bonneville Dam, Bradford Island Fish Ladder Exit Dredging Project – dredged material evaluation history and suitability determination." *Prepared by* SQT, 28 January 2016, 4 pp. + attachments.



a) Plan View of Dredge Extents with Contours





ODOT Riprap Class	T (feet)
50	1.0
100	1.5
200	2.0
700	3.0
2000	4.0

Figure 1. Bonneville Bradford Island Fish Ladder, B-Branch fishway erosion repair: approximate excavation area and cross-sectional views of excavation area and rip rap placement.

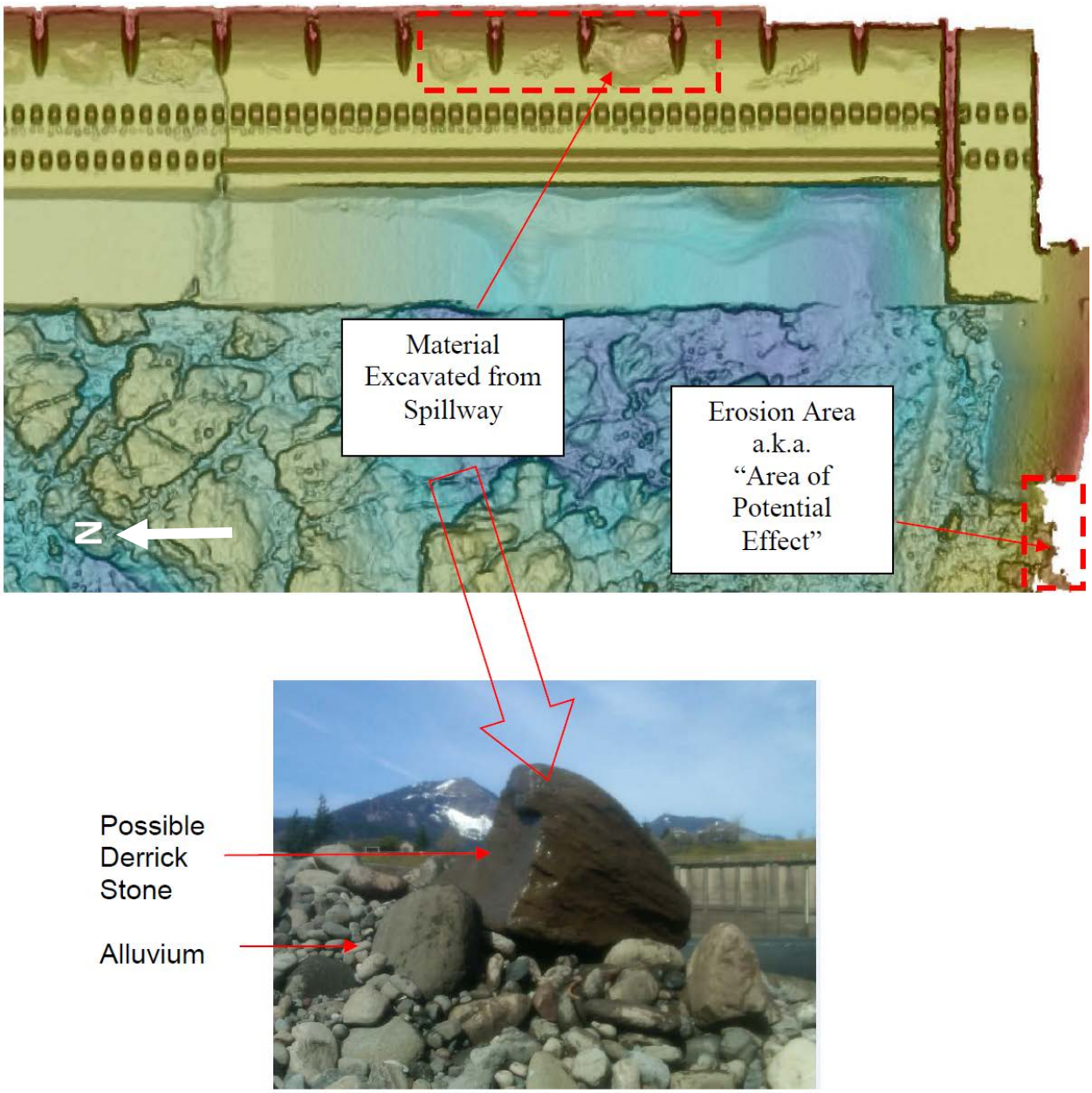


Figure 2. Hydrographic survey and photograph of material excavated during the Bonneville Bradford Island Fish Ladder, B-Branch fishway erosion repair project in 2011-2012.

