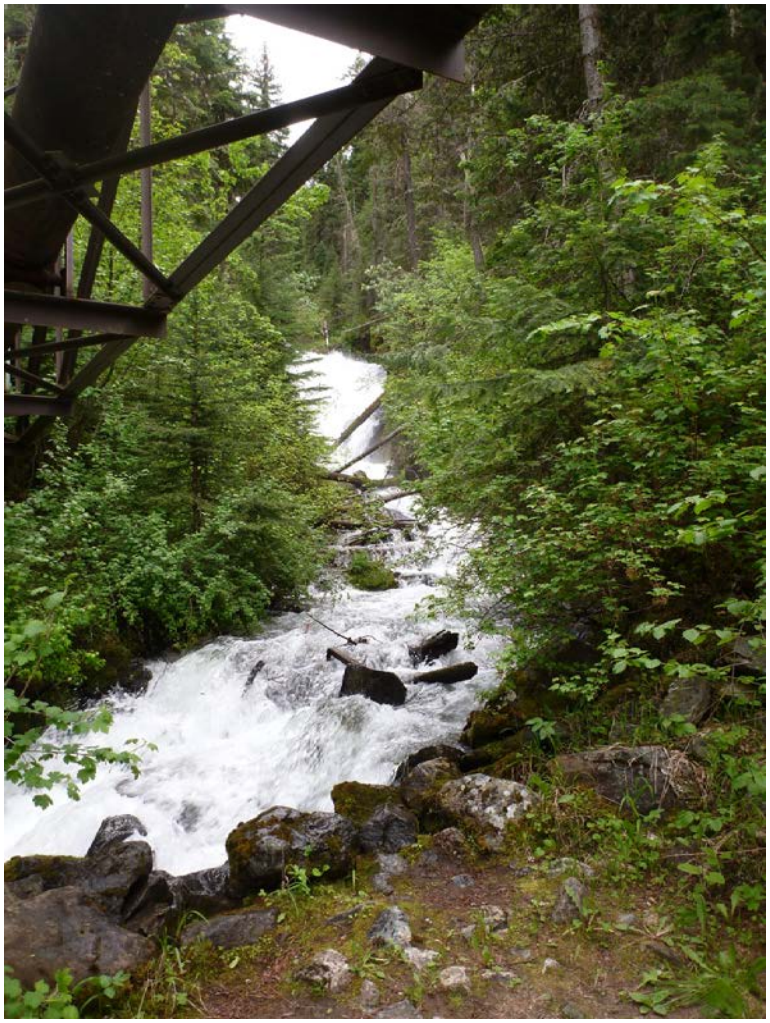
Wallowa Falls Hydroelectric Project
FERC Project No. P-308
Updated Study Report
(Final Technical Report)

Sediment and Substrate Characterization



PACIFICORP ENERGY
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Prepared By PacifiCorp Energy

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1.0 Introduction

PacifiCorp Energy (PacifiCorp) owns and operates the Wallowa Falls Hydroelectric Project located in Wallowa County in northeast Oregon, on the East Fork Wallowa River approximately 17.7 kilometers (11 miles) south of the town of Joseph near Wallowa Lake. The project is partially within the Wallowa-Whitman National Forest and consists of the following components (Figure 1) (PacifiCorp, 2012):

- a small concrete diversion dam and pipe, at elevation 5,838 feet (ft.) (1,779 meters (m)) on Royal Purple Creek which is a tributary to the East Fork Wallowa River;
- a rock-filled timber crib dam, at elevation 5,795 ft, (1,766 m) on the East Fork Wallowa River;
- a 0.2-acre forebay and 5,688 ft. (1,734 m) long steel penstock;
- a bypassed portion of the East Fork Wallowa River (approximately 1.75 miles (2,800 m) from the diversion dam to its confluence with the West Fork Wallowa River;
- a powerhouse containing a single generating unit with a rated capacity of 1.1 mw;
- a tailrace discharging Project flows into the West Fork Wallowa River; and,
- a 20 ft. (6.1 m) long, 7.2-kilovolt (kV) transmission line which connects to the local electric grid.

The Wallowa Falls Hydroelectric Project diverts up to 15 cfs of water from the East Fork Wallowa River (and 1 cfs from Royal Purple Creek) for power generation. Stream flows not diverted for power generation are passed through or over the Wallowa Falls diversion dam into the East Fork Wallowa River. The portion of the East Fork below the dam is referred to as the "bypassed reach". The East Fork Wallowa River flows into the West Fork Wallowa River approximately 1.75 miles (2,800 m) below the Wallowa Falls dam, which then flows into Wallowa Lake approximately 2.25 mile (3,621 m) below the dam.

The bypassed portion of the East Fork Wallowa River is characterized by steep rocky slopes that constrain the channel in a narrow v-shaped valley. The upper portion of the bypassed reach located from the diversion dam to approximately 1 mile (1,609 m) downstream is high gradient (19 percent) and characterized by numerous vertical waterfalls and cascades; substrate is dominated by bedrock and boulders. Downstream from this reach, the lower 4,058 ft. (1237 m) of the bypassed reach to the confluence of the West Fork Wallowa River, is characterized by a gentler gradient (8.5 percent) and numerous riffles and pools (PacifiCorp 2011b).

The East Fork Wallowa River is a snowmelt runoff stream. As such snow acts as an important flow regulator or storage mechanism, holding a significant portion of the precipitation in the area during the winter and releasing it later in the year as it melts. Peak runoff generally occurs from May through mid-July, from melting snowpack. By late July little snow is left in the Wallowa Mountains. Runoff recedes to low flows by August and September. Flows may increase in the fall in response to autumn rains, but relatively low flows generally persist from late fall through winter. Freezing conditions in the contributing high-elevation watershed areas can result in little or no direct runoff through the winter months (PacifiCorp 2011b).

Over time, sediment from mass wasting events upstream are transported through the natural form and function of the East Fork Wallowa River and a portion accumulates in the Project forebay. This sediment accumulation requires regular flushing to prevent damage to the penstock and generating unit. The current Federal Energy Regulatory Commission (FERC) license restricts forebay flushing to the period of May 1 through August 30 of each year for the protection of kokanee eggs and sac fry in the gravel areas upstream of Wallowa Lake. Flushing

activities have the potential to increase suspended sediment concentrations downstream of the forebay (PacifiCorp, 2011). The forebay was last flushed in 2009; some sediment was released from the forebay when it was dewatered in 2012 for sediment sampling and surveying. In 2011 PacifiCorp initiated discussions with the U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (USACE) and the Oregon Department of Environmental Quality regarding necessary permitting and consultation for future forebay flushing under the current FERC license. To determine baseline conditions and potential impacts of regular flushing of sediment from the project forebay into the bypassed reach, PacifiCorp completed studies to assess sediment quality and substrate characteristics in the Project forebay and bypassed reach. This technical report describes PacifiCorp's approach and results for sediment and substrate characterization.

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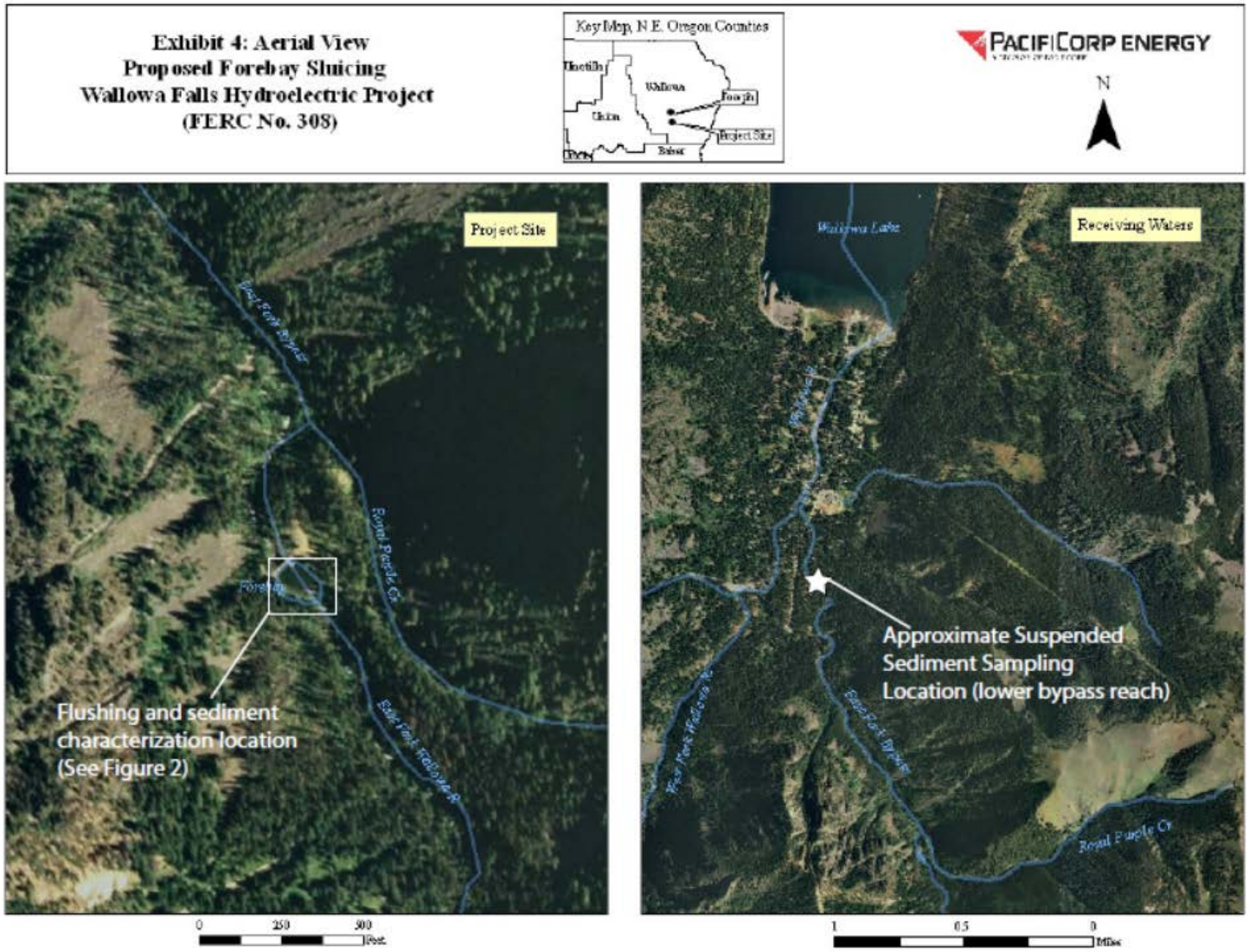


Figure 1. Overview map of forebay and downstream area

2.0 Purpose and Objectives

The purpose of this report is to analyze potential effects of future forebay flushing on water quality, substrate composition, and aquatic resources in the Wallowa Falls Project bypassed reach. Specific objectives include:

- Determine volume of sediment accumulated in the Project forebay;
- Characterize grain size and metals content of sediment in the forebay;
- Obtain baseline turbidity conditions in the bypassed reach during spring high flows; and
- Characterize surface and subsurface grain size distribution in the lower bypassed reach after a sediment release from the forebay.

2.1 Study Area

The study area includes the East Fork Wallowa River from just upstream of the Project forebay to the confluence with the West Fork Wallowa River. Additional substrate sampling was conducted in the West Fork Wallowa River for comparison with the East Fork data.

3.0 Methods

Field activities included a volumetric survey and grain size/metals sampling of forebay sediments, turbidity monitoring in the bypassed reach, and substrate sampling in the East Fork and West Fork Wallowa River. Table 1 summarizes data collected. Each of these activities is discussed in more detail in the following sections.

Table 1. Summary of Sediment Sampling Methods

Data Collected	Methods
Forebay sediment volumetric survey	Professional surveyor surveyed surface and base of fine grain sediment deposit of drained forebay.
Forebay sediment bulk metal concentrations (mg/kg)	Sediment samples were collected from the forebay; results were obtained from the analytical testing at a Test America laboratory.
Forebay sediment particle size distribution (ASTM D422 standard sieve sizes plus hydrometer)	Sediment samples were collected from the forebay; results were obtained from the analytical testing at a Test America laboratory.
Bypassed reach suspended sediment concentrations (mg/L)	Surface water samples were collected in the lower bypassed reach in June 2012; results were obtained from the analytical testing at a Test America laboratory.
Bypassed Reach continuous turbidity monitoring	Turbidity monitoring was collecting for the entire month of June 2012 in the lower bypassed reach using a sonde.
East and West Fork Wallowa River substrate grain size analysis	Surface pebble counts were conducted using the Wolman pebble count method; subsurface bulk samples were collected at three sites and analyzed for grain size at a Test America laboratory.

3.1 Forebay Sampling

3.1.1 Sediment Volumetric Survey

On August 13, 2012 sediment sampling and a bathymetric survey was conducted in the forebay to characterize and estimate the volume of material likely to be mobilized during forebay flushing. The forebay was drained prior to the survey. The survey was conducted by Haner, Ross and Sporseen Engineers.

3.1.2 Forebay Surface Sediment Sampling

It was assumed that the composition of the sediment deposited in the forebay was homogenous with depth (vertically), but varied spatially (longitudinally in the upstream-to downstream direction). Based on these assumptions, surface sediment samples were collected to characterize the material in the forebay. It was assumed that the material was spatially heterogeneous, with coarser material near the forebay inlet and finer material near the penstock intake. Based on this assumption, the forebay was divided into three sampling units radiating from the point of inflow. For each of these three units, a composite sample consisting of five discrete samples was collected (sampling map provided in Attachment B). The three composited samples from the sampling units were homogenized and placed in containers for subsequent laboratory analysis of grain size distribution and metals. Sediment samples were analyzed for metals as prescribed in the Sediment Evaluation Framework for the Pacific Northwest (RSET, 2006)[1].

3.2 Suspended Sediment Sampling Measurements

One stream site in the lower bypassed reach downstream of the forebay (Figure 1) was identified for suspended sediment sampling to determine background sediment concentration during June high flows. The sampling location was at the downstream side of the road bridge, about 300 ft (100 m) upstream of the lower bypassed reach stream gage site. Four grab samples, evenly spaced across the wetted width of the river, were collected on June 14, 2012 and sent to a Test America lab for analysis.

Continuous turbidity monitoring for the month of June 2012 was conducted at the same location as the stream gage in the lower bypassed reach (Figure 1). Turbidity monitoring was attempted in June 2013, but the sensor malfunctioned and the data was lost.

3.3 Wolman Pebble Counts and Subsurface Grain Size in the East Fork and West Fork Wallowa River

During the week of October 22, 2012, five transect sites within the lower 4,058 ft. (1,237 m) of the bypassed reach were sampled for streambed grain size analysis (Figure 2). These same locations were sampled again on August 14, 2013. In 2013, two sites just upstream of the forebay (Transects 7 and 6) and two sites in the West Fork Wallow River upstream of the Project tailrace (Transects 9 and 8) were also sampled to provide data on substrate size in geomorphically similar areas not affected by forebay flushing. At each sampling location, a Global Positioning System (GPS) point was recorded, the wetted width of the channel was measured, the geomorphic habitat unit type[2] was identified and site conditions were photographed.

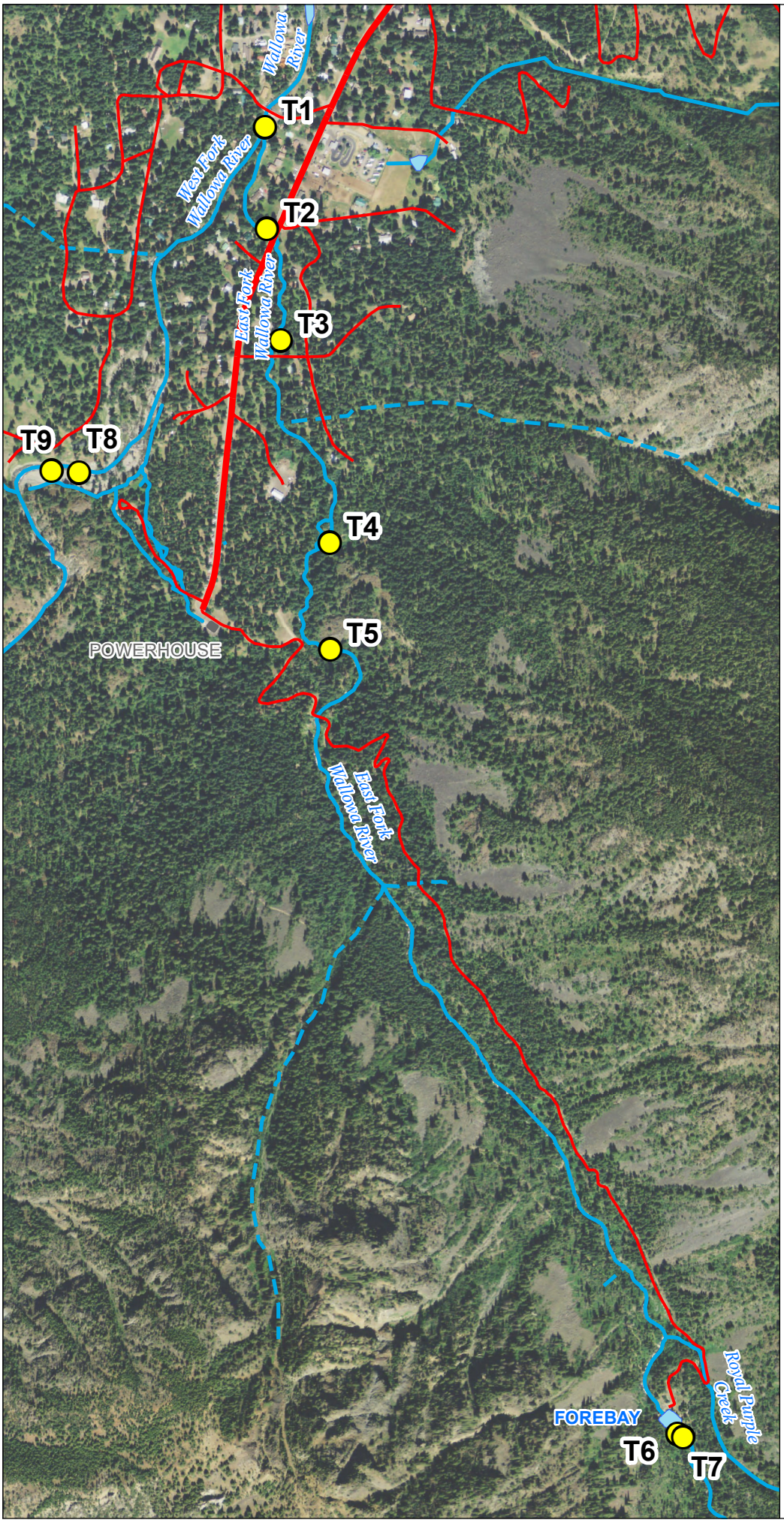
[1] Metals (RSET, 2006): antimony, arsenic, cadmium, chromium, copper, chromium, lead, mercury, selenium, silver and zinc.

[2] Geomorphic habitat units were characterized using the Oregon Department of Fish and Wildlife Methods for Stream Habitat Surveys and Aquatic Inventories. (Moore, et. al. 2002)

Surficial substrate was assessed using a Wolman pebble count technique at each sampling location. Particles were collected in a zig-zag line pattern across the stream, utilizing approximately a 30 degree turn angle, extending across the wetted width of the river channel. If 100 particles were not collected in one pass across the channel, the method was repeated going back across the channel in the opposite direction. Particle distance along each transect was one boot length or step apart. The intermediate axis of each particle[3] was measured in millimeters using a transparent metric ruler. For each transect, measured particles were put into size categories and converted to percentages by size class.

Quantitative sampling of the sub-armor layer (sediment below the coarse surface armor layer) was also conducted at three of the transect sites in 2012. Sub-armor sample locations were selected to be representative of the upper, middle and lower portions of the lower gradient 4,058 ft. (1237 m)of the bypassed reach. Quantitative sample locations were selected outside of the wetted width but within the ordinary high water mark (OHWM) of the river at transect locations 4, 3 and 2 (Photos 13, 16, and 19-20, respectively). At each sample site, surface stones as well as a sample of subsurface material were removed from an approximately 225 square inch (1,444 square centimeters) area and placed in three gallon buckets. Samples were sent to a Test America laboratory for grain size analysis.

[3] The intermediate axis is defined as neither the longest nor the shortest of three mutually perpendicular axes of a particle.



Legend

- Pebble Transect Locations
- Road
- Highway
- Perennial Stream
- Intermittent Stream
- Water Body

0 500 1,000

Feet

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12/12/2013 gisdept@pacificorp.com
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Figure 2: Pebble Count Transect Locations East Fork Wallowa River

4.0 Results and Discussion

4.1 Forebay Sediment

The forebay sediment survey was conducted on August 13, 2012. The water level in the forebay was drawn down prior to the August surveying, resulting in inadvertent erosion of some of the sediment deposited in the forebay. The survey report is provided as Attachment A, and shows both the forebay deposits as surveyed and the estimated sediment surfaces prior to formation of the erosion channels. A total of 244 cubic yards (223 cubic meters) of sediment were in the forebay at the time of the survey; the surveyor estimated that 560 cubic yards (512 cubic meters) of sediment were in the forebay prior to the drawdown event (an estimated 316 cubic yards (288 cubic meters) were released downstream during the drawdown prior to surveying).

The grain size of material within the forebay was sampled in three zones proceeding from upstream to downstream and was composed of primarily fine-grained sediment (sampling map provided in Attachment B). Between 67-77 percent of the sampled sediment was finer than 2 mm; 34-61 percent was finer than 0.63 mm (Table 2, Figures 3 and 4).

Table 2. 2012 Forebay Sampling Grain Size Distribution

		Percent of total in size class		
Size Categories	**Size Ranges (mm)**	**Unit A**	**Unit B**	**Unit C**
Silt and clay	≤ 0.063	4.8	13.8	10.3
Fine Sand	06063 - 0.25	18.9	43.2	17.8
Medium Sand	0.25 - 0.5	43.5	20.3	45.1
Coarse sand	0.5 - 2	18.3	14.1	18.5
Gravel	2 - 64	14.5	8.6	8.3
Cobble and larger	> 64	0	0	0

Given the location of the project forebay in close proximity to the Eagle Cap Wilderness, contamination in the forebay sediments was expected to be negligible and derived from natural sources. A mineral resource analysis of the area (Weis, et al., 1976) indicates the primary rock types upstream of the forebay are granodiorite, limestone, and argillite. There are a few minor mining claims within the watershed and the main potential for mining are silver, lead, gold, and copper. Therefore, the most likely contaminants would be naturally occurring metals. Composited sediment samples from the three zones of the project forebay were tested for antimony, arsenic, cadmium, chromium, copper, lead, selenium, silver, zinc, and mercury. The only metals that were above detection limits were chromium, copper, zinc, and mercury (Table 3); levels in the forebay sediments were well below the Sediment Quality Guidelines (RSET 2006) and below ODEQ Screening Level Values (ODEQ 2001) except for copper which was just above the ODEQ screening values for two of the samples. The sediment metals data suggest that metals concentrations in Wallowa Falls Forebay sediments are low; below screening values set by DEQ. Two of the three sediment copper levels exceeded DEQ's 2001 screening levels for ecological risk assessment. However, a mineral resource analysis of the area identifies copper as the most abundant metal in the Eagle Cap Wilderness with significant concentrations documented in the Aneroid Basin directly upstream of the Wallowa Falls Dam and forebay (Weis et. al. 1976). Based on this information, concentrations of copper detected in sediments collected from the forebay do not represent levels elevated about natural background conditions, nor do they represent an ecological risk. Flushing of the sediments is not expected to have deleterious effects on

aquatic organisms during any future forebay flushing events. Detailed forebay sediment particle size and metals data are provided as Attachment B.

Table 3. Forebay Sediment Metals Test Results.

Metals Above Detection Limit	Unit A	Unit B	Unit C	Sediment Quality Guidelines (RSET 2006)	Screening Level Values (ODEQ 2001)
Chromium	8.1 mg/Kg	12 mg/Kg	9 mg/Kg	95-100 mg/Kg	37 mg/Kg
Copper	22 mg/Kg	38 mg/Kg	38 mg/Kg	80-830 mg/Kg	36 mg/Kg
Zinc	38 mg/Kg	53 mg/Kg	44 mg/Kg	130-400 mg/Kg	123 mg/Kg
Mercury	0.14 mg/Kg	ND	ND	0.25-075 mg/Kg	0.2 mg/Kg

ND – not detectable.

4.2 Turbidity Monitoring

Continuous turbidity monitoring at the stream gage in the lower bypassed reach was conducted in June 2012. The purpose of this monitoring was to develop a record of background turbidity for a typical June runoff period prior to future forebay flushing events. Turbidity levels ranged from 3.5 to 29.7 Nephelometric Turbidity Units (NTU) and correlated with flow (Figure 3). Comparison of the June 2012 turbidity and flow data indicates that turbidity peaked with initial high flows later returned to baseline conditions despite two additional high flow events that occurred later in the month. The highest turbidity was recorded during the first high flow event in June, where flow reached 80 cfs and turbidity peaked at 29.7 NTU. Subsequent flow peaks near 80 cfs did not result in such high turbidity levels (9.7-10.3 NTU) suggesting that the first high flow of the spring runoff season may flush accumulated fine sediment through the system.

