

**Groundwater Monitoring and
Seep Study Report
Chemtrade Performance
Chemicals US LLC Site
(aka Former Clariant Corporation Facility)**

**Kalama, Washington
Facility No. 24634187
VCP Project No. SW0492**

**H&H Job No. CLR-045
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SMARTER ENVIRONMENTAL SOLUTIONS

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Chemtrade Performance Chemicals US LLC Site
404 N Hendrickson Drive
Kalama, Washington
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1.0 Introduction and Background

On behalf of Clariant Corporation (Clariant), Hart & Hickman, PC (H&H) is submitting this report to document the methods and results of a groundwater monitoring event and seep study completed during August 2017 at the Chemtrade Performance Chemicals US LLC site (Cleanup Site No. 1784, Facility/Site No. 24634187) located at 404 N. Hendrickson Drive in Kalama, Cowlitz County, WA. Note that we have previously referred to the site as the former Clariant Corporation facility site. The site is currently enrolled in the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP Project No. SW0492). A site location map is included as Figure 1.

Previous investigations indicate that soil and groundwater at the site are impacted with elevated concentrations of cadmium and zinc. There are two main areas of impact at the site: the Former Settling Basins (FSB) area and the Manufacturing Plant Area (MPA). Impacts in the FSB area are associated with former settling basin #1 (FSB1) and with former settling basin #2 (FSB2), and impacts in the MPA are primarily associated with activities in the manufacturing plant. A site plan is provided as Figure 2.

H&H submitted a *Seep Study Work Plan* dated May 31, 2017 (Work Plan) to Ecology in response to Ecology's February 9, 2017 opinion letter (February 2017 Opinion) which recommended preparation and submittal of a work plan for a seep study at the site. The purpose of the seep study was to evaluate the potential presence and location of preferential pathways for cadmium and zinc associated with the site to enter sediments and surface water in the Columbia River adjacent to the site, and to evaluate concentrations of the metals in surface water and sediment at locations of preferential pathways. In addition to proposed seep study methods, the

Work Plan included a discussion of groundwater cleanup levels (CULs) and points of compliance (POCs) currently and potentially applicable to the site, and a request for Ecology to provide comment/technical assistance regarding the applicability of groundwater CULs and POCs at the site. In addition, the Work Plan noted that a groundwater sampling event would be completed at the site during the seep study mobilization. Ecology provided a review and comments on the Work Plan in an opinion letter dated June 28, 2017 (June 2017 Opinion). The June 2017 Opinion also indicated that Ecology would separately provide the requested technical assistance on setting CULs and POCs for the site, and that additional remedial investigation and reporting are needed before establishing CULs and POCs.

This report is primarily intended to present the methods and results of the groundwater monitoring and seep study completed during August 2017 at the site. Please note that the results will also be used in preparation of an updated conceptual site model (CSM), and the CSM will include a detailed discussion of site background information, geology and hydrogeology, contaminant sources and migration, etc. The methods and results of the August 2017 groundwater monitoring are presented in Section 2.0, and the methods and results of the August 2017 seep study are presented in Section 3.0.

2.0 Groundwater Monitoring

On August 7-9, 2017, H&H personnel completed a groundwater monitoring event in order to obtain updated site-wide groundwater data. The groundwater monitoring event included measurement of depth-to-groundwater in and collection of samples from piezometers PZ1 through PZ15, angle bore wells AB1 and AB2, and observation wells OW1, OW2, and OW3 (hereafter referred to as site monitor wells). A summary of site monitor well construction details is included as Table 1 and site monitor well locations are depicted in Figure 3. The methods and results of the monitoring event are presented in the following sections.

2.1 Groundwater Elevations

Prior to collecting groundwater samples, depth-to-water measurements were collected in site monitor wells with an electronic water level meter on August 7, 2017. Groundwater elevations in each monitor well were calculated relative to the Columbia River Datum (CRD) using top-of-casing elevations and depth-to-water data. Groundwater elevation data (including Columbia River tidal data) are summarized in Table 2 and a groundwater elevation contour map for the August 2017 groundwater elevation data is included as Figure 3.

Consistent with previous sampling events, the August 2017 groundwater elevation data indicate shallow groundwater flow at the site is influenced by the tidal elevation variations of the Columbia River. In the eastern portion of the site, there is a relatively strong hydraulic gradient (approximately 4%) from east to west toward the river. In the western portion of the site, hydraulic communication between the river and shallow groundwater results in a temporal mound in the groundwater table near the river that creates a weak hydraulic gradient (less than 1%) from west to east in that area. The groundwater mound near the river is temporal and its presence depends upon the timing and magnitude of the tides. Well gauging was conducted approximately 5 to 6 hours after high tide (3 to 4 hours prior to low tide).

2.2 Sampling Methods

Groundwater from the site monitor wells was purged and sampled using standard low-flow/low-stress techniques. Groundwater parameters that included temperature, pH, conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP), and turbidity were measured during the low-flow purging and prior to sample collection. After groundwater parameters stabilized during purging, groundwater from each monitor well was poured directly into a laboratory-supplied container, which was then sealed, labeled, placed into a laboratory-supplied sample cooler, and covered with ice. The cooler was delivered under standard chain-of-custody protocols to Test America of Nashville, TN (Test America) for analysis of total cadmium and zinc by EPA Method 6020A.

2.3 Sample Results

Analytical results of groundwater samples collected during August 2017 are summarized along with historical groundwater data in Table 3. Zinc and cadmium isoconcentration maps for August 2017 are included as Figures 4A and 4B, respectively. The laboratory analytical report for the August 2017 groundwater samples is included in Appendix A. Groundwater sample information and data were uploaded to the Environmental Information Management System (EIM) database during October 2017.

As discussed in the Work Plan, the potable groundwater CULs established for human health protection (hereafter referred to as the HH CULs) which are currently applicable to the site are 5 micrograms per liter ($\mu\text{g/l}$) for cadmium and 4,800 $\mu\text{g/l}$ for zinc. Note that we believe implementation of an institutional control to prohibit use of site groundwater for potable purposes should be allowed under the Model Toxics Control Act (MTCA) rules in lieu of the HH CULs. Potable groundwater CULs established for protection of surface water beneficial uses (hereafter referred to as SW CULs) are also currently applicable to the site. The SW CULs which are currently applicable to the site are 0.7 $\mu\text{g/l}$ for cadmium and 66 $\mu\text{g/l}$ for zinc.

2.3.1 MPA

Zinc

As shown in Figure 4A, concentrations of zinc detected in MPA groundwater above the SW CUL (66 µg/l) during August 2017 extend from east of the northern portion of the manufacturing building to west of the site toward the Columbia River. Zinc concentrations were detected above the SW CUL in seven MPA wells ranging from 250 µg/l to 6,760 µg/l, and the zinc concentrations detected in PZ3 (6,760 µg/l) and PZ9 (5,940 µg/l) were the only detections above the HH CUL (4,800 µg/l) in the MPA wells. PZ3 and PZ9 are located along the western edge of the site. The August 2017 zinc concentrations detected in the MPA wells were generally similar to historical concentrations and fluctuations.

In the period between January 2015 and August 2017, zinc concentrations decreased in PZ4 (from 2,450 µg/l to 1,180 µg/l), PZ5 (from 4,100 µg/l to 2,260 µg/l), and PZ6 (from 10,700 µg/l to 1,150 µg/l). These three wells are located to the west (downgradient) of the manufacturing building and within the area of groundwater injections completed during 2010 and 2011. In the period between January 2015 and August 2017, zinc concentrations increased in PZ3 (from 3,780 µg/l to 6,760 µg/l) and AB1 (from 447 µg/l to 854 µg/l). These two wells are located along the western edge of the site (and, AB1 is installed at an angle beneath the bank of the Columbia River). Note that prior to August 2017, PZ7, PZ8, and PZ10 were last sampled in 2005, PZ15 was last sampled in 2007, and PZ9 was last sampled in 2010. These five wells are located outside the anticipated influence of groundwater injections completed during 2010 and 2011 and, therefore were not included in injection performance monitoring events completed after the injections. Zinc was detected in PZ7 (250 µg/l) and PZ9 (5,940 µg/l) during August 2017, but was not detected in PZ8, PZ10, or PZ15.

Cadmium

As shown in Figure 4B, concentrations of cadmium detected in MPA groundwater above the SW CUL (0.7 µg/l) during August 2017 are inferred to extend from the north-central portion of the manufacturing plant to approximately 100 ft west of the building. Cadmium concentrations

were detected above the SW CUL and the HH CUL (5 µg/l) in two MPA wells (PZ4 at 9.76 µg/l and PZ5 at 64.6 µg/l). These detections are lower than the January 2015 cadmium concentrations detected in PZ4 (16.4 µg/l) and PZ5 (111 µg/l). Cadmium was not detected in any of the other MPA well samples during August 2017 and it does not appear that the cadmium plume associated with the MPA extends off-site to the Columbia River.

2.3.2 FSB Area

Zinc

As shown in Figure 4A, concentrations of zinc detected in FSB2 area groundwater above the SW CUL (66 µg/l) during August 2017 are inferred to extend from the eastern portion of FSB2 to west of the site toward the Columbia River. Zinc concentrations were detected above the SW CUL and HH CUL (4,800 µg/l) in each of seven FSB2 area wells ranging from 6,460 µg/l to 141,000 µg/l. Consistent with previous sampling events, zinc concentrations detected in the FSB2 area plume during August 2017 were generally significantly higher than those detected in the MPA plume.

In the period between January 2015 and August 2017, zinc concentrations decreased significantly in OW1 (from 146,000 µg/l to 41,800 µg/l), OW3 (from 73,100 µg/l to 52,100 µg/l), PZ1 (from 76,800 µg/l to 45,400 µg/l), PZ12 (from 90,900 µg/l to 6,460 µg/l), and PZ13 (from 65,900 µg/l to 28,200 µg/l). PZ12 and PZ13 are located within the extents of FSB2 and the 2010 and 2011 injections areas, OW1 and OW3 are located adjacent to the western edge of FSB2, and PZ1 is located approximately 20 ft west of FSB2. During the August 2017 event, zinc was detected at a maximum concentration of 141,000 µg/l in OW2 which is located along the western edge of the site in the FSB2 area near angle bore well AB2. The detection is similar to the zinc concentration (145,000 µg/l) detected in OW2 during January 2015. Finally, in the period between January 2015 and August 2017, zinc concentrations increased in angle bore well AB2 (from 17,300 µg/l to 59,800 µg/l). AB2 is located at the western edge of the site and is installed at an angle beneath the bank of the Columbia River. Zinc was not detected in PZ14 which is located northwest of FSB2 near the western edge of the site.

Zinc was also detected at a relatively low concentration above the SW CUL and below the HH CUL in the August 2017 sample collected from PZ11 (415 µg/l). PZ11 is located in FSB1. Zinc was not detected in PZ2 which is located to the west of PZ11 near the western edge of the site. Therefore, it does not appear that zinc concentrations above the SW CUL likely extend to the western edge of the site from the area of PZ2.

Cadmium

As shown in Figure 4B, concentrations of cadmium were detected above the SW CUL (0.7 µg/l) and the HH CUL (5 µg/l) in two wells (OW2 at 8.13 µg/l and PZ1 at 6.31 µg/l) located to the west of FSB2 during August 2017. In addition, concentrations of cadmium were detected above the SW CUL (0.7 µg/l), but below the HH CUL (5 µg/l), in two wells (AB2 at 4.69 µg/l and OW3 at 4.19 µg/l). These two wells are also located to the west of FSB2. During January 2015, cadmium was detected in AB2 (1.06 µg/l), OW2 (2.61 µg/l), and PZ1 (1.32 µg/l), but was not detected in OW3. Cadmium was not detected in any of the other FSB area wells during August 2017.

3.0 Seep Study

On August 7-11, 2017, H&H personnel completed seep study activities to evaluate for the potential presence and location of areas of relatively higher hyporheic exchange (i.e., the process of water and solute exchange in both directions across a streambed) which may act as preferential pathways (or, seeps) for contaminants in groundwater associated with the site to enter sediments and surface water in the Columbia River. As proposed in the Work Plan, the seep study activities were conducted along the portion of the river bank adjacent to the site property between the locations of onsite piezometers PZ14 and PZ15 (Figure 3). Based on groundwater sample data which indicates zinc and cadmium impacts are not present in PZ14 and PZ15, these extents are believed to be reasonable limits for evaluation of potential discharge of impacted groundwater to surface water.