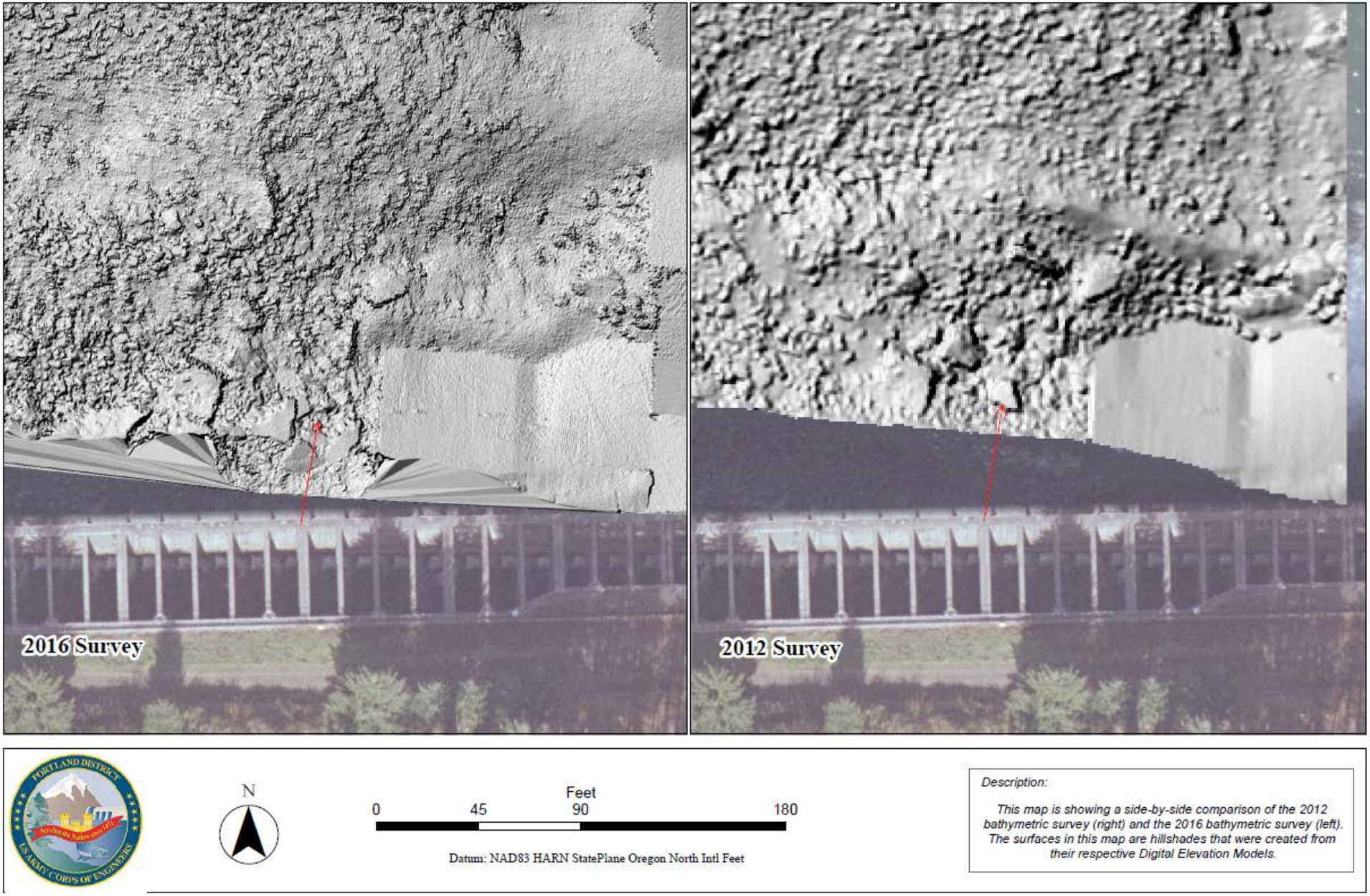


Figure 3. 2012 and 2016 hydrographic surveys of the Bonneville Bradford Island Fish Ladder, B-Branch fishway erosion repair project. Large boulders, cobbles, and gravel are the predominant materials below the spillway.