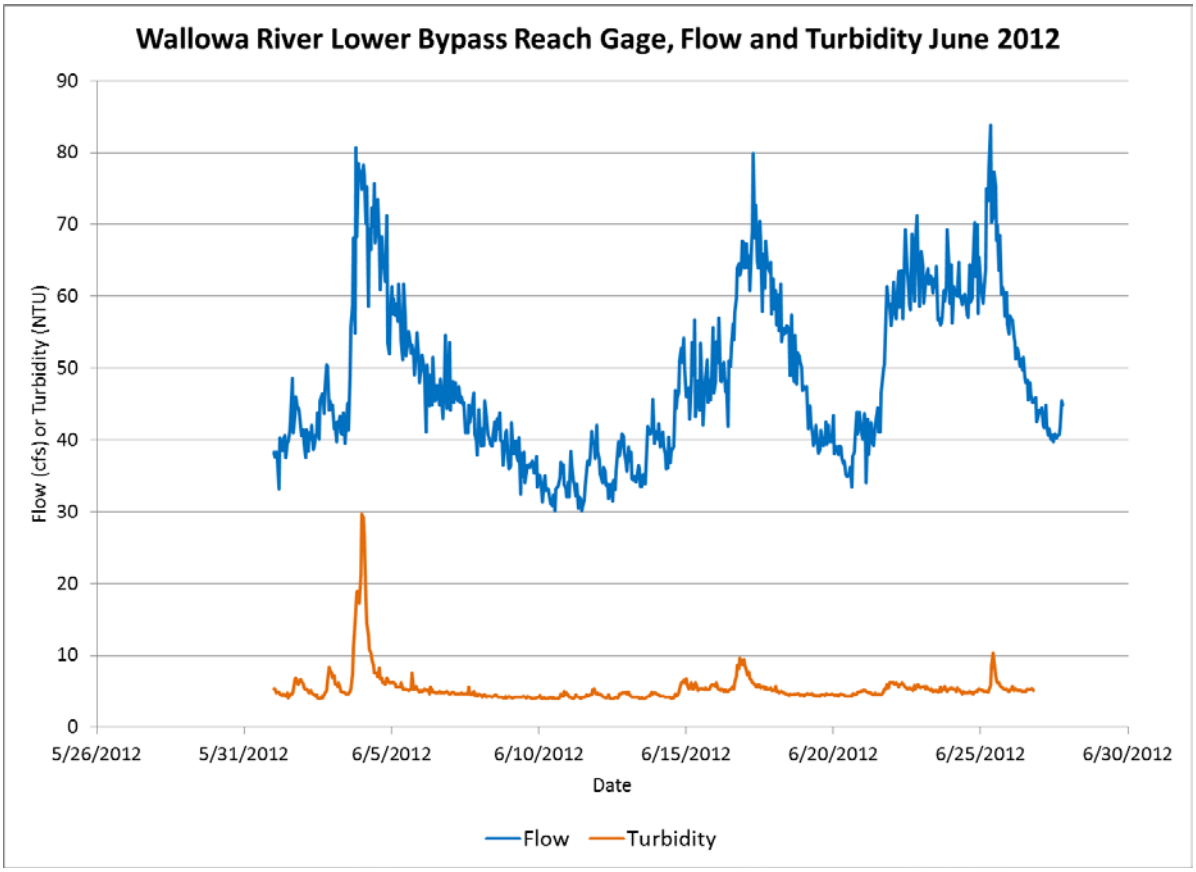


Figure 3. Flow and Turbidity in Wallowa River Lower Bypassed Reach, June 2012.

All four water samples collected for suspended sediment sampling during June 2012 were below the laboratory reporting limit of 34 mg/L. Detailed suspended sediment and turbidity monitoring results are provided as Attachment C.

4.3 Instream Substrate Characterization

The bypassed portion of the East Fork Wallowa River from the diversion dam to its confluence with the West Fork Wallowa River is approximately 2,800 meters (1.75 miles) long. There is a naturally occurring fish passage barrier, in the form of a 15 ft. (4.6 m) waterfall (Photo 3), approximately. 4,058 ft (1237 m)above the East Fork's confluence with the West Fork. Substrate was sampled in cascade, riffle, and pool tailout locations in the bypassed reach, just upstream of the forebay, and in the West Fork Wallowa River. Wetted stream widths at the transects ranged from 13.4 to 35 ft. (4.08 to 10.67 m) and gradient from 2 to 3 percent. A summary of transect site characteristics at the nine substrate sample locations is provided in Table 4.

Table 4. Substrate Sampling Transect Locations and Descriptions.

Transect #	Location	Wetted Width	Average Gradient	Habitat Unit Type	Photo Reference
9 (2013)	West Fork Wallowa River: In front of third snag on river left upstream of mess hall.	35 ft (10.7 m)	3%	Cascade over boulder	1
8 (2013)	West Fork Wallowa River: In front of Boy Scout mess hall.	35 ft. (10.7 m)	3%	Cascade over boulder	2
7 (2013)	Above project forebay	19.5 ft. (6.0 m)	3%	Riffle	4
6 (2013)	Above project forebay	13.7 ft. (4.2 m)	3%	Pool tailout	5 and 6
5	Above abandoned well house/old staff gage site at abandoned water intake.	14.2 ft. (4.3 meters)	2%	Cascade over boulder	7 and 8
4	At channel split near USFS maintenance yard	12 ft.side channel (3.7 m); 13.4 ft main channel (4.1 m)	2% 3%	Side channel - Riffle Main channel – Cascade over boulder	9 and 10 11 and 12
3	At IFIM Transect 13	15 ft. (4.6 m)	2%	Riffle/glide	14 and 15
2	Approximately 20 meters below road bridge	18.3 ft. (5.6 m)	3%	Riffle	17 and 18
1	Immediately above confluence of the East and West Fork Wallowa Rivers.	13.4 ft. (4.1 m)	3%	Riffle	21and 22

4.3.1 Armor Layer Data (Pebble Counts)

The 2012 pebble counts were completed in October 2012 after the Project forebay was drained for surveying in August of 2012. During the draining of the forebay approximately 316 cubic yards of sediment was unintentionally evacuated from the forebay through the low level outlet pipe. The 2012 Pebble count data reflects streambed surface conditions after this sediment input to the bypassed reach[4]. Pebble count data collected in August 2013 represent conditions one year after the sediment release.

[4] Due to the time of year of sampling, each transect site was assessed prior to sample collection to confirm that no fish redds were observed within the sample area.

Results of the substrate sampling are shown in Tables 5 and 6 and Figures 4 and 5. On average over 50 percent of the substrate samples from both 2012 and 2013 were gravel sized material. The amount of fine-grained sediment (sand, silt, clay) in the bypassed reach is of particular concern, in as much as it may be effected by planned forebay flushing events. In 2012, sampled substrate in the bypassed reach ranged from 12 to 38.7 percent sand and finer. In 2013 sand and finer at each bypassed reach sample site was generally less than during 2012 and ranged from 14.8 to 33.9 percent. The percent sand and finer in samples upstream of the forebay ranged from 14.5-21.9 percent, similar to the 2013 sampling in the bypassed reach, suggesting that the level of fines in the bypassed reach is similar to areas not being influenced by forebay flushing.

The bypassed reach transect with the highest levels of fine-grained sediment during both years, Transect 4, is likely being influenced by a very low gradient side channel which includes primarily fine-grained substrate.

A photo was also taken on the East Fork Wallowa River 35.5 m above the road bridge. Bull trout were observed spawning in this location in September 2010 and there were potential redds observed in this area during the October 2012 surveys. Therefore, no pebble count transect was done at this location. However, photos of this location were taken so that temporal changes in surface substrate conditions can be documented (photo 23). A photo of this location taken in 2013 (photo 24) shows similar levels of fine gravels and sand as observed in 2012. This is likely due to there being a slower backwater eddy and side channel on river right, which is where there is a notable fine sediment deposit.

Table 5. 2012 Substrate Samples Grain Size Distribution

		2012 Percent of total in size class in bypassed reach transects				
Size Categories	**Size Ranges (mm)**	**Transect 5**	**Transect 4[5]**	**Transect 3**	**Transect 2**	**Transect 1**
Sand and Fines	≤2 mm	23.1	36.9	38.7	23.1	12.0
Very fine gravel	2 - 4	1.1	3.7	12.6	4.4	2.8
Fine Gravel	5 - 8	6.3	13	3.6	9.7	9.3
Medium gravel	9 - 16	9.5	5.5	9.9	9.7	20.6
Course gravel	17 - 32	14.7	13.9	8.1	12.4	24.2
Very course gravel	33 - 64	11.6	6.5	10.8	15.0	15.9
Small cobble	65 - 90	10.5	1.9	5.4	6.2	2.8
Medium cobble	91 - 128	10.5	0.9	5.4	3.5	2.8
Large cobble	129 - 180	3.2	4.6	2.7	4.4	2.8
Very large cobble	181 - 255	0	4.6	0.9	3.5	4.7
Small boulder	256 - 512	9.5	1.9	0.9	6.2	1.8
Medium boulder	513 - 1024	0	0	0.9	0	0

[5] An additional 5.5 percent of the cumulative pebble count at this transect was classified as woody debris, leaves and sticks and 0.9 % was classified as bedrock.

Table 6. 2013 Substrate Samples Grain Size Distribution

		2013 Percent of total in size class in bypassed reach transects				
Size Categories	**Size Ranges (mm)**	**Transect 5**	**Transect 4**	**Transect 3**	**Transect 2**	**Transect 1**
Sand and Fines	≤2 mm	15.4	33.9	18.9	15.5	14.8
Very fine gravel	2 - 4	10.3	6.5	7.1	15.5	7.8
Fine Gravel	5 - 8	12.0	14.5	16.5	16.5	16.5
Medium gravel	9 - 16	6.8	12.1	20.5	16.5	14.8
Course gravel	17 - 32	9.4	14.5	18.1	11.7	18.3
Very course gravel	33 - 64	12.8	8.1	9.4	9.7	12.2
Small cobble	65 - 90	12.8	2.4	1.6	6.8	7.0
Medium cobble	91 - 128	6.0	1.6	2.4	2.9	2.6
Large cobble	129 - 180	2.6	3.2	3.1	2.9	0.9
Very large cobble	181 - 255	7.7	0.8	0.8	1.0	3.5
Small boulder	256 - 512	1.7	1.6	1.6	1.0	1.7
Medium boulder	513 - 1024	0	0	0	0	0

Table 6 (continued). 2013 Substrate Samples Grain Size Distribution

		2013 Percent of total in size class upstream of forebay and in West Fork Wallowa River transects			
Size Categories	**Size Ranges (mm)**	**Transect 6 (upstream of forebay)**	**Transect 7 (upstream of forebay)**	**Transect 8 (West Fork Wallowa)**	**Transect 9 (West Fork Wallowa)**
Sand and Fines	≤2 mm	21.9	14.5	5.5	1.0
Very fine gravel	2 - 4	11.4	1.8	4.0	2.0
Fine Gravel	5 - 8	21.0	20.0	6.3	5.0
Medium gravel	9 - 16	8.6	17.3	12.7	3.0
Course gravel	17 - 32	4.8	10.9	12.7	11.0
Very course gravel	33 - 64	8.6	15.5	11.1	21.0
Small cobble	65 - 90	10.5	2.7	11.1	24.0
Medium cobble	91 - 128	5.7	3.6	6.3	5.0
Large cobble	129 - 180	3.8	8.2	9.5	10.0
Very large cobble	181 - 255	2.9	3.6	7.1	6.0
Small boulder	256 - 512	1.0	1.8	5.6	10.0
Medium boulder	513 - 1024	0	0	1.6	0

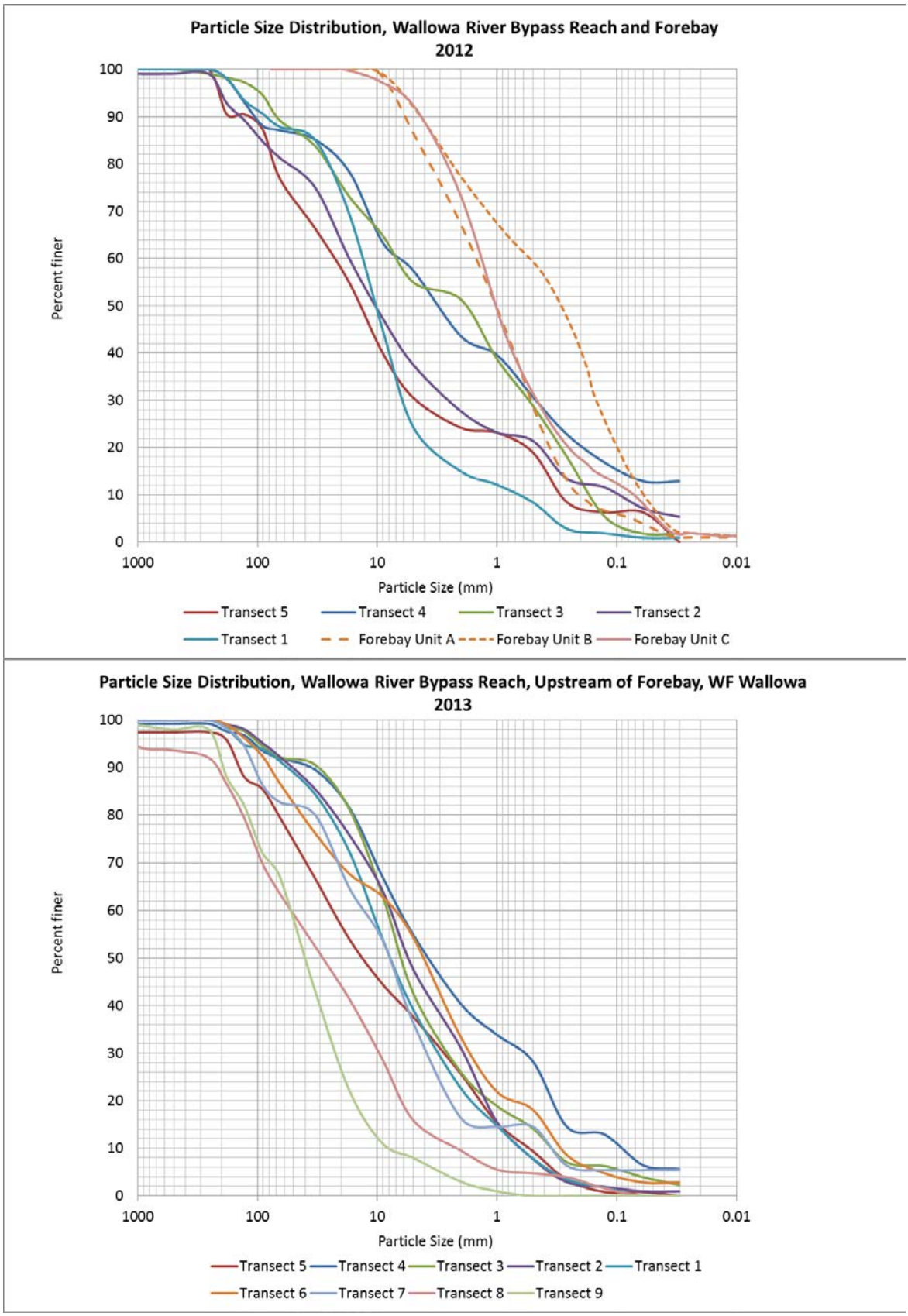


Figure 4. Sediment Percent Finer, 2012 and 2013 Substrate Samples.

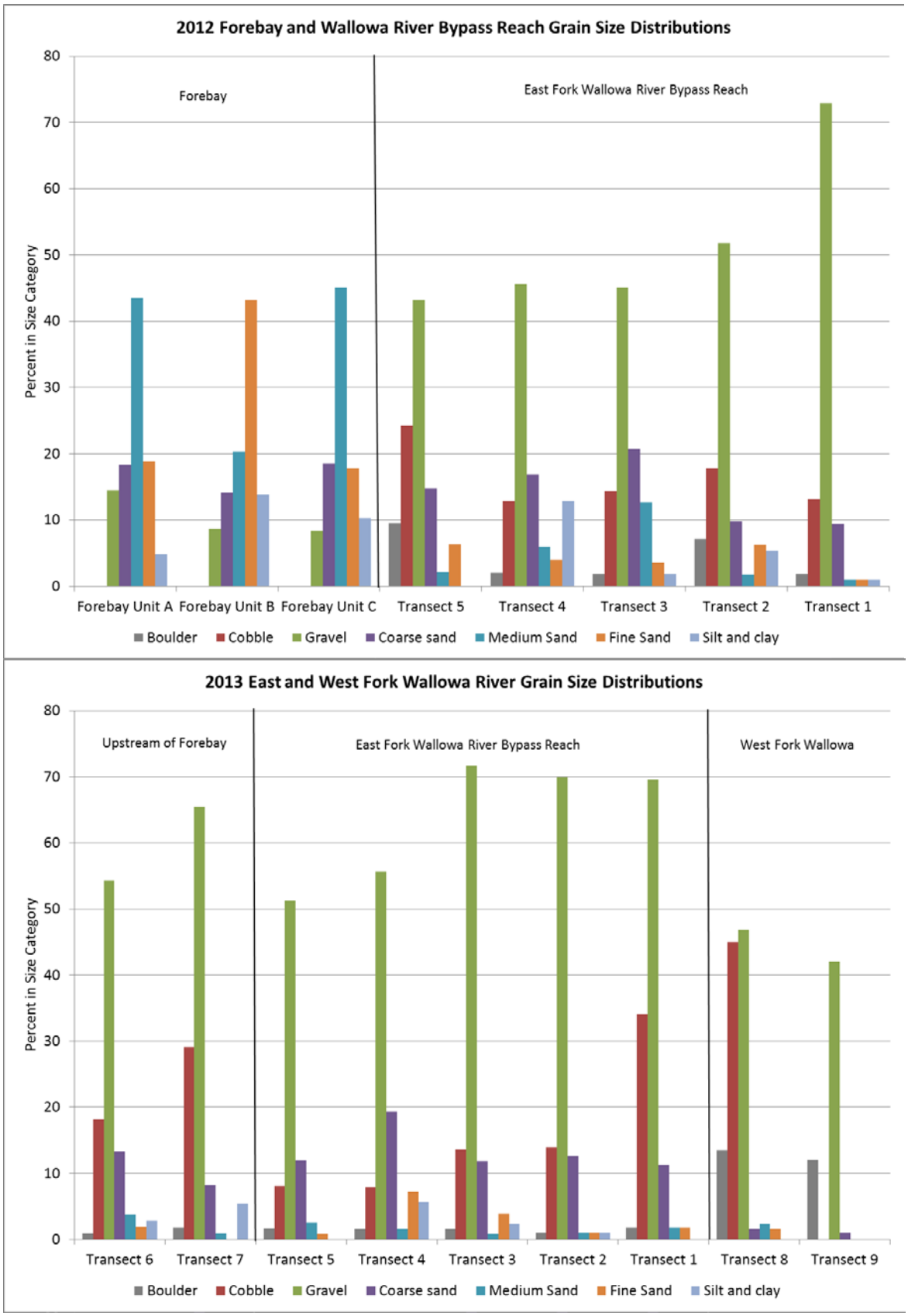


Figure 5. Particle Size Distributions, 2012 and 2013 Substrate Samples.

4.3.2 Sub-Armor Layer Data (Sieved Samples)

Sub-armor layer samples, taken at Transects 2, 3, and 4 in 2012, contained primarily gravel-sized sediment (Table 7, Figures 6 and 7). The sample from transect 3 was the finest-grained, with 44 percent sand and fines. Transect 2 contained only 8 percent sand/fines. Photos 13, 16, and 19-20 show the sample locations and detailed sub-surface particle size data is provided as Attachment D.

Table 7. 2012 Sub-surface Samples Grain Size Distribution

		2012 Percent of total in size class		
Size Categories	**Size Ranges (mm)**	**Transect 2**	**Transect 3**	**Transect 4**
Sand and Fines	≤2 mm	8.1	44.2	24.6
Very fine gravel	2 - 4	8.1	8.9	10.5
Fine Gravel	5 - 8	10.1	11.8	11.8
Medium gravel	9 - 16	30.1	13.5	7.2
Course gravel	17 - 32	3.5	21.6	0
Very course gravel	33 - 64	40.1	0	45.9
Cobble and larger	≥65	0	0	0

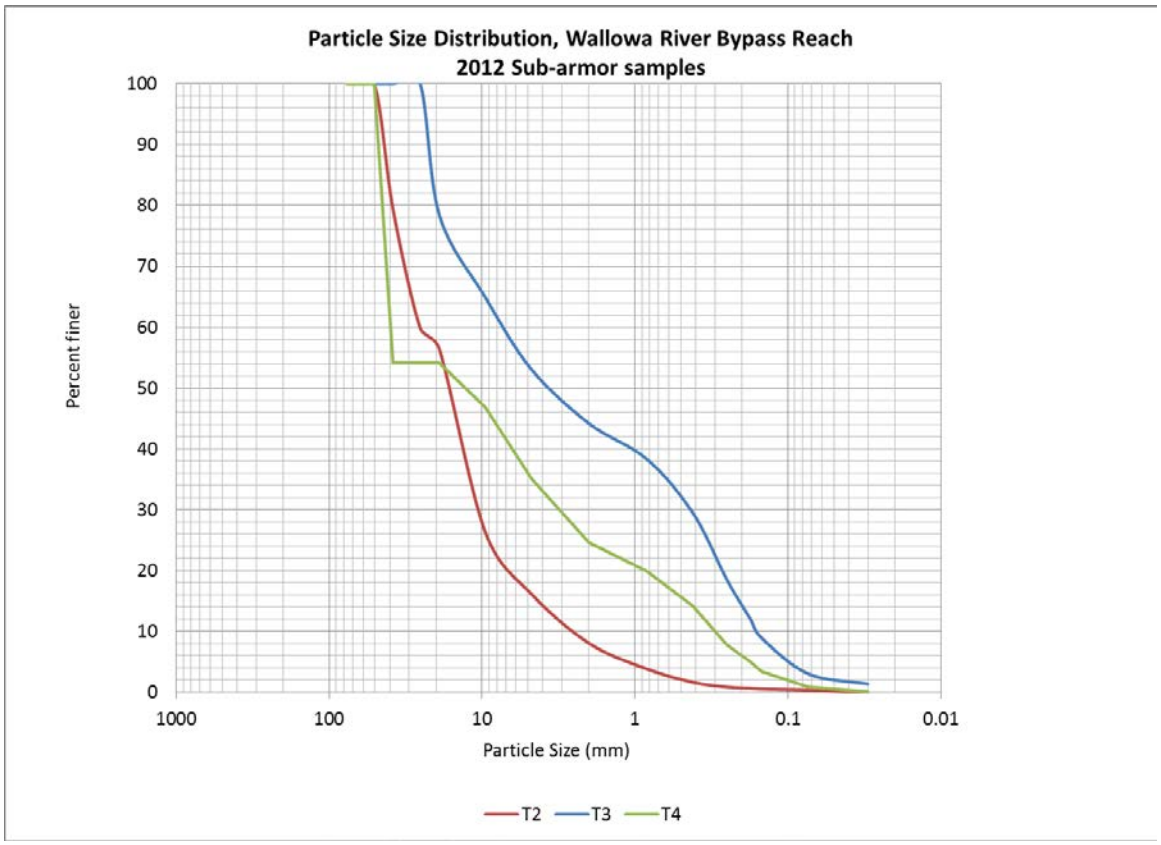


Figure 6. Sediment Percent Finer, 2012 Sub-surface Samples.

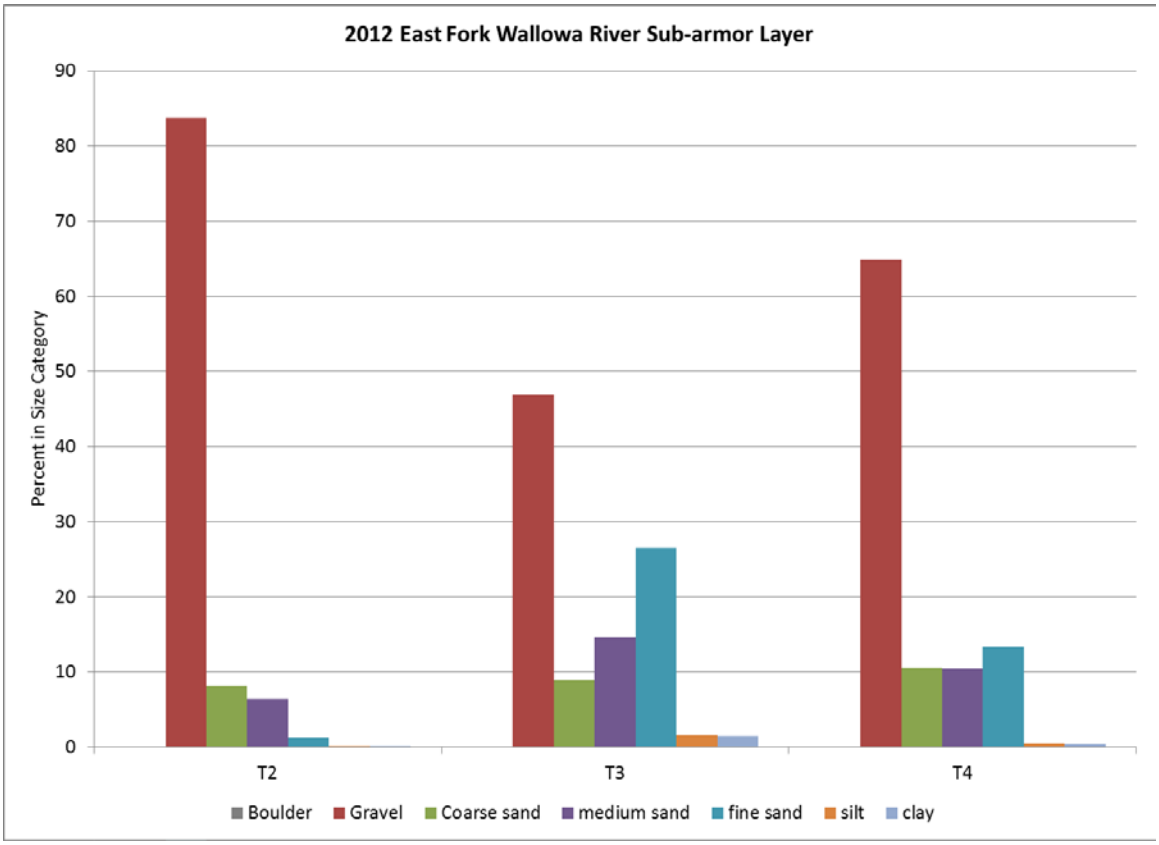


Figure 7. Particle Size Distributions, 2012 Sub-surface Samples.

4.3.3 Estimated Flow to Transport Sand and Fines

As part of relicensing efforts, PHABSIM transects were surveyed and hydraulic data was collected at fourteen locations in the lower bypassed reach (up to approximately 500 m upstream of the confluence with West Fork). These data were used to estimate shear stress in the center of the channel at the highest flow measured (15 cfs) and compared to critical shear stress required to move 2mm particles on the stream bed.

Shear stress at 15 cfs flow ranged from 0.3 to 4 pounds/square foot at the deepest point on the transects (water depths ranged from 0.85 to 1.8 ft (0.26 to 0.55 m)). Shear stress to move 2 mm particles is estimated at 0.04 pounds/square foot using Shield's criteria for uniform-size streambeds. Andrews (1983) criteria for mixed-grain-size streambeds was used to estimate shear stress to move 2 mm particles on a bed with a sub-armor D_{50} grain size of 3.5 mm (T3 sub-armor sample) and 15 mm (T4 sub-armor sample); the required shear stress to move 2 mm particles ranged from 0.09 to 0.32 pounds/square foot. These calculations suggest that flows of 15 cfs would be able to pick up and transport fines through the thalweg of the channel in the bypassed reach. At higher flows, fines would be able to be picked up across the majority of the channel cross sections; shear stress will always be lowest along shallow channel margins for a given flow, but at 45 cfs (June 50 percent exceedence flow in bypassed reach) it is likely that sand and fines would be moved throughout the bypassed reach.