According to the National Oceanic and Atmospheric Association (NOAA), low river stages in the Columbia River generally occur during August through October each year. Groundwater to surface water flux rates at the site (and, therefore the potential for contaminant transport from site groundwater to surface water) are expected to be relatively higher during low river stages and as the river level decreases leading up to the low river stage. In addition, groundwater to surface water flux rates are expected to be relatively higher during periods of the day when the river level is at or approaching low tide. As indicated in the June 2017 Opinion, daytime negative tidal elevations were predicted for the site on August 6-10, 2017, and Ecology indicated this date range was acceptable for completion of the seep study activities (and, that the activities should be completed at or near the period of lowest tidal elevations during the date range).

The seep study activities were generally completed during the hours of 12:00 pm and 3:00 pm Pacific Daylight Time (PDT). Based upon mean lower low water (MLLW) data obtained from NOAA, negative tidal elevations (relative to the CRD) were predicted to occur at the location of the site during August 7-11, 2017, and low tide was predicted to occur between approximately 12:45 pm and 3:00 pm PDT on these dates. The site is located approximately halfway between the Longview, WA and St. Helens, OR measuring stations; therefore, the midpoint of the low

tide times and elevations from these two stations were used to estimate predicted and verified tidal information for the site. Verified tidal elevation information for these dates were generally similar to predicted data. Estimated low tide times and elevations which are based on verified NOAA data are included in Table 4 for August 9-11, 2017 (which are the dates on which PushPoint samples were collected, as discussed in Section 3.3).

The seep study activities consisted of an identification of potential seeps adjacent to the site followed by PushPoint groundwater, surface water, and sediment sampling. Several methods were utilized as part of the seep study to identify potential groundwater seeps adjacent to the site. The methods and the results of each method are discussed in the following sections.

3.1 Visual Observations for Seeps

On August 7-8, 2017, H&H personnel conducted field reconnaissance of the river bank on foot to observe for visual evidence indicative of groundwater seeps. Ecology personnel (Mr. Adam Harris, LHG) accompanied H&H personnel during field reconnaissance activities on August 8, 2017. During the field reconnaissance, H&H personnel observed for the presence of the following:

- Pools and riffles which may be indicative of downwelling/upwelling, subaqueous groundwater seeps and springs, and groundwater seeps in the river bank above the surface water level.
- Discoloration of riprap and sediments potentially attributable to mineral precipitates (which may be indicative of relatively high hyporheic exchange areas where dissolved metals in groundwater precipitate as insoluble complexes when introduced to the surface water).
- Areas with a relatively high density of aquatic plant biomass. Nutrients in groundwater and other groundwater conditions have the potential to enhance aquatic plant growth.

During the field reconnaissance, no visual evidence potentially indicative of groundwater seeps was observed. Please note that the Columbia River bank adjacent to the site is armored with riprap which prevents direct observation of riverbed sediments along the majority of the river bank adjacent to the site. A photograph of the river bank adjacent to the site is included in Appendix B.

In addition, H&H personnel utilized a Testo 875 thermal imaging camera to observe for thermal variation which may be indicative of areas of relatively higher hyporheic exchange. However, uneven diurnal heating of riprap, surface water wave action, and other heterogeneities resulted in significant thermal variation which prevented identification of thermal variation potentially attributable to areas of relatively higher hyporheic exchange. Note that the Work Plan indicated that thermal imaging activities would be completed in the morning (to minimize the potential interference from diurnal heating of riprap). However, because tidal elevations were near daily highs between the hours of approximately 5:00 am to 6:30 am during the seep study activities, groundwater to surface water flux was not expected in the mornings during the seep study.

3.2 Sediment Survey for Seeps

On August 7-8, 2017, H&H personnel conduct a survey of sediments located in the river channel adjacent to the site to assess for areas of groundwater upwelling. The survey was performed using a calibrated YSI 556 meter to continuously measure temperature, conductivity, DO, ORP, and pH at the riverbed/surface water interface. H&H personnel waded in the river along the shoreline slightly beyond the edge of subaqueous riprap (which was observed to extend approximately 5 to 10 ft from the shoreline along the lateral extent of the survey) and towed the YSI meter's probe so that it remained in contact with riverbed sediments. Three passes were made adjacent to the river bank (one on August 7 and two on August 8) for the sediment survey. During each pass, H&H personnel observed three to five areas of relatively low DO and ORP levels, and logged the coordinates of the locations with a sub-meter GPS. There were no significant variations in temperature, conductivity, pH, or TDS measurements observed during the surveying.

Based on our review of the GPS location data for the three sediment survey passes, there were no areas identified where measured DO/ORP levels were consistently relatively low during multiple passes, and it is possible that fluctuations in the DO/ORP levels were attributable to surface water movement. Note that wind and boat/ship wake resulted in significant wave action near the river bank during the survey. In the Work Plan, we proposed to perform the survey by towing the YSI meter's probe behind a small boat. H&H personnel attempted to perform the survey using a small inflatable boat; however, wave action and wind made it extremely difficult to steer the boat along the desired path.

3.3 PushPoint, Sediment, and Surface Water Sampling

The Work Plan indicates that pore water, sediment, and surface water would be collected in areas of potential seeps if identified by the visual observations and/or sediment survey discussed above. As proposed the Work Plan, because there were no areas of potential seeps identified, PushPoint samplers obtained from MHE Products were installed at a spacing of approximately 40 ft along the shore line adjacent to the site property in the locations depicted in Figures 4A and 4B. In the June 2017 Opinion, Ecology recommended use of incremental sampling methods to evaluate sediments and pore water if detection of potential seeps was limited during the visual reconnaissance and sediment survey. However, while at the site on August 8, 2017, Mr. Adam Harris (Ecology) acknowledged that implementation of incremental sampling methods was not feasible due to site conditions (i.e., riprap armoring). Mr. Harris indicated implementation of the PushPoint sampling at approximately 40-ft spacings as proposed in the Work Plan was reasonable considering the site conditions.

According to Ecology's July 25, 2017 Implementation Memorandum No. 16 (*Developing Conditional Points of Compliance at MTCA Sites Where Groundwater Discharges to Surface Water*), before groundwater discharges into surface water, it typically enters into a transitional zone in the aquifer where some mixing of groundwater and surface water occurs, and this zone is often called the hyporheic zone. Per Washington Administrative Code (WAC) 173-340-200, "groundwater" means water in a saturated zone or stratum beneath the surface of land or below a

surface water. This definition encompasses the transitional zone; therefore, water in this zone is considered groundwater under MTCA. As is highlighted in Implementation Memorandum No. 16, sediment porewater generally refers to interstitial water present in sediments, and the Sediment Management Standards (SMS) recognize sediment porewater as the interstitial water in an uppermost thickness of sediment that is defined on a site-specific basis as the biologically active zone. Per the Implementation Memorandum No. 16, this SMS distinction results in assigning groundwater to a location immediately below the biologically active zone.

The US EPA Ecological Risk Assessment Support Center (ERASC) *Determination of the Biologically Relevant Sampling Depth for Terrestrial and Aquatic Ecological Risk Assessments* (ERASC Technical Paper) documents the results of a study used to develop defensible habitat-specific practical default values for the depth of the biologically active zone (where most organism-substrate interactions occur). The ERASC Technical Paper recommends that the depth of the biologically active zone be based upon the 80th percentile of abundance or biomass depth distributions, and indicates the mean 80th percentile for river coarse grained/sand with fines extends to 10 to 15 cm (approximately 4 to 6 in) and the maximum 80th percentile extends to 15 cm. The ERASC Technical Paper indicates that, in most habitats where data are available, the 80th percentile of depth distributions based on biomass exceeds respective distributions based on abundance, and that the values may be used for decisions related to ecological assessment or remediation in aquatic scenarios.

Based on the information presented above, the depth of the biologically active zone in the Columbia River sediments adjacent to the site is assumed to be 15 cm (approximately 6 in) and water in the transitional zone beneath this depth is considered to be groundwater.

3.3.1 Sample Methods

PushPoint Groundwater

The PushPoint sampler is a ¼”-diameter machined sampling tool consisting of a tubular stainless steel body constructed with an approximately 2-inch long screened zone at the bottom end and a

sampling port at the top end. For the seep study, each PushPoint sampler was installed to a depth of approximately 24 to 30 inches below the top of sediment (below the biologically active zone). The samplers were generally installed into submersed sediment within approximately 5 ft of the river edge (where the riprap armoring was relatively thin compared to above the water line). In order to minimize installation time, riprap was not moved prior to PushPoint installation in the majority of the sample locations. Instead, PushPoint samplers were generally used to probe between riprap in order to access the top of sediment. In addition, PushPoint samplers were installed after low tide on the day prior to sample collection so that that samples could efficiently be collected from each location during low tidal conditions and time was not spent installing the samplers during the relatively short low tidal condition period.

Groundwater samples were collected from a total of 24 PushPoint samplers on August 9-11, 2017 (during multiple tide cycles) within approximately 1.5 hours of low tide. The locations of the PushPoint samplers, labeled PP-1 to PP-22, PP-US, and PP-DS, are indicated in Figure 4A. PP-1 through PP-22 were collected adjacent to the site between PZ14 and PZ15, PP-US was collected near the upstream boundary of the site, and PP-DS was collected near the downstream boundary of the site.

The samples were collected using a peristaltic pump and ¼"-diameter polyethylene tubing connected by Tygon tubing to the top the sampler. Prior to collection of groundwater from each PushPoint sampler, groundwater parameters that included conductivity, DO, ORP, and pH were measured during low-flow purging of each sampler and prior to sample collection. In addition, conductivity, DO, ORP, and pH measurements were collected from the surface water at each PushPoint sample location immediately prior to or after groundwater sample collection. Groundwater and surface water quality parameters and tidal information are summarized along with July 2015 PushPoint groundwater and surface water data in Table 4. As shown in the table, DO and pH levels measured in groundwater from each PushPoint sampler were lower than DO and pH levels measured in surface water at the corresponding PushPoint location. The difference between the DO and pH levels is an indicator of hydraulic separation between the screened interval of the PushPoint sampler and the surface water. There were not consistent

correlations between conductivity and ORP levels in the PushPoint groundwater and corresponding surface water.

After recording parameters, groundwater from the PushPoint sampler was pumped through a 0.45-micron field filter directly into a laboratory-supplied container, which was then sealed, labeled, placed into a laboratory-supplied sample cooler, and covered with ice. The cooler was delivered under standard chain-of-custody protocols to Test America for analysis of dissolved cadmium and zinc by EPA Method 6020A.

Each PushPoint sampler was also used as a piezometer to measure the potentiometric surface of the groundwater relative to the surface of the Columbia River by establishing a continuous stream of water in the tubing connected to the sampler and maintaining a portion of the tubing below the river surface and the open end of the tubing above the river surface. At each sample location, the potentiometric surface of the groundwater was higher than that of the river surface (indicating a hydraulic gradient from the groundwater to the surface water at the time of sampling). The approximate potentiometric surface in each sample point relative to the river surface is shown in Table 4. The relative difference between the groundwater potentiometric surface and the river surface is also an indicator of hydraulic separation between the screened interval of the PushPoint sampler and the surface water.

Photographs of the PushPoint sampling are included in Appendix B.

Sediment

After completing the PushPoint sampling at each location, the sampler was removed and the location was flagged. During periods prior to and after low tide (when PushPoint sampling was not being completed) on August 9-11, 2017, H&H personnel returned to the sample locations and moved riprap in order to expose the sediment surface for sediment sample collection. The Work Plan included collection of sediment samples from each PushPoint sample location; however, due to difficulty moving riprap and time constraints, H&H elected to expose sediment at every even-numbered PushPoint sampling location starting with PP-2 and proceeding through

PP-20 (total of 10 sediment samples). In addition, upstream (SD-US) and downstream (SD-DS) sediment samples were collected near the upstream and downstream boundaries of the site.

