Technical Memorandum

10230 NE Points Drive
Suite 400
Kirkland, WA 98033
Phone (425) 822-4446
Fax (425) 827-9577

To: Clinton Brandon, Project Manager
Army Corps of Engineers City of Sammamish

From: Kevin O'Brien

Copies: Greg Laird, Courtney Moore, Tawni Dalziel, File

Date: 11/7/17

Subject: Addendum to SPIF and JARPA for Proposed Zackuse Creek Fish Passage Project, NWS 2017-529

Project No.: 32794

This technical memorandum represents an addendum to the Specific Project Information Form (SPIF) and the Joint Aquatic Resources Permit Application (JARPA) for the proposed Zackuse Creek; the documents were dated March 8, 2017 and May 30, 2017, respectively. Both documents were submitted to the Army Corps of Engineers on May 31, 2017. The proposed project is intended to improve fish passage, instream complexity, and spawning habitat for kokanee salmon. The project proposes to attain these objectives by replacing three culverts with stream-simulation designed culverts, realign the existing stream for 400 linear feet of Zackuse Creek, and place appropriate spawning gravels and large wood in the realigned portion of the stream.

Design elements, originally proposed in the May 31, 2017 Corps permit submittal package, have been altered as follows:

1. The culvert replacement under the East Lake Sammamish Parkway will still be designed per WDFW stream simulation criteria for fish passage. However, in order to avoid and minimize impacts to the stream, the project will install the fish-passable culvert per the following:

    a. Open cut through the roadway will still occur—no changes to timing or area affected are anticipated;

    b. However, sheet piling will be installed through the subgrade roadway peat material to a depth of competent load-bearing material—approximately 40-60 feet in depth;

    c. Sheet piling installation serves two purposes: allowing for dewatering of the culvert installation work area, and providing a long-term safety benefit with respect to roadway subsidence;

    d. Sheet piling installation will occur while the stream bypass, work isolation measures, and groundwater removal described in the JARPA and SPIF will be in place. As a

result of this work taking place in the dry (no surface water connection to the stream or lake), hydroacoustic effects to Zackuse Creek or Lake Sammamish are not anticipated.

2. The culvert replacement under East Lake Sammamish Parkway will involve more permanent wetland impacts than had previously been documented in the JARPA. The increase in wetland impact is an element of stabilizing the roadway and improving safety, per City of Sammamish requirements.

    a. Wetland 1/26A (see Otak JARPA, May 2017): An additional 1,330 square feet of permanent wetland fill will occur.

    b. Wetland 2: 13,330 square feet of conversion from wetland to stream habitat will occur.

    c. Wetland 2: 2,000 square feet of permanent wetland impact will occur, based on roadway safety design elements.

    d. The proposed stream realignment will convert existing wetland to stream habitat, and will involve 13,330 square feet of wetland conversion to fluvial habitat.

3. In addition to the change in wetland impact, several project elements associated with the stream realignment—primarily installations of instream and floodplain habitat features—have been altered.

4. An individual HPA will be acquired for the proposed project.

5. Revised, relevant JARPA design drawings accompany this technical memorandum. All other JARPA design drawings, submitted in May 2017, remain the same. All other elements described in the May 2017 JARPA and SPIF submittal remain the same.

The following tables represent the original JARPA table for wetland and stream impacts and the SPIF table for project elements, respectively, compared with the updated impact quantities and revised project elements. JARPA sheets 11-13

JARPA Table—Original and Revised Project Elements

Activity (fill, drain, excavate, flood, etc.)	Wetland Name	Wetland type and rating category	Impact area (sq. ft. or Acres)—Original Estimate	Impact area (sq. ft. or Acres)—Revised Estimate	Duration of impact	Proposed mitigation type	Wetland mitigation area (sq. ft. or acres)
Conversion—wetland to stream habitat	Wetland 2	PFO,PSS, PEM (Category II)	--	5,930 SF	Permanent	None	--
Excavate	Wetland 2	PFO,PSS, PEM (Category II)	5,930 SF	500 SF	Permanent	None	--
Fill	Wetland 2	PFO,PSS, PEM (Category II)	Same as excavation area	1,500 SF	Permanent	None	--
Clearing and Restoration	Wetland 2	PFO,PSS, PEM (Category II)	7,950 SF	5,523 SF	Temporary	None	--
Excavate	Wetland 1 / 26A	PFO,PSS (Category III)	399 SF	1,500 SF	Permanent	None	--
Fill	Wetland 1 / 26A	PFO,PSS (Category III)	Same as excavation	Same as excavation	Permanent	None	--
Clearing	Wetland 1 / 26A	PFO,PSS (Category III)	1,486 SF	No change	Temporary	None (restoration)	--
Clearing	26B	PEM (Category IV)	99	No change	Temporary	None (restoration)	--
Clearing	26C	PSS,PEM (Category IV)	248	No change	Temporary	None (restoration)	--

SPIF Table—Original and Revised Project Elements

Action Category	**Project Length and Width where applicable**	**Number of Structures**	**Revised Project Elements**
1. Fish Passage:			
a. Culvert Replacement and Relocation	3 culverts—12 ft. wide x 62 ft. long; 12 ft. wide x 19 ft. long; 12 ft. wide x 12 ft. long	3	No Change
b. Retrofitting Culverts			
c. Culvert Removal			
d. Tidegate Removal			
e. Removal or Modification of Sediment Bars or Terraces			
f. Temporary Placement of Sandbags, Hay Bales and Ecology Blocks			
g. Construction of Structures to Provide Passage over Small Dams			
2. Installation of Instream Structures:			
a. Placement of Woody Debris	Large woody debris to be placed within new stream channel; spaced along the entire length of	10	13

Action Category	**Project Length and Width where applicable**	**Number of Structures**	**Revised Project Elements**
	the stream of 450 LF.		
b. Placement of Live Stakes	Along entire sediment deposition area as delineated by former OHWM boundaries	10 foot spacing on center, 25% of tree plantings	No planting within OWHM; otherwise no change
c. Placement of Engineered Log Jams			Installed within overbank floodplain—6 ELJ structures to be constructed
d. Grade Control ELJs			
e. Trapping Mobile Wood			
f. Placement of Boulders	13 boulder bands (each 8 ft. wide x 1 ft. long)	26 1-man boulders and 52 2-man boulders total (2-1 man and 4 2-man per band)	6-12" boulders to be placed for each boulder band; no change in number of boulder bands
g. Boulder Weirs and Roughened Channels		13 boulder bands	No change
h. Gravel Placement Associated with Structure Placement	530 linear feet (stream realignment) 62 lf (ELS Parkway culvert) 124 lf (County culverts)		400 linear feet of gravel placement for stream realignment; no change otherwise; Total = 586 LF (4,688

Action Category	Project Length and Width where applicable	Number of Structures	Revised Project Elements
	Total = 690 LF (5,520 SF)		SF)
3. Levee Removal and Modification			
4. Side Channel/Off Channel Habitat Restoration and Reconnection			
5. Salmonid Spawning Gravel Restoration	716 LF (5,728 SF)		586 LF (4,688 SF)
6. Forage Fish Spawning Gravel Restoration			
7. Hardened Fords and Fencing for Livestock Stream Crossings			
8. Irrigation Screen Installation and Replacement			
9. Debris and Structure Removal			

Please contact me if you have any questions regarding the information contained herein.

Regards,

Otak, Incorporated

Kevin O'Brien, Ph.D. | Senior Ecologist