4.4 Considerations for Future Forebay Flushing

Based on the sediment and turbidity sampling conducted in 2012-2013, the following observations and recommendations should be considered for future flushing events:

- Based on shear stress calculations at PHABSIM transects in the lower bypassed reach, the median monthly flow (61 cfs) during June (spring runoff) should be able to move 2 mm and finer sediment through the bypassed reach. If possible, given access and snow pack considerations, flushing the forebay during June would provide the best chance of high flows moving sediment through the bypassed reach in a natural manner.
- It is expected that there will be short-term increases in turbidity during the flushing event; monitoring of turbidity levels prior to, during, and following the flushing event will provide information on the magnitude and duration of increased turbidity levels in comparison to normal levels.
- Fine sediment levels at transects upstream of the forebay and in the lower bypassed reach were similar, suggesting that past forebay flushing does not result in a long-lasting increase in fine sediment levels in the bypassed reach.

5.0 References

Andrews, E.D. 1983. Entrainment of Gravel from Naturally Sorted Riverbed Material. Geological Society of America Bulletin. Volume 94, p. 1225-1231.

EPA. 2003. Guidance for Developing Ecological Soil Screening Levels. OSWER Directive 9285.7-55

Moore, Kelly; Jones, Kim; Dambacher, Jeff. 2002. Oregon Department of Fish and Wildlife. Methods for Stream Habitat Surveys Aquatic Inventories Project.

ODEQ. 2001. Guidance for Ecological Risk Assessment: Levels I, II, III, IV. Oregon Department of Environmental Quality Final 1998, Screening Levels updated 12/2001.

PacifiCorp. 2011 Wallowa Falls Hydroelectric Project FERC No. P-308 Revised Study Plans – Water Resources. December 2011.

PacifiCorp. 2011b. Wallowa Falls Hydroelectric Project FERC No. P-308 Notice of Intent to Relicense and Pre-Application Document. February 2011. Portland, Oregon.

Regional Sediment Evaluation Team (RSET). 2006. Northwest Regional Sediment Evaluation Framework Interim Final. Prepared by U.S. Army Corps of Engineers – Seattle District, Portland District, Walla Walla District, and Northwestern Division; Environmental Protection Agency Region 10; Washington Department of Ecology; Washington Department of Natural Resources; Oregon Department of Environmental Quality; Idaho Department of Environmental Quality; National Marine Fisheries Service; and the U.S. Fish and Wildlife Service.

Weis, P.L, and others. 1976. Mineral Resources of the Eagle Cap Wilderness and Adjacent Areas, Oregon. US Geological Survey Bulletin 1385-E, 100 p.

Photos

Photo 1: Wolman pebble count Transect 9, West Fork Wallowa River most upstream transect above the Project tailrace (2013).

Photo 2: Wolman pebble count Transect 8, West Fork Wallowa River upstream of the Project tailrace (2013).

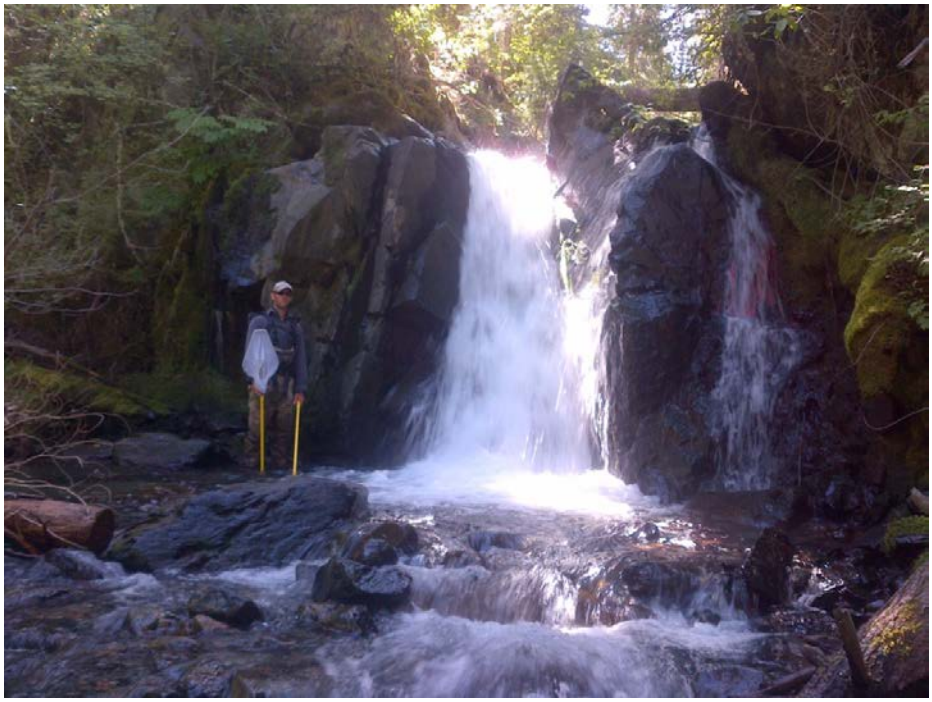


Photo 3: Waterfall on the East Fork Wallowa River located approximately 4,058 ft (1237 m)above its confluence with the West Fork Wallowa River.

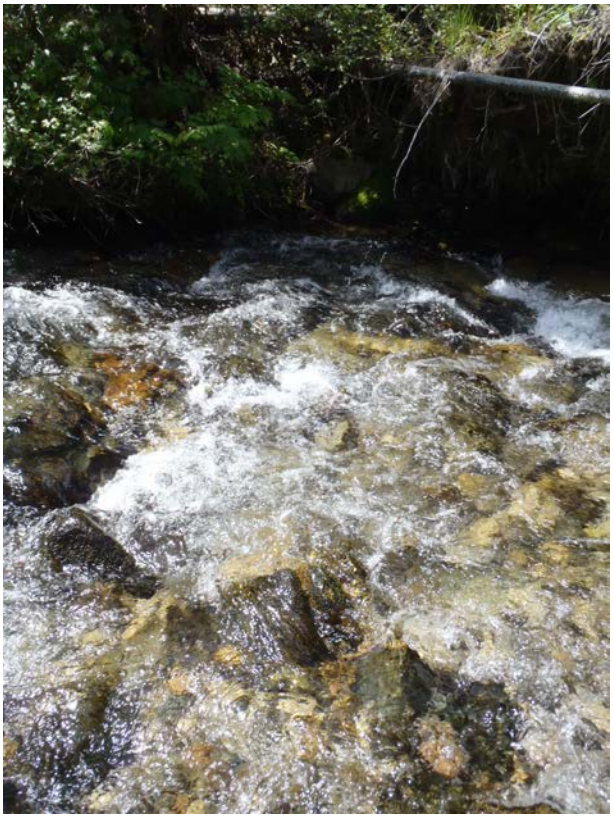


Photo 4: Wolman pebble count Transect 7, East Fork Wallowa River upstream of Project forebay (2013).

Photo 5: Wolman pebble count Transect 6, East Fork Wallowa River upstream of Project forebay (2013).

Photo 6: Wolman pebble count Transect 6, East Fork Wallowa River upstream of Project forebay (2013).

Photo 7: Wolman pebble counts Transect 5, East Fork Wallowa River bypassed reach (2012).

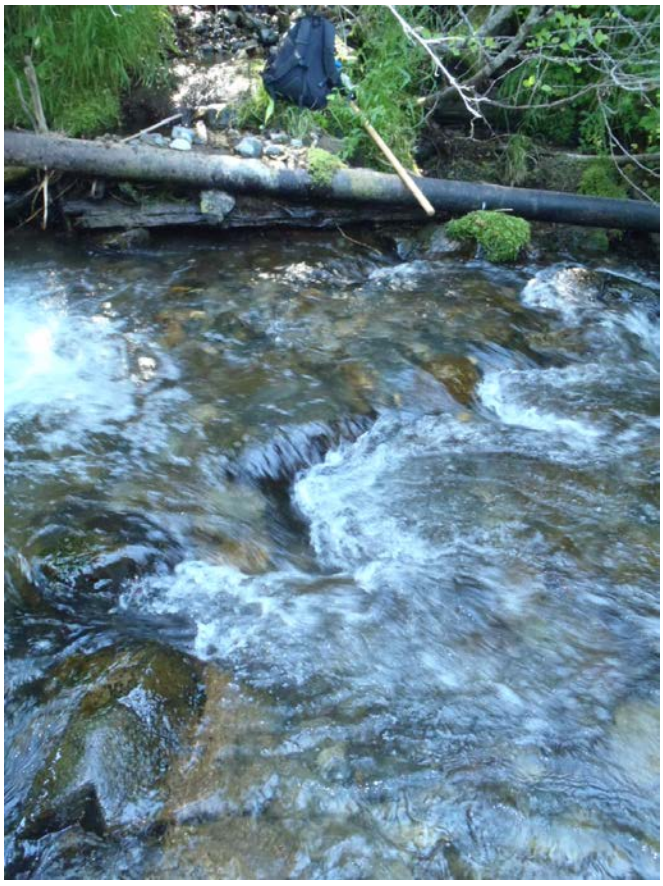


Photo 8: Wolman pebble count Transect 5, East Fork Wallowa River bypassed reach (2013).

Photo 9: Wolman pebble count Transect 4 – side channel on river left, East Fork Wallowa River bypassed reach (2012).

Photo 10: Wolman pebble count Transect 4 – side channel on river left, East Fork Wallowa River bypassed reach (2013).

Photo 11: Wolman pebble count Transect 4 – main channel, East Fork Wallowa River bypassed reach (2012).

Photo 12: Wolman pebble count transect 4 – main channel, East Fork Wallowa River bypassed reach (2013).

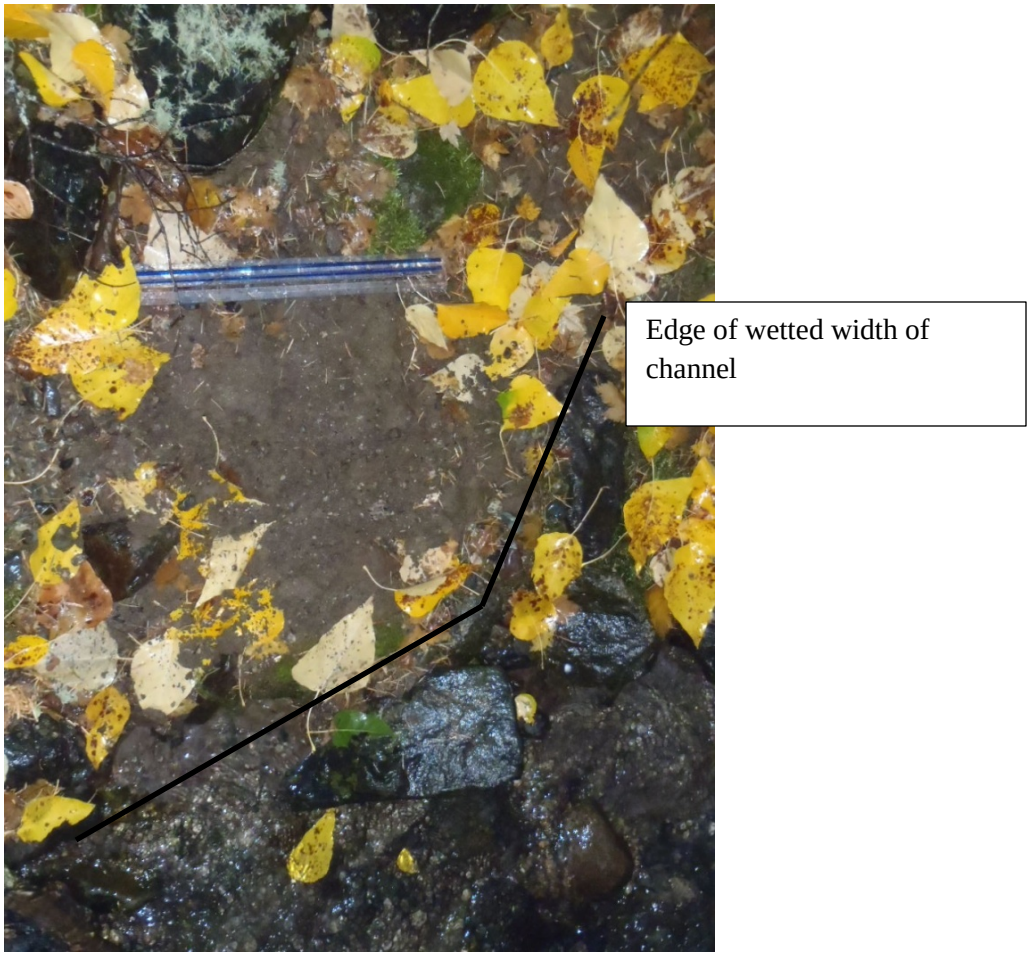


Photo 13: Subsurface bulk sample location. Located above wetted width on river left just downstream of pebble count Transect 4 (2012).

Photo 14: Wolman pebble count Transect 3 (at IFIM Transect 13) , East Fork Wallowa River bypassed reach (2012).

Photo 15: Wolman pebble count Transect 3 (at IFIM Transect 13) , East Fork Wallowa River bypassed reach (2013).

Photo 16: Subsurface bulk sample location. Located above wetted width on river left just downstream of pebble count Transect 3 (2012).

Photo 17: Wolman pebble count Transect 2, East Fork Wallowa River bypassed reach (2012).

Photo 18: Wolman pebble count Transect 2, East Fork Wallowa River bypassed reach (2013).

Photos 19 and 20: Subsurface bulk sample location. Located above wetted width on river left at pebble count Transect 2 (2012).

Photo 21: Wolman pebble count Transect 1, East Fork Wallowa River bypassed reach (2012).

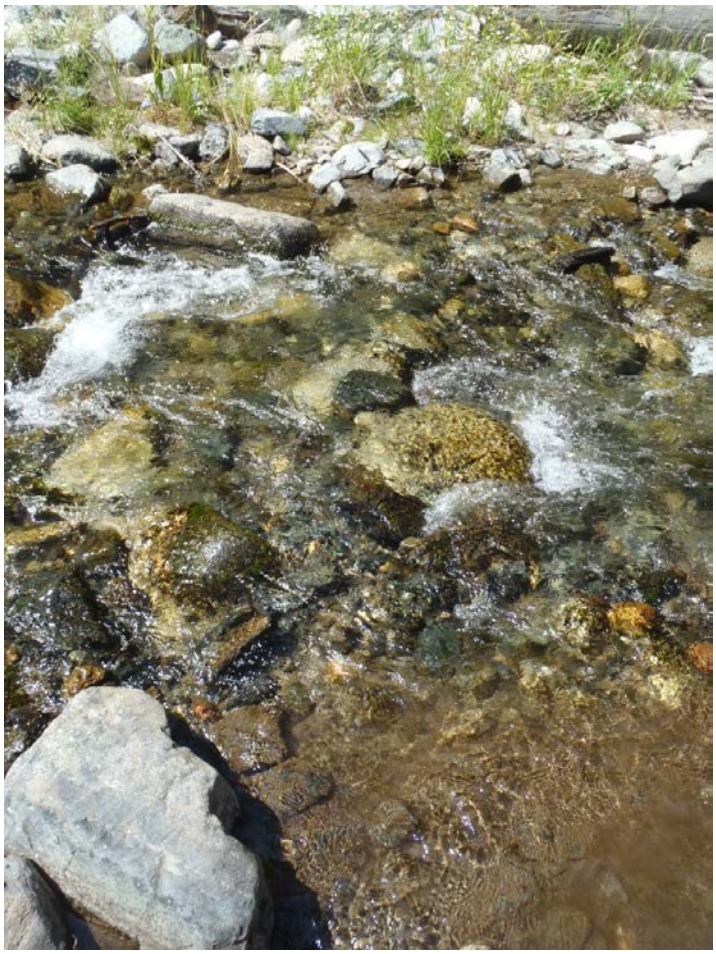
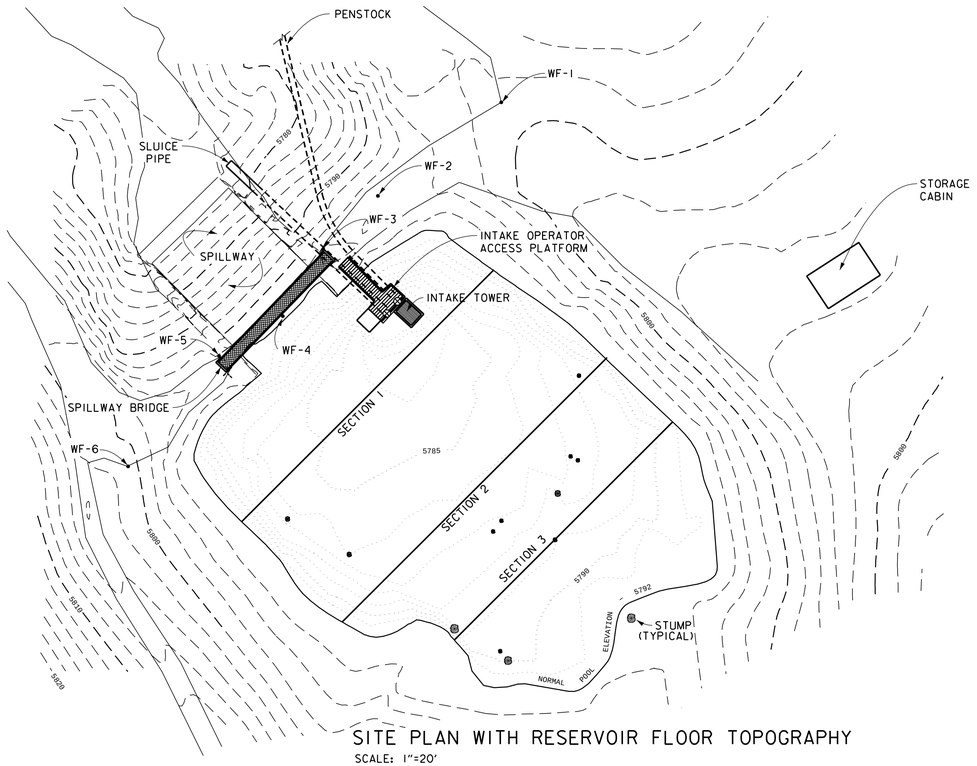


Photo 22: Wolman pebble count Transect 1, East Fork Wallowa River bypassed reach (2013).

Photo 23: Photo point 100 ft (30.5 m) upstream of road bridge, , East Fork Wallowa River bypassed reach (2012).

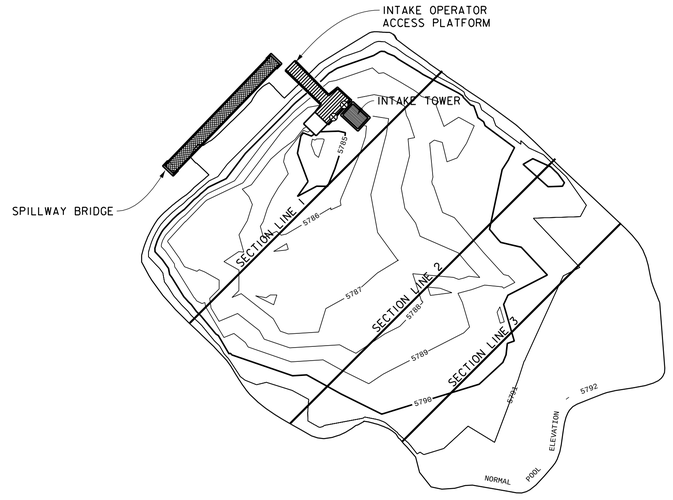
Photo 24: Photo point 100 ft (30.5 m) upstream of road bridge, , East Fork Wallowa River bypassed reach (2013).

Attachment A –Forebay Sediment Volumetric Survey



SITE PLAN WITH RESERVOIR FLOOR TOPOGRAPHY

SCALE: 1"=20'



RESERVOIR BEDLOAD DEPOSIT TOPOGRAPHY

SCALE: 1"=20'

NOTES:

SURVEY DATA FOR MAPPING OBTAINED ON 2012/08/14.

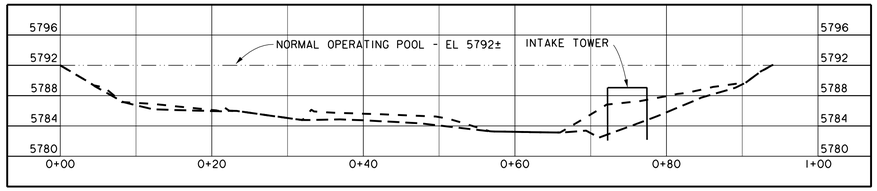
WF-1,2,3,4,5,6 ARE SURVEY CONTROL MONUMENTS.

ASSUMED VERTICAL DATUM: EL. 5799.00 AT WF-1.

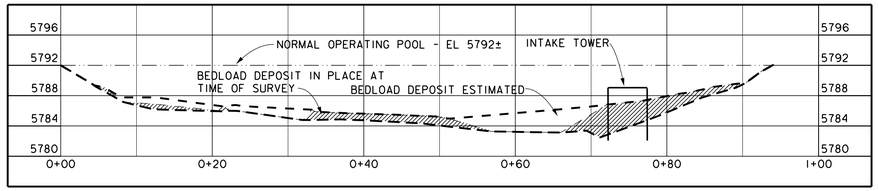
THE VOLUME OF MATERIAL DEPOSITED ABOVE THE RESERVOIR FLOOR IS 560 CU. YD.

THE RESERVOIR POOL WAS DRAWN DOWN COMPLETELY AND EROSION CHANNELS CUT TO THE RESERVOIR FLOOR PRIOR TO COMMENCEMENT OF THIS SURVEY. HOWEVER, AT THE TIME OF SURVEY SUFFICIENT SEDIMENT DEPOSITS WERE STILL IN PLACE SUCH THAT PROFILES OF THE BEDLOAD SEDIMENT DEPOSITS PRIOR TO EROSION COULD BE CONSTRUCTED.

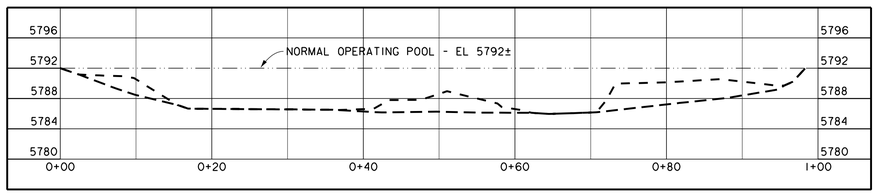
THE ELEVATED POSITION OF THE PENSTOCK OUTLET LEAVES THE IN-STREAM FLOW ORFICE ON THE SLUICE GATE AS THE ONLY SOURCE OF OUTLET WORKS SCOURING VELOCITY. BECAUSE OF THIS ARRANGEMENT INCOMING BEDLOAD IS MORE OR LESS UNIFORMLY DISTRIBUTED ACROSS THE FLOOR OF THE RESERVOIR, SAVE FOR A MINOR CHANNEL THAT WILL FORM IN FRONT OF THE AFORMENTIONED IN-STREAM FLOW ORIFICE.



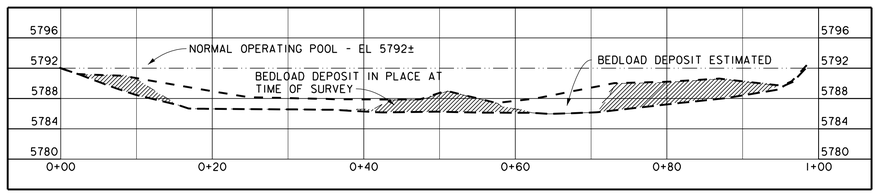
SECTION 1 - RESERVOIR BEDLOAD DEPOSIT, EROSION CHANNELS SHOWN AS SURVEYED



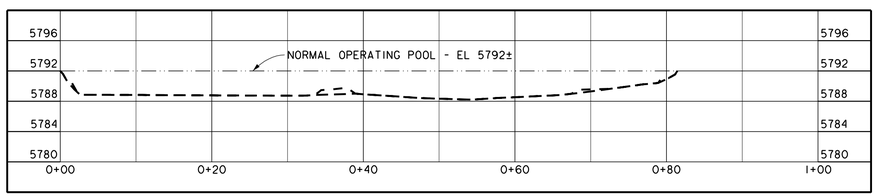
SECTION 1 - RESERVOIR BEDLOAD DEPOSIT, EROSION CHANNELS FILLED



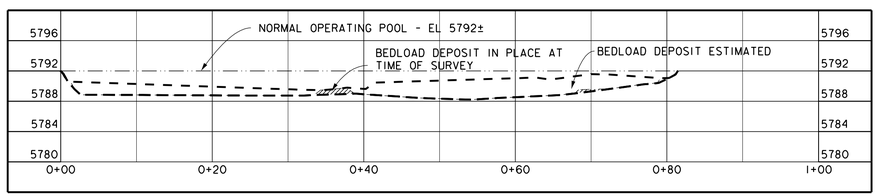
SECTION 2 - RESERVOIR BEDLOAD DEPOSIT, EROSION CHANNELS SHOWN AS SURVEYED



SECTION 2 - RESERVOIR BEDLOAD DEPOSIT, EROSION CHANNELS FILLED



SECTION 3 - RESERVOIR BEDLOAD DEPOSIT, EROSION CHANNELS SHOWN AS SURVEYED



SECTION 3 - RESERVOIR BEDLOAD DEPOSIT, EROSION CHANNELS FILLED

PACIFICORP
WALLOWA FALLS HYDROELECTRIC PROJECT
FERC PROJECT NO. 308
RESERVOIR TOPOGRAPHY AND SEDIMENT BEDLOAD DEPOSIT VOLUME

FILE 0617 STATUS RECORD SHEET 1 OF 1

HANER, ROSS & SPORSEEN, P.C.
ENGINEERS CONSULTANTS SURVEYORS
2895 BEAVERCREEK ROAD, OREGON CITY, OR 97045 (503) 657-1384 PHONE (503) 657-1387 FAX