On August 11, 2017, H&H personnel collected sediment samples from each location where riprap was moved to expose the sediment surface. Sediment sample locations are depicted in Figure 5. Sediment samples were collected using a gloved hand from the sediment surface to approximately four inches below the sediment surface. The sediment was placed directly into a laboratory-supplied sample container, which was then sealed, labeled, placed into a laboratory-supplied sample cooler, and covered with ice. The cooler was delivered under standard chain-of-custody protocols to Test America for analysis of cadmium and zinc by EPA Method 6020A.

Surface Water

On August 11, 2017, H&H personnel collected three surface water samples (SW-1, SW-2, and SW-3) from the locations depicted in Figures 4A and 4B. SW-1 was collected west of the MPA, SW-2 was collected west of FSB2, and SW-3 was collected northwest of FSB2. The Work Plan included collection of surface water samples from the approximate location of each PushPoint sample; however, while at the site on August 8, 2017, Mr. Adam Harris (Ecology) indicated that collection of surface water samples from each PushPoint location was not necessary. Each surface water sample was collected using a peristaltic pump to pump surface water through a 0.45-micron field filter directly into a laboratory-supplied container, which was then sealed, labeled, placed into a laboratory-supplied sample cooler, and covered with ice. The cooler was delivered under standard chain-of-custody protocols to Test America for analysis of dissolved cadmium and zinc by EPA Method 6020A.

3.3.2 Sample Results

PushPoint Groundwater

Analytical results of PushPoint groundwater samples collected during August 2017 are summarized along with July 2015 PushPoint groundwater sample data in Table 5, and the PushPoint groundwater zinc results are depicted in Figure 4A. The laboratory analytical report

for the August 2017 PushPoint groundwater samples is included in Appendix A. PushPoint groundwater sample information and data were uploaded to the EIM database during October 2017.

Results of analyses of the PushPoint groundwater samples indicate zinc was detected above the MRL in four samples (PP-8 at 362 µg/l, PP-9 at 22.4 µg/l, PP-10 at 53.4 µg/l, and PP-20 at 58.8 µg/l). The laboratory MRLs were 52.0 µg/l for all but one sample (the MRL for PP-9 was 5.2 µg/l). As previously mentioned, the zinc SW CUL is 66 µg/l. Therefore, only the zinc concentration detected in PP-8 is above the SW CUL. As shown in Figure 4A, the PP-8 sample location is approximately 15 ft downstream of on-site angle bore well AB1, and PP-9 and PP-10 are located approximately 40 ft and 80 ft downstream of PP-8, respectively. The zinc concentrations detected in these PushPoint groundwater samples appear to be associated with the MPA zinc plume. PP-20 is located approximately 115 ft downstream of angle bore well AB2 and it is possible that the zinc concentration detected in this PushPoint groundwater sample is associated with the FSB2 zinc plume.

Results of analyses of the PushPoint groundwater samples indicate cadmium was not detected above laboratory minimum reporting limits (MRLs) in any of the samples. The laboratory MRLs were 1 µg/l for all but one sample (the MRL for PP-9 was 0.1 µg/l). As previously mentioned, the cadmium SW CUL is 0.7 µg/l.

Sediment

Analytical results of sediment samples collected during August 2017 are summarized along with July 2015 sediment sample data in Table 6, and the sediment sample zinc results are depicted in Figure 5. The laboratory analytical report for the August 2017 sediment samples is included in Appendix A. Sediment sample information and data were uploaded to the EIM database during October 2017.

Results of analyses of the sediment samples indicate zinc was detected in each sample collected within the extents of the seep study (i.e., between wells PZ14 and PZ15) at concentrations

ranging from 16.2 to 42.4 mg/kg. Zinc was detected in the upstream and downstream sample locations at concentrations of 250 mg/kg and 17.8 mg/kg, respectively. The zinc concentrations detected in each sediment sample are consistent with background and significantly lower than the sediment CUL of 3,200 mg/kg.

Results of analyses of the sediment samples indicate cadmium was not detected above laboratory MRLs in any of the samples. The laboratory MRLs for the samples ranged from 0.53 to 1.26 mg/kg. The sediment CUL applicable to the site for cadmium is 2.1 mg/kg.

Surface Water

Analytical results of surface water samples collected during August 2017 are summarized along with the PushPoint groundwater data in Table 5, and the surface water zinc results are depicted in Figure 4A. The laboratory analytical report for the August 2017 surface water samples is included in Appendix A. Surface water sample information and data were uploaded to the EIM database during October 2017.

Results of analyses of the surface water samples indicate cadmium and zinc were not detected above laboratory MRLs (1.0 and 52.0 µg/l, respectively) in any of the samples. The SW CULs for cadmium and zinc are 0.7 and 66 µg/l, respectively. Surface water sample SW-1 was collected in the area where the highest concentration of zinc was detected in PushPoint sample PP-8 indicating that the low concentrations of zinc in transitional groundwater in this area are not affecting surface water quality.

4.0 Conclusions

On August 7-11, 2017, H&H personnel completed a seep study and a site-wide groundwater monitoring event at the Chemtrade Performance Chemicals US LLC site. Our evaluation of the August 2017 results is summarized below.

- Shallow groundwater flow at the site is primarily from east to west toward the Columbia River. However, consistent with previous sampling events, August 2017 groundwater elevation data indicate hydraulic communication between the Columbia River and shallow groundwater results in a temporal mound in the groundwater table near the river that creates a weak hydraulic gradient from west to east in that area and appears to limit ground water flow from the site to the river. The groundwater mound near the river is temporal and its presence depends upon the timing and magnitude of the tides.
- A seep study was conducted along the eastern bank of the Columbia River adjacent to the site during a five-day period near the daily period of lowest tidal river elevations. There were no groundwater seeps identified along the river bank by visual observations or sediment survey activities completed as part of the seep study. Because there were no seeps identified, 24 PushPoint samplers were installed at a spacing of approximately 40 ft along the shore line adjacent to the site. The screened intervals of the PushPoint samplers were installed within the transitional zone beneath the depth of the biologically active zone in the Columbia River sediments (15 cm). Based on our review of Ecology's July 25, 2017 Implementation Memorandum No. 16 and the EPA ERASC *Determination of the Biologically Relevant Sampling Depth for Terrestrial and Aquatic Ecological Risk Assessments*, water in the transitional zone beneath 15 cm is considered to be groundwater.
- In the Manufacturing Plant Area (MPA), zinc concentrations in groundwater above the potable groundwater CULs established for protection of surface water beneficial uses

(SW CULs) extend from east of the northern portion of the manufacturing building to the transitional zone beneath the eastern edge of the Columbia River. In the period between January 2015 and August 2017, zinc concentrations in the central portion of the MPA decreased and zinc concentrations in the western portion of the site increased. Zinc was detected above the potable groundwater CUL established for human health protection (HH CUL) in two MPA wells (both located near the western edge of the site). Zinc was detected above the SW CUL in one PushPoint groundwater sample collected from the transitional zone beneath the eastern edge of the Columbia River adjacent to the MPA, and zinc was detected below the SW CUL in two additional PushPoint groundwater samples adjacent to the MPA. Although zinc was detected in the PushPoint groundwater samples beneath the eastern edge of the Columbia River adjacent to the MPA, zinc was not detected in surface water in this area and zinc in sediment was consistent with background, indicating that zinc in transitional zone groundwater is not affecting surface water or sediment quality.

Cadmium was detected above the SW CUL and HH CUL in two wells located in the central portion of the MPA and was not detected in any of the other MPA wells or in any of the PushPoint groundwater samples collected from the transitional zone beneath the eastern edge of the Columbia River. It does not appear that the cadmium plume associated with the MPA extends off-site toward the Columbia River.

- Consistent with previous sampling events, the August 2017 groundwater results indicate impacts in the Former Settling Basin (FSB) area are primarily associated with the former settling basin #2 (FSB2), and zinc concentrations in the FSB2 area are generally significantly higher than in the MPA. During August 2017, zinc concentrations above the SW CUL and HH CUL were detected in each FSB2 well. In the period between January 2015 and August 2017, zinc concentrations in the majority of the FSB2 area wells decreased significantly (including in the two wells located within the FSB2). During the same period, zinc concentrations increased in two wells located in the western portion of the FSB2 (including in angle bore well AB2 which is installed at an angle

beneath the bank of the Columbia River).

Zinc was detected below the SW CUL in one PushPoint groundwater sample collected from the transitional zone beneath the eastern edge of the Columbia River adjacent to the FSB area. Therefore, it appears that zinc concentrations in groundwater associated with the FSB2 plume extend to the transitional zone beneath the eastern edge of the Columbia River; however, zinc concentrations above the SW CUL were not identified in PushPoint groundwater samples collected from the transitional zone beneath the eastern edge of the Columbia River adjacent to the FSB area. Further, surface water samples collected from this area did not contain detectable concentrations of zinc and sediment samples collected from this area contained zinc concentrations consistent with background, indicating that zinc in transitional zone groundwater is not affecting surface water or sediment quality.

During August 2017, cadmium was detected above the SW CUL in four wells located to the west of FSB2 (including in angle bore well AB2). Two of the detections were also above the HH CUL. Cadmium was not detected in any of the other FSB area wells or in any of the PushPoint groundwater samples collected from the transitional zone beneath the eastern edge of the Columbia River adjacent to the FSB area.

- Zinc was detected at concentrations consistent with background and significantly below the sediment CUL in each sediment sample collected from PushPoint sample locations during the seep study, and cadmium was not detected in any of the sediment samples. Zinc and cadmium were not detected in any surface water samples collected from the Columbia River during the seep study.

An updated CSM which incorporates the results of the August 2017 seep study and ground water monitoring will be prepared and submitted to Ecology. After submitting the updated CSM, H&H will provide an outline of remedial alternatives for the site to Ecology for review and approval. The remedial alternatives will be included in a feasibility study prepared for the site in

accordance applicable WAC.

Table 1
Summary of Site Monitor Well Construction Details
Chemtrade Performance Chemicals US LLC Site
Kalama, WA
H&H Project No. CLR-045

Well ID	Installation Date	Well Diameter (inches)	Total Depth (ft bgs)	Screen Interval (ft bgs)	TOC Elevation (ft CRD)
PZ1	04/15/03	1	32	17-32	28.99
PZ2	04/15/03	1	32	17-32	30.16
PZ3	04/15/03	1	32	17-32	28.47
PZ4	04/15/03	1	32	17-32	26.78
PZ5	04/16/03	1	32	17-32	26.86
PZ6	04/16/03	1	32	17-32	27.58
PZ7	04/16/03	1	31	16-31	28.06
PZ8	04/16/03	1	31	15.5-30.5	28.17
PZ9	05/06/03	1	32	17-32	27.54
PZ10	07/26/05	0.75	32	17-32	26.94
PZ11	07/27/05	0.75	32	17-32	30.39
PZ12	07/27/05	0.75	32	17-32	30.53
PZ13	07/27/05	0.75	30	15-30	30.40
PZ14	02/06/07	0.75	32	17-32	29.09
PZ15	02/06/07	0.75	32	17-32	27.79
AB1	07/01/03	2	28	14.1-28.2	27.53
AB2	07/01/03	2	30	14.4-30.0	28.41
OW1	09/20/10	2	35	20-35	26.51
OW2	09/20/10	2	35	20-35	25.99
OW3	09/20/10	2	35	20-35	26.13

Notes:

ft bgs = feet below ground surface

ft CRD = elevation in ft relative to Columbia River Datum

TOC = Top of Casing

Survey of well elevations based on NAVD88 and adjusted to CRD by subtracting 3.8 ft

OW1 through OW3 TOC elevations have not been surveyed

Depth and screen interval of AB1 and AB2 account for 45° and 35° angles of installation relative to vertical, respectively.

