

Tech Memo

To: Chris Clemons, Yakama Nation UCHRP
Authors: Dan Miller, P.E.
Date: December 13, 2019
Re: Upper Burns & Angle Point Areas Habitat Enhancement Project – Soil Pits Summary

1. Introduction

Inter-Fluve and Wildlands completed soil pits and installation of piezometers at the Entiat River Upper Burns & Angle Point Areas Habitat Enhancement Project side channel sites on October 24, 2019. Field investigations were completed to inform design for potential for through flow side channels to the Entiat River. Entiat River flows during the field work were recorded at 100-cfs at the USGS 12452800 gage at Entiat River at Ardenvoir, WA (<https://waterdata.usgs.gov/nwis/uv?12452800>).

Six test pits were dug by Wildlands with hand operated power augers and shovels to depths up to 3.0 feet below ground (BG) along two side channels on the river right floodplain. Locations are shown in Figure 1. Four inch diameter PVC piezometers and hobo data loggers were installed in all pits. A hobo data logger (serial number 10569855) to record atmospheric pressures was installed in a branch of a hawthorn tree about 30 feet up valley of pit/ piezometer #6. Locations and elevations of the piezometers were surveyed and tied into the project topographic mapping.

The following sections describe and document work completed and the results.

2. Soil pits

2.1. PIT 1

Pit 1 is the eastern and most downstream of the pits and is located along the proposed downstream river right side channel. Soil Pit 1 was excavated to 1.9 feet below ground (BG). As shown on the soil profile graphic in the Appendix, soils from 0 to 1.0 feet BG is silty coarse sand; 1.0 to 1.9 feet BG is sandy gravel cobble with some stone sup to 9 inches in diameter. Water was encountered at 0.8 feet BG. The soil profile graphic includes photos of the pit and excavated material.

Hobo data logger serial number 10569876 was installed in the piezometer. Piezometer rim elevation is 1781.80 feet, ground elevation is 1779.83 feet, rim to groundwater depth at time of installation was 2.80 feet, rim to data logger depth is 3.69 feet and rim to bottom of piezometer is 3.85 feet.

2.2. PIT 2

Pit 2 is the middle pit located along the proposed downstream river right side channel. Soil Pit 2 was excavated to 2.6 feet below ground (BG). As shown on the soil profile graphic in the Appendix, soils from 0 to 1.8 feet BG is silty mucky sand; 1.8 to 2.6 feet BG is cobbly sand. Water was encountered at 1.25 feet BG. The soil profile graphic includes photos of the pit and excavated material.

Hobo data logger serial number 10329206 was installed in the piezometer. Piezometer rim elevation is 1782.84 feet, ground elevation is 1780.74 feet, rim to groundwater depth at time of installation was 3.35 feet, rim to data logger depth is 4.64 feet and rim to bottom of piezometer is 4.69 feet.

2.3. PIT 3

Pit 3 is the upstream pit located along the proposed downstream river right side channel. Soil Pit 3 was excavated to 2.9 feet below ground (BG). As shown on the soil profile graphic in the Appendix, all soils from 0 to 2.9 feet BG is silty sand with organics. Water was encountered at 0.80 feet BG. The soil profile graphic includes photos of the pit and excavated material.

Hobo data logger serial number 874180 was installed in the piezometer. Piezometer rim elevation is 1782.33 feet, ground elevation is 1780.61 feet, rim to groundwater depth at time of installation was 2.52 feet, rim to data logger depth is 4.41 feet and rim to bottom of piezometer is 4.61 feet.

2.4. PIT 4

Pit 4 is the downstream pit located along the proposed upstream river right side channel. Soil Pit 4 was excavated to 2.6 feet below ground (BG). As shown on the soil profile graphic in the Appendix, soils from 0 to 2.6 feet BG is silty sand. The pit encountered alluvium with stone to 10 inch diameter at the bottom of the pit. Water was encountered at 1.80 feet BG. The soil profile graphic includes photos of the pit and excavated material.

Hobo data logger serial number 10588348 was installed in the piezometer. Piezometer rim elevation is 1788.35 feet, ground elevation is 1786.50 feet, rim to groundwater depth at time of installation was 3.65 feet, rim to data logger depth is 4.41 feet and rim to bottom of piezometer is 4.46 feet.

2.5. PIT 5

Pit 5 is the middle pit located along the proposed upstream river right side channel. Soil Pit 5 was excavated to 3.0 feet below ground (BG). As shown on the soil profile graphic in the Appendix, soils from 0 to 3.0 feet BG is silty sand. Water was encountered at 2.0 feet BG. The soil profile graphic includes photos of the pit and excavated material.

Hobo data logger serial number 10569875 was installed in the piezometer. Piezometer rim elevation is 1788.70 feet, ground elevation is 1787.16 feet, rim to groundwater depth at time of installation was 3.53 feet, rim to data logger depth is 4.49 feet and rim to bottom of piezometer is 4.53 feet.

2.6. PIT 6

Pit 6 is the upstream pit located along the proposed upstream river right side channel. Soil Pit 6 was excavated to 2.6 feet below ground (BG). As shown on the soil profile graphic in the Appendix, soils from 0 to 2.6 feet BG is silty sand. The pit encountered alluvium with stone to 3 inch diameter at the bottom of the pit. Water was encountered at 1.90 feet BG. The soil profile graphic includes photos of the pit and excavated material.