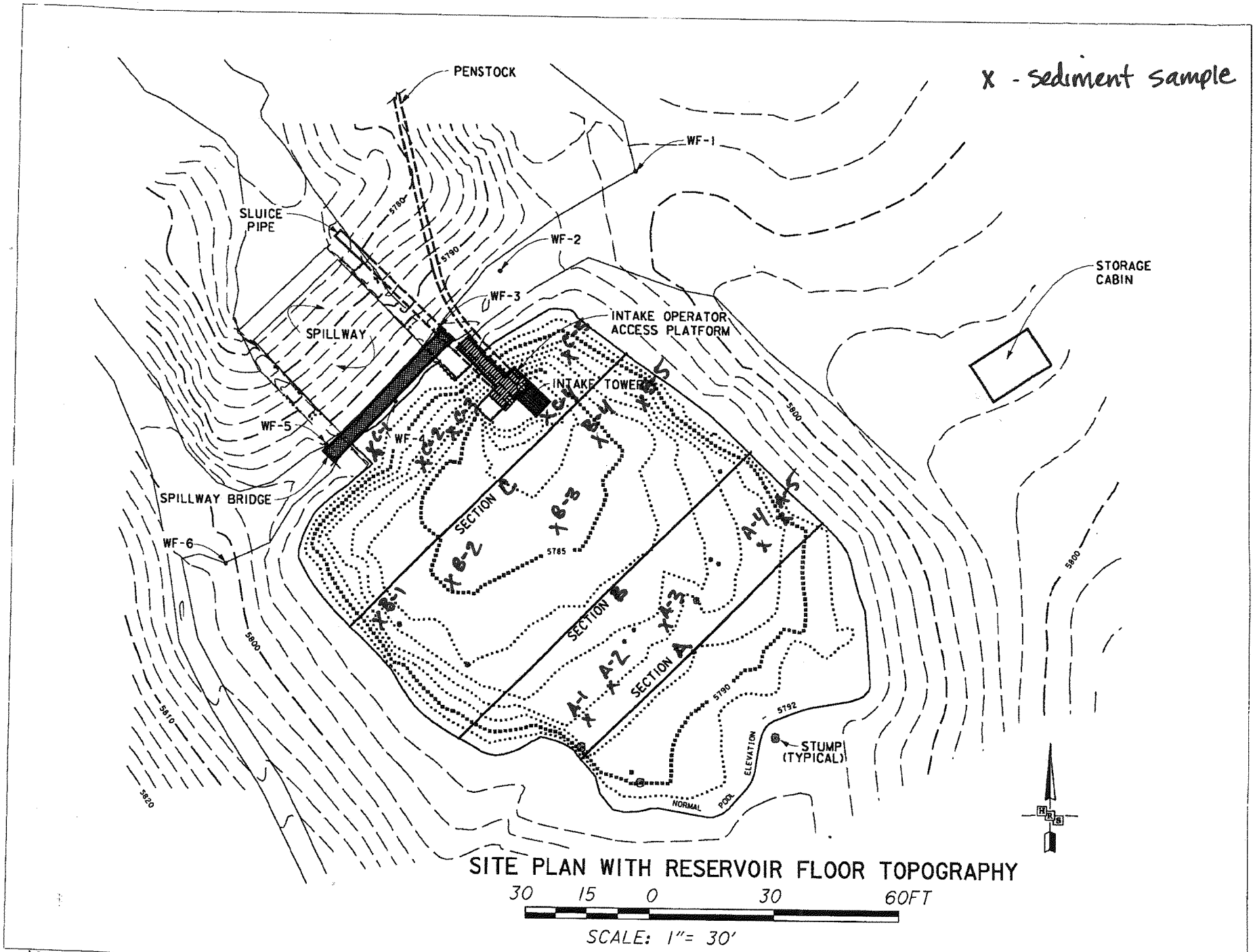
INITIAL DATE
DESIGNED J.N.G. 2012/09/01
DRAWN E.D.R., J.N.G. 2012/09/01
CHECKED J.N.G. 2012/09/14
SUPERVISED J.N.G. 2012/09/14
APPROVED 2012/09/14

REGISTERED PROFESSIONAL ENGINEER OREGON JULY 13, 1990 J. N. GREEN
EXPIRES: 2013/06/30

REV. NO.	DATE	DESCRIPTION	BY	CHECKED

Attachment B – Forebay Sediment Sampling Analytical Results

WALLOWA FALLS HYDROELECTRIC PROJECT: FORBAY SEDIMENT SAMPLING, AUGUST 13, 2012



...\06172012_dgn\0617_res_4.dgn Dec. 18, 2013 10:56:29

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

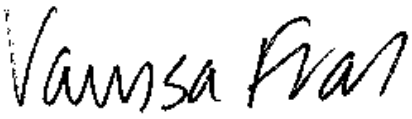
Job Number: 250-5919-1

SDG Number: 2500739

Job Description: Wallowa Falls Forebay

For:
Pacificorp Hydro Resources
825 NE Multnomah Blvd
Portland, OR 97232

Attention: Briana Weatherly



Approved for release.
Vanessa Frahs
Project Manager I
8/30/2012 8:22 PM

Vanessa Frahs
Project Manager I
vanessa.frahs@testamericainc.com
08/30/2012

TestAmerica Laboratories, Inc
TestAmerica Portland 9405 SW Nimbus Ave., Beaverton, OR 97008
Tel (503) 906-9200 Fax (503) 906-9210 www.testamericainc.com

Receipt
The samples were received on 8/16/2012 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.8º C.

Metals
No analytical or quality issues were noted.

Geotechnical
No analytical or quality issues were noted.

EXECUTIVE SUMMARY - Detections

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
250-5919-1	**UNIT A**					
Chromium		8.1		2.2	mg/Kg	6010B
Copper		22	^	2.2	mg/Kg	6010B
Zinc		38		11	mg/Kg	6010B
Mercury		0.14		0.11	mg/Kg	7471A
Percent Moisture		11		0.010	%	D2216-80
Percent Solids		89		0.010	%	D2216-80
Sieve Size 3 inch - Percent Finer		100.0			% Passing	D422
Gravel		14.5			%	D422
Hydrometer Reading 1 - Particle Size		36.7			um	D422
Sieve Size 2 inch - Percent Finer		100.0			% Passing	D422
Sand		80.7			%	D422
Hydrometer Reading 2 - Particle Size		23.3			um	D422
Sieve Size 1.5 inch - Percent Finer		100.0			% Passing	D422
Coarse Sand		18.3			%	D422
Hydrometer Reading 3 - Particle Size		13.5			um	D422
Sieve Size 1 inch - Percent Finer		100.0			% Passing	D422
Medium Sand		43.5			%	D422
Hydrometer Reading 4 - Particle Size		9.4			um	D422
Sieve Size 0.75 inch - Percent Finer		100.0			% Passing	D422
Fine Sand		18.9			%	D422
Hydrometer Reading 5 - Particle Size		6.8			um	D422
Sieve Size 0.375 inch - Percent Finer		99.1			% Passing	D422
Silt		4.1			%	D422
Hydrometer Reading 6 - Particle Size		3.2			um	D422
Sieve Size #4 - Percent Finer		85.5			% Passing	D422
Clay		0.7			%	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422
Sieve Size #10 - Percent Finer		67.2			% Passing	D422
Sieve Size #20 - Percent Finer		44.7			% Passing	D422
Sieve Size #40 - Percent Finer		23.7			% Passing	D422
Sieve Size #60 - Percent Finer		12.3			% Passing	D422
Sieve Size #80 - Percent Finer		8.7			% Passing	D422
Sieve Size #100 - Percent Finer		7.3			% Passing	D422
Sieve Size #200 - Percent Finer		4.9			% Passing	D422
Hydrometer Reading 1 - Percent Finer		1.3			% Passing	D422
Hydrometer Reading 2 - Percent Finer		1			% Passing	D422
Hydrometer Reading 3 - Percent Finer		1			% Passing	D422
Hydrometer Reading 4 - Percent Finer		1			% Passing	D422
Hydrometer Reading 5 - Percent Finer		0.7			% Passing	D422
Hydrometer Reading 6 - Percent Finer		0.2			% Passing	D422
Hydrometer Reading 7 - Percent Finer		0.2			% Passing	D422

EXECUTIVE SUMMARY - Detections

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
250-5919-2	**UNIT B**					
Chromium		12		2.4	mg/Kg	6010B
Copper		38	^	2.4	mg/Kg	6010B
Zinc		53		12	mg/Kg	6010B
Percent Moisture		16		0.010	%	D2216-80
Percent Solids		84		0.010	%	D2216-80
Sieve Size 3 inch		0.0			%	D422
Sieve Size 3 inch - Percent Finer		100.0			% Passing	D422
Gravel		8.6			%	D422
Hydrometer Reading 1 - Particle Size		35.9			um	D422
Sieve Size 2 inch		0.0			%	D422
Sieve Size 2 inch - Percent Finer		100.0			% Passing	D422
Sand		77.6			%	D422
Hydrometer Reading 2 - Particle Size		23.1			um	D422
Sieve Size 1.5 inch		0.0			%	D422
Sieve Size 1.5 inch - Percent Finer		100.0			% Passing	D422
Coarse Sand		14.1			%	D422
Hydrometer Reading 3 - Particle Size		13.4			um	D422
Sieve Size 1 inch		0.0			%	D422
Sieve Size 1 inch - Percent Finer		100.0			% Passing	D422
Medium Sand		20.3			%	D422
Hydrometer Reading 4 - Particle Size		9.2			um	D422
Sieve Size 0.75 inch		0.0			%	D422
Sieve Size 0.75 inch - Percent Finer		100.0			% Passing	D422
Fine Sand		43.2			%	D422
Hydrometer Reading 5 - Particle Size		6.8			um	D422
Sieve Size 0.375 inch		0.6			%	D422
Sieve Size 0.375 inch - Percent Finer		99.4			% Passing	D422
Silt		12.9			%	D422
Hydrometer Reading 6 - Particle Size		3.3			um	D422
Sieve Size #4		8.0			%	D422
Sieve Size #4 - Percent Finer		91.4			% Passing	D422
Clay		0.9			%	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422
Sieve Size #10		14.1			%	D422
Sieve Size #10 - Percent Finer		77.3			% Passing	D422
Sieve Size #20		12.1			%	D422
Sieve Size #20 - Percent Finer		65.2			% Passing	D422
Sieve Size #40		8.2			%	D422
Sieve Size #40 - Percent Finer		57.0			% Passing	D422
Sieve Size #60		10.4			%	D422
Sieve Size #60 - Percent Finer		46.6			% Passing	D422
Sieve Size #80		9.7			%	D422
Sieve Size #80 - Percent Finer		36.9			% Passing	D422
Sieve Size #100		6.8			%	D422
Sieve Size #100 - Percent Finer		30.1			% Passing	D422
Sieve Size #200		16.3			%	D422

EXECUTIVE SUMMARY - Detections

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
Sieve Size #200 - Percent Finer		13.8			% Passing	D422
Hydrometer Reading 1		10.6			%	D422
Hydrometer Reading 1 - Percent Finer		3.2			% Passing	D422
Hydrometer Reading 2		1.3			%	D422
Hydrometer Reading 2 - Percent Finer		1.9			% Passing	D422
Hydrometer Reading 3		0.3			%	D422
Hydrometer Reading 3 - Percent Finer		1.5			% Passing	D422
Hydrometer Reading 4		0.3			%	D422
Hydrometer Reading 4 - Percent Finer		1.2			% Passing	D422
Hydrometer Reading 5		0.3			%	D422
Hydrometer Reading 5 - Percent Finer		0.9			% Passing	D422
Hydrometer Reading 6		0.3			%	D422
Hydrometer Reading 6 - Percent Finer		0.5			% Passing	D422
Hydrometer Reading 7		0.3			%	D422
Hydrometer Reading 7 - Percent Finer		0.2			% Passing	D422
Gravel		8.6			%	D422
Sand		77.6			%	D422
Coarse Sand		14.1			%	D422
Medium Sand		20.3			%	D422
Fine Sand		43.2			%	D422
Silt		12.9			%	D422
Clay		0.9			%	D422
Hydrometer Reading 1 - Particle Size		35.9			um	D422
Hydrometer Reading 2 - Particle Size		23.1			um	D422
Hydrometer Reading 3 - Particle Size		13.4			um	D422
Hydrometer Reading 4 - Particle Size		9.2			um	D422
Hydrometer Reading 5 - Particle Size		6.8			um	D422
Hydrometer Reading 6 - Particle Size		3.3			um	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422

EXECUTIVE SUMMARY - Detections

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
250-5919-3	**UNIT C**					
Chromium		9.0		2.4	mg/Kg	6010B
Copper		38	^	2.4	mg/Kg	6010B
Zinc		44		12	mg/Kg	6010B
Percent Moisture		19		0.010	%	D2216-80
Percent Solids		81		0.010	%	D2216-80
Sieve Size 3 inch		0.0			%	D422
Sieve Size 3 inch - Percent Finer		100.0			% Passing	D422
Gravel		8.3			%	D422
Hydrometer Reading 1 - Particle Size		36.4			um	D422
Sieve Size 2 inch		0.0			%	D422
Sieve Size 2 inch - Percent Finer		100.0			% Passing	D422
Sand		81.4			%	D422
Hydrometer Reading 2 - Particle Size		23.1			um	D422
Sieve Size 1.5 inch		0.0			%	D422
Sieve Size 1.5 inch - Percent Finer		100.0			% Passing	D422
Coarse Sand		18.5			%	D422
Hydrometer Reading 3 - Particle Size		13.5			um	D422
Sieve Size 1 inch		0.0			%	D422
Sieve Size 1 inch - Percent Finer		100.0			% Passing	D422
Medium Sand		45.1			%	D422
Hydrometer Reading 4 - Particle Size		9.5			um	D422
Sieve Size 0.75 inch		0.0			%	D422
Sieve Size 0.75 inch - Percent Finer		100.0			% Passing	D422
Fine Sand		17.8			%	D422
Hydrometer Reading 5 - Particle Size		6.6			um	D422
Sieve Size 0.375 inch		2.5			%	D422
Sieve Size 0.375 inch - Percent Finer		97.5			% Passing	D422
Silt		9.7			%	D422
Hydrometer Reading 6 - Particle Size		3.3			um	D422
Sieve Size #4		5.8			%	D422
Sieve Size #4 - Percent Finer		91.7			% Passing	D422
Clay		0.6			%	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422
Sieve Size #10		18.5			%	D422
Sieve Size #10 - Percent Finer		73.2			% Passing	D422
Sieve Size #20		29.6			%	D422
Sieve Size #20 - Percent Finer		43.6			% Passing	D422
Sieve Size #40		15.5			%	D422
Sieve Size #40 - Percent Finer		28.1			% Passing	D422
Sieve Size #60		8.2			%	D422
Sieve Size #60 - Percent Finer		19.9			% Passing	D422
Sieve Size #80		3.3			%	D422
Sieve Size #80 - Percent Finer		16.6			% Passing	D422
Sieve Size #100		1.8			%	D422
Sieve Size #100 - Percent Finer		14.8			% Passing	D422
Sieve Size #200		4.5			%	D422

EXECUTIVE SUMMARY - Detections

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
Sieve Size #200 - Percent Finer		10.3			% Passing	D422
Hydrometer Reading 1		8.0			%	D422
Hydrometer Reading 1 - Percent Finer		2.3			% Passing	D422
Hydrometer Reading 2		0.3			%	D422
Hydrometer Reading 2 - Percent Finer		1.9			% Passing	D422
Hydrometer Reading 3		0.7			%	D422
Hydrometer Reading 3 - Percent Finer		1.3			% Passing	D422
Hydrometer Reading 4		0.0			%	D422
Hydrometer Reading 4 - Percent Finer		1.3			% Passing	D422
Hydrometer Reading 5		0.7			%	D422
Hydrometer Reading 5 - Percent Finer		0.6			% Passing	D422
Hydrometer Reading 6		0.0			%	D422
Hydrometer Reading 6 - Percent Finer		0.6			% Passing	D422
Hydrometer Reading 7		0.3			%	D422
Hydrometer Reading 7 - Percent Finer		0.2			% Passing	D422
Gravel		8.3			%	D422
Sand		81.4			%	D422
Coarse Sand		18.5			%	D422
Medium Sand		45.1			%	D422
Fine Sand		17.8			%	D422
Silt		9.7			%	D422
Clay		0.6			%	D422
Hydrometer Reading 1 - Particle Size		36.4			um	D422
Hydrometer Reading 2 - Particle Size		23.1			um	D422
Hydrometer Reading 3 - Particle Size		13.5			um	D422
Hydrometer Reading 4 - Particle Size		9.5			um	D422
Hydrometer Reading 5 - Particle Size		6.6			um	D422
Hydrometer Reading 6 - Particle Size		3.3			um	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422

METHOD SUMMARY

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Description	Lab Location	Method	Preparation Method
Matrix Solid			
Metals (ICP)	TAL PRT	SW846 6010B	
Preparation, Metals	TAL PRT		SW846 3050B
Mercury (CVAA)	TAL PRT	SW846 7471A	
Preparation, Mercury	TAL PRT		SW846 7471A
Percent Dry Weight (Solids) per ASTM D2216-80	TAL PRT	ASTM D2216-80	
Grain Size	TAL BUR	ASTM D422	

Lab References:

TAL BUR = TestAmerica Burlington

TAL PRT = TestAmerica Portland

Method References:

ASTM = ASTM International

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Method	Analyst	Analyst ID
SW846 6010B	Lindquist, Trang	TL
SW846 7471A	Hyland, Patrick (Joe)	PH
ASTM D2216-80	Clesceri, Danica	DC
ASTM D422	Bourdeau, Timothy P	TPB

SAMPLE SUMMARY

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
250-5919-1	Unit A	Solid	08/14/2012 1400	08/16/2012 1000
250-5919-2	Unit B	Solid	08/14/2012 1300	08/16/2012 1000
250-5919-3	Unit C	Solid	08/14/2012 1130	08/16/2012 1000

SAMPLE RESULTS

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Client Sample ID: **Unit A**

Lab Sample ID: 250-5919-1
Client Matrix: Solid
% Moisture: 10.6

Date Sampled: 08/14/2012 1400
Date Received: 08/16/2012 1000

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	250-8921	Instrument ID:	V-ICP
Prep Method:	3050B	Prep Batch:	250-8911	Lab File ID:	081712.csv
Dilution:	1.0			Initial Weight/Volume:	+1.0092 g
Analysis Date:	08/18/2012 0302			Final Weight/Volume:	50 mL
Prep Date:	08/17/2012 1408				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	RL
Antimony		ND		5.5
Arsenic		ND		5.5
Cadmium		ND		2.2
Chromium		8.1		2.2
Copper		22	^	2.2
Lead		ND		5.5
Selenium		ND		5.5
Silver		ND		5.5
Zinc		38		11

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	250-9244	Instrument ID:	HGCVAA
Prep Method:	7471A	Prep Batch:	250-9211	Lab File ID:	082712.txt
Dilution:	1.0			Initial Weight/Volume:	+0.4166 g
Analysis Date:	08/27/2012 2026			Final Weight/Volume:	50 mL
Prep Date:	08/27/2012 1132				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	RL
Mercury		0.14		0.11

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Client Sample ID: **Unit B**

Lab Sample ID: 250-5919-2
Client Matrix: Solid
% Moisture: 16.3

Date Sampled: 08/14/2012 1300
Date Received: 08/16/2012 1000

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	250-8921	Instrument ID:	V-ICP
Prep Method:	3050B	Prep Batch:	250-8911	Lab File ID:	081712.csv
Dilution:	1.0			Initial Weight/Volume:	+1.0039 g
Analysis Date:	08/18/2012 0308			Final Weight/Volume:	50 mL
Prep Date:	08/17/2012 1408				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	RL
Antimony		ND		5.9
Arsenic		ND		5.9
Cadmium		ND		2.4
Chromium		12		2.4
Copper		38	^	2.4
Lead		ND		5.9
Selenium		ND		5.9
Silver		ND		5.9
Zinc		53		12

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	250-9244	Instrument ID:	HGCVAA
Prep Method:	7471A	Prep Batch:	250-9211	Lab File ID:	082712.txt
Dilution:	1.0			Initial Weight/Volume:	+0.4153 g
Analysis Date:	08/27/2012 2034			Final Weight/Volume:	50 mL
Prep Date:	08/27/2012 1132				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	RL
Mercury		ND		0.12

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Client Sample ID: **Unit C**

Lab Sample ID: 250-5919-3
Client Matrix: Solid
% Moisture: 18.7

Date Sampled: 08/14/2012 1130
Date Received: 08/16/2012 1000

6010B Metals (ICP)

Analysis Method:	6010B	Analysis Batch:	250-8921	Instrument ID:	V-ICP
Prep Method:	3050B	Prep Batch:	250-8911	Lab File ID:	081712.csv
Dilution:	1.0			Initial Weight/Volume:	+1.0198 g
Analysis Date:	08/18/2012 0314			Final Weight/Volume:	50 mL
Prep Date:	08/17/2012 1408				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	RL
Antimony		ND		6.0
Arsenic		ND		6.0
Cadmium		ND		2.4
Chromium		9.0		2.4
Copper		38	^	2.4
Lead		ND		6.0
Selenium		ND		6.0
Silver		ND		6.0
Zinc		44		12

7471A Mercury (CVAA)

Analysis Method:	7471A	Analysis Batch:	250-9244	Instrument ID:	HGCVAA
Prep Method:	7471A	Prep Batch:	250-9211	Lab File ID:	082712.txt
Dilution:	1.0			Initial Weight/Volume:	+0.4428 g
Analysis Date:	08/27/2012 2037			Final Weight/Volume:	50 mL
Prep Date:	08/27/2012 1132				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	RL
Mercury		ND		0.11

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

General Chemistry

Client Sample ID: **Unit A**

Lab Sample ID: 250-5919-1
Client Matrix: Solid

Date Sampled: 08/14/2012 1400
Date Received: 08/16/2012 1000

Analyte	Result	Qual	Units	RL	Dil	Method
Percent Moisture	11		%	0.010	1.0	D2216-80
Analysis Batch: 250-8864	Analysis Date: 08/16/2012 1727					DryWt Corrected: N
Percent Solids	89		%	0.010	1.0	D2216-80
Analysis Batch: 250-8864	Analysis Date: 08/16/2012 1727					DryWt Corrected: N

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

General Chemistry

Client Sample ID: **Unit B**

Lab Sample ID: 250-5919-2
Client Matrix: Solid

Date Sampled: 08/14/2012 1300
Date Received: 08/16/2012 1000

Analyte	Result	Qual	Units	RL	Dil	Method
Percent Moisture	16		%	0.010	1.0	D2216-80
Analysis Batch: 250-8864	Analysis Date: 08/16/2012 1727					DryWt Corrected: N
Percent Solids	84		%	0.010	1.0	D2216-80
Analysis Batch: 250-8864	Analysis Date: 08/16/2012 1727					DryWt Corrected: N

General Chemistry

Client Sample ID: **Unit C**

Lab Sample ID: 250-5919-3
Client Matrix: Solid

Date Sampled: 08/14/2012 1130
Date Received: 08/16/2012 1000

Analyte	Result	Qual	Units	RL	Dil	Method
Percent Moisture	19		%	0.010	1.0	D2216-80
Analysis Batch: 250-8864	Analysis Date: 08/16/2012 1727					DryWt Corrected: N
Percent Solids	81		%	0.010	1.0	D2216-80
Analysis Batch: 250-8864	Analysis Date: 08/16/2012 1727					DryWt Corrected: N

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Client Sample ID: **Unit A**

Lab Sample ID: 250-5919-1
Client Matrix: Solid

Date Sampled: 08/14/2012 1400
Date Received: 08/16/2012 1000

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-44068	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-5919-A-1.txt
Dilution:	1.0			Initial Weight/Volume:	330.57 g
Analysis Date:	08/21/2012 2341			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (% Passing)	Qualifier	NONE
Sieve Size 3 inch - Percent Finer		100.0		
Sieve Size 2 inch - Percent Finer		100.0		
Sieve Size 1.5 inch - Percent Finer		100.0		
Sieve Size 1 inch - Percent Finer		100.0		
Sieve Size 0.75 inch - Percent Finer		100.0		
Sieve Size 0.375 inch - Percent Finer		99.1		
Sieve Size #4 - Percent Finer		85.5		
Sieve Size #10 - Percent Finer		67.2		
Sieve Size #20 - Percent Finer		44.7		
Sieve Size #40 - Percent Finer		23.7		
Sieve Size #60 - Percent Finer		12.3		
Sieve Size #80 - Percent Finer		8.7		
Sieve Size #100 - Percent Finer		7.3		
Sieve Size #200 - Percent Finer		4.9		
Hydrometer Reading 1 - Percent Finer		1.3		
Hydrometer Reading 2 - Percent Finer		1		
Hydrometer Reading 3 - Percent Finer		1		
Hydrometer Reading 4 - Percent Finer		1		
Hydrometer Reading 5 - Percent Finer		0.7		
Hydrometer Reading 6 - Percent Finer		0.2		
Hydrometer Reading 7 - Percent Finer		0.2		

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Client Sample ID: **Unit A**

Lab Sample ID: 250-5919-1
Client Matrix: Solid

Date Sampled: 08/14/2012 1400
Date Received: 08/16/2012 1000

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-44068	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-5919-A-1.txt
Dilution:	1.0			Initial Weight/Volume:	330.57 g
Analysis Date:	08/21/2012 2341			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE
Gravel		14.5		
Sand		80.7		
Coarse Sand		18.3		
Medium Sand		43.5		
Fine Sand		18.9		
Silt		4.1		
Clay		0.7		

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Client Sample ID: **Unit A**

Lab Sample ID: 250-5919-1
Client Matrix: Solid

Date Sampled: 08/14/2012 1400
Date Received: 08/16/2012 1000

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-44068	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-5919-A-1.txt
Dilution:	1.0			Initial Weight/Volume:	330.57 g
Analysis Date:	08/21/2012 2341			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (um)	Qualifier	NONE
Hydrometer Reading 1 - Particle Size		36.7		
Hydrometer Reading 2 - Particle Size		23.3		
Hydrometer Reading 3 - Particle Size		13.5		
Hydrometer Reading 4 - Particle Size		9.4		
Hydrometer Reading 5 - Particle Size		6.8		
Hydrometer Reading 6 - Particle Size		3.2		
Hydrometer Reading 7 - Particle Size		1.4		

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Client Sample ID: **Unit B**

Lab Sample ID: 250-5919-2
Client Matrix: Solid

Date Sampled: 08/14/2012 1300
Date Received: 08/16/2012 1000

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-44068	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-5919-A-2.txt
Dilution:	1.0			Initial Weight/Volume:	288.48 g
Analysis Date:	08/21/2012 2342			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE
Sieve Size 3 inch		0.0		
Sieve Size 2 inch		0.0		
Sieve Size 1.5 inch		0.0		
Sieve Size 1 inch		0.0		
Sieve Size 0.75 inch		0.0		
Sieve Size 0.375 inch		0.6		
Sieve Size #4		8.0		
Sieve Size #10		14.1		
Sieve Size #20		12.1		
Sieve Size #40		8.2		
Sieve Size #60		10.4		
Sieve Size #80		9.7		
Sieve Size #100		6.8		
Sieve Size #200		16.3		
Hydrometer Reading 1		10.6		
Hydrometer Reading 2		1.3		
Hydrometer Reading 3		0.3		
Hydrometer Reading 4		0.3		
Hydrometer Reading 5		0.3		
Hydrometer Reading 6		0.3		
Hydrometer Reading 7		0.3		
Gravel		8.6		
Sand		77.6		
Coarse Sand		14.1		
Medium Sand		20.3		
Fine Sand		43.2		
Silt		12.9		
Clay		0.9		

Analyte	DryWt Corrected: N	Result (um)	Qualifier	NONE
Hydrometer Reading 1 - Particle Size		35.9		
Hydrometer Reading 2 - Particle Size		23.1		
Hydrometer Reading 3 - Particle Size		13.4		
Hydrometer Reading 4 - Particle Size		9.2		
Hydrometer Reading 5 - Particle Size		6.8		
Hydrometer Reading 6 - Particle Size		3.3		
Hydrometer Reading 7 - Particle Size		1.4		