Table 2
Summary of Groundwater Elevation Data
Chemtrade Performance Chemicals US LLC Site
Kalama, WA
H&H Project No. CLR-045

Well ID	Date Measured	TOC Elevation ¹ (ft CRD)	Depth to Water (ft below TOC)	Water Elevation ¹ (ft CRD)	Time Measured	High (CRD) ²		Low (CRD) ²	
						Time	Elevation (ft)	Time	Elevation (ft)
PZ1	02/04/10	28.99	23.65	5.34	8:29 a.m.	7:39 a.m.	5.47	2:45 p.m.	1.34
PZ1	09/01/10		26.84	2.15	9:54 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93
PZ1	11/02/10		25.50	3.49	11:19 a.m.	1:15 p.m.	4.42	8:42 a.m.	0.75
PZ1	12/20/10		22.68	6.31	11:13 a.m.	--	--	10:09 a.m.	4.25
PZ1	12/20/10		21.74	7.25	2:25 p.m.	2:27 p.m.	7.11	--	--
PZ1	03/21/11		21.64	7.35	3:52 p.m.	--	--	2:15 p.m.	4.77
PZ1	03/23/11		21.34	7.65	8:32 a.m.	7:18 a.m.	7.27	--	--
PZ1	06/21/11		18.43	10.56	3:17 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39
PZ1	06/22/11		18.49	10.50	8:20 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71
PZ1	09/23/11		26.97	2.02	8:45 a.m.	--	--	9:06 a.m.	-0.73
PZ1	09/28/11		25.31	3.68	3:25 p.m.	5:27 p.m.	4.72	--	--
PZ1	01/12/12		24.59	4.40	8:26 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02
PZ1	03/20/12		20.72	8.27	9:30 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92
PZ1	06/26/12		19.87	9.12	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35
PZ1	10/31/12		24.11	4.88	1:20 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67
PZ1	05/31/13		21.99	7.00	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80
PZ1	08/27/13		25.68	3.31	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01
PZ1	12/19/13		25.31	3.68	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69
PZ1	01/07/15		23.32	5.67	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19
PZ1	08/07/17		25.06	3.93	9:45 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03
PZ2	02/04/10	30.16	24.74	5.42	9:05 a.m.	7:39 a.m.	5.47	2:45 p.m.	1.34
PZ2	09/01/10		28.04	2.12	9:51 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93
PZ2	12/20/10		23.86	6.30	11:28 a.m.	--	--	10:09 a.m.	4.25
PZ2	12/20/10		22.80	7.36	2:34 p.m.	2:27 p.m.	7.11	--	--
PZ2	03/21/11		22.86	7.30	4:06 p.m.	--	--	2:15 p.m.	4.77
PZ2	03/23/11		22.44	7.72	8:41 a.m.	7:18 a.m.	7.27	--	--
PZ2	06/21/11		19.67	10.49	3:33 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39
PZ2	06/22/11		19.72	10.44	8:06 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71
PZ2	09/23/11		28.24	1.92	8:45 a.m.	--	--	9:06 a.m.	-0.73
PZ2	09/28/11		26.52	3.64	3:25 p.m.	5:27 p.m.	4.72	--	--
PZ2	01/12/12		25.78	4.38	8:42 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02
PZ2	03/20/12		21.92	8.24	9:28 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92
PZ2	06/26/12		21.02	9.14	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35
PZ2	10/31/12		23.61	6.55	2:18 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67
PZ2	05/31/13		23.21	6.95	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80
PZ2	08/27/13		26.82	3.34	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01
PZ2	12/19/13		26.45	3.71	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69
PZ2	01/07/15		24.62	5.54	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19
PZ2	08/07/17		26.85	3.31	9:23 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03
PZ3	02/04/10		28.47	22.99	5.48	9:19 a.m.	7:39 a.m.	5.47	2:45 p.m.
PZ3	09/01/10	26.30		2.17	09:45 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93
PZ3	11/02/10	24.55		3.92	11:59 a.m.	1:15 p.m.	4.42	8:42 a.m.	0.75
PZ3	12/20/10	22.08		6.39	11:32 a.m.	--	--	10:09 a.m.	4.25
PZ3	12/20/10	20.96		7.51	2:38 p.m.	2:27 p.m.	7.11	--	--
PZ3	03/21/11	20.98		7.49	4:34 p.m.	--	--	2:15 p.m.	4.77
PZ3	03/23/11	20.70		7.77	9:07 a.m.	7:18 a.m.	7.27	--	--
PZ3	06/21/11	17.96		10.51	3:38 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39
PZ3	06/22/11	18.01		10.46	7:45 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71
PZ3	09/23/11	26.66		1.81	8:45 a.m.	--	--	9:06 a.m.	-0.73
PZ3	09/28/11	24.66		3.81	3:25 p.m.	5:27 p.m.	4.72	--	--
PZ3	01/12/12	24.07		4.40	8:45 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02
PZ3	03/20/12	20.23		8.24	9:24 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92
PZ3	06/26/12	19.29		9.18	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35
PZ3	10/31/12	23.61		4.86	1:47 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67
PZ3	05/31/13	21.31		7.16	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80
PZ3	08/27/13	25.04		3.43	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01
PZ3	12/19/13	24.70		3.77	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69
PZ3	01/07/15	22.92		5.55	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19
PZ3	08/07/17	24.72		3.75	9:15 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03
PZ4	02/04/10	26.78	NM	NM	NM	7:39 a.m.	5.47	2:45 p.m.	1.34
PZ4	09/01/10		24.61	2.17	10:18 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93
PZ4	11/02/10		23.16	3.62	11:52 a.m.	13:15 p.m.	4.42	8:42 a.m.	0.75
PZ4	12/20/10		20.41	6.37	10:30 a.m.	--	--	10:09 a.m.	4.25
PZ4	12/20/10		19.60	7.18	2:44 p.m.	2:27 p.m.	7.11	--	--
PZ4	03/21/11		19.17	7.61	4:11 p.m.	--	--	2:15 p.m.	4.77
PZ4	03/23/11		19.14	7.64	9:12 a.m.	7:18 a.m.	7.27	--	--
PZ4	06/21/11		16.07	10.71	2:55 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39
PZ4	06/22/11		16.26	10.52	7:42 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71
PZ4	09/23/11		24.60	2.18	8:45 a.m.	--	--	9:06 a.m.	-0.73
PZ4	09/28/11		23.13	3.65	3:25 p.m.	5:27 p.m.	4.72	--	--
PZ4	01/12/12		22.39	4.39	8:48 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02
PZ4	03/20/12		18.49	8.29	9:55 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92
PZ4	06/26/12		17.69	9.09	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35
PZ4	10/31/12		21.87	4.91	1:54 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67
PZ4	05/31/13		19.74	7.04	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80
PZ4	08/27/13		23.44	3.34	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01
PZ4	12/19/13		23.30	3.48	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69
PZ4	01/07/15		21.08	5.70	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19
PZ4	08/07/17		23.20	3.58	9:05 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03
PZ5	02/04/10	26.86	21.70	5.16	9:27 a.m.	7:39 a.m.	5.47	2:45 p.m.	1.34
PZ5	09/01/10		24.73	2.13	10:22 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93
PZ5	11/02/10		23.34	3.52	11:56 a.m.	1:15 p.m.	4.42	8:42 a.m.	0.75
PZ5	12/20/10		20.41	6.45	11:36 a.m.	--	--	10:09 a.m.	4.25
PZ5	12/20/10		19.83	7.03	2:42 p.m.	2:27 p.m.	7.11	--	--
PZ5	03/21/11		19.19	7.67	4:56 p.m.	--	--	2:15 p.m.	4.77
PZ5	03/23/11		19.30	7.56	9:17 a.m.	7:18 a.m.	7.27	--	--
PZ5	06/21/11		16.06	10.80	2:53 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39
PZ5	06/22/11		16.29	10.57	7:39 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71
PZ5	09/23/11		24.47	2.39	8:45 a.m.	--	--	9:06 a.m.	-0.73
PZ5	09/28/11		23.22	3.64	3:25 p.m.	5:27 p.m.	4.72	--	--
PZ5	01/12/12		22.51	4.35	8:50 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02
PZ5	03/20/12		18.51	8.35	10:00 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92
PZ5	06/26/12		17.85	9.01	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35
PZ5	10/31/12		21.91	4.95	1:50 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67
PZ5	05/31/13		19.78	7.08	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80
PZ5	08/27/13		23.57	3.29	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01
PZ5	12/19/13		23.24	3.62	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69
PZ5	01/07/15		21.06	5.80	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19
PZ5	08/07/17		22.69	4.17	9:02 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03

Table 2
Summary of Groundwater Elevation Data
Chemtrade Performance Chemicals US LLC Site
Kalama, WA
H&H Project No. CLR-045