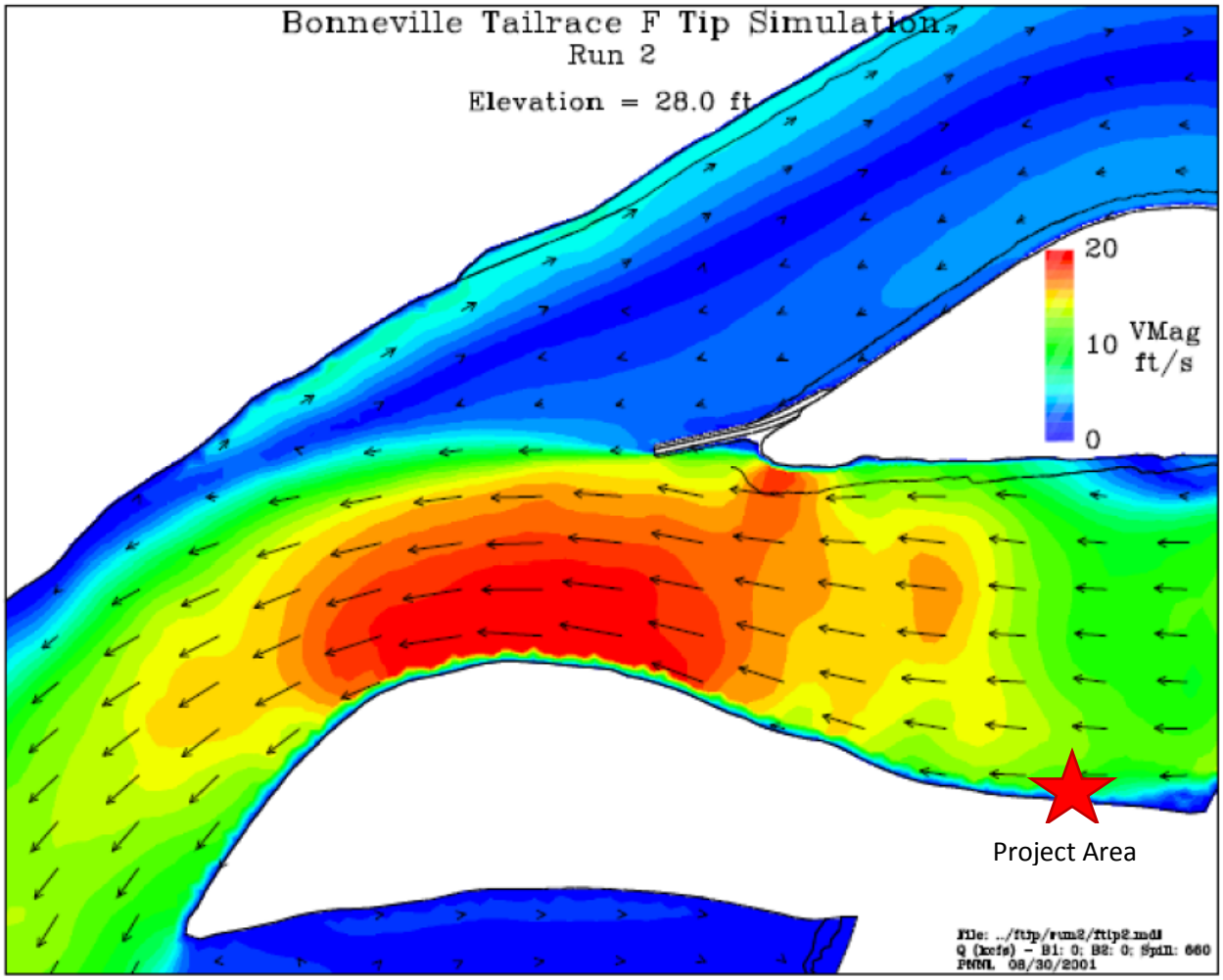


Figure 4. Bonneville Bradford Island Fish Ladder, B-Branch fishway erosion repair project: current velocities (ft/s) in the spillway tailrace at 660,000 cfs.