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Client Sample ID: **Unit B**

Lab Sample ID: 250-5919-2
Client Matrix: Solid

Date Sampled: 08/14/2012 1300
Date Received: 08/16/2012 1000

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-44068	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-5919-A-2.txt
Dilution:	1.0			Initial Weight/Volume:	288.48 g
Analysis Date:	08/21/2012 2342			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (% Passing)	Qualifier	NONE
Sieve Size 3 inch - Percent Finer		100.0		
Sieve Size 2 inch - Percent Finer		100.0		
Sieve Size 1.5 inch - Percent Finer		100.0		
Sieve Size 1 inch - Percent Finer		100.0		
Sieve Size 0.75 inch - Percent Finer		100.0		
Sieve Size 0.375 inch - Percent Finer		99.4		
Sieve Size #4 - Percent Finer		91.4		
Sieve Size #10 - Percent Finer		77.3		
Sieve Size #20 - Percent Finer		65.2		
Sieve Size #40 - Percent Finer		57.0		
Sieve Size #60 - Percent Finer		46.6		
Sieve Size #80 - Percent Finer		36.9		
Sieve Size #100 - Percent Finer		30.1		
Sieve Size #200 - Percent Finer		13.8		
Hydrometer Reading 1 - Percent Finer		3.2		
Hydrometer Reading 2 - Percent Finer		1.9		
Hydrometer Reading 3 - Percent Finer		1.5		
Hydrometer Reading 4 - Percent Finer		1.2		
Hydrometer Reading 5 - Percent Finer		0.9		
Hydrometer Reading 6 - Percent Finer		0.5		
Hydrometer Reading 7 - Percent Finer		0.2		

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Client Sample ID: **Unit B**

Lab Sample ID: 250-5919-2
Client Matrix: Solid

Date Sampled: 08/14/2012 1300
Date Received: 08/16/2012 1000

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-44068	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-5919-A-2.txt
Dilution:	1.0			Initial Weight/Volume:	288.48 g
Analysis Date:	08/21/2012 2342			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE
Gravel		8.6		
Sand		77.6		
Coarse Sand		14.1		
Medium Sand		20.3		
Fine Sand		43.2		
Silt		12.9		
Clay		0.9		

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Client Sample ID: **Unit B**

Lab Sample ID: 250-5919-2
Client Matrix: Solid

Date Sampled: 08/14/2012 1300
Date Received: 08/16/2012 1000

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-44068	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-5919-A-2.txt
Dilution:	1.0			Initial Weight/Volume:	288.48 g
Analysis Date:	08/21/2012 2342			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (um)	Qualifier	NONE
Hydrometer Reading 1 - Particle Size		35.9		
Hydrometer Reading 2 - Particle Size		23.1		
Hydrometer Reading 3 - Particle Size		13.4		
Hydrometer Reading 4 - Particle Size		9.2		
Hydrometer Reading 5 - Particle Size		6.8		
Hydrometer Reading 6 - Particle Size		3.3		
Hydrometer Reading 7 - Particle Size		1.4		

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Client Sample ID: **Unit C**

Lab Sample ID: 250-5919-3
Client Matrix: Solid

Date Sampled: 08/14/2012 1130
Date Received: 08/16/2012 1000

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-44068	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-5919-A-3.txt
Dilution:	1.0			Initial Weight/Volume:	285.58 g
Analysis Date:	08/21/2012 2343			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE
Sieve Size 3 inch		0.0		
Sieve Size 2 inch		0.0		
Sieve Size 1.5 inch		0.0		
Sieve Size 1 inch		0.0		
Sieve Size 0.75 inch		0.0		
Sieve Size 0.375 inch		2.5		
Sieve Size #4		5.8		
Sieve Size #10		18.5		
Sieve Size #20		29.6		
Sieve Size #40		15.5		
Sieve Size #60		8.2		
Sieve Size #80		3.3		
Sieve Size #100		1.8		
Sieve Size #200		4.5		
Hydrometer Reading 1		8.0		
Hydrometer Reading 2		0.3		
Hydrometer Reading 3		0.7		
Hydrometer Reading 4		0.0		
Hydrometer Reading 5		0.7		
Hydrometer Reading 6		0.0		
Hydrometer Reading 7		0.3		
Gravel		8.3		
Sand		81.4		
Coarse Sand		18.5		
Medium Sand		45.1		
Fine Sand		17.8		
Silt		9.7		
Clay		0.6		

Analyte	DryWt Corrected: N	Result (um)	Qualifier	NONE
Hydrometer Reading 1 - Particle Size		36.4		
Hydrometer Reading 2 - Particle Size		23.1		
Hydrometer Reading 3 - Particle Size		13.5		
Hydrometer Reading 4 - Particle Size		9.5		
Hydrometer Reading 5 - Particle Size		6.6		
Hydrometer Reading 6 - Particle Size		3.3		
Hydrometer Reading 7 - Particle Size		1.4		

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Client Sample ID: **Unit C**

Lab Sample ID: 250-5919-3
Client Matrix: Solid

Date Sampled: 08/14/2012 1130
Date Received: 08/16/2012 1000

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-44068	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-5919-A-3.txt
Dilution:	1.0			Initial Weight/Volume:	285.58 g
Analysis Date:	08/21/2012 2343			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (% Passing)	Qualifier	NONE
Sieve Size 3 inch - Percent Finer		100.0		
Sieve Size 2 inch - Percent Finer		100.0		
Sieve Size 1.5 inch - Percent Finer		100.0		
Sieve Size 1 inch - Percent Finer		100.0		
Sieve Size 0.75 inch - Percent Finer		100.0		
Sieve Size 0.375 inch - Percent Finer		97.5		
Sieve Size #4 - Percent Finer		91.7		
Sieve Size #10 - Percent Finer		73.2		
Sieve Size #20 - Percent Finer		43.6		
Sieve Size #40 - Percent Finer		28.1		
Sieve Size #60 - Percent Finer		19.9		
Sieve Size #80 - Percent Finer		16.6		
Sieve Size #100 - Percent Finer		14.8		
Sieve Size #200 - Percent Finer		10.3		
Hydrometer Reading 1 - Percent Finer		2.3		
Hydrometer Reading 2 - Percent Finer		1.9		
Hydrometer Reading 3 - Percent Finer		1.3		
Hydrometer Reading 4 - Percent Finer		1.3		
Hydrometer Reading 5 - Percent Finer		0.6		
Hydrometer Reading 6 - Percent Finer		0.6		
Hydrometer Reading 7 - Percent Finer		0.2		

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Client Sample ID: **Unit C**

Lab Sample ID: 250-5919-3
Client Matrix: Solid

Date Sampled: 08/14/2012 1130
Date Received: 08/16/2012 1000

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-44068	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-5919-A-3.txt
Dilution:	1.0			Initial Weight/Volume:	285.58 g
Analysis Date:	08/21/2012 2343			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE
Gravel		8.3		
Sand		81.4		
Coarse Sand		18.5		
Medium Sand		45.1		
Fine Sand		17.8		
Silt		9.7		
Clay		0.6		

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Client Sample ID: **Unit C**

Lab Sample ID: 250-5919-3
Client Matrix: Solid

Date Sampled: 08/14/2012 1130
Date Received: 08/16/2012 1000

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-44068	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-5919-A-3.txt
Dilution:	1.0			Initial Weight/Volume:	285.58 g
Analysis Date:	08/21/2012 2343			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (um)	Qualifier	NONE
Hydrometer Reading 1 - Particle Size		36.4		
Hydrometer Reading 2 - Particle Size		23.1		
Hydrometer Reading 3 - Particle Size		13.5		
Hydrometer Reading 4 - Particle Size		9.5		
Hydrometer Reading 5 - Particle Size		6.6		
Hydrometer Reading 6 - Particle Size		3.3		
Hydrometer Reading 7 - Particle Size		1.4		

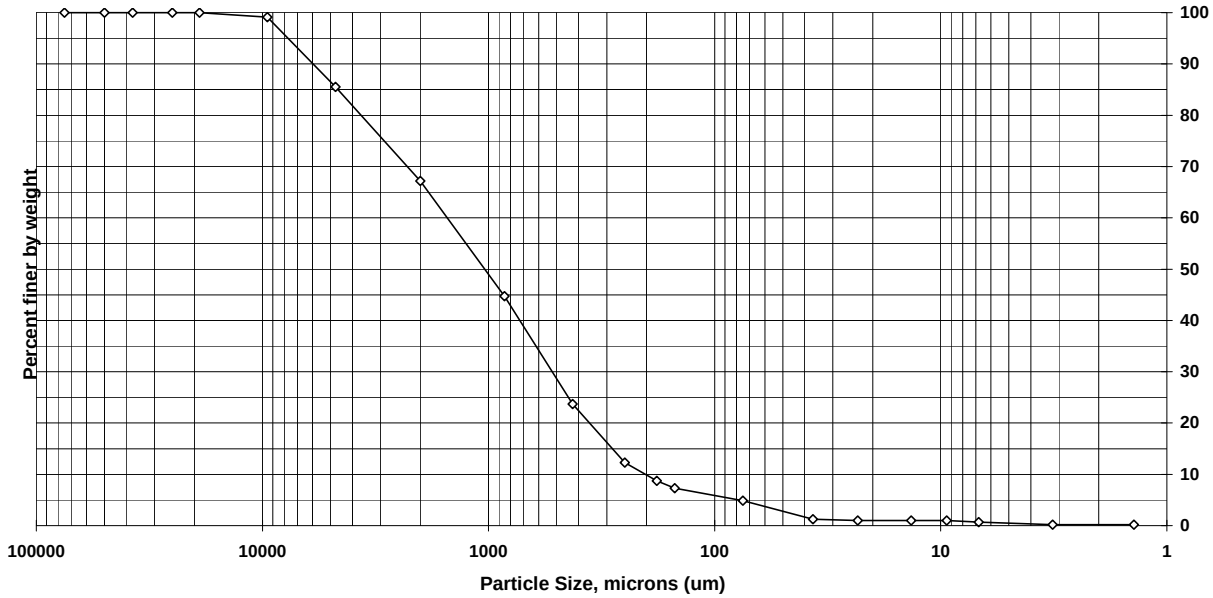
Particle Size of Soils by ASTM D422

				Date Received:	1/0/1900
Sample ID:	0	**Percent Solids:**	90.9%	**Start Date:**	8/21/2012
Lab ID:	250-5919-A-1	**Specific Gravity:**	2.650	**End Date:**	8/25/2012

Shape (> #10): subrounded

Non-soil material: plant

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	99.1	0.9
#4	4750	85.5	13.6
#10	2000	67.2	18.3
#20	850	44.7	22.5
#40	425	23.7	21.0
#60	250	12.3	11.4
#80	180	8.7	3.6
#100	150	7.3	1.5
#200	75	4.9	2.4
Hyd1	36.7	1.3	3.6
Hyd2	23.3	1.0	0.3
Hyd3	13.5	1.0	0.0
Hyd4	9.4	1.0	0.0
Hyd5	6.8	0.7	0.3
Hyd6	3.2	0.2	0.5
Hyd7	1.4	0.2	0.0

Soil Classification	Percent of sample
Gravel	14.5
Sand	80.7
Coarse Sand	18.3
Medium Sand	43.5
Fine Sand	18.9
Silt	4.1
Clay	0.7

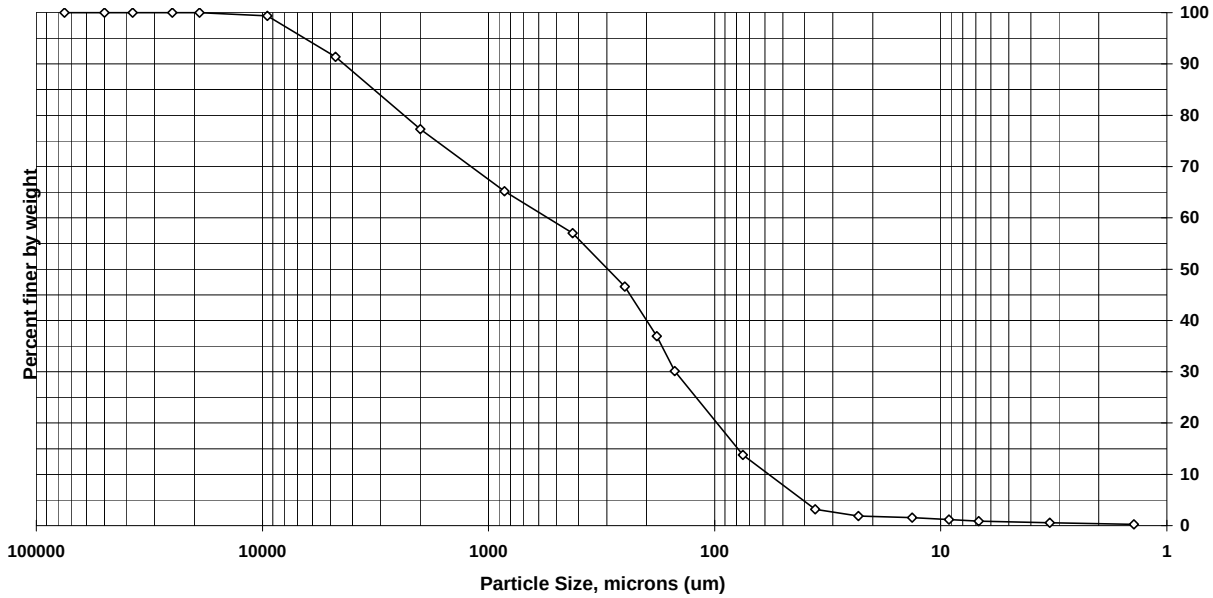
Particle Size of Soils by ASTM D422

				Date Received:	1/0/1900
Sample ID:	0	**Percent Solids:**	84.5%	**Start Date:**	8/21/2012
Lab ID:	250-5919-A-2	**Specific Gravity:**	2.650	**End Date:**	8/25/2012

Shape (> #10): subrounded

Non-soil material: plant

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	99.4	0.6
#4	4750	91.4	8.0
#10	2000	77.3	14.1
#20	850	65.2	12.1
#40	425	57.0	8.2
#60	250	46.6	10.4
#80	180	36.9	9.7
#100	150	30.1	6.8
#200	75	13.8	16.3
Hyd1	35.9	3.2	10.6
Hyd2	23.1	1.9	1.3
Hyd3	13.4	1.5	0.3
Hyd4	9.2	1.2	0.3
Hyd5	6.8	0.9	0.3
Hyd6	3.3	0.5	0.3
Hyd7	1.4	0.2	0.3

Soil Classification	Percent of sample
Gravel	8.6
Sand	77.6
Coarse Sand	14.1
Medium Sand	20.3
Fine Sand	43.2
Silt	12.9
Clay	0.9

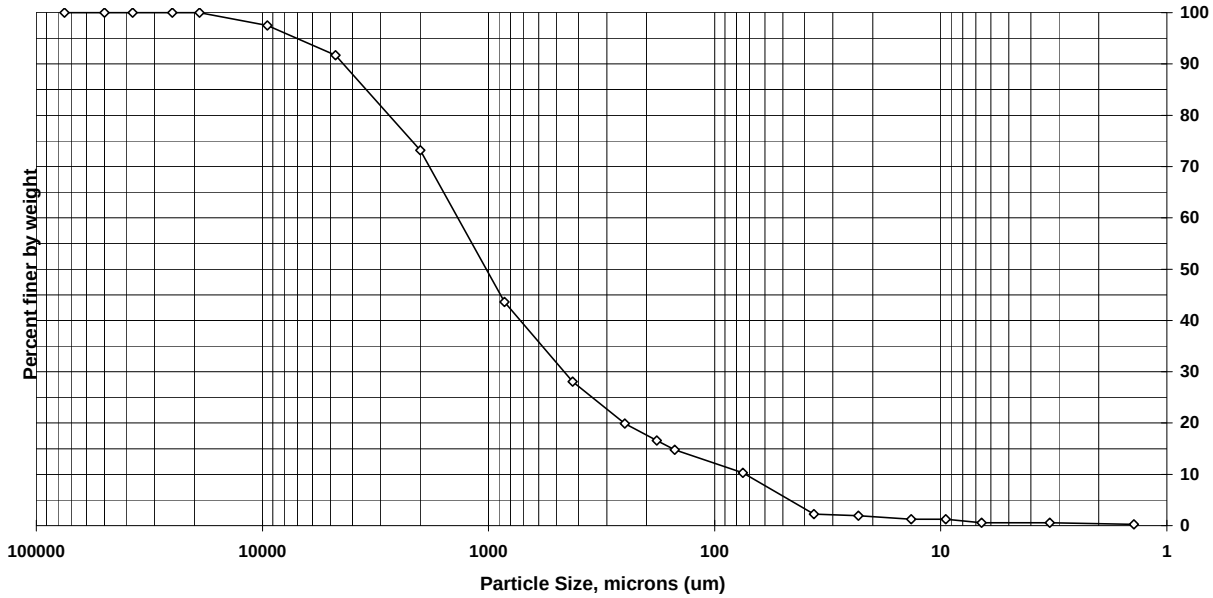
Particle Size of Soils by ASTM D422

				Date Received:	1/0/1900
Sample ID:	0	**Percent Solids:**	82.7%	**Start Date:**	8/21/2012
Lab ID:	250-5919-A-3	**Specific Gravity:**	2.650	**End Date:**	8/25/2012

Shape (> #10): subrounded

Non-soil material: plant

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	97.5	2.5
#4	4750	91.7	5.8
#10	2000	73.2	18.5
#20	850	43.6	29.6
#40	425	28.1	15.5
#60	250	19.9	8.2
#80	180	16.6	3.3
#100	150	14.8	1.8
#200	75	10.3	4.5
Hyd1	36.4	2.3	8.0
Hyd2	23.1	1.9	0.3
Hyd3	13.5	1.3	0.7
Hyd4	9.5	1.3	0.0
Hyd5	6.6	0.6	0.7
Hyd6	3.3	0.6	0.0
Hyd7	1.4	0.2	0.3

Soil Classification	Percent of sample
Gravel	8.3
Sand	81.4
Coarse Sand	18.5
Medium Sand	45.1
Fine Sand	17.8
Silt	9.7
Clay	0.6

Sediment Grain Size - D422

Client		Date Received	
Client Sample ID		Start Date	08/21/2012 23:41
Lab Sample ID	250-5919-A-1	End Date	08/25/2012 13:15

Dry Weight Determination

Tin Weight	1.01	g	Non-soil material:	plant
Wet Sample + Tin	36.71	g	Shape (> #10):	subrounded
Dry Sample + Tin	33.46	g	Hardness (> #10):	hard
% Moisture	9.10	%		

Date/Time in oven	08/21/2012 23:41
Date/Time out of oven	08/23/2012 10:27

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)		330.57	330.57
Sample Weight (Oven Dried)			300

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			98.5
Sample <#10			202
% Passing #10			61.1

Hydrometer Data	
Serial Number	741402
Calib. Date (mm/dd/yyyy)	12/21/2010
Low Temp (C)	17.0
Reading at Low Temp	1.0035
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-8.33333E-05
Hydrometer Cal Intercept	1.004916667
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500	447.46	450.29	2.83	g	99.1	Gravel	
#4	4750	488.22	528.98	40.76	g	85.5	Gravel	
#10	2000	462.87	517.78	54.91	g	67.2	Sand	Coarse
#20	850	383.10	450.49	67.39	g	44.7	Sand	Medium
#40	425	353.39	416.25	62.86	g	23.7	Sand	Medium
#60	250	341.34	375.55	34.21	g	12.3	Sand	Fine
#80	180	330.77	341.48	10.71	g	8.7	Sand	Fine
#100	150	327.83	332.20	4.37	g	7.3	Sand	Fine
#200	75	312.14	319.40	7.26	g	4.9	Sand	Fine
				0.00	g	4.9		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	300

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0055	21.0	36.7	1.25	Silt	
5	5	1.0050	21.0	23.3	0.981	Silt	
15	15	1.0050	21.0	13.5	0.981	Silt	
30	31	1.0050	21.0	9.4	0.981	Silt	
60	59	1.0045	21.0	6.8	0.714	Silt	
250	265	1.0035	21.0	3.2	0.178	Clay	
1440	1412	1.0035	21.0	1.4	0.178	Clay	

Sediment Grain Size - D422

Client	
Client Sample ID	
Lab Sample ID	250-5919-A-2

Date Received	
Start Date	08/21/2012 23:42
End Date	08/25/2012 13:18

Dry Weight Determination

Tin Weight	0.99	g
Wet Sample + Tin	36.58	g
Dry Sample + Tin	31.07	g
% Moisture	15.48	%

Non-soil material:	plant
Shape (> #10):	subrounded
Hardness (> #10):	hard

Date/Time in oven	08/21/2012 23:43
Date/Time out of oven	08/23/2012 10:28

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)		288.48	288.48
Sample Weight (Oven Dried)			244

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			55.5
Sample <#10			189
% Passing #10			65.5

Hydrometer Data	
Serial Number	741402
Calib. Date (mm/dd/yyyy)	12/21/2010
Low Temp (C)	17.0
Reading at Low Temp	1.0035
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-8.33333E-05
Hydrometer Cal Intercept	1.004916667
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500	447.46	448.87	1.41	g	99.4	Gravel	
#4	4750	488.22	507.84	19.62	g	91.4	Gravel	
#10	2000	462.87	497.38	34.51	g	77.3	Sand	Coarse
#20	850	390.46	420.04	29.58	g	65.2	Sand	Medium
#40	425	355.28	375.17	19.89	g	57.0	Sand	Medium
#60	250	321.89	347.22	25.33	g	46.6	Sand	Fine
#80	180	332.18	355.81	23.63	g	36.9	Sand	Fine
#100	150	331.34	347.85	16.51	g	30.1	Sand	Fine
#200	75	320.84	360.53	39.69	g	13.8	Sand	Fine
				0.00	g	13.8		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	244

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0080	21.0	35.9	3.18	Silt	
5	5	1.0060	21.0	23.1	1.86	Silt	
15	15	1.0055	21.0	13.4	1.54	Silt	
30	32	1.0050	21.0	9.2	1.21	Silt	
60	60	1.0045	21.0	6.8	0.878	Silt	
250	259	1.0040	21.0	3.3	0.549	Clay	
1440	1406	1.0035	21.0	1.4	0.219	Clay	

Sediment Grain Size - D422

Client		Date Received	
Client Sample ID		Start Date	08/21/2012 23:43
Lab Sample ID	250-5919-A-3	End Date	08/25/2012 13:29

Dry Weight Determination

Tin Weight	0.97	g	Non-soil material:	plant
Wet Sample + Tin	26.00	g	Shape (> #10):	subrounded
Dry Sample + Tin	21.66	g	Hardness (> #10):	hard
% Moisture	17.34	%		

Date/Time in oven	08/21/2012 23:44
Date/Time out of oven	08/23/2012 10:28

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)		285.58	285.58
Sample Weight (Oven Dried)			236

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			63.4
Sample <#10			173
% Passing #10			60.6

Hydrometer Data	
Serial Number	741402
Calib. Date (mm/dd/yyyy)	12/21/2010
Low Temp (C)	17.0
Reading at Low Temp	1.0035
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-8.33333E-05
Hydrometer Cal Intercept	1.004916667
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000			0.00	g	100.0	Gravel	
3/8 inch	9500	447.46	453.46	6.00	g	97.5	Gravel	
#4	4750	488.22	501.89	13.67	g	91.7	Gravel	
#10	2000	462.87	506.55	43.68	g	73.2	Sand	Coarse
#20	850	383.10	453.04	69.94	g	43.6	Sand	Medium
#40	425	353.39	389.97	36.58	g	28.1	Sand	Medium
#60	250	341.34	360.74	19.40	g	19.9	Sand	Fine
#80	180	330.77	338.47	7.70	g	16.6	Sand	Fine
#100	150	327.83	331.97	4.14	g	14.8	Sand	Fine
#200	75	312.14	322.85	10.71	g	10.3	Sand	Fine
				0.00	g	10.3		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	236

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0065	21.0	36.4	2.27	Silt	
5	5	1.0060	21.0	23.1	1.93	Silt	
15	15	1.0050	21.0	13.5	1.25	Silt	
30	30	1.0050	21.0	9.5	1.25	Silt	
60	63	1.0040	21.0	6.6	0.567	Silt	
250	253	1.0040	21.0	3.3	0.567	Clay	
1440	1400	1.0035	21.0	1.4	0.227	Clay	

DATA REPORTING QUALIFIERS

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Lab Section	Qualifier	Description
Metals		
	^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC exceeds the control limits.