Well ID	Date Measured	TOC Elevation ¹ (ft CRD)	Depth to Water (ft below TOC)	Water Elevation ¹ (ft CRD)	Time Measured	High (CRD) ²		Low (CRD) ²		
						Time	Elevation (ft)	Time	Elevation (ft)	
PZ6	02/04/10	27.58	22.54	5.04	9:23 a.m.	7:39 a.m.	5.47	2:45 p.m.	1.34	
PZ6	09/01/10		25.46	2.12	10:10 a.m.					
PZ6	09/01/10		24.80	2.78	10:15 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93	
PZ6	11/02/10		24.10	3.48	11:48 a.m.	1:15 p.m.	4.42	8:42 a.m.	0.75	
PZ6	12/20/10		21.15	6.43	10:21 a.m.	--	--	10:09 a.m.	4.25	
PZ6	12/20/10		20.65	6.93	2:52 p.m.	2:27 p.m.	7.11	--	--	
PZ6	03/21/11		19.92	7.66	4:47 p.m.	--	--	2:15 p.m.	4.77	
PZ6	03/23/11		20.16	7.42	8:50 a.m.	7:18 a.m.	7.27	--	--	
PZ6	06/21/11		16.70	10.88	2:30 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39	
PZ6	06/22/11		16.99	10.59	7:50 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71	
PZ6	09/23/11		25.11	2.47	8:45 a.m.	--	--	9:06 a.m.	-0.73	
PZ6	09/28/11		23.96	3.62	3:25 p.m.	5:27 p.m.	4.72	--	--	
PZ6	01/12/12		NM	NM	NM	5:57 a.m.	4.01	1:48 p.m.	1.02	
PZ6	03/20/12		19.33	8.25	10:10 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92	
PZ6	06/26/12		18.61	8.97	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35	
PZ6	10/31/12		22.57	5.01	1:52 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67	
PZ6	05/31/13		20.58	7.00	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80	
PZ6	08/27/13		24.35	3.23	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01	
PZ6	12/19/13		24.15	3.43	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69	
PZ6	01/07/15		21.68	5.90	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19	
PZ6	08/07/17	24.16	3.42	9:10 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03		
PZ7	02/04/10	28.06	24.80	3.26	10:40 a.m.	7:39 a.m.	5.47	2:45 p.m.	1.34	
PZ7	12/20/10		20.89	7.17	10:55 a.m.	--	--	10:09 a.m.	4.25	
PZ7	12/20/10		20.84	7.22	3:03 p.m.	2:27 p.m.	7.11	--	--	
PZ7	03/21/11		19.52	8.54	4:25 p.m.	--	--	2:15 p.m.	4.77	
PZ7	03/23/11		19.17	8.89	9:00 a.m.	7:18 a.m.	7.27	--	--	
PZ7	06/21/11		16.61	11.45	2:42 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39	
PZ7	06/22/11		16.91	11.15	7:55 p.m.	9:48 a.m.	9.13	6:54 a.m.	8.71	
PZ7	09/23/11		24.61	3.45	8:45 a.m.	--	--	9:06 a.m.	-0.73	
PZ7	09/28/11		23.77	4.29	3:25 p.m.	5:27 p.m.	4.72	--	--	
PZ7	01/12/12		NM	NM	NM	5:57 a.m.	4.01	1:48 p.m.	1.02	
PZ7	03/20/12		19.40	8.66	9:15 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92	
PZ7	06/26/12		18.20	9.86	2:30 p.m.	10:27 p.m.	6.27	5:20 p.m.	3.35	
PZ7	10/31/12		NM	NM	NM	5:42 a.m.	5.17	12:45 p.m.	2.67	
PZ7	05/31/13		NM	NM	NM	5:42 a.m.	10.15	5:00 p.m.	3.80	
PZ7	08/27/13		NM	NM	NM	4:00 p.m.	6.91	8:21 a.m.	2.01	
PZ7	12/19/13		NM	NM	NM	2:39 p.m.	8.48	4:15 a.m.	1.69	
PZ7	01/07/15		21.20	6.86	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19	
PZ7	08/07/17		23.00	5.06	8:45 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03	
PZ8	02/04/10		28.17	21.02	7.15	9:35 a.m.	7:39 a.m.	5.47	2:45 p.m.	1.34
PZ8	09/01/10			21.54	6.63	10:10 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93
PZ8	12/20/10	20.39		7.78	11:05 a.m.	--	--	10:09 a.m.	4.25	
PZ8	12/20/10	20.35		7.82	2:55 p.m.	2:27 p.m.	7.11	--	--	
PZ8	03/21/11	19.35		8.82	4:15 p.m.	--	--	2:15 p.m.	4.77	
PZ8	03/23/11	19.84		8.33	8:54 a.m.	7:18 a.m.	7.27	--	--	
PZ8	06/21/11	16.59		11.58	2:38 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39	
PZ8	06/22/11	16.89		11.28	7:58 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71	
PZ8	09/23/11	21.83		6.34	8:45 a.m.	--	--	9:06 a.m.	-0.73	
PZ8	09/28/11	21.68		6.49	3:25 p.m.	5:27 p.m.	4.72	--	--	
PZ8	01/12/12	21.09		7.08	9:04 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02	
PZ8	03/20/12	19.31		8.86	9:10 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92	
PZ8	06/26/12	17.52		10.65	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35	
PZ8	10/31/12	20.31		7.86	2:30 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67	
PZ8	05/31/13	20.02		8.15	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80	
PZ8	08/27/13	21.58		6.59	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01	
PZ8	12/19/13	21.26		6.91	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69	
PZ8	01/07/15	20.19		7.98	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19	
PZ8	08/07/17	21.50		6.67	8:40 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03	
PZ9	02/04/10	27.54		22.04	5.50	9:42 a.m.	7:39 a.m.	5.47	2:45 p.m.	1.34
PZ9	09/01/10		25.34	2.20	9:47 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93	
PZ9	12/20/10		21.06	6.48	11:40 a.m.	--	--	10:09 a.m.	4.25	
PZ9	12/20/10		19.97	7.57	2:40 p.m.	2:27 p.m.	7.11	--	--	
PZ9	03/21/11		19.98	7.56	4:39 p.m.	--	--	2:15 p.m.	4.77	
PZ9	03/23/11		19.73	7.81	9:23 a.m.	7:18 a.m.	7.27	--	--	
PZ9	06/21/11		16.98	10.56	3:40 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39	
PZ9	06/22/11		17.06	10.48	7:36 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71	
PZ9	09/23/11		25.67	1.87	8:45 a.m.	--	--	9:06 a.m.	-0.73	
PZ9	09/28/11		23.68	3.86	3:25 p.m.	5:27 p.m.	4.72	--	--	
PZ9	01/12/12		23.07	4.47	8:53 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02	
PZ9	03/20/12		19.23	8.31	9:20 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92	
PZ9	06/26/12		18.32	9.22	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35	
PZ9	10/31/12		23.61	3.93	2:21 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67	
PZ9	05/31/13		20.50	7.04	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80	
PZ9	08/27/13		24.01	3.53	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01	
PZ9	12/19/13		23.82	3.72	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69	
PZ9	01/07/15		22.00	5.54	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19	
PZ9	08/07/17		23.82	3.72	8:58 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03	
PZ10	02/04/10		26.94	NM	NM	NM	7:39 a.m.	5.47	2:45 p.m.	1.34
PZ10	09/01/10	24.62		2.32	10:05 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93	
PZ10	12/20/10	20.26		6.68	11:51 p.m.	2:27 p.m.	7.11	10:09 a.m.	4.25	
PZ10	12/20/10	19.73		7.21	3:10 p.m.	2:27 p.m.	7.11	10:09 a.m.	4.25	
PZ10	03/21/11	19.02		7.92	4:57 p.m.	--	--	2:15 p.m.	4.77	
PZ10	03/23/11	19.26		7.68	9:27 a.m.	7:18 a.m.	7.27	--	--	
PZ10	06/21/11	15.79		11.15	3:04 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39	
PZ10	06/22/11	16.06		10.88	7:33 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71	
PZ10	09/23/11	24.00		2.94	8:45 a.m.	--	--	9:06 a.m.	-0.73	
PZ10	09/28/11	23.08		3.86	3:25 p.m.	5:27 p.m.	4.72	--	--	
PZ10	01/12/12	22.45		4.49	8:59 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02	
PZ10	03/20/12	18.26		8.68	9:05 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92	
PZ10	06/26/12	17.82		9.12	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35	
PZ10	05/31/13	19.66		7.28	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80	
PZ10	08/27/13	23.51		3.43	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01	
PZ10	12/19/13	23.28		3.66	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69	
PZ10	01/07/15	20.87		6.07	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19	
PZ10	08/07/17	22.64		4.30	8:50 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03	

Table 2
Summary of Groundwater Elevation Data
Chemtrade Performance Chemicals US LLC Site
Kalama, WA
H&H Project No. CLR-045

Well ID	Date Measured	TOC Elevation ¹ (ft CRD)	Depth to Water (ft below TOC)	Water Elevation ¹ (ft CRD)	Time Measured	High (CRD) ²		Low (CRD) ²		
						Time	Elevation (ft)	Time	Elevation (ft)	
PZ11	02/04/10	30.39	25.26	5.13	9:10 a.m.	7:39 a.m.	5.47	2:45 p.m.	1.34	
PZ11	09/01/10		28.39	2.00	10:02 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93	
PZ11	12/20/10		24.11	6.28	11:26 a.m.	--	--	10:09 a.m.	4.25	
PZ11	12/20/10		23.50	6.89	2:31 p.m.	2:27 p.m.	7.11	--	--	
PZ11	03/21/11		22.92	7.47	4:03 p.m.	--	--	2:15 p.m.	4.77	
PZ11	03/23/11		22.98	7.41	8:38 a.m.	7:18 a.m.	7.27	--	--	
PZ11	06/21/11		19.73	10.66	3:10 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39	
PZ11	06/22/11		19.92	10.47	8:08 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71	
PZ11	09/23/11		28.17	2.22	8:45 a.m.	--	--	9:06 a.m.	-0.73	
PZ11	09/28/11		26.86	3.53	3:25 p.m.	5:27 p.m.	4.72	--	--	
PZ11	01/12/12		26.17	4.22	8:40 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02	
PZ11	03/20/12		22.14	8.25	9:50 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92	
PZ11	06/26/12		21.42	8.97	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35	
PZ11	10/31/12		23.70	6.69	2:24 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67	
PZ11	05/31/13		23.40	6.99	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80	
PZ11	08/27/13		27.25	3.14	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01	
PZ11	12/19/13		26.90	3.49	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69	
PZ11	01/07/15	24.72	5.67	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19		
PZ11	08/07/17	27.18	3.21	9:20 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03		
PZ12	02/04/10	30.53	25.42	5.11	8:34 a.m.	7:39 a.m.	5.47	2:45 p.m.	1.34	
PZ12	09/01/10		NM	NM	NM	9:42 p.m.	2.62	5:33 a.m.	-0.93	
PZ12	11/02/10		27.18	3.35	11:37 a.m.	1:15 p.m.	4.42	8:42 a.m.	0.75	
PZ12	12/20/10		24.25	6.28	11:20 a.m.	--	--	10:09 a.m.	4.25	
PZ12	12/20/10		23.50	7.03	3:12 p.m.	2:27 p.m.	7.11	--	--	
PZ12	03/21/11		23.06	7.47	3:33 p.m.	--	--	2:15 p.m.	4.77	
PZ12	03/23/11		23.21	7.32	8:08 a.m.	7:18 a.m.	7.27	--	--	
PZ12	06/21/11		19.91	10.62	3:12 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39	
PZ12	06/22/11		20.11	10.42	8:11 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71	
PZ12	09/23/11		28.27	2.26	8:45 a.m.	--	--	9:06 a.m.	-0.73	
PZ12	09/28/11		NM	NM	3:25 p.m.	5:27 p.m.	4.72	--	--	
PZ12	01/12/12		26.32	4.21	8:38 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02	
PZ12	03/20/12		22.27	8.26	9:45 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92	
PZ12	06/26/12		21.60	8.93	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35	
PZ12	10/31/12		25.61	4.92	5:42 a.m.	5:42 a.m.	5.17	12:45 p.m.	2.67	
PZ12	05/31/13		23.58	6.95	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80	
PZ12	08/27/13		27.44	3.09	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01	
PZ12	12/19/13	27.31	3.22	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69		
PZ12	01/07/15	24.83	5.70	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19		
PZ12	08/07/17	26.89	3.64	9:30 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03		
PZ13	02/04/10	30.40	25.50	4.90	8:32 a.m.	7:39 a.m.	5.47	2:45 p.m.	1.34	
PZ13	09/01/10		28.21	2.19	9:59 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93	
PZ13	11/02/10		26.93	3.47	11:30 a.m.	1:15 p.m.	4.42	8:42 a.m.	0.75	
PZ13	12/20/10		23.89	6.51	11:18 a.m.	--	--	10:09 a.m.	4.25	
PZ13	12/20/10		23.56	6.84	2:22 p.m.	2:27 p.m.	7.11	--	--	
PZ13	03/21/11		23.57	6.83	3:36 p.m.	--	--	2:15 p.m.	4.77	
PZ13	03/23/11		23.11	7.29	8:05 a.m.	7:18 a.m.	7.27	--	--	
PZ13	06/21/11		19.50	10.90	3:14 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39	
PZ13	06/22/11		19.75	10.65	8:14 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71	
PZ13	09/23/11		27.82	2.58	8:45 a.m.	--	--	9:06 a.m.	-0.73	
PZ13	09/28/11		26.63	3.77	3:25 p.m.	5:27 p.m.	4.72	--	--	
PZ13	01/12/12		26.12	4.28	8:30 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02	
PZ13	03/20/12		21.81	8.59	9:40 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92	
PZ13	06/26/12		21.36	9.04	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35	
PZ13	10/31/12		25.31	5.09	5:42 a.m.	5:42 a.m.	5.17	12:45 p.m.	2.67	
PZ13	05/31/13		23.19	7.21	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80	
PZ13	08/27/13		27.17	3.23	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01	
PZ13	12/19/13	26.95	3.45	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69		
PZ13	01/07/15	24.35	6.05	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19		
PZ13	08/07/17	26.50	3.90	9:30 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03		
PZ14	02/04/10	29.09	23.74	5.35	8:20 a.m.	7:39 a.m.	5.47	2:45 p.m.	1.34	
PZ14	09/01/10		26.94	2.15	9:57 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93	
PZ14	06/21/11		18.55	10.54	3:17 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39	
PZ14	06/22/11		18.62	10.47	8:16 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71	
PZ14	09/23/11		27.15	1.94	8:45 a.m.	--	--	9:06 a.m.	-0.73	
PZ14	09/28/11		25.44	3.65	3:25 p.m.	5:27 p.m.	4.72	--	--	
PZ14	01/12/12		24.72	4.37	8:35 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02	
PZ14	03/20/12		21.02	8.07	9:35 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92	
PZ14	06/26/12		19.57	9.52	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35	
PZ14	05/31/13		22.10	6.99	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80	
PZ14	08/27/13		25.85	3.24	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01	
PZ14	12/19/13		25.52	3.57	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69	
PZ14	01/07/15		23.56	5.53	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19	
PZ14	08/07/17		25.96	3.13	9:27 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03	
PZ15	02/04/10		27.79	22.22	5.57	9:45 a.m.	7:39 a.m.	5.47	2:45 p.m.	1.34
PZ15	09/01/10			25.58	2.21	9:50 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93
PZ15	06/21/11			NM	NM	NM	8:48 a.m.	9.36	5:06 p.m.	8.39
PZ15	06/22/11	NM		NM	NM	9:48 a.m.	9.13	6:54 a.m.	8.71	
PZ15	09/23/11	26.04		1.75	8:45 a.m.	--	--	9:06 a.m.	-0.73	
PZ15	09/28/11	23.91		3.88	3:25 p.m.	5:27 p.m.	4.72	--	--	
PZ15	01/12/12	23.31		4.48	8:56 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02	
PZ15	03/20/12	19.51		8.28	9:18 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92	
PZ15	06/26/12	18.30		9.49	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35	
PZ15	05/31/13	20.81		6.98	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80	
PZ15	08/27/13	24.23		3.56	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01	
PZ15	12/19/13	23.95		3.84	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69	
PZ15	01/07/15	22.05		5.74	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19	
PZ15	08/07/17	24.26		3.53	8:55 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03	