Hobo data logger serial number 10588349 was installed in the piezometer. Piezometer rim elevation is 1790.33 feet, ground elevation is 1788.82 feet, rim to groundwater depth at time of installation was 3.41 feet, rim to data logger depth is 3.97 feet and rim to bottom of piezometer is 4.08 feet.

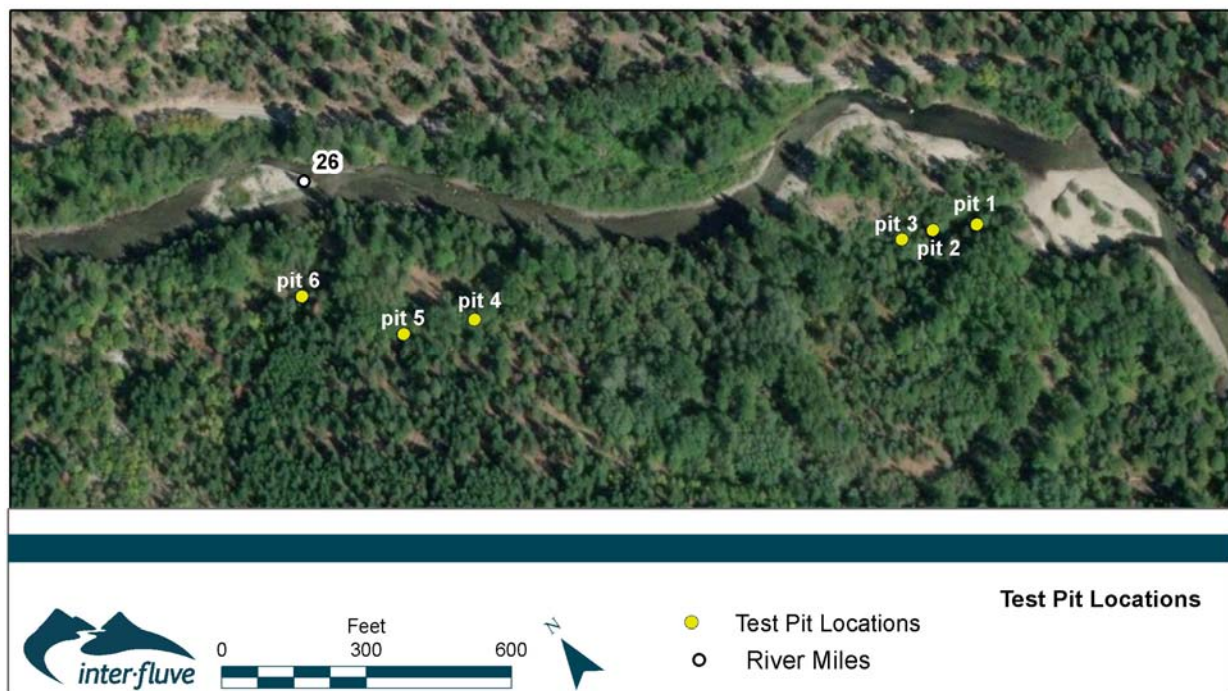


Figure 1. Location of test pits within the project area.

3. Soil Pit Profiles

Graphical summary of soil pit profiles is shown on the following pages.

PIT 1

DEPTH, FT	SYMBOL	DESCRIPTION EG ELEV = 1779.83-ft	DEPTH, FT	NOTES
0'				
		SILTY COARSE SAND	1.0'	WATER AT 0.83' DEPTH
		SANDY GRAVEL COBBLE WITH STONE TO 9-INCHES	1.9'	
2.5'				
5'				
7.5'				



PIT



EXCAVATED MATERIAL

PIT 2

DEPTH, FT	SYMBOL	DESCRIPTION EG ELEV = 1780.74-ft	DEPTH, FT	NOTES
0'				
		SILTY MUCKY SAND		
			1.8'	WATER AT 1.25' DEPTH
2.5'		COBBLY SAND	2.6'	
5'				
7.5'				




PIT



EXCAVATED MATERIAL

PIT 3

DEPTH, FT	SYMBOL	DESCRIPTION EG ELEV = 1780.61-ft	DEPTH, FT	NOTES
0'		SILTY SAND WITH ORGANICS		WATER AT 0.80'
				DEPTH
2.5'			2.9'	
5'				
7.5'				



PIT



EXCAVATED MATERIAL

PIT 4

DEPTH, FT	SYMBOL	DESCRIPTION EG ELEV = 1786.50-ft	DEPTH, FT	NOTES
0'				
		SILTY SAND		
				WATER AT 1.80'
2.5'			2.6'	DEPTH
		ALLUVIUM WITH STONE TO 10-INCH ENCOUNTERED AT BOTTOM OF PIT		
5'				
7.5'				




PIT



EXCAVATED MATERIAL

PIT 5

DEPTH, FT	SYMBOL	DESCRIPTION EG ELEV = 1787.16-ft	DEPTH, FT	NOTES
0'		SILTY SAND		
2.5'				
			3.0'	WATER AT 2.0' DEPTH
5'				
7.5'				



PIT



EXCAVATED MATERIAL

PIT 6

DEPTH, FT	SYMBOL	DESCRIPTION EG ELEV = 1788.82-ft	DEPTH, FT	NOTES
0'				
		SILTY SAND		
				WATER AT 1.90'
2.5'			2.6'	DEPTH
		ALLUVIUM WITH STONE TO 3-INCH ENCOUNTERED AT BOTTOM OF PIT		
5'				
7.5'				



PIT



EXCAVATED MATERIAL