QUALITY CONTROL RESULTS

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 250-8911					
LCS 250-8911/2-A	Lab Control Sample	T	Solid	3050B	
MB 250-8911/1-A	Method Blank	T	Solid	3050B	
250-5919-1	Unit A	T	Solid	3050B	
250-5919-2	Unit B	T	Solid	3050B	
250-5919-3	Unit C	T	Solid	3050B	
Analysis Batch:250-8921					
LCS 250-8911/2-A	Lab Control Sample	T	Solid	6010B	250-8911
MB 250-8911/1-A	Method Blank	T	Solid	6010B	250-8911
250-5919-1	Unit A	T	Solid	6010B	250-8911
250-5919-2	Unit B	T	Solid	6010B	250-8911
250-5919-3	Unit C	T	Solid	6010B	250-8911
Prep Batch: 250-9211					
LCS 250-9211/11-A	Lab Control Sample	T	Solid	7471A	
MB 250-9211/10-A	Method Blank	T	Solid	7471A	
250-5919-1	Unit A	T	Solid	7471A	
250-5919-1MS	Matrix Spike	T	Solid	7471A	
250-5919-1MSD	Matrix Spike Duplicate	T	Solid	7471A	
250-5919-2	Unit B	T	Solid	7471A	
250-5919-3	Unit C	T	Solid	7471A	
Analysis Batch:250-9244					
LCS 250-9211/11-A	Lab Control Sample	T	Solid	7471A	250-9211
MB 250-9211/10-A	Method Blank	T	Solid	7471A	250-9211
250-5919-1	Unit A	T	Solid	7471A	250-9211
250-5919-1MS	Matrix Spike	T	Solid	7471A	250-9211
250-5919-1MSD	Matrix Spike Duplicate	T	Solid	7471A	250-9211
250-5919-2	Unit B	T	Solid	7471A	250-9211
250-5919-3	Unit C	T	Solid	7471A	250-9211

Report Basis
T = Total

General Chemistry

Analysis Batch:250-8864					
250-5919-1	Unit A	T	Solid	D2216-80	
250-5919-2	Unit B	T	Solid	D2216-80	
250-5919-3	Unit C	T	Solid	D2216-80	

Report Basis
T = Total

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Geotechnical					
Analysis Batch:200-44068					
250-5919-1	Unit A	T	Solid	D422	
250-5919-2	Unit B	T	Solid	D422	
250-5919-3	Unit C	T	Solid	D422	

Report Basis
T = Total

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Method Blank - Batch: 250-8911

Method: 6010B
Preparation: 3050B

Lab Sample ID:	MB 250-8911/1-A	Analysis Batch:	250-8921	Instrument ID:	V-ICP
Client Matrix:	Solid	Prep Batch:	250-8911	Lab File ID:	081712.csv
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+1.0123 g
Analysis Date:	08/18/2012 0201	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	08/17/2012 1408				
Leach Date:	N/A				

Analyte	Result	Qual	RL
Antimony	ND		4.9
Arsenic	ND		4.9
Cadmium	ND		2.0
Chromium	ND		2.0
Copper	ND	^	2.0
Lead	ND		4.9
Selenium	ND		4.9
Silver	ND		4.9
Zinc	ND		9.9

Lab Control Sample - Batch: 250-8911

Method: 6010B
Preparation: 3050B

Lab Sample ID:	LCS 250-8911/2-A	Analysis Batch:	250-8921	Instrument ID:	V-ICP
Client Matrix:	Solid	Prep Batch:	250-8911	Lab File ID:	081712.csv
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+1.0238 g
Analysis Date:	08/18/2012 0207	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	08/17/2012 1408				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Antimony	48.8	45.2	93	80 - 120	
Arsenic	48.8	48.1	99	80 - 120	
Cadmium	24.4	24.3	99	80 - 120	
Chromium	48.8	47.8	98	80 - 120	
Copper	48.8	48.5	99	80 - 120	^
Lead	48.8	47.9	98	80 - 120	
Selenium	48.8	44.7	92	80 - 120	
Silver	24.4	23.9	98	80 - 120	
Zinc	48.8	48.3	99	80 - 120	

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
Sdg Number: 2500739

Method Blank - Batch: 250-9211

Method: 7471A
Preparation: 7471A

Lab Sample ID:	MB 250-9211/10-A	Analysis Batch:	250-9244	Instrument ID:	HGCVAA
Client Matrix:	Solid	Prep Batch:	250-9211	Lab File ID:	082712.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.4102 g
Analysis Date:	08/27/2012 2016	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	08/27/2012 1132				
Leach Date:	N/A				

Analyte	Result	Qual	RL
Mercury	ND		0.098

Lab Control Sample - Batch: 250-9211

Method: 7471A
Preparation: 7471A

Lab Sample ID:	LCS 250-9211/11-A	Analysis Batch:	250-9244	Instrument ID:	HGCVAA
Client Matrix:	Solid	Prep Batch:	250-9211	Lab File ID:	082712.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.4210 g
Analysis Date:	08/27/2012 2018	Units:	mg/Kg	Final Weight/Volume:	50 mL
Prep Date:	08/27/2012 1132				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	0.594	0.638	107	80 - 120	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 250-9211

Method: 7471A
Preparation: 7471A

MS Lab Sample ID:	250-5919-1	Analysis Batch:	250-9244	Instrument ID:	HGCVAA
Client Matrix:	Solid	Prep Batch:	250-9211	Lab File ID:	082712.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.4447 g
Analysis Date:	08/27/2012 2028			Final Weight/Volume:	50 mL
Prep Date:	08/27/2012 1132				
Leach Date:	N/A				

MSD Lab Sample ID:	250-5919-1	Analysis Batch:	250-9244	Instrument ID:	HGCVAA
Client Matrix:	Solid	Prep Batch:	250-9211	Lab File ID:	082712.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	+0.4239 g
Analysis Date:	08/27/2012 2031			Final Weight/Volume:	50 mL
Prep Date:	08/27/2012 1132				
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Mercury	108	107	75 - 125	3	40		

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

5755 8th Street East, Tacoma, WA 98424-1317 253-9[illegible]-5047
11922 E. First Ave., Spokane WA 99206-5302 509-[illegible]-9290
9405 SW Nimbus Ave., Beaverton, OR 97008-7145 503-[illegible]-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-[illegible]-9210

Loc: 250
5919

CHAIN OF CUSTODY REPORT

Work Order #

CLIENT: PacifiCorp

REPORT TO: PacifiCorp/Briana Weathenly
ADDRESS: 825 NE Multnomah Suite 1500 Portland OR 97232
PHONE: 503 813 7039 FAX:

INVOICE TO: Briana Weathenly
825 NE Multnomah Suite 1500
Portland OR 97232

P.O. NUMBER:

PROJECT NAME: Wallowa Falls Forebay
PROJECT NUMBER: 25000739
SAMPLED BY: Russ Howison

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: [10 STD.] [7] [5] [4] [3] [2] [1] [<1]
Petroleum Hydrocarbon Analyses: [5 STD.] [4] [3] [2] [1] [<1]
[OTHER] Specify:

* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PRESERVATIVE: None	None	REQUESTED ANALYSES: ASTM D422	6010B	MATRIX (W, S, O)	# OF CONT.	LOCATION/ COMMENTS	TA WO ID
1	Unit A	8/14/12 1400			X	X	S			
2	Unit B	8/14/12 13:00			X	X	S			
3	Unit C	8/14/12 11:30			X	X	S			
4										
5										
6										
7										
8										
9										
10										

RELEASED BY: PRINT NAME: RR Howison FIRM: PacifiCorp DATE: 8/15/12 TIME: 11:00
RECEIVED BY: Erica Tot PRINT NAME: Erica Tot FIRM: TA DATE: 8/16/12 TIME: 1000

RELEASED BY: PRINT NAME: FIRM: DATE: TIME:
RECEIVED BY: PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS: Call Briana Weathenly (503 813 7039) if you have any Questions:

TEMP: 2.8°C 8/16/12 PAGE OF

TAL-1000 (0612)

Samples were put in a cooler upon Field collection & Kept in a Refrigerator Overnight before Shipping. RRH

2.8°C Digi#2 Bel 8/16/12

08/30/2012

Login Sample Receipt Checklist

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
SDG Number: 2500739

Login Number: 5919
List Number: 1
Creator: Svabik-Seror, Philip

List Source: TestAmerica Portland

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Pacificorp Hydro Resources

Job Number: 250-5919-1
SDG Number: 2500739

Login Number: 5919
List Number: 1
Creator: Poucher, Stephanie A

List Source: TestAmerica Burlington
List Creation: 08/21/12 11:56 AM

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	593419
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.0ºC IR GUN ID 176. CF -0.8
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	Check done at department level as required.

Attachment C – East Fork Wallowa River

June 2012 Suspended Sediment and Turbidity Data

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Portland
9405 SW Nimbus Ave.
Beaverton, OR 97008
Tel: (503)906-9200

TestAmerica Job ID: 250-4011-1
Client Project/Site: Wallowa Falls 6/14/12

For:
Pacificorp Hydro Resources
825 NE Multnomah Blvd
Portland, Oregon 97232

Attn: Briana Weatherly

Brian L Cone

Authorized for release by:
7/3/2012 5:34:23 PM

Brian Cone
Project Manager I
brian.cone@testamericainc.com

Table of Contents

Sample Summary

Client: Pacificorp Hydro Resources
Project/Site: Wallowa Falls 6/14/12

TestAmerica Job ID: 250-4011-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
250-4011-1	EF 1	Water	06/14/12 16:24	06/19/12 15:20
250-4011-2	EF 2	Water	06/14/12 16:25	06/19/12 15:20
250-4011-3	EF 3	Water	06/14/12 16:25	06/19/12 15:20
250-4011-4	EF 4	Water	06/14/12 16:26	06/19/12 15:20

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client: Pacificorp Hydro Resources
Project/Site: Wallowa Falls 6/14/12

TestAmerica Job ID: 250-4011-1

General Chemistry

Client Sample ID: EF 1 — **Lab Sample ID: 250-4011-1**
Date Collected: 06/14/12 16:24 — **Matrix: Water**
Date Received: 06/19/12 15:20

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		34		mg/L			06/21/12 17:26	1

Client Sample ID: EF 2 — **Lab Sample ID: 250-4011-2**
Date Collected: 06/14/12 16:25 — **Matrix: Water**
Date Received: 06/19/12 15:20

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		34		mg/L			06/21/12 17:26	1

Client Sample ID: EF 3 — **Lab Sample ID: 250-4011-3**
Date Collected: 06/14/12 16:25 — **Matrix: Water**
Date Received: 06/19/12 15:20

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		34		mg/L			06/21/12 17:26	1

Client Sample ID: EF 4 — **Lab Sample ID: 250-4011-4**
Date Collected: 06/14/12 16:26 — **Matrix: Water**
Date Received: 06/19/12 15:20

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		35		mg/L			06/21/12 17:26	1

Client: Pacificorp Hydro Resources
Project/Site: Wallowa Falls 6/14/12

TestAmerica Job ID: 250-4011-1

Method: D3977-07 - Suspended Sediment Concentration

Lab Sample ID: MB 250-6762/1
Matrix: Water
Analysis Batch: 6762

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		10		mg/L			06/21/12 17:26	1

Lab Sample ID: LCS 250-6762/2
Matrix: Water
Analysis Batch: 6762

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Suspended Solids			59.9	59.1		mg/L		99	80 - 120		

Lab Sample ID: LCSD 250-6762/3
Matrix: Water
Analysis Batch: 6762

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Suspended Solids			60.1	58.5		mg/L		97	80 - 120	1	20

QC Association Summary

Client: Pacificorp Hydro Resources
Project/Site: Wallowa Falls 6/14/12

TestAmerica Job ID: 250-4011-1

General Chemistry

Analysis Batch: 6762

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
250-4011-1	EF 1	Total/NA	Water	D3977-07	
250-4011-2	EF 2	Total/NA	Water	D3977-07	
250-4011-3	EF 3	Total/NA	Water	D3977-07	
250-4011-4	EF 4	Total/NA	Water	D3977-07	
LCS 250-6762/2	Lab Control Sample	Total/NA	Water	D3977-07	
LCSD 250-6762/3	Lab Control Sample Dup	Total/NA	Water	D3977-07	
MB 250-6762/1	Method Blank	Total/NA	Water	D3977-07	

Certification Summary

Client: Pacificorp Hydro Resources
Project/Site: Wallowa Falls 6/14/12

TestAmerica Job ID: 250-4011-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Portland	Alaska	State Program	10	OR00040
TestAmerica Portland	Alaska (UST)	State Program	10	UST-012
TestAmerica Portland	California	State Program	9	2597
TestAmerica Portland	Oregon	NELAC	10	OR100021
TestAmerica Portland	USDA	Federal		P330-11-00092
TestAmerica Portland	Washington	State Program	10	C586

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

Method Summary

Client: Pacificorp Hydro Resources
Project/Site: Wallowa Falls 6/14/12

TestAmerica Job ID: 250-4011-1

Method	Method Description	Protocol	Laboratory
D3977-07	Suspended Sediment Concentration	ASTM	TAL PRT

Protocol References:

ASTM = ASTM International

Laboratory References:

TAL PRT = TestAmerica Portland, 9405 SW Nimbus Ave., Beaverton, OR 97008, TEL (503)906-9200

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244 ... X 420-9210
5755 8TH Street East, Tacoma, Wa 98424 ... X 922-5047
9405 SW Nimbus Ave, Beaverton, OR 97008-7145 ... X 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 ... X 563-9210

Loc: 250
4011

CHAIN OF CUSTODY REPORT

Work Orde

CLIENT: PacifiCorp

REPORT TO: Briana Weatherly
ADDRESS: 825 NE Multnomah, Ste. 1500
Portland, OR 97232
PHONE: 503-813-7039 FAX:

INVOICE TO: PacifiCorp
Briana Weatherly

P.O. NUMBER:

PROJECT NAME: Wallowa Falls

PROJECT NUMBER:

SAMPLED BY: Briana Weatherly

TURNAROUND REQUEST
in Business Days *

Organic & Inorganic Analyses: 10 STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PRESERVATIVE	REQUESTED ANALYSES: TSS (ASTM D3977)	MATRIX (W, S, O)	# OF CONT.	LOCATION/ COMMENTS	TA WO ID
1	EF1	6-14-12/4:24pm		✓	W	1	River-left	
2	EF2	6-14-12/4:25pm		✓	W	1	River-center	
3	EF3	6-14-12/4:25pm		✓	W	1	River-center	
4	EF4	6-14-12/4:26pm		✓	W	1	River-right	
5								
6								
7								
8								
9								
10								

RELEASED BY: Briana Weatherly — DATE: 6/19/12
PRINT NAME: Briana Weatherly — FIRM: PacifiCorp — TIME: 10:30 AM

RECEIVED BY: Barbara Boy FC — DATE: 6/19/12
PRINT NAME: — FIRM: TAL — TIME: 14:45

RELEASED BY: — DATE: 6/19/12
PRINT NAME: To Lab — FIRM: — TIME: 15:20

RECEIVED BY: — DATE:
PRINT NAME: — FIRM: — TIME:

ADDITIONAL REMARKS:

TEMP: 5.5 °C

PAGE OF

TAL-1000 (0212)

7/3/2012

Login Sample Receipt Checklist

Client: Pacificorp Hydro Resources

Job Number: 250-4011-1

Login Number: 4011

List Number: 1

Creator: Svabik-Seror, Philip

List Source: TestAmerica Portland

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/1/2012	0:00:51	4.5
6/1/2012	1:00:51	4.8
6/1/2012	2:00:51	4.3
6/1/2012	3:00:51	4.2
6/1/2012	4:00:51	4
6/1/2012	5:00:52	4.1
6/1/2012	6:00:52	3.7
6/1/2012	7:00:51	3.8
6/1/2012	8:00:51	3.7
6/1/2012	9:00:31	3.9
6/1/2012	10:00:51	3.7
6/1/2012	11:00:52	3.7
6/1/2012	12:00:52	3.6
6/1/2012	13:00:51	3.5
6/1/2012	14:00:51	3.5
6/1/2012	15:00:51	3.6
6/1/2012	16:00:50	3.9
6/1/2012	17:00:50	4.2
6/1/2012	18:00:51	5.4
6/1/2012	19:00:51	5.9
6/1/2012	20:00:51	8.3
6/1/2012	21:00:51	6.8
6/1/2012	22:00:51	6.4
6/1/2012	23:00:51	5.8
6/2/2012	0:00:51	5.4
6/2/2012	1:00:51	5.4
6/2/2012	2:00:51	4.8
6/2/2012	3:00:51	4.9
6/2/2012	4:00:52	4.9
6/2/2012	5:00:51	4.7
6/2/2012	6:00:51	4.5
6/2/2012	7:00:52	4.4
6/2/2012	8:00:52	4.6
6/2/2012	9:00:51	4.4
6/2/2012	10:00:52	4.3
6/2/2012	11:00:52	4.8
6/2/2012	12:00:52	4.1
6/2/2012	13:00:51	4.4
6/2/2012	14:00:51	4.6
6/2/2012	15:00:52	4.7
6/2/2012	16:00:52	5.1
6/2/2012	17:00:51	6.5

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/2/2012	18:00:51	6.8
6/2/2012	19:00:52	6.2
6/2/2012	20:00:52	5.9
6/2/2012	21:00:52	6.4
6/2/2012	22:00:51	6.6
6/2/2012	23:00:52	6.3
6/3/2012	0:00:52	6
6/3/2012	1:00:51	5.5
6/3/2012	2:00:52	5.2
6/3/2012	3:00:52	5.4
6/3/2012	4:00:52	5
6/3/2012	5:00:52	4.8
6/3/2012	6:00:52	5.1
6/3/2012	7:00:52	4.8
6/3/2012	8:00:52	4.7
6/3/2012	9:00:52	4.5
6/3/2012	10:00:52	4.3
6/3/2012	11:00:52	4.5
6/3/2012	12:00:52	4.1
6/3/2012	13:00:52	4
6/3/2012	14:00:52	4
6/3/2012	15:00:51	4.3
6/3/2012	16:00:51	4.1
6/3/2012	17:00:51	4.5
6/3/2012	18:00:51	4.8
6/3/2012	19:00:51	5.1
6/3/2012	20:00:51	6.4
6/3/2012	21:00:52	8.4
6/3/2012	22:00:52	7.9
6/3/2012	23:00:52	7.5
6/4/2012	0:00:52	6.8
6/4/2012	1:00:51	7.2
6/4/2012	2:00:52	6
6/4/2012	3:00:52	5.9
6/4/2012	4:00:52	5.7
6/4/2012	5:00:52	6.1
6/4/2012	6:00:52	5.5
6/4/2012	7:00:52	5
6/4/2012	8:00:52	4.9
6/4/2012	9:00:52	4.9
6/4/2012	10:00:52	4.8
6/4/2012	11:00:52	4.7

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/4/2012	12:00:51	4.7
6/4/2012	13:00:52	4.7
6/4/2012	14:00:51	5
6/4/2012	15:00:51	5.4
6/4/2012	16:00:51	7.4
6/4/2012	17:00:51	11.1
6/4/2012	18:00:51	14.7
6/4/2012	19:00:51	16.6
6/4/2012	20:00:51	18.8
6/4/2012	21:00:52	18.9
6/4/2012	22:00:52	17.2
6/4/2012	23:00:51	21.3
6/5/2012	0:00:52	29.7
6/5/2012	1:00:52	29.1
6/5/2012	2:00:52	26.4
6/5/2012	3:00:52	17.5
6/5/2012	4:00:52	14.4
6/5/2012	5:00:52	12.8
6/5/2012	6:00:52	10.8
6/5/2012	7:00:52	10.3
6/5/2012	8:00:52	9.4
6/5/2012	9:00:52	8.6
6/5/2012	10:00:52	7.5
6/5/2012	11:00:52	7.5
6/5/2012	12:00:52	7.5
6/5/2012	13:00:52	7
6/5/2012	14:00:52	8.2
6/5/2012	15:00:52	6.7
6/5/2012	16:00:52	6.8
6/5/2012	17:00:52	6.2
6/5/2012	18:00:52	6.2
6/5/2012	19:00:52	5.9
6/5/2012	20:00:52	6.9
6/5/2012	21:00:52	6.6
6/5/2012	22:00:52	6.1
6/5/2012	23:00:52	6.1
6/6/2012	0:00:52	6.2
6/6/2012	1:00:52	6.3
6/6/2012	2:00:52	6.2
6/6/2012	3:00:52	6
6/6/2012	4:00:52	5.6
6/6/2012	5:00:52	5.6

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/6/2012	6:00:52	5.6
6/6/2012	7:00:52	5.6
6/6/2012	8:00:52	6.1
6/6/2012	9:00:52	5.3
6/6/2012	10:00:52	5.2
6/6/2012	11:00:52	5.3
6/6/2012	12:00:52	5.2
6/6/2012	13:00:52	5.2
6/6/2012	14:00:52	5.1
6/6/2012	15:00:52	5.2
6/6/2012	16:00:51	5.3
6/6/2012	17:00:51	7.5
6/6/2012	18:00:52	5.2
6/6/2012	19:00:52	5.3
6/6/2012	20:00:52	5.7
6/6/2012	21:00:51	5.2
6/6/2012	22:00:52	5.1
6/6/2012	23:00:52	4.9
6/7/2012	0:00:52	5.1
6/7/2012	1:00:52	5
6/7/2012	2:00:52	5.1
6/7/2012	3:00:52	5.3
6/7/2012	4:00:52	5.1
6/7/2012	5:00:52	5.2
6/7/2012	6:00:52	5.1
6/7/2012	7:00:52	4.7
6/7/2012	8:00:52	5.6
6/7/2012	9:00:52	5.2
6/7/2012	10:00:52	4.9
6/7/2012	11:00:52	4.9
6/7/2012	12:00:52	4.8
6/7/2012	13:00:52	4.8
6/7/2012	14:00:52	4.8
6/7/2012	15:00:52	5
6/7/2012	16:00:52	4.8
6/7/2012	17:00:52	4.9
6/7/2012	18:00:51	4.8
6/7/2012	19:00:52	4.8
6/7/2012	20:00:52	4.9
6/7/2012	21:00:52	5
6/7/2012	22:00:52	4.8
6/7/2012	23:00:52	4.6

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/8/2012	0:00:52	4.7
6/8/2012	1:00:52	4.8
6/8/2012	2:00:52	4.9
6/8/2012	3:00:52	4.8
6/8/2012	4:00:52	4.7
6/8/2012	5:00:52	4.7
6/8/2012	6:00:52	4.7
6/8/2012	7:00:52	4.7
6/8/2012	8:00:52	4.7
6/8/2012	9:00:52	4.8
6/8/2012	10:00:52	4.7
6/8/2012	11:00:52	4.7
6/8/2012	12:00:52	4.6
6/8/2012	13:00:52	4.7
6/8/2012	14:00:52	4.7
6/8/2012	15:00:52	5.6
6/8/2012	16:00:52	4.6
6/8/2012	17:00:52	4.5
6/8/2012	18:00:52	4.7
6/8/2012	19:00:52	5
6/8/2012	20:00:52	4.4
6/8/2012	21:00:52	4.6
6/8/2012	22:00:52	4.3
6/8/2012	23:00:52	4.7
6/9/2012	0:00:52	4.5
6/9/2012	1:00:52	4.4
6/9/2012	2:00:52	4.2
6/9/2012	3:00:52	4.5
6/9/2012	4:00:52	4.5
6/9/2012	5:00:52	4.2
6/9/2012	6:00:52	4.3
6/9/2012	7:00:52	4.3
6/9/2012	8:00:53	4.3
6/9/2012	9:00:52	4.3
6/9/2012	10:00:52	4.2
6/9/2012	11:00:52	4.3
6/9/2012	12:00:53	4.4
6/9/2012	13:00:53	4.5
6/9/2012	14:00:53	4.3
6/9/2012	15:00:52	4.2
6/9/2012	16:00:52	4.2
6/9/2012	17:00:52	4.2

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/9/2012	18:00:52	4.2
6/9/2012	19:00:52	4.1
6/9/2012	20:00:52	4.1
6/9/2012	21:00:52	4.3
6/9/2012	22:00:52	4.1
6/9/2012	23:00:52	4.2
6/10/2012	0:00:52	4.3
6/10/2012	1:00:52	4.2
6/10/2012	2:00:53	4.1
6/10/2012	3:00:52	4.1
6/10/2012	4:00:52	4.2
6/10/2012	5:00:52	4.2
6/10/2012	6:00:52	4.2
6/10/2012	7:00:52	4.2
6/10/2012	8:00:52	4.2
6/10/2012	9:00:52	4.2
6/10/2012	10:00:53	4.2
6/10/2012	11:00:52	4.3
6/10/2012	12:00:53	4.3
6/10/2012	13:00:52	4.2
6/10/2012	14:00:52	4.1
6/10/2012	15:00:52	4.3
6/10/2012	16:00:52	4.2
6/10/2012	17:00:52	4.2
6/10/2012	18:00:51	4
6/10/2012	19:00:51	4.1
6/10/2012	20:00:51	4
6/10/2012	21:00:52	4.1
6/10/2012	22:00:51	4.1
6/10/2012	23:00:52	4.2
6/11/2012	0:00:52	4.2
6/11/2012	1:00:52	4.4
6/11/2012	2:00:52	4
6/11/2012	3:00:52	4
6/11/2012	4:00:52	4.2
6/11/2012	5:00:52	4
6/11/2012	6:00:52	3.9
6/11/2012	7:00:52	4.1
6/11/2012	8:00:52	4
6/11/2012	9:00:52	4.2
6/11/2012	10:00:52	4.2
6/11/2012	11:00:52	4

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/11/2012	12:00:52	4.2
6/11/2012	13:00:52	3.9
6/11/2012	14:00:52	4
6/11/2012	15:00:51	4.1
6/11/2012	16:00:52	4
6/11/2012	17:00:51	4.2
6/11/2012	18:00:51	4.7
6/11/2012	19:00:51	4.3
6/11/2012	20:00:51	4.3
6/11/2012	21:00:51	5
6/11/2012	22:00:51	4.5
6/11/2012	23:00:51	4.8
6/12/2012	0:00:52	4.4
6/12/2012	1:00:52	4.2
6/12/2012	2:00:52	4.2
6/12/2012	3:00:52	4.1
6/12/2012	4:00:52	4
6/12/2012	5:00:31	4.1
6/12/2012	6:00:52	4.5
6/12/2012	7:00:52	4.3
6/12/2012	8:00:52	4.2
6/12/2012	9:00:52	4.2
6/12/2012	10:00:52	4
6/12/2012	11:00:52	4.2
6/12/2012	12:00:52	4.2
6/12/2012	13:00:51	4.2
6/12/2012	14:00:51	4.2
6/12/2012	15:00:51	4.5
6/12/2012	16:00:51	4.3
6/12/2012	17:00:51	4.4
6/12/2012	18:00:51	4.5
6/12/2012	19:00:51	4.5
6/12/2012	20:00:51	5.2
6/12/2012	21:00:51	5.3
6/12/2012	22:00:52	4.8
6/12/2012	23:00:51	4.7
6/13/2012	0:00:52	4.8
6/13/2012	1:00:51	4.5
6/13/2012	2:00:52	4.7
6/13/2012	3:00:52	4.5
6/13/2012	4:00:51	4.3
6/13/2012	5:00:52	4.2

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/13/2012	6:00:52	4.2
6/13/2012	7:00:52	4.1
6/13/2012	8:00:52	4.2
6/13/2012	9:00:52	4.5
6/13/2012	10:00:52	4
6/13/2012	11:00:52	4
6/13/2012	12:00:52	3.9
6/13/2012	13:00:52	4
6/13/2012	14:00:51	4.2
6/13/2012	15:00:51	4.2
6/13/2012	16:00:51	4.1
6/13/2012	17:00:51	4.2
6/13/2012	18:00:51	4.7
6/13/2012	19:00:51	4.7
6/13/2012	20:00:51	4.8
6/13/2012	21:00:51	4.8
6/13/2012	22:00:52	4.8
6/13/2012	23:00:52	4.9
6/14/2012	0:00:51	4.6
6/14/2012	1:00:52	4.9
6/14/2012	2:00:52	4.5
6/14/2012	3:00:52	4.3
6/14/2012	4:00:52	4.2
6/14/2012	5:00:52	4.2
6/14/2012	6:00:52	4.2
6/14/2012	7:00:52	4.2
6/14/2012	8:00:52	4.2
6/14/2012	9:00:53	4.2
6/14/2012	10:00:52	4
6/14/2012	11:00:52	4
6/14/2012	12:00:52	4.2
6/14/2012	13:00:52	4
6/14/2012	14:00:52	4
6/14/2012	15:00:51	4.1
6/14/2012	16:00:51	4.2
6/14/2012	17:00:51	4.3
6/14/2012	18:00:51	4.3
6/14/2012	19:00:51	4.5
6/14/2012	20:00:51	4.9
6/14/2012	21:00:51	4.7
6/14/2012	22:00:51	4.8
6/14/2012	23:00:51	4.8