Table 2
Summary of Groundwater Elevation Data
Chemtrade Performance Chemicals US LLC Site
Kalama, WA
H&H Project No. CLR-045

Well ID	Date Measured	TOC Elevation ¹ (ft CRD)	Depth to Water (ft below TOC)	Water Elevation ¹ (ft CRD)	Time Measured	High (CRD) ²		Low (CRD) ²		
						Time	Elevation (ft)	Time	Elevation (ft)	
AB1 ^o	02/04/10	27.53	30.08	6.26	9:17 a.m.	7:39 a.m.	5.47	2:45 p.m.	1.34	
AB1 ^o	09/01/10		34.71	2.99	10:27 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93	
AB1 ^o	11/02/10		32.19	4.77	12:03 p.m.	13:15 p.m.	4.42	8:42 a.m.	0.75	
AB1 ^o	12/20/10		29.08	6.97	11:30 a.m.	--	--	10:09 a.m.	4.25	
AB1 ^o	12/20/10		28.32	7.50	2:36 p.m.	2:27 p.m.	7.11	--	--	
AB1 ^o	03/21/11		27.65	7.98	4:32 p.m.	--	--	2:15 p.m.	4.77	
AB1 ^o	03/23/11		27.07	8.39	8:30 a.m.	7:18 a.m.	7.27	--	--	
AB1 ^o	06/21/11		23.48	10.93	3:36 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39	
AB1 ^o	06/22/11		23.49	10.92	7:46 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71	
AB1 ^o	09/23/11		35.19	2.65	8:45 a.m.	--	--	9:06 a.m.	-0.73	
AB1 ^o	09/28/11		32.64	4.45	3:25 p.m.	5:27 p.m.	4.72	--	--	
AB1 ^o	01/12/12		31.76	5.07	8:46 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02	
AB1 ^o	03/20/12		26.52	8.78	9:23 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92	
AB1 ^o	06/26/12		25.13	9.76	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35	
AB1 ^o	10/31/12		31.11	5.53	1:45 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67	
AB1 ^o	05/31/13		28.32	7.50	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80	
AB1 ^o	08/27/13		32.97	4.22	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01	
AB1 ^o	12/19/13		32.59	4.49	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69	
AB1 ^o	01/07/15		30.29	6.11	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19	
AB1 ^o	08/07/17		32.80	4.34	9:17 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03	
AB2 ^o	02/04/10	28.41	27.23	6.10	8:27 a.m.	7:39 a.m.	5.47	2:45 p.m.	1.34	
AB2 ^o	09/01/10		31.21	2.84	10:30 a.m.	9:42 p.m.	2.62	5:33 a.m.	-0.93	
AB2 ^o	11/02/10		29.56	4.19	11:21 a.m.	13:15 p.m.	4.42	8:42 a.m.	0.75	
AB2 ^o	12/20/10		26.36	6.82	11:16 a.m.	--	--	10:09 a.m.	4.25	
AB2 ^o	12/20/10		24.97	7.95	2:26 p.m.	2:27 p.m.	7.11	--	--	
AB2 ^o	03/21/11		25.20	7.77	3:54 p.m.	--	--	2:15 p.m.	4.77	
AB2 ^o	03/23/11		24.63	8.23	8:30 a.m.	7:18 a.m.	7.27	--	--	
AB2 ^o	06/21/11		21.36	10.91	3:21 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39	
AB2 ^o	06/22/11		21.35	10.92	8:19 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71	
AB2 ^o	09/23/11		31.66	2.47	8:45 a.m.	--	--	9:06 a.m.	-0.73	
AB2 ^o	09/28/11		29.45	4.28	3:25 p.m.	5:27 p.m.	4.72	--	--	
AB2 ^o	01/12/12		28.60	4.98	8:25 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02	
AB2 ^o	03/20/12		24.03	8.72	9:32 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92	
AB2 ^o	06/26/12		22.93	9.63	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35	
AB2 ^o	10/31/12		28.01	5.46	1:23 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67	
AB2 ^o	05/31/13		25.56	7.47	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80	
AB2 ^o	08/27/13		29.80	4.00	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01	
AB2 ^o	12/19/13		29.47	4.27	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69	
AB2 ^o	01/07/15		27.17	6.15	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19	
AB2 ^o	08/07/17		29.29	4.42	9:40 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03	
OW1	11/02/10	26.51	23.00	3.51	11:26 a.m.	13:15 p.m.	4.42	8:42 a.m.	0.75	
OW1	12/20/10		20.22	6.29	11:10 a.m.	--	--	10:09 a.m.	4.25	
OW1	12/20/10		19.38	7.13	2:20 p.m.	2:27 p.m.	7.11	--	--	
OW1	03/21/11		19.15	7.36	3:40 p.m.	--	--	2:15 p.m.	4.77	
OW1	03/23/11		18.97	7.54	8:20 a.m.	7:18 a.m.	7.27	--	--	
OW1	06/21/11		15.93	10.58	3:26 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39	
OW1	06/22/11		16.05	10.46	8:21 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71	
OW1	09/23/11		24.43	2.08	8:45 a.m.	--	--	9:06 a.m.	-0.73	
OW1	09/28/11		22.79	3.72	3:25 p.m.	5:27 p.m.	4.72	--	--	
OW1	01/12/12		22.16	4.35	8:26 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02	
OW1	03/20/12		18.25	8.26	10:20 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92	
OW1	06/26/12		17.41	9.10	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35	
OW1	10/31/12		21.62	4.89	1:26 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67	
OW1	05/31/13		19.49	7.02	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80	
OW1	08/27/13		23.25	3.26	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01	
OW1	12/19/13		23.00	3.51	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69	
OW1	01/07/15		20.85	5.66	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19	
OW1	08/07/17		22.66	3.85	9:35 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03	
OW2	11/02/10		25.99	22.45	3.54	11:24 p.m.	13:15 p.m.	4.42	8:42 a.m.	0.75
OW2	12/20/10			19.71	6.28	11:08 a.m.	--	--	10:09 a.m.	4.25
OW2	12/20/10	18.56		7.43	3:14 p.m.	2:27 p.m.	7.11	--	--	
OW2	03/21/11	18.64		7.35	3:58 p.m.	--	--	2:15 p.m.	4.77	
OW2	03/23/11	18.37		7.62	8:27 a.m.	7:18 a.m.	7.27	--	--	
OW2	06/21/11	15.48		10.51	3:24 a.m.	8:48 a.m.	9.36	5:06 p.m.	8.39	
OW2	06/22/11	15.51		10.48	8:23 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71	
OW2	09/23/11	23.99		2.00	8:45 a.m.	--	--	9:06 a.m.	-0.73	
OW2	09/28/11	22.85		3.14	3:25 p.m.	5:27 p.m.	4.72	--	--	
OW2	01/12/12	21.62		4.37	8:28 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02	
OW2	03/20/12	17.81		8.18	10:25 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92	
OW2	06/26/12	16.87		9.12	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35	
OW2	10/31/12	21.14		4.85	1:30 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67	
OW2	05/31/13	19.01		6.98	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80	
OW2	08/27/13	22.67		3.32	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01	
OW2	12/19/13	22.35		3.64	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69	
OW2	01/07/15	20.34		5.65	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19	
OW2	08/07/17	22.21		3.78	9:35 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03	

Table 2
Summary of Groundwater Elevation Data
Chemtrade Performance Chemicals US LLC Site
Kalama, WA
H&H Project No. CLR-045

Well ID	Date Measured	TOC Elevation ¹ (ft CRD)	Depth to Water (ft below TOC)	Water Elevation ¹ (ft CRD)	Time Measured	High (CRD) ²		Low (CRD) ²	
						Time	Elevation (ft)	Time	Elevation (ft)
OW3	11/02/10	26.13	22.62	3.51	11:28 a.m.	13:15 p.m.	4.42	8:42 a.m.	0.75
OW3	12/20/10		19.83	6.30	11:13 a.m.	--	--	10:09 a.m.	4.25
OW3	12/20/10		19.98	6.15	2:28 p.m.	2:27 p.m.	7.11	--	--
OW3	03/21/11		18.76	7.37	3:42 p.m.	--	--	2:15 p.m.	4.77
OW3	03/23/11		18.60	7.53	8:14 a.m.	7:18 a.m.	7.27	--	--
OW3	06/21/11		15.55	10.58	3:30 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39
OW3	06/22/11		15.65	10.48	8:24 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71
OW3	09/23/11		24.05	2.08	8:45 a.m.	--	--	9:06 a.m.	-0.73
OW3	09/28/11		22.52	3.61	3:25 p.m.	5:27 p.m.	4.72	--	--
OW3	01/12/12		21.76	4.37	8:07 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02
OW3	03/20/12		17.90	8.23	10:30 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92
OW3	06/26/12		17.03	9.10	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35
OW3	10/31/12		21.22	4.91	1:33 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67
OW3	05/31/13		19.15	6.98	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80
OW3	08/27/13		22.87	3.26	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01
OW3	12/19/13		22.70	3.43	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69
OW3	01/07/15		20.46	5.67	2:30 p.m.	4:53 p.m.	5.85	1:33 a.m.	3.19
OW3	08/07/17		22.51	3.62	9:40 a.m.	4:03 a.m.	4.13	12:54 p.m.	-0.03

Notes:

Pre-2010 data not shown in table

- 1) Survey based on NAVD88 and adjusted to CRD by subtracting 3.8 feet. Control point was taken from the I-5 intersection at the Todd Road overpass located at the northeast corner of the interchange.
- 2) Tidal data are from NOAA Co-ops web site <http://co-ops.nos.noaa.gov>. Verified times and high/low water level data from the Longview and St. Helens stations were used. Tides for Kalama were estimated by using the difference between the times and water level data at these two stations (assuming Kalama is located approximately at the midpoint). These elevations are based on MLLW.
- 3) Water elevations in the angle monitoring wells are approximated by the following calculations (where WL = depth to water):
 AB1 (27.53 - WL COS 45°)
 AB2 (28.41 - WL COS 35°)

ft TOC = feet below top of casing; CRD = Columbia River Datum; NM = n

Table 3
Summary of Groundwater Cadmium and Zinc Analytical Data
Chemtrade Performance Chemicals US LLC Site
Kalama, WA
H&H Project No. CLR-045