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/15/2012	0:00:52	4.7
6/15/2012	1:00:52	4.5
6/15/2012	2:00:52	4.5
6/15/2012	3:00:52	4.3
6/15/2012	4:00:52	4.3
6/15/2012	5:00:52	4.3
6/15/2012	6:00:52	4.3
6/15/2012	7:00:52	4.2
6/15/2012	8:00:52	4.2
6/15/2012	9:00:52	4.2
6/15/2012	10:00:52	4.2
6/15/2012	11:00:52	4.2
6/15/2012	12:00:52	4
6/15/2012	13:00:52	4.2
6/15/2012	14:00:52	4.1
6/15/2012	15:00:51	4.6
6/15/2012	16:00:51	4.3
6/15/2012	17:00:51	4.4
6/15/2012	18:00:51	4.8
6/15/2012	19:00:51	5.4
6/15/2012	20:00:51	6.1
6/15/2012	21:00:51	6.1
6/15/2012	22:00:52	6.5
6/15/2012	23:00:52	6.2
6/16/2012	0:00:52	6.7
6/16/2012	1:00:52	5.9
6/16/2012	2:00:52	5.3
6/16/2012	3:00:52	5.6
6/16/2012	4:00:52	6.1
6/16/2012	5:00:52	5.4
6/16/2012	6:00:52	5.4
6/16/2012	7:00:52	5.9
6/16/2012	8:00:52	6.2
6/16/2012	9:00:55	5.6
6/16/2012	10:00:53	5.1
6/16/2012	11:00:52	5.3
6/16/2012	12:00:31	5.4
6/16/2012	13:00:49	5.3
6/16/2012	14:00:52	5.3
6/16/2012	15:00:52	5.2
6/16/2012	16:00:57	5.5
6/16/2012	17:00:55	5.2

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/16/2012	18:00:54	5.2
6/16/2012	19:00:52	5.4
6/16/2012	20:00:52	5.7
6/16/2012	21:00:50	5.9
6/16/2012	22:00:55	5.8
6/16/2012	23:00:54	5.9
6/17/2012	0:00:51	5.7
6/17/2012	1:00:51	6.1
6/17/2012	2:00:52	5.4
6/17/2012	3:00:52	5.3
6/17/2012	4:00:52	5.1
6/17/2012	5:00:52	5.4
6/17/2012	6:00:52	5.2
6/17/2012	7:00:52	5
6/17/2012	8:00:52	5.2
6/17/2012	9:00:50	5
6/17/2012	10:00:51	5
6/17/2012	11:00:55	5.1
6/17/2012	12:00:54	5.3
6/17/2012	13:00:52	5.4
6/17/2012	14:00:44	5.7
6/17/2012	15:00:51	5.4
6/17/2012	16:00:51	6.3
6/17/2012	17:00:51	7.1
6/17/2012	18:00:52	8.6
6/17/2012	19:00:31	8.1
6/17/2012	20:00:50	9.7
6/17/2012	21:00:51	8.9
6/17/2012	22:00:51	8.7
6/17/2012	23:00:51	9.4
6/18/2012	0:00:51	8.6
6/18/2012	1:00:51	7.9
6/18/2012	2:00:51	7.3
6/18/2012	3:00:51	7.7
6/18/2012	4:00:51	6.7
6/18/2012	5:00:51	6.5
6/18/2012	6:00:51	6.1
6/18/2012	7:00:52	6.1
6/18/2012	8:00:52	5.9
6/18/2012	9:00:51	5.7
6/18/2012	10:00:52	5.6
6/18/2012	11:00:52	5.9

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/18/2012	12:00:51	5.8
6/18/2012	13:00:51	5.5
6/18/2012	14:00:51	5.6
6/18/2012	15:00:51	5.7
6/18/2012	16:00:51	5.3
6/18/2012	17:00:51	5.6
6/18/2012	18:00:51	5.2
6/18/2012	19:00:51	5.3
6/18/2012	20:00:51	5.3
6/18/2012	21:00:51	5.5
6/18/2012	22:00:51	5.1
6/18/2012	23:00:52	5.1
6/19/2012	0:00:52	5.1
6/19/2012	1:00:52	5.7
6/19/2012	2:00:52	5
6/19/2012	3:00:52	5
6/19/2012	4:00:52	4.8
6/19/2012	5:00:51	5
6/19/2012	6:00:51	5
6/19/2012	7:00:52	4.8
6/19/2012	8:00:52	4.8
6/19/2012	9:00:52	4.7
6/19/2012	10:00:52	4.6
6/19/2012	11:00:52	4.5
6/19/2012	12:00:52	4.4
6/19/2012	13:00:52	4.7
6/19/2012	14:00:52	4.5
6/19/2012	15:00:52	4.5
6/19/2012	16:00:52	4.7
6/19/2012	17:00:52	4.5
6/19/2012	18:00:52	4.6
6/19/2012	19:00:51	4.7
6/19/2012	20:00:51	4.6
6/19/2012	21:00:52	4.4
6/19/2012	22:00:51	4.5
6/19/2012	23:00:52	4.5
6/20/2012	0:00:52	4.3
6/20/2012	1:00:51	4.5
6/20/2012	2:00:52	4.6
6/20/2012	3:00:52	4.6
6/20/2012	4:00:52	4.7
6/20/2012	5:00:51	4.5

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/20/2012	6:00:52	4.6
6/20/2012	7:00:52	4.6
6/20/2012	8:00:52	4.4
6/20/2012	9:00:52	4.4
6/20/2012	10:00:52	4.3
6/20/2012	11:00:52	4.4
6/20/2012	12:00:52	4.3
6/20/2012	13:00:52	4.3
6/20/2012	14:00:51	4.5
6/20/2012	15:00:51	4.5
6/20/2012	16:00:51	4.5
6/20/2012	17:00:51	4.4
6/20/2012	18:00:51	4.7
6/20/2012	19:00:51	4.7
6/20/2012	20:00:51	4.5
6/20/2012	21:00:51	4.5
6/20/2012	22:00:51	4.5
6/20/2012	23:00:51	4.7
6/21/2012	0:00:51	4.5
6/21/2012	1:00:51	4.4
6/21/2012	2:00:51	4.4
6/21/2012	3:00:51	4.5
6/21/2012	4:00:51	4.3
6/21/2012	5:00:52	4.5
6/21/2012	6:00:52	4.6
6/21/2012	7:00:52	4.5
6/21/2012	8:00:52	4.5
6/21/2012	9:00:52	4.4
6/21/2012	10:00:52	4.3
6/21/2012	11:00:52	4.3
6/21/2012	12:00:52	4.3
6/21/2012	13:00:51	4.3
6/21/2012	14:00:51	4.3
6/21/2012	15:00:51	4.3
6/21/2012	16:00:51	4.6
6/21/2012	17:00:51	4.7
6/21/2012	18:00:51	4.5
6/21/2012	19:00:51	4.6
6/21/2012	20:00:51	4.9
6/21/2012	21:00:50	4.9
6/21/2012	22:00:51	5
6/21/2012	23:00:51	5

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/22/2012	0:00:51	5.1
6/22/2012	1:00:51	5.1
6/22/2012	2:00:51	5.1
6/22/2012	3:00:51	5
6/22/2012	4:00:52	4.9
6/22/2012	5:00:51	4.8
6/22/2012	6:00:51	4.8
6/22/2012	7:00:51	4.8
6/22/2012	8:00:51	4.5
6/22/2012	9:00:52	4.5
6/22/2012	10:00:51	4.8
6/22/2012	11:00:51	4.5
6/22/2012	12:00:51	4.5
6/22/2012	13:00:51	4.6
6/22/2012	14:00:51	4.5
6/22/2012	15:00:51	4.5
6/22/2012	16:00:50	4.8
6/22/2012	17:00:51	5
6/22/2012	18:00:50	5.4
6/22/2012	19:00:51	5.3
6/22/2012	20:00:50	5.9
6/22/2012	21:00:51	5.5
6/22/2012	22:00:50	6.1
6/22/2012	23:00:51	6.1
6/23/2012	0:00:51	6.1
6/23/2012	1:00:51	6.1
6/23/2012	2:00:51	5.9
6/23/2012	3:00:51	6.1
6/23/2012	4:00:51	6
6/23/2012	5:00:51	5.6
6/23/2012	6:00:51	5.9
6/23/2012	7:00:51	5.9
6/23/2012	8:00:52	6.1
6/23/2012	9:00:51	6
6/23/2012	10:00:51	5.7
6/23/2012	11:00:51	5.6
6/23/2012	12:00:51	5.4
6/23/2012	13:00:51	5.4
6/23/2012	14:00:51	5.5
6/23/2012	15:00:51	5.4
6/23/2012	16:00:51	5.3
6/23/2012	17:00:51	5.1

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/23/2012	18:00:50	5.8
6/23/2012	19:00:51	5.3
6/23/2012	20:00:51	5.6
6/23/2012	21:00:51	5.9
6/23/2012	22:00:51	5.6
6/23/2012	23:00:51	5.5
6/24/2012	0:00:51	5.6
6/24/2012	1:00:51	5.6
6/24/2012	2:00:52	5.7
6/24/2012	3:00:51	5.3
6/24/2012	4:00:51	5.7
6/24/2012	5:00:51	5.3
6/24/2012	6:00:51	5.3
6/24/2012	7:00:51	5.1
6/24/2012	8:00:51	5.3
6/24/2012	9:00:52	5
6/24/2012	10:00:51	5
6/24/2012	11:00:51	5.1
6/24/2012	12:00:52	5.1
6/24/2012	13:00:51	4.9
6/24/2012	14:00:51	5
6/24/2012	15:00:51	5.6
6/24/2012	16:00:51	5
6/24/2012	17:00:51	5.3
6/24/2012	18:00:51	5.2
6/24/2012	19:00:51	5.7
6/24/2012	20:00:51	5.1
6/24/2012	21:00:51	5
6/24/2012	22:00:51	5.3
6/24/2012	23:00:51	5.3
6/25/2012	0:00:51	5.5
6/25/2012	1:00:51	5.4
6/25/2012	2:00:51	5.3
6/25/2012	3:00:51	5.2
6/25/2012	4:00:51	5
6/25/2012	5:00:51	5.5
6/25/2012	6:00:51	5.2
6/25/2012	7:00:51	5.1
6/25/2012	8:00:51	5
6/25/2012	9:00:51	4.7
6/25/2012	10:00:51	5
6/25/2012	11:00:51	4.8

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/25/2012	12:00:51	4.8
6/25/2012	13:00:51	4.8
6/25/2012	14:00:51	4.8
6/25/2012	15:00:50	5
6/25/2012	16:00:51	4.8
6/25/2012	17:00:50	4.9
6/25/2012	18:00:51	4.7
6/25/2012	19:00:50	4.9
6/25/2012	20:00:50	5
6/25/2012	21:00:51	5
6/25/2012	22:00:51	5.2
6/25/2012	23:00:51	5.3
6/26/2012	0:00:51	5.2
6/26/2012	1:00:51	5.1
6/26/2012	2:00:51	5.1
6/26/2012	3:00:51	5
6/26/2012	4:00:51	5
6/26/2012	5:00:52	5
6/26/2012	6:00:51	4.9
6/26/2012	7:00:51	5.2
6/26/2012	8:00:51	5.8
6/26/2012	9:00:51	8.5
6/26/2012	10:00:51	10.3
6/26/2012	11:00:51	9.2
6/26/2012	12:00:51	7.2
6/26/2012	13:00:51	6.5
6/26/2012	14:00:51	6.2
6/26/2012	15:00:51	6.2
6/26/2012	16:00:51	5.8
6/26/2012	17:00:51	5.6
6/26/2012	18:00:51	5.5
6/26/2012	19:00:51	5.4
6/26/2012	20:00:51	5.2
6/26/2012	21:00:51	5.3
6/26/2012	22:00:51	5.1
6/26/2012	23:00:51	5
6/27/2012	0:00:51	5.1
6/27/2012	1:00:51	5.4
6/27/2012	2:00:51	5.7
6/27/2012	3:00:51	5.1
6/27/2012	4:00:51	5.3
6/27/2012	5:00:51	5.3

PacifiCorp Wallowa Falls Hydroelectric Project (FERC No. 308)
East Fork Wallowa River at Lower Bypass Reach Staff Gage
June 1012 Background Turbitidy Data

Date	Time	Turbidity
m/d/y	hh:mm:ss	NTU
6/27/2012	6:00:51	5.1
6/27/2012	7:00:52	5.1
6/27/2012	8:00:52	5.1
6/27/2012	9:00:52	5.1
6/27/2012	10:00:51	5
6/27/2012	11:00:51	5
6/27/2012	12:00:51	5
6/27/2012	13:00:51	5
6/27/2012	14:00:51	5.4
6/27/2012	15:00:51	5.2
6/27/2012	16:00:51	5.2
6/27/2012	17:00:51	5.4
6/27/2012	18:00:51	5.3
6/27/2012	19:00:51	5.1

Attachment D – East Fork Wallowa River

Sub -Armor Substrate Sample Results

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 250-8119-1

Job Description: Sediment/Water

For:
Pacificorp Hydro Resources
825 NE Multnomah Blvd
Portland, OR 97232

Attention: Briana Weatherly

Approved for release.
Ella Sandquist
Project Manager I
11/23/2012 3:01 PM

Ella Sandquist
Project Manager I
ella.sandquist@testamericainc.com
11/23/2012

TestAmerica Laboratories, Inc
TestAmerica Portland 9405 SW Nimbus Ave., Beaverton, OR 97008
Tel (503) 906-9200 Fax (503) 906-9210 www.testamericainc.com

Table of Contents

Receipt
The samples were received on 11/9/2012 11:12 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 12.0º C.

Except:

The following sample(s) was received at the laboratory outside the required temperature criteria: EF-T2 (250-8119-1), EF-T3 (250-8119-2), EF-T4 (250-8119-3). The client was contacted regarding this issue, and the laboratory was instructed to proceed with/cancel analysis.

The following sample(s) was collected in an improper container: EF-T2 (250-8119-1), EF-T3 (250-8119-2), EF-T4 (250-8119-3).

Sample were sent in in large pails with an excess volume. Please contact your project manager to receive the proper sized containers for future sampling.

Geotechnical
No analytical or quality issues were noted.

EXECUTIVE SUMMARY - Detections

Client: Pacificorp Hydro Resources Job Number: 250-8119-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
250-8119-1	**EF-T2**					
Sieve Size 3 inch		0.0			%	D422
Gravel		83.8			%	D422
Hydrometer Reading 1 - Particle Size		37.3			um	D422
Sieve Size 2 inch		0.0			%	D422
Sand		15.9			%	D422
Hydrometer Reading 2 - Particle Size		23.6			um	D422
Sieve Size 1.5 inch		20.8			%	D422
Coarse Sand		8.1			%	D422
Hydrometer Reading 3 - Particle Size		13.6			um	D422
Sieve Size 1 inch		19.3			%	D422
Medium Sand		6.4			%	D422
Hydrometer Reading 4 - Particle Size		9.7			um	D422
Sieve Size 0.75 inch		3.5			%	D422
Fine Sand		1.3			%	D422
Hydrometer Reading 5 - Particle Size		6.9			um	D422
Sieve Size 0.375 inch		30.1			%	D422
Silt		0.2			%	D422
Hydrometer Reading 6 - Particle Size		3.3			um	D422
Sieve Size #4		10.1			%	D422
Clay		0.2			%	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422
Sieve Size #10		8.1			%	D422
Sieve Size #20		4.2			%	D422
Sieve Size #40		2.2			%	D422
Sieve Size #60		0.8			%	D422
Sieve Size #80		0.2			%	D422
Sieve Size #100		0.1			%	D422
Sieve Size #200		0.2			%	D422
Hydrometer Reading 1		0.02			%	D422
Hydrometer Reading 2		0.0			%	D422
Hydrometer Reading 3		0.0			%	D422
Hydrometer Reading 4		0.2			%	D422
Hydrometer Reading 5		0.0			%	D422
Hydrometer Reading 6		0.2			%	D422
Hydrometer Reading 7		0.0			%	D422
Gravel		83.8			%	D422
Sand		15.9			%	D422
Coarse Sand		8.1			%	D422
Medium Sand		6.4			%	D422
Fine Sand		1.3			%	D422
Silt		0.2			%	D422
Clay		0.2			%	D422
Hydrometer Reading 1 - Particle Size		37.3			um	D422
Hydrometer Reading 2 - Particle Size		23.6			um	D422
Hydrometer Reading 3 - Particle Size		13.6			um	D422
Hydrometer Reading 4 - Particle Size		9.7			um	D422

EXECUTIVE SUMMARY - Detections

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Lab Sample ID / Client Sample ID / Analyte	Result	Qualifier	Reporting Limit	Units	Method
Hydrometer Reading 5 - Particle Size	6.9			um	D422
Hydrometer Reading 6 - Particle Size	3.3			um	D422
Hydrometer Reading 7 - Particle Size	1.4			um	D422

EXECUTIVE SUMMARY - Detections

Client: Pacificorp Hydro Resources Job Number: 250-8119-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
250-8119-2	**EF-T3**					
Sieve Size 3 inch		0.0			%	D422
Gravel		46.9			%	D422
Hydrometer Reading 1 - Particle Size		36.6			um	D422
Sieve Size 2 inch		0.0			%	D422
Sand		50.0			%	D422
Hydrometer Reading 2 - Particle Size		23.2			um	D422
Sieve Size 1.5 inch		0.0			%	D422
Coarse Sand		8.9			%	D422
Hydrometer Reading 3 - Particle Size		13.5			um	D422
Sieve Size 1 inch		0.0			%	D422
Medium Sand		14.6			%	D422
Hydrometer Reading 4 - Particle Size		9.6			um	D422
Sieve Size 0.75 inch		21.6			%	D422
Fine Sand		26.5			%	D422
Hydrometer Reading 5 - Particle Size		6.9			um	D422
Sieve Size 0.375 inch		13.5			%	D422
Silt		1.6			%	D422
Hydrometer Reading 6 - Particle Size		3.3			um	D422
Sieve Size #4		11.8			%	D422
Clay		1.5			%	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422
Sieve Size #10		8.9			%	D422
Sieve Size #20		5.8			%	D422
Sieve Size #40		8.8			%	D422
Sieve Size #60		11.1			%	D422
Sieve Size #80		6.3			%	D422
Sieve Size #100		3.2			%	D422
Sieve Size #200		5.9			%	D422
Hydrometer Reading 1		0.2			%	D422
Hydrometer Reading 2		0.0			%	D422
Hydrometer Reading 3		0.9			%	D422
Hydrometer Reading 4		0.5			%	D422
Hydrometer Reading 5		0.0			%	D422
Hydrometer Reading 6		0.08			%	D422
Hydrometer Reading 7		0.0			%	D422
Gravel		46.9			%	D422
Sand		50.0			%	D422
Coarse Sand		8.9			%	D422
Medium Sand		14.6			%	D422
Fine Sand		26.5			%	D422
Silt		1.6			%	D422
Clay		1.5			%	D422
Hydrometer Reading 1 - Particle Size		36.6			um	D422
Hydrometer Reading 2 - Particle Size		23.2			um	D422
Hydrometer Reading 3 - Particle Size		13.5			um	D422
Hydrometer Reading 4 - Particle Size		9.6			um	D422

EXECUTIVE SUMMARY - Detections

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
Hydrometer Reading 5 - Particle Size		6.9			um	D422
Hydrometer Reading 6 - Particle Size		3.3			um	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422

EXECUTIVE SUMMARY - Detections

Client: Pacificorp Hydro Resources Job Number: 250-8119-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
250-8119-3	**EF-T4**					
Sieve Size 3 inch		0.0			%	D422
Gravel		64.9			%	D422
Hydrometer Reading 1 - Particle Size		36.8			um	D422
Sieve Size 2 inch		0.0			%	D422
Sand		34.2			%	D422
Hydrometer Reading 2 - Particle Size		23.4			um	D422
Sieve Size 1.5 inch		45.9			%	D422
Coarse Sand		10.5			%	D422
Hydrometer Reading 3 - Particle Size		13.6			um	D422
Sieve Size 1 inch		0.0			%	D422
Medium Sand		10.4			%	D422
Hydrometer Reading 4 - Particle Size		9.7			um	D422
Sieve Size 0.75 inch		0.0			%	D422
Fine Sand		13.3			%	D422
Hydrometer Reading 5 - Particle Size		6.9			um	D422
Sieve Size 0.375 inch		7.2			%	D422
Silt		0.5			%	D422
Hydrometer Reading 6 - Particle Size		3.4			um	D422
Sieve Size #4		11.8			%	D422
Clay		0.4			%	D422
Hydrometer Reading 7 - Particle Size		1.4			um	D422
Sieve Size #10		10.5			%	D422
Sieve Size #20		4.6			%	D422
Sieve Size #40		5.8			%	D422
Sieve Size #60		6.3			%	D422
Sieve Size #80		2.9			%	D422
Sieve Size #100		1.6			%	D422
Sieve Size #200		2.5			%	D422
Hydrometer Reading 1		0.02			%	D422
Hydrometer Reading 2		0.2			%	D422
Hydrometer Reading 3		0.2			%	D422
Hydrometer Reading 4		0.0			%	D422
Hydrometer Reading 5		0.2			%	D422
Hydrometer Reading 6		0.2			%	D422
Hydrometer Reading 7		0.0			%	D422
Gravel		64.9			%	D422
Sand		34.2			%	D422
Coarse Sand		10.5			%	D422
Medium Sand		10.4			%	D422
Fine Sand		13.3			%	D422
Silt		0.5			%	D422
Clay		0.4			%	D422
Hydrometer Reading 1 - Particle Size		36.8			um	D422
Hydrometer Reading 2 - Particle Size		23.4			um	D422
Hydrometer Reading 3 - Particle Size		13.6			um	D422
Hydrometer Reading 4 - Particle Size		9.7			um	D422

EXECUTIVE SUMMARY - Detections

Client: Pacificorp Hydro Resources Job Number: 250-8119-1

Lab Sample ID / Client Sample ID Analyte	Result	Qualifier	Reporting Limit	Units	Method
Hydrometer Reading 5 - Particle Size	6.9			um	D422
Hydrometer Reading 6 - Particle Size	3.4			um	D422
Hydrometer Reading 7 - Particle Size	1.4			um	D422

METHOD SUMMARY

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Description	Lab Location	Method	Preparation Method
Matrix Solid			
Grain Size	TAL BUR	ASTM D422	

Lab References:

TAL BUR = TestAmerica Burlington

Method References:

ASTM = ASTM International

METHOD / ANALYST SUMMARY

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Method	Analyst	Analyst ID
ASTM D422	Bourdeau, Timothy P	TPB

SAMPLE SUMMARY

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
250-8119-1	EF-T2	Solid	10/24/2012 1222	11/09/2012 1112
250-8119-2	EF-T3	Solid	10/24/2012 1148	11/09/2012 1112
250-8119-3	EF-T4	Solid	10/24/2012 1535	11/09/2012 1112

SAMPLE RESULTS

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Client Sample ID: **EF-T2**

Lab Sample ID: 250-8119-1
Client Matrix: Solid

Date Sampled: 10/24/2012 1222
Date Received: 11/09/2012 1112

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-48204	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-8119-A-1.txt
Dilution:	1.0			Initial Weight/Volume:	565.12 g
Analysis Date:	11/14/2012 2254			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE
Sieve Size 3 inch		0.0		
Sieve Size 2 inch		0.0		
Sieve Size 1.5 inch		20.8		
Sieve Size 1 inch		19.3		
Sieve Size 0.75 inch		3.5		
Sieve Size 0.375 inch		30.1		
Sieve Size #4		10.1		
Sieve Size #10		8.1		
Sieve Size #20		4.2		
Sieve Size #40		2.2		
Sieve Size #60		0.8		
Sieve Size #80		0.2		
Sieve Size #100		0.1		
Sieve Size #200		0.2		
Hydrometer Reading 1		0.02		
Hydrometer Reading 2		0.0		
Hydrometer Reading 3		0.0		
Hydrometer Reading 4		0.2		
Hydrometer Reading 5		0.0		
Hydrometer Reading 6		0.2		
Hydrometer Reading 7		0.0		
Gravel		83.8		
Sand		15.9		
Coarse Sand		8.1		
Medium Sand		6.4		
Fine Sand		1.3		
Silt		0.2		
Clay		0.2		

Analyte	DryWt Corrected: N	Result (um)	Qualifier	NONE
Hydrometer Reading 1 - Particle Size		37.3		
Hydrometer Reading 2 - Particle Size		23.6		
Hydrometer Reading 3 - Particle Size		13.6		
Hydrometer Reading 4 - Particle Size		9.7		
Hydrometer Reading 5 - Particle Size		6.9		
Hydrometer Reading 6 - Particle Size		3.3		
Hydrometer Reading 7 - Particle Size		1.4		

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Client Sample ID: **EF-T2**

Lab Sample ID: 250-8119-1
Client Matrix: Solid

Date Sampled: 10/24/2012 1222
Date Received: 11/09/2012 1112

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-48204	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-8119-A-1.txt
Dilution:	1.0			Initial Weight/Volume:	565.12 g
Analysis Date:	11/14/2012 2254			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE
Gravel		83.8		
Sand		15.9		
Coarse Sand		8.1		
Medium Sand		6.4		
Fine Sand		1.3		
Silt		0.2		
Clay		0.2		

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Client Sample ID: **EF-T2**

Lab Sample ID: 250-8119-1
Client Matrix: Solid

Date Sampled: 10/24/2012 1222
Date Received: 11/09/2012 1112

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-48204	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-8119-A-1.txt
Dilution:	1.0			Initial Weight/Volume:	565.12 g
Analysis Date:	11/14/2012 2254			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (um)	Qualifier	NONE
Hydrometer Reading 1 - Particle Size		37.3		
Hydrometer Reading 2 - Particle Size		23.6		
Hydrometer Reading 3 - Particle Size		13.6		
Hydrometer Reading 4 - Particle Size		9.7		
Hydrometer Reading 5 - Particle Size		6.9		
Hydrometer Reading 6 - Particle Size		3.3		
Hydrometer Reading 7 - Particle Size		1.4		

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Client Sample ID: **EF-T3**

Lab Sample ID: 250-8119-2
Client Matrix: Solid

Date Sampled: 10/24/2012 1148
Date Received: 11/09/2012 1112

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-48204	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-8119-B-2.txt
Dilution:	1.0			Initial Weight/Volume:	220.56 g
Analysis Date:	11/14/2012 2256			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE
Sieve Size 3 inch		0.0		
Sieve Size 2 inch		0.0		
Sieve Size 1.5 inch		0.0		
Sieve Size 1 inch		0.0		
Sieve Size 0.75 inch		21.6		
Sieve Size 0.375 inch		13.5		
Sieve Size #4		11.8		
Sieve Size #10		8.9		
Sieve Size #20		5.8		
Sieve Size #40		8.8		
Sieve Size #60		11.1		
Sieve Size #80		6.3		
Sieve Size #100		3.2		
Sieve Size #200		5.9		
Hydrometer Reading 1		0.2		
Hydrometer Reading 2		0.0		
Hydrometer Reading 3		0.9		
Hydrometer Reading 4		0.5		
Hydrometer Reading 5		0.0		
Hydrometer Reading 6		0.08		
Hydrometer Reading 7		0.0		
Gravel		46.9		
Sand		50.0		
Coarse Sand		8.9		
Medium Sand		14.6		
Fine Sand		26.5		
Silt		1.6		
Clay		1.5		