Sample ID	Sample Date	Sample Time	Zinc		Cadmium	
			Total	Dissolved	Total	Dissolved
µg/L						
PZ1	04/15/03	1255	--	2,100	--	<4.4
PZ1	07/18/03	1430	--	3,500	--	--
PZ1	08/13/03	1035	7,300	--	<4.4	--
PZ1	01/28/04	1530	10,000	--	--	--
PZ1	04/29/04	1214	--	13,000	--	--
PZ1	07/29/04	1532	--	16,000	--	--
PZ1	10/27/04	0915	--	13,000	--	--
PZ1	01/27/05	1015	--	16,100	--	--
PZ1	05/03/05	1532	--	16,800	--	--
PZ1	07/26/05	0900	--	20,500	--	<2.0
PZ1	10/26/05	1535	--	12,600	--	--
PZ1	07/12/06	1836	--	11,500	--	0.7
PZ1	02/04/10	1415	--	8,440	--	0.5
PZ1	09/02/10	1400	5,630	--	<1.0	--
PZ1	11/02/10	1650	--	7,290	--	<1.0
PZ1	12/20/10	1640	--	6,720	--	<1.0
PZ1	03/22/11	1030	--	12,300	--	<10.0
PZ1	06/21/11	1140	--	14,700	--	<10.0
PZ1	09/22/11	1125	--	17,800	--	<1.0
PZ1	01/12/11	1010	--	40,000	--	<10.0
PZ1	03/21/12	1235	--	70,000	--	5.1 J
PZ1	06/26/12	1255	--	84,500	--	<100
PZ1	10/31/12	1340	--	29,900	--	3
PZ1	05/30/13	920	--	85,400	--	2.1
PZ1	08/28/13	855	--	51,000	--	1.5
PZ1	12/20/13	830	--	44,200	--	<10.0
PZ1	01/06/15	1640	76,800	--	1.32	--
PZ1	08/07/17	1015	45,400	--	6.31	--
PZ2	04/15/03	1430	--	<28	--	<4.4
PZ2	08/13/03	1120	<28	--	<4.4	--
PZ2	01/28/04	1450	<28	--	--	--
PZ2	04/28/04	1919	--	<50	--	--
PZ2	07/29/04	1434	--	<50	--	--
PZ2	10/27/04	1030	--	<50	--	--
PZ2	01/27/05	1315	--	27	--	--
PZ2	05/03/05	1450	--	14	--	--
PZ2	07/26/05	1025	--	15	--	<2.0
PZ2	10/26/05	1630	--	15	--	--
PZ2	07/12/06	1634	--	11	11	<0.2
PZ2	02/05/10	0945	--	8	--	<0.2
PZ2	08/07/17	1625	<25.0	--	<1.0	--
PZ3	04/15/03	1645	--	7,200	--	<4.4
PZ3	05/06/03	1550	--	11,000	--	<4.4
PZ3	05/21/03	1215	--	12,000	--	<4.0
PZ3	07/18/03	1615	--	12,000	--	--
PZ3	08/13/03	1202	7,400	--	<4.4	--
PZ3	01/28/04	1330	8,300	--	<4.4	--
PZ3	04/28/04	1747	--	11,000	--	<4.0
PZ3	07/29/04	1239	--	6,600	--	<4.0
PZ3	10/27/04	1100	--	4,300	--	<4.0
PZ3	01/27/05	1440	--	8,920	--	<2
PZ3	05/03/05	1335	--	7,160	--	<2
PZ3	07/25/05	1256	--	6,850	--	<2.0
PZ3	10/27/05	0915	--	4,140	--	<2.0
PZ3	07/13/06	0718	--	7,510	--	1.0
PZ3	07/13/06	1600	--	850	--	0.3
PZ3	02/05/10	1170	--	3,690	--	0.5
PZ3	09/01/10	1436	2,670	--	<1.0	--
PZ3	11/03/10	1310	--	1,940	--	<1.0
PZ3	12/21/10	1445	--	2,280	--	<1.0
PZ3	03/22/11	1620	--	4,370	--	<10.0
PZ3	09/22/11	1625	--	2,930	--	<10.0
PZ3	06/21/11	0945	--	4,420	--	<1.0
PZ3	01/12/12	1420	--	4,530	--	<10.0
PZ3	03/21/12	1020	--	11,000	--	1.7 J
PZ3	06/27/12	900	--	6,480	--	1.0
PZ3	10/31/12	1030	--	3,530	--	<1.0
PZ3	05/30/13	1505	--	6,240	--	<1.0
PZ3	08/27/13	1140	--	4,480	--	0.7 J
PZ3	12/19/13	1120	--	4,570	--	<1.0
PZ3	01/07/15	1345	--	3,780	--	<1.0
PZ3	08/08/17	845	6,760	--	<1.0	--
PZ4	04/15/03	1845	--	3,300	--	46
PZ4	05/21/03	1246	--	650	--	9.2
PZ4	08/13/03	1346	720	--	9.6	--
PZ4	01/28/04	1110	6,600	--	64	--
PZ4	04/28/04	2122	--	2,300	--	27
PZ4	07/29/04	1825	--	3,500	--	37
PZ4	10/27/04	1335	--	1,700	--	16
PZ4	01/27/05	1645	--	8,060	--	82
PZ4	05/03/05	1152	--	2,090	--	19
PZ4	07/25/05	1530	--	1,190	--	10
PZ4	10/26/05	1310	--	1,450	--	13
PZ4	07/13/06	0746	--	620	--	7.7
PZ4	07/13/06	1640	--	420	--	5.3
PZ4	09/01/10	1244	2,210	--	16.6	--
PZ4	11/03/10	1120	--	1,890	--	15.6
PZ4	12/21/10	1515	--	896	--	6.61

Table 3
Summary of Groundwater Cadmium and Zinc Analytical Data
Chemtrade Performance Chemicals US LLC Site
Kalama, WA
H&H Project No. CLR-045

Sample ID	Sample Date	Sample Time	Zinc		Cadmium	
			Total	Dissolved	Total	Dissolved
µg/L						
PZ4	03/22/11	1445	--	3,980	--	36.9
PZ4	06/21/11	1515	--	5,310	--	38.3
PZ4	09/22/11	1620	--	2,810	--	26.1
PZ4	01/12/12	1510	--	437	--	<10.0
PZ4	03/21/12	1135	--	1,700	--	10.0
PZ4	06/26/12	1520	--	4,880	--	31.2
PZ4	10/31/12	945	--	2,770	--	21.5
PZ4	05/30/13	1545	--	1,720	--	11.6
PZ4	08/27/13	1340	--	1,710	--	13.4
PZ4	12/19/13	1240	--	1,930	--	12.6
PZ4	01/07/15	1255	--	2,450	--	16.4
PZ4	08/07/17	1715	1,180	--	9.76	--
PZ5	04/16/03	1115	--	3,600	--	180
PZ5	05/21/03	1320	--	3,000	--	120
PZ5	08/13/03	1729	4,300	--	160	--
PZ5	01/28/04	1150	3,700	--	110	--
PZ5	04/28/04	1958	--	6,700	--	200
PZ5	07/29/04	1902	--	8,800	--	320
PZ5	10/27/04	1415	--	34,000	--	1,100
PZ5	01/27/05	1605	--	7,930	--	326
PZ5	05/03/05	1100	--	5,850	--	244
PZ5	07/25/05	1737	--	7,550	--	302
PZ5	10/26/05	1224	--	14,100	--	628
PZ5	07/13/06	0800	--	3,390	--	152
PZ5	07/13/06	1658	--	3,250	--	146
PZ5	02/05/10	1450	--	3,060	--	107
PZ5	09/01/10	1521	4,350	--	118	--
PZ5	11/03/10	1035	--	2,080	--	69.7
PZ5	12/21/10	1545	--	2,880	--	91.8
PZ5	03/22/11	1520	--	2,980	--	84.7
PZ5	06/21/11	1555	--	35,800	--	1,150
PZ5	09/22/11	1650	--	2,390	--	102
PZ5	01/12/12	1550	--	394	--	<10.0
PZ5	03/21/12	1200	--	2,100	--	43
PZ5	06/26/12	1600	--	1,680	--	4.3
PZ5	10/31/12	905	--	141	--	1.8
PZ5	05/30/13	1605	--	2,110	--	47
PZ5	08/27/13	1405	--	2,410	--	94.6
PZ5	12/19/13	1200	--	3,480	--	151
PZ5	01/07/15	1240	--	4,100	--	111
PZ5	08/08/17	935	2,260	--	64.6	--
PZ6	04/16/03	1310	--	1,500	--	<4.4
PZ6	05/21/03	1415	--	1,400	--	<4.0
PZ6	08/13/03	1642	2,100	--	<4.4	--
PZ6	01/28/04	1020	2,600	--	--	--
PZ6	04/28/04	1412	--	1,400	--	--
PZ6	07/29/04	1738	--	4,600	--	--
PZ6	10/27/04	1500	--	2,600	--	--
PZ6	01/27/05	1730	--	5,370	--	--
PZ6	05/03/05	1233	--	12,500	--	--
PZ6	07/25/05	1549	--	26,200	--	6
PZ6	10/27/05	0721	--	16,800	--	6
PZ6	07/13/06	0906	3,800	--	1.7	--
PZ6	09/01/10	1133	1,310	--	<1.0	--
PZ6	11/03/10	1155	--	1,190	--	<1.0
PZ6	12/20/10	1715	--	553	--	<1.0
PZ6	03/22/11	1415	--	740	--	<10.0
PZ6	06/21/11	1550	--	1,660	--	<10.0
PZ6	09/22/11	1555	--	500	--	<1.0
PZ6	01/12/12	1450	--	26.3	--	<10.0
PZ6	03/21/12	1105	--	980	--	<10.0
PZ6	06/26/12	805	--	3,570	--	<1.0
PZ6	11/01/12	920	--	6,360	--	2.2
PZ6	05/30/13	1525	--	1,650	--	<1.0
PZ6	08/27/13	1215	--	565	--	<1.0
PZ6	12/19/13	1325	--	4,080	--	<1.0
PZ6	01/07/15	1045	--	10,700	--	3.60
PZ6	08/07/17	1715	1,150	--	<1.0	--
PZ7	04/16/03	1425	--	570	--	<4.4
PZ7	08/13/03	1603	--	<25	--	<4.0
PZ7	07/26/05	1641	--	22	--	<2
PZ7	08/08/17	1545	250	--	<1.0	--
PZ8	04/16/03	1645	--	390	--	<4.4
PZ8	08/13/03	1435	--	<25	--	<4.0
PZ8	07/25/05	1235	--	15	--	<2.0
PZ8	08/09/17	945	<25.0	--	<1.0	--
PZ9	05/06/03	1210	--	1,300	--	<4.4
PZ9	08/13/03	1313	<28	--	<4.4	--
PZ9	01/28/04	1225	2,900	--	--	--
PZ9	04/28/04	1713	--	4,100	--	--
PZ9	07/29/04	1121	--	3,400	--	--
PZ9	10/27/04	1300	--	2,700	--	--
PZ9	01/27/05	1515	--	2,230	--	--
PZ9	05/03/05	1008	--	2,580	--	--
PZ9	07/25/05	1139	--	4,050	--	<2.0
PZ9	10/26/05	1115	--	4,240	--	--
PZ9	07/13/06	0944	--	5,530	--	0.8
PZ9	02/05/10	1345	--	2,910	--	1.2
PZ9	08/08/17	925	5,940	--	<1.0	--
PZ10	07/26/05	1505	--	46	--	<2.0
PZ10	08/08/17	1010	<25.0	--	<1.0	--

Table 3
Summary of Groundwater Cadmium and Zinc Analytical Data
Chemtrade Performance Chemicals US LLC Site
Kalama, WA
H&H Project No. CLR-045