Analyte	DryWt Corrected: N	Result (um)	Qualifier	NONE
Hydrometer Reading 1 - Particle Size		36.6		
Hydrometer Reading 2 - Particle Size		23.2		
Hydrometer Reading 3 - Particle Size		13.5		
Hydrometer Reading 4 - Particle Size		9.6		
Hydrometer Reading 5 - Particle Size		6.9		
Hydrometer Reading 6 - Particle Size		3.3		
Hydrometer Reading 7 - Particle Size		1.4		

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Client Sample ID: **EF-T3**

Lab Sample ID: 250-8119-2
Client Matrix: Solid

Date Sampled: 10/24/2012 1148
Date Received: 11/09/2012 1112

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-48204	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-8119-B-2.txt
Dilution:	1.0			Initial Weight/Volume:	220.56 g
Analysis Date:	11/14/2012 2256			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE
Gravel		46.9		
Sand		50.0		
Coarse Sand		8.9		
Medium Sand		14.6		
Fine Sand		26.5		
Silt		1.6		
Clay		1.5		

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Client Sample ID: **EF-T3**

Lab Sample ID: 250-8119-2
Client Matrix: Solid

Date Sampled: 10/24/2012 1148
Date Received: 11/09/2012 1112

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-48204	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-8119-B-2.txt
Dilution:	1.0			Initial Weight/Volume:	220.56 g
Analysis Date:	11/14/2012 2256			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (um)	Qualifier	NONE
Hydrometer Reading 1 - Particle Size		36.6		
Hydrometer Reading 2 - Particle Size		23.2		
Hydrometer Reading 3 - Particle Size		13.5		
Hydrometer Reading 4 - Particle Size		9.6		
Hydrometer Reading 5 - Particle Size		6.9		
Hydrometer Reading 6 - Particle Size		3.3		
Hydrometer Reading 7 - Particle Size		1.4		

Client: Pacificorp Hydro Resources | Job Number: 250-8119-1

Client Sample ID: **EF-T4**

Lab Sample ID: 250-8119-3 | Date Sampled: 10/24/2012 1535
Client Matrix: Solid | Date Received: 11/09/2012 1112

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-48204	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-8119-A-3.txt
Dilution:	1.0			Initial Weight/Volume:	514.79 g
Analysis Date:	11/14/2012 2305			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE
Sieve Size 3 inch		0.0		
Sieve Size 2 inch		0.0		
Sieve Size 1.5 inch		45.9		
Sieve Size 1 inch		0.0		
Sieve Size 0.75 inch		0.0		
Sieve Size 0.375 inch		7.2		
Sieve Size #4		11.8		
Sieve Size #10		10.5		
Sieve Size #20		4.6		
Sieve Size #40		5.8		
Sieve Size #60		6.3		
Sieve Size #80		2.9		
Sieve Size #100		1.6		
Sieve Size #200		2.5		
Hydrometer Reading 1		0.02		
Hydrometer Reading 2		0.2		
Hydrometer Reading 3		0.2		
Hydrometer Reading 4		0.0		
Hydrometer Reading 5		0.2		
Hydrometer Reading 6		0.2		
Hydrometer Reading 7		0.0		
Gravel		64.9		
Sand		34.2		
Coarse Sand		10.5		
Medium Sand		10.4		
Fine Sand		13.3		
Silt		0.5		
Clay		0.4		

Analyte	DryWt Corrected: N	Result (um)	Qualifier	NONE
Hydrometer Reading 1 - Particle Size		36.8		
Hydrometer Reading 2 - Particle Size		23.4		
Hydrometer Reading 3 - Particle Size		13.6		
Hydrometer Reading 4 - Particle Size		9.7		
Hydrometer Reading 5 - Particle Size		6.9		
Hydrometer Reading 6 - Particle Size		3.4		
Hydrometer Reading 7 - Particle Size		1.4		

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Client Sample ID: **EF-T4**

Lab Sample ID: 250-8119-3
Client Matrix: Solid

Date Sampled: 10/24/2012 1535
Date Received: 11/09/2012 1112

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-48204	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-8119-A-3.txt
Dilution:	1.0			Initial Weight/Volume:	514.79 g
Analysis Date:	11/14/2012 2305			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (%)	Qualifier	NONE
Gravel		64.9		
Sand		34.2		
Coarse Sand		10.5		
Medium Sand		10.4		
Fine Sand		13.3		
Silt		0.5		
Clay		0.4		

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Client Sample ID: **EF-T4**

Lab Sample ID: 250-8119-3
Client Matrix: Solid

Date Sampled: 10/24/2012 1535
Date Received: 11/09/2012 1112

D422 Grain Size

Analysis Method:	D422	Analysis Batch:	200-48204	Instrument ID:	D422_import
	N/A	Prep Batch:	N/A	Lab File ID:	250-8119-A-3.txt
Dilution:	1.0			Initial Weight/Volume:	514.79 g
Analysis Date:	11/14/2012 2305			Final Weight/Volume:	
Prep Date:	N/A				

Analyte	DryWt Corrected: N	Result (um)	Qualifier	NONE
Hydrometer Reading 1 - Particle Size		36.8		
Hydrometer Reading 2 - Particle Size		23.4		
Hydrometer Reading 3 - Particle Size		13.6		
Hydrometer Reading 4 - Particle Size		9.7		
Hydrometer Reading 5 - Particle Size		6.9		
Hydrometer Reading 6 - Particle Size		3.4		
Hydrometer Reading 7 - Particle Size		1.4		

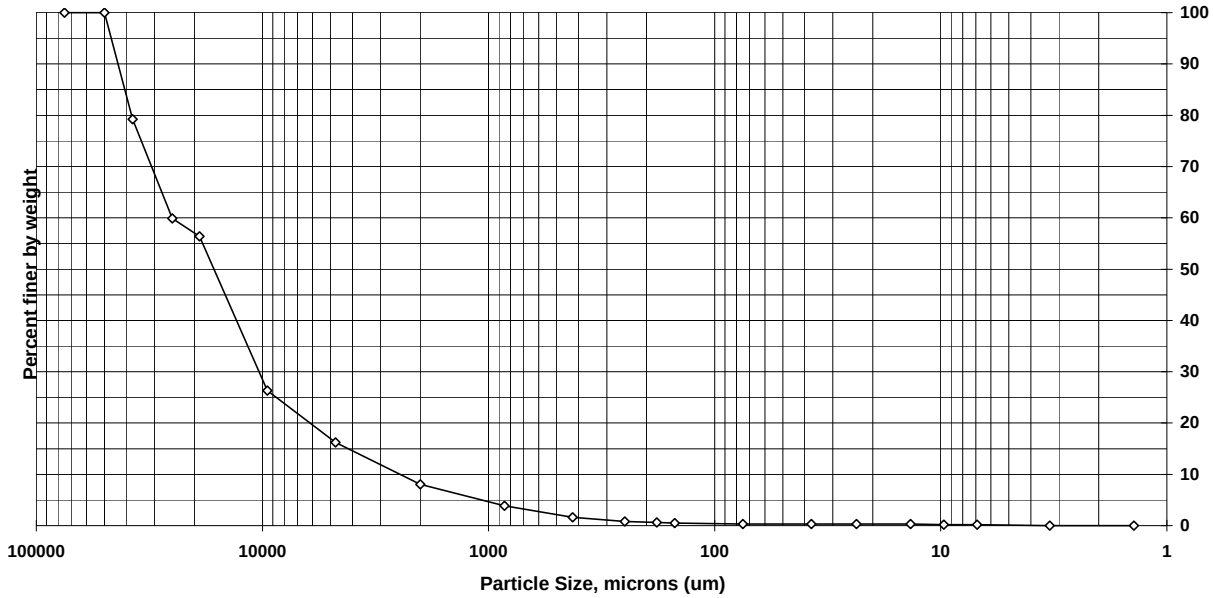
Particle Size of Soils by ASTM D422

				Date Received:	11/9/2012
Sample ID:	EF-T2	**Percent Solids:**	94.4%	**Start Date:**	11/14/2012
Lab ID:	250-8119-A-1	**Specific Gravity:**	2.650	**End Date:**	11/17/2012

Shape (> #10): rounded

Non-soil material: N/A

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	79.2	20.8
1 inch	25000	59.9	19.3
3/4 inch	19000	56.4	3.5
3/8 inch	9500	26.3	30.1
#4	4750	16.2	10.1
#10	2000	8.1	8.1
#20	850	3.9	4.2
#40	425	1.7	2.2
#60	250	0.8	0.8
#80	180	0.6	0.2
#100	150	0.5	0.1
#200	75	0.3	0.2
Hyd1	37.3	0.3	0.0
Hyd2	23.6	0.3	0.0
Hyd3	13.6	0.3	0.0
Hyd4	9.7	0.2	0.2
Hyd5	6.9	0.2	0.0
Hyd6	3.3	0.0	0.2
Hyd7	1.4	0.0	0.0

Soil Classification	Percent of sample
Gravel	83.8
Sand	15.9
Coarse Sand	8.1
Medium Sand	6.4
Fine Sand	1.3
Silt	0.2
Clay	0.2

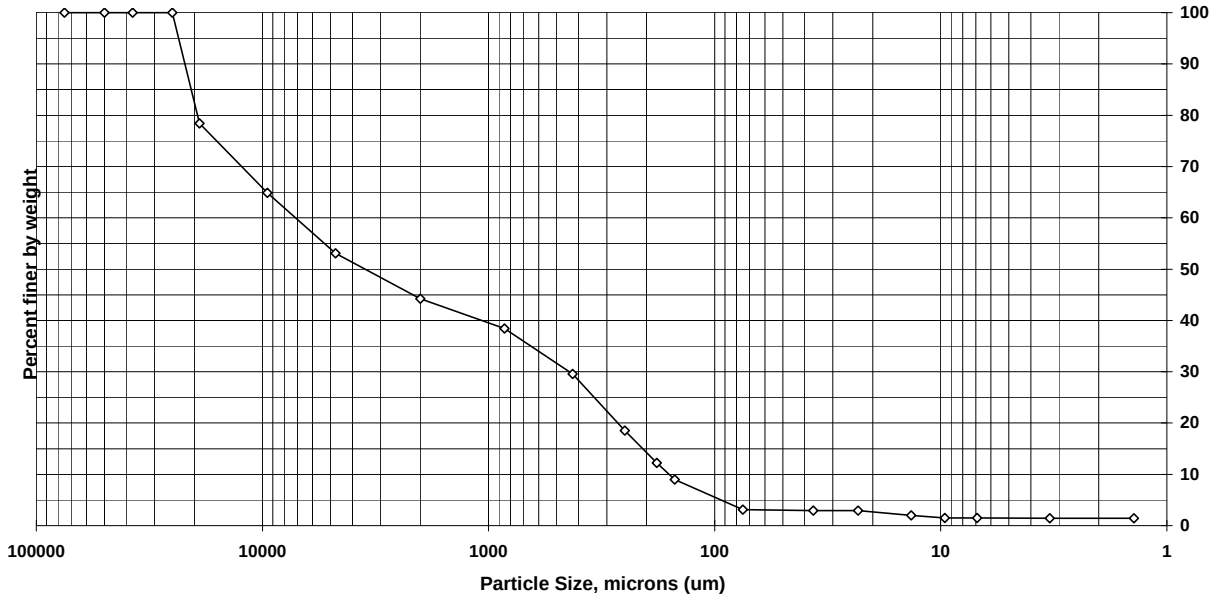
Particle Size of Soils by ASTM D422

				Date Received:	11/9/2012
Sample ID:	EF-T3	**Percent Solids:**	77.2%	**Start Date:**	11/14/2012
Lab ID:	250-8119-B-2	**Specific Gravity:**	2.650	**End Date:**	11/17/2012

Shape (> #10): subangular

Non-soil material: plant

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	78.4	21.6
3/8 inch	9500	64.9	13.5
#4	4750	53.1	11.8
#10	2000	44.2	8.9
#20	850	38.4	5.8
#40	425	29.6	8.8
#60	250	18.5	11.1
#80	180	12.2	6.3
#100	150	9.0	3.2
#200	75	3.1	5.9
Hyd1	36.6	2.9	0.2
Hyd2	23.2	2.9	0.0
Hyd3	13.5	2.0	0.9
Hyd4	9.6	1.5	0.5
Hyd5	6.9	1.5	0.0
Hyd6	3.3	1.4	0.1
Hyd7	1.4	1.4	0.0

Soil Classification	Percent of sample
Gravel	46.9
Sand	50.0
Coarse Sand	8.9
Medium Sand	14.6
Fine Sand	26.5
Silt	1.6
Clay	1.5

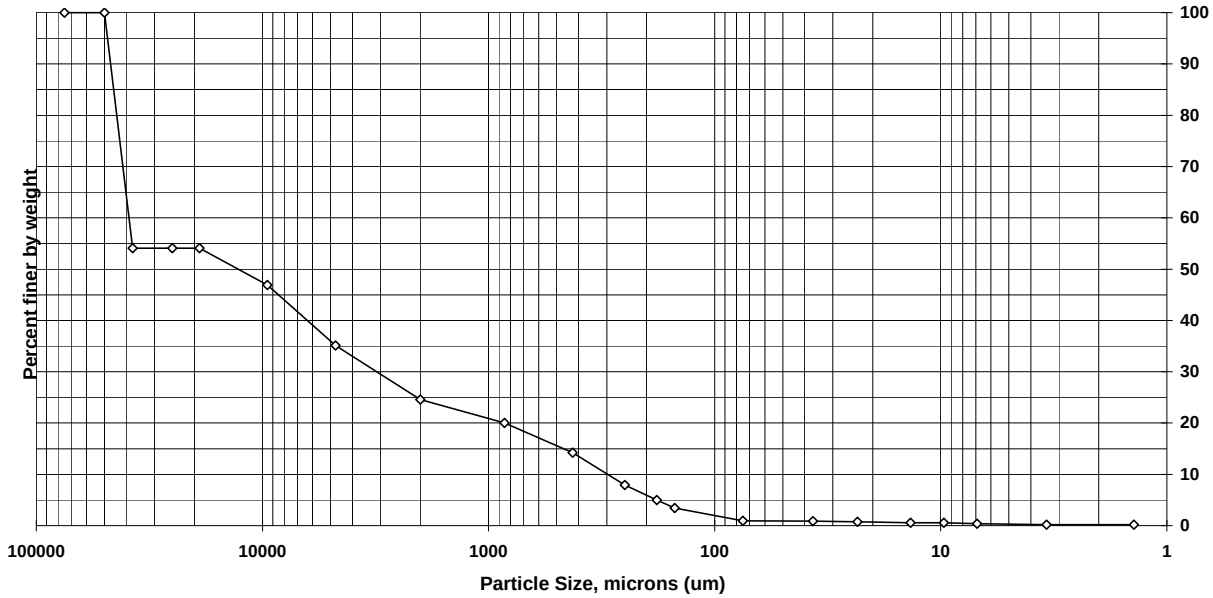
Particle Size of Soils by ASTM D422

				Date Received:	11/9/2012
Sample ID:	EF-T4	**Percent Solids:**	90.3%	**Start Date:**	11/14/2012
Lab ID:	250-8119-A-3	**Specific Gravity:**	2.650	**End Date:**	11/17/2012

Shape (> #10): subrounded

Non-soil material: plant

Hardness (> #10): hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	54.1	45.9
1 inch	25000	54.1	0.0
3/4 inch	19000	54.1	0.0
3/8 inch	9500	46.9	7.2
#4	4750	35.1	11.8
#10	2000	24.6	10.5
#20	850	20.0	4.6
#40	425	14.2	5.8
#60	250	7.9	6.3
#80	180	5.0	2.9
#100	150	3.4	1.6
#200	75	0.9	2.5
Hyd1	36.8	0.9	0.0
Hyd2	23.4	0.7	0.2
Hyd3	13.6	0.5	0.2
Hyd4	9.7	0.5	0.0
Hyd5	6.9	0.4	0.2
Hyd6	3.4	0.2	0.2
Hyd7	1.4	0.2	0.0

Soil Classification	Percent of sample
Gravel	64.9
Sand	34.2
Coarse Sand	10.5
Medium Sand	10.4
Fine Sand	13.3
Silt	0.5
Clay	0.4

TestAmerica Burlington

Sediment Grain Size - D422

Client	
Client Sample ID	EF-T2
Lab Sample ID	250-8119-A-1

Date Received	11/9/2012
Start Date	11/14/2012 22:54
End Date	11/17/2012 12:51

Dry Weight Determination

Tin Weight	0.98	g
Wet Sample + Tin	65.92	g
Dry Sample + Tin	62.29	g
% Moisture	5.59	%

Non-soil material:	N/A
Shape (> #10):	rounded
Hardness (> #10):	hard

Date/Time in oven	11/14/2012 22:54
Date/Time out of oven	11/15/2012 22:17

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)		565.12	565.12
Sample Weight (Oven Dried)			534

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			491
Sample <#10			43
% Passing #10			7.61

Hydrometer Data

Serial Number	705151
Calib. Date (mm/dd/yyyy)	12/21/2010
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500	468.51	579.82	111.31	g	79.2	Gravel	
1 inch	25000	466.39	569.49	103.10	g	59.9	Gravel	
3/4 inch	19000	457.75	476.45	18.70	g	56.4	Gravel	
3/8 inch	9500	447.40	608.16	160.76	g	26.3	Gravel	
#4	4750	488.19	542.03	53.84	g	16.2	Gravel	
#10	2000	462.84	506.25	43.41	g	8.1	Sand	Coarse
#20	850	390.32	412.80	22.48	g	3.9	Sand	Medium
#40	425	355.16	366.97	11.81	g	1.7	Sand	Medium
#60	250	346.18	350.54	4.36	g	0.8	Sand	Fine
#80	180	331.99	333.08	1.09	g	0.6	Sand	Fine
#100	150	331.19	331.74	0.55	g	0.5	Sand	Fine
#200	75	320.65	321.64	0.99	g	0.3	Sand	Fine
				0.00	g	0.3		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	534

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0045	20.5	37.3	0.326	Silt	
5	5	1.0045	20.5	23.6	0.326	Silt	
15	15	1.0045	20.5	13.6	0.326	Silt	
30	30	1.0040	20.5	9.7	0.175	Silt	
60	59	1.0040	20.5	6.9	0.175	Silt	
250	256	1.0035	20.0	3.3	0	Clay	
1440	1440	1.0035	20.0	1.4	0	Clay	

TestAmerica Burlington

Sediment Grain Size - D422

Client	
Client Sample ID	EF-T3
Lab Sample ID	250-8119-B-2

Date Received	11/9/2012
Start Date	11/14/2012 22:56
End Date	11/17/2012 12:54

Dry Weight Determination

Tin Weight	1.00	g
Wet Sample + Tin	27.59	g
Dry Sample + Tin	21.52	g
% Moisture	22.83	%

Non-soil material:	plant
Shape (> #10):	subangular
Hardness (> #10):	hard

Date/Time in oven	11/14/2012 22:56
Date/Time out of oven	11/15/2012 22:18

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)		220.56	220.56
Sample Weight (Oven Dried)			170

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			94.7
Sample <#10			75.3
% Passing #10			34.1

Hydrometer Data

Serial Number	705151
Calib. Date (mm/dd/yyyy)	12/21/2010
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500			0.00	g	100.0	Gravel	
1 inch	25000			0.00	g	100.0	Gravel	
3/4 inch	19000	457.75	494.51	36.76	g	78.4	Gravel	
3/8 inch	9500	447.40	470.27	22.87	g	64.9	Gravel	
#4	4750	488.19	508.17	19.98	g	53.1	Gravel	
#10	2000	462.84	477.95	15.11	g	44.2	Sand	Coarse
#20	850	382.66	392.49	9.83	g	38.4	Sand	Medium
#40	425	353.00	367.97	14.97	g	29.6	Sand	Medium
#60	250	341.05	359.91	18.86	g	18.5	Sand	Fine
#80	180	330.35	341.04	10.69	g	12.2	Sand	Fine
#100	150	327.40	332.84	5.44	g	9.0	Sand	Fine
#200	75	311.76	321.72	9.96	g	3.1	Sand	Fine
				0.00	g	3.1		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	170

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0065	20.5	36.6	2.91	Silt	
5	5	1.0065	20.5	23.2	2.91	Silt	
15	15	1.0055	20.5	13.5	1.97	Silt	
30	30	1.0050	20.5	9.6	1.5	Silt	
60	58	1.0050	20.5	6.9	1.5	Silt	
250	256	1.0050	20.0	3.3	1.42	Clay	
1440	1440	1.0050	20.0	1.4	1.42	Clay	

TestAmerica Burlington

Sediment Grain Size - D422

Client	
Client Sample ID	EF-T4
Lab Sample ID	250-8119-A-3

Date Received	11/9/2012
Start Date	11/14/2012 23:05
End Date	11/17/2012 13:07

Dry Weight Determination

Tin Weight	0.98	g
Wet Sample + Tin	24.28	g
Dry Sample + Tin	22.03	g
% Moisture	9.66	%

Non-soil material:	plant
Shape (> #10):	subrounded
Hardness (> #10):	hard

Date/Time in oven	11/14/2012 23:05
Date/Time out of oven	11/15/2012 22:18

Sample Weights	Tare (g)	Pan+Samp (g)	Samp (g)
Sample Weight (Wet)		514.79	514.79
Sample Weight (Oven Dried)			465

Sample Split (oven dried)	Tare (g)	Pan+Samp (g)	Samp (g)
Sample >=#10			351
Sample <#10			114
% Passing #10			22.1

Hydrometer Data

Serial Number	705151
Calib. Date (mm/dd/yyyy)	12/21/2010
Low Temp (C)	17.0
Reading at Low Temp	1.0040
High Temp (C)	23.0
Reading at High Temp	1.0030
Hydrometer Cal Slope	-0.000166667
Hydrometer Cal Intercept	1.006833333
Default Soil Gravity	2.6500

Gravel/Sand Fraction (Sieves)

Sample Fraction	Size (um)	Pan Tare (g)	Pan+Sample (g)	Sample		% Finer	Classification	Sub Class
3 inch	75000			0.00	g	100.0	Gravel	
2 inch	50000			0.00	g	100.0	Gravel	
1.5 inch	37500	468.51	681.92	213.41	g	54.1	Gravel	
1 inch	25000			0.00	g	54.1	Gravel	
3/4 inch	19000			0.00	g	54.1	Gravel	
3/8 inch	9500	447.40	481.02	33.62	g	46.9	Gravel	
#4	4750	488.19	543.03	54.84	g	35.1	Gravel	
#10	2000	462.84	511.88	49.04	g	24.6	Sand	Coarse
#20	850	390.32	411.70	21.38	g	20.0	Sand	Medium
#40	425	355.16	382.02	26.86	g	14.2	Sand	Medium
#60	250	346.18	375.33	29.15	g	7.9	Sand	Fine
#80	180	331.99	345.57	13.58	g	5.0	Sand	Fine
#100	150	331.19	338.48	7.29	g	3.4	Sand	Fine
#200	75	320.65	332.42	11.77	g	0.9	Sand	Fine
				0.00	g	0.9		

Adjusted Hydrometer Sample Mass

Hydrometer Sample Mass (g)	465

Silt/Clay Fraction (Hydrometer Test)

Hydrometer Test Time (min)	Actual	Spec. Gravity	Temp C	Particle Size (Micron)	% Finer	Classification	Sub Class
2	2	1.0060	20.5	36.8	0.892	Silt	
5	5	1.0055	20.5	23.4	0.72	Silt	
15	15	1.0050	20.5	13.6	0.547	Silt	
30	29	1.0050	20.5	9.7	0.547	Silt	
60	58	1.0045	20.5	6.9	0.374	Silt	
250	250	1.0040	20.0	3.4	0.173	Clay	
1440	1434	1.0040	20.0	1.4	0.173	Clay	

DATA REPORTING QUALIFIERS

Lab Section	Qualifier	Description

QUALITY CONTROL RESULTS

Client: Pacificorp Hydro Resources Job Number: 250-8119-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Geotechnical					
Analysis Batch:200-48204					
250-8119-1	EF-T2	T	Solid	D422	
250-8119-2	EF-T3	T	Solid	D422	
250-8119-3	EF-T4	T	Solid	D422	

Report Basis
T = Total

>>> Select a Laboratory <<<
#N/A
#N/A
#N/A
#N/A

Chain of Custody Record

8119

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Briana Weatherly	Site Contact:	Date: 11/9/12	COC No:
Your Company Name here: PacifiCorp	Tel/Fax: 503-819-2281 (cell)	Lab Contact:	Carrier:	____ of ____ COCs
Address: 825 NE Multnomah, Ste. 1500	Analysis Turnaround Time			For Lab Use Only:
City/State/Zip: Portland, OR 97232	Calendar (C) or Work Days (W) ____			Walk-in Client:
(xxx) xxx-xxxx Phone: 503-813-7039	TAT if different from Below ____			Lab Sampling:
(xxx) xxx-xxxx FAX: 503-813-6659	☑ 2 weeks			
Project Name: Wallowa Falls	☐ 1 week			Job / SDG No.:
Site:	☐ 2 days			
PO# 4500073 9	☐ 1 day			Sampler:

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample (Y/N)	Composite = C / Grab = G	ASTM D422	ample Specific Notes:
EF-T2	10/24/12	12:22PM	G	S	1			✓	
EF-T3	10/24/12	11:48AM	G	S	1			✓	
EF-T5	10/24/12	3:35PM	G	S	1			✓	

Page 32 of 34

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments:
D422 - Particle size distribution and % passing routine list for all samples.

12/P/N
12.0°C

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Briana Weatherly	PacifiCorp	11/9/12 9:40AM	Tom Krause	TAP	11/09/12 1112
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

12/5/2012

Login Sample Receipt Checklist

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Login Number: 8119

List Source: TestAmerica Portland

List Number: 1

Creator: Svabik-Seror, Philip

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	Containers were large pails - won't fit in cooler.
Cooler Temperature is acceptable.	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	False	Please contact lab for appropriate sample containers in the future.
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Pacificorp Hydro Resources

Job Number: 250-8119-1

Login Number: 8119
List Number: 1
Creator: Gagne, Eric

List Source: TestAmerica Burlington
List Creation: 11/13/12 11:32 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	577504 & 577505
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.1ºC & 1.7ºC IR GUN ID 181. CF +0.3
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	ON COC ONLY
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	