Sample ID	Sample Date	Sample Time	Zinc		Cadmium	
			Total	Dissolved	Total	Dissolved
µg/L						
PZ11	07/27/05	1615	--	592	--	<2.0
PZ11	10/26/05	1355	--	900	--	--
PZ11	07/12/06	1721	--	600	--	0.4
PZ11	02/04/10	1430	--	330	--	0.2
PZ11	08/07/17	1630	415	--	<1.0	--
PZ12	07/27/05	1452	--	57,300	--	<2.0
PZ12	10/26/05	1430	--	44,600	--	--
PZ12	07/12/06	1802	--	37,400	--	0.4
PZ12	02/04/10	1230	--	34,200	--	0.6
PZ12	09/02/10	1124	37,800	--	<1.0	--
PZ12	11/03/10	945	--	1,940	--	<1.0
PZ12	12/21/10	1230	--	87,100	--	<1.0
PZ12	03/22/11	945	--	112,000	--	<10.0
PZ12	06/21/11	1405	--	74,100	--	<10.0
PZ12	09/22/11	1520	--	88,100	--	<1.0
PZ12	01/12/12	1255	--	83,600	--	<200
PZ12	03/21/12	1505	--	300,000	--	6.7 J
PZ12	06/27/12	1025	--	352,000	--	<100
PZ12	11/01/12	1015	--	68,500	--	1.0
PZ12	05/30/13	1255	--	118,000	--	2.9
PZ12	08/28/13	1150	--	135,000	--	10.9
PZ12	12/19/13	1415	--	175,000	--	27
PZ12	01/07/15	925	--	90,900	--	2.40
PZ12	08/07/17	1535	6,460	--	<1.0	--
PZ13	07/27/05	1032	--	17,300	--	<2.0
PZ13	09/02/10	1029	18,400	--	<1.0	--
PZ13	11/02/10	1420	--	151	--	<1.0
PZ13	12/21/10	1020	--	79,000	--	<1.0
PZ13	03/22/11	900	--	68,200	--	<10.0
PZ13	06/21/11	1340	--	21,100	--	<10.0
PZ13	09/22/11	1430	--	<10.0	--	<1.0
PZ13	01/12/12	1325	--	2,140	--	<10.0
PZ13	03/21/12	1555	--	89,000	--	2.4 J
PZ13	06/27/12	940	--	210	--	<1.0
PZ13	11/01/12	1145	--	<50	--	<1.0
PZ13	05/30/13	1330	--	749,000	--	<1.0
PZ13	08/28/13	1235	--	70,400	--	<1.0
PZ13	12/19/13	1515	--	208,000	--	<10.0
PZ13	01/07/15	1010	--	65,900	--	<1.0
PZ13	08/07/17	1155	28,200	--	<1.0	--
PZ14	02/07/07	--	--	15	--	<0.2
PZ14	08/07/17	1545	<25.0	--	<1.0	--
PZ15	02/07/07	--	--	19	--	<0.2
PZ15	08/08/17	1635	<25.0	--	<1.0	--
AB1	07/07/03	1531	1,200	1,100	<4.4	<4.0
AB1	07/18/03	1525	--	610	--	--
AB1	08/13/03	1218	--	810	--	<4.0
AB1	01/28/04	1410	680	--	--	--
AB1	04/28/04	1843	--	1,200	--	--
AB1	07/29/04	1356	--	1,100	--	--
AB1	10/27/04	1210	--	660	--	--
AB1	01/27/05	1355	--	1,050	--	--
AB1	05/03/05	1408	--	1,330	--	--
AB1	07/25/05	1425	--	1,280	--	<2.0
AB1	10/27/05	1030	--	697	--	--
AB1	07/13/06	0730	--	630	--	0.3
AB1	07/13/06	1612	--	9,000	--	1.2
AB1	02/05/10	1045	--	980	--	0.3
AB1	09/01/10	1339	996	--	<1.0	--
AB1	11/03/10	1245	--	613	--	<1.0
AB1	12/21/10	1410	--	463	--	<1.0
AB1	03/22/11	1600	--	439	--	<10.0
AB1	06/21/11	1640	--	304	--	<10.0
AB1	09/22/11	1020	--	1090	--	<1.0
AB1	01/12/12	1350	--	923	--	<10.0
AB1	03/21/12	1035	--	950	--	<10.0
AB1	06/27/12	835	--	736	--	<1.0
AB1	10/31/12	1105	--	877	--	<1.0
AB1	05/30/13	1435	--	1,130	--	<1.0
AB1	08/27/13	1100	--	772	--	0.4 J
AB1	12/19/13	1045	--	1,380	--	<1.0
AB1	01/07/15	1410	--	447	--	<1.0
AB1	08/08/17	850	854	--	<1.0	--
AB2	07/07/03	1247	3,700	3,600	<4.0	<4.0
AB2	07/18/03	1325	--	3,200	--	--
AB2	08/12/03	1700	--	2,700	--	<4.0
AB2	01/28/04	1860	3,500	--	--	--
AB2	04/28/04	1030	--	1,200	--	--
AB2	07/29/04	1628	--	6,200	--	--
AB2	10/27/04	0955	--	4,800	--	--
AB2	01/27/05	1135	--	8,490	--	--
AB2	05/03/05	1732	--	10,600	--	--
AB2	07/26/05	0811	--	7,960	--	<2.0
AB2	10/26/05	1510	--	7,540	--	--
AB2	07/13/06	0702 (HT)	--	8,010	--	0.8
AB2	07/13/06	1542 (LT)	--	4,840	--	0.5
AB2	02/04/10	1330	--	5,840	--	0.4
AB2	09/02/10	1319	9,290	--	<1.0	--
AB2	11/02/10	1545	--	7,310	--	<1.0
AB2	12/20/10	1610	--	6,310	--	<1.0
AB2	03/22/11	1125	--	5,630	--	<10.0
AB2	06/21/11	935	--	4,210	--	<10.0
AB2	09/22/11	1155	--	14,300	--	<1.0
AB2	01/12/12	940	--	19,500	--	<10.0

Table 3
Summary of Groundwater Cadmium and Zinc Analytical Data
Chemtrade Performance Chemicals US LLC Site
Kalama, WA
H&H Project No. CLR-045

Sample ID	Sample Date	Sample Time	Zinc		Cadmium	
			Total	Dissolved	Total	Dissolved
µg/L						
AB2	03/21/12	1255	--	20,000	--	1.5 J
AB2	06/26/12	1230	--	33,300	--	<1.0
AB2	10/31/12	1255	--	9,600	--	<1.0
AB2	05/30/13	1005	--	15,300	--	1.1
AB2	08/28/13	815	--	13,700	--	1.3
AB2	12/20/13	930	--	16,900	--	<10.0
AB2	01/06/15	1545	17,300	--	1.06	--
AB2	08/07/17	1000	59,800	--	4.69	--
OW1	09/23/10	1000	--	15,200	--	<1.0
OW1	11/02/10	1845	--	14,800	--	<1.0
OW1	12/20/10	1545	--	14,600	--	<1.0
OW1	03/22/10	1340	--	12,500	--	<10.0
OW1	06/21/11	1040	--	21,100	--	<10.0
OW1	09/22/11	1305	--	28,600	--	1.18
OW1	01/12/12	1100	--	44,500	--	<100
OW1	03/21/12	1420	--	46,000	--	2.8 J
OW1	06/26/12	1435	--	23,900	--	<100
OW1	10/31/12	1455	--	22,200	--	<1.0
OW1	05/30/13	1040	--	26,300	--	1.4
OW1	08/28/13	1020	--	68,100	--	<1.0
OW1	12/20/13	1130	--	106,000	--	<10.0
OW1	01/06/15	1610	146,000	--	<2.0	--
OW1	08/07/17	1105	41,800	--	<1.0	--
OW2	09/23/10	0920	--	11,700	--	<1.0
OW2	11/02/10	1645	--	9,790	--	<1.0
OW2	12/20/10	1355	--	7,750	--	<1.0
OW2	03/22/11	1055	--	19,900	--	<10.0
OW2	06/21/11	1015	--	28,600	--	<10.0
OW2	09/22/11	1235	--	31,100	--	1.62
OW2	01/12/12	1035	--	52,500	--	<100
OW2	03/21/12	1320	--	91,000	--	8.4 J
OW2	06/26/12	1400	--	91,400	--	<100
OW2	10/31/12	1540	--	71,800	--	<1.0
OW2	05/30/13	1055	--	76,200	--	2.4
OW2	08/28/13	935	--	77,100	--	0.2 J
OW2	12/20/13	1030	--	38,100	--	<10.0
OW2	01/06/15	1500	145,000	--	2.61	--
OW2	08/07/17	1105	141,000	--	8.13	--
OW3	09/23/10	0830	--	13,200	--	<1.0
OW3	11/02/10	1845	--	16,700	--	<1.0
OW3	12/21/10	1110	--	22,400	--	<1.0
OW3	03/22/11	1150	--	35,100	--	<10.0
OW3	06/21/11	1120	--	22,400	--	<10.0
OW3	09/22/11	1330	--	41,600	--	1.72
OW3	01/12/12	1140	--	8,100	--	<10
OW3	03/21/12	1400	--	11,000	--	<10.0
OW3	06/26/12	1335	--	47,700	--	<100
OW3	10/31/12	1415	--	10,800	--	3.5
OW3	05/30/13	1115	--	52,500	--	<1.0
OW3	08/28/13	1105	--	28,800	--	0.6 J
OW3	12/20/13	1230	--	23,600	--	<10.0
OW3	01/07/15	845	--	73,100	--	<1.0
OW3	08/07/17	1140	52,100	--	4.19	--

Notes:

µg/L = micrograms per liter; -- indicates not analyzed

"J" indicates result is less than laboratory reporting limit, but greater than or equal to the minimum detection limit and the concentration is approximate

Table 4
Summary of PushPoint Groundwater and Surface Water Field Parameter Data and
Estimated Columbia River Levels
Chemtrade Performance Chemicals US LLC Site
Kalama, WA
H&H Project No. CLR-045

Sample ID / Location	Sample Date	Sample Time (PDT/LST)	Conductivity (µs/cm)	DO (mg/L)	pH (s.u.)	ORP (mV)	PushPoint Groundwater Potentiometric Surface (ft ACRS)	High (CRD) ¹		Low (CRD) ¹	
								Time (LST)	Elevation (ft)	Time (LST)	Elevation (ft)
Surface Water at Upstream Location	07/22/15	10:50:00	129	8.7	6.91	301	--	7:30	2.90	14:45	0.02
PW-US	07/22/15	10:45:00	146	7.8	7.70	262	0.08				
Surface Water at Downstream Location	07/22/15	10:05:00	137	8.3	6.99	314	--	19:30	3.51	14:30	-0.05
PW-DS	07/22/15	10:00:00	134	6.4	7.42	293	0.08				
Surface Water at AB1 Sample Group	07/21/15	11:20:00	126	9.1	8.13	228	--	5:36	4.19	14:00	0.01
PW AB1-A	07/21/15	10:25:00	132	4.2	6.35	320	0.25				
PW AB1-B	07/21/15	11:15:00	118	3.4	5.96	332	0.30	6:04	3.87	14:30	0.24
PW AB1-C	07/21/15	12:00:00	133	6.1	6.50	336	0.33				
Surface Water at AB2 Sample Group	07/21/15	15:10:00	124	8.3	6.88	306	--	6:39	4.07	15:00	0.24
PW AB2-A	07/21/15	14:25:00	128	2.4	6.95	304	0.58				
PW AB2-B	07/21/15	15:05:00	121	2.9	6.91	304	0.50	6:04	3.87	14:30	0.24
PW AB2-C	07/21/15	15:35:00	120	2.8	6.92	321	0.50				
PP-1	08/09/17	13:10:00	138	2.0	6.24	91	0.25	6:39	4.07	15:00	0.24
Surface Water at PP-1			143	3.0	7.49	62					
PP-2	08/09/17	13:15:00	109	2.9	6.62	93	0.50	6:04	3.87	14:30	0.24
Surface Water at PP-2			140	3.9	7.86	67					
PP-3	08/09/17	13:30:00	122	3.6	6.77	90	0.50	6:39	4.07	15:00	0.24
Surface Water at PP-3			140	4.9	8.09	61					
PP-4	08/09/17	13:40:00	127	3.4	6.68	157	0.75	6:04	3.87	14:30	0.24
Surface Water at PP-4			155	4.5	7.42	115					
PP-5	08/09/17	13:55:00	138	2.3	6.54	119	1.0	6:39	4.07	15:00	0.24
Surface Water at PP-5			148	5.0	7.45	102					
PP-6	08/09/17	14:10:00	184	1.5	6.35	130	1.0	6:04	3.87	14:30	0.24
Surface Water at PP-6			164	3.3	7.51	120					
PP-7	08/09/17	14:20:00	234	0.7	6.37	118	0.75	6:39	4.07	15:00	0.24
Surface Water at PP-7			165	3.5	7.95	93					
PP-8	08/09/17	14:40:00	206	2.2	6.71	104	0.50	6:04	3.87	14:30	0.24
Surface Water at PP-8			167	3.1	7.62	100					
PP-9	08/09/17	15:00:00	258	2.2	6.47	128	0.50	6:39	4.07	15:00	0.24
Surface Water at PP-9			166	3.9	7.48	123					
PP-10	08/09/17	15:10:00	122	1.1	6.95	74	0.25	6:04	3.87	14:30	0.24
Surface Water at PP-10			167	3.6	7.93	70					
PP-11	08/10/17	13:15:00	125	4.3	6.18	119	0.25	6:39	4.07	15:00	0.24
Surface Water at PP-11			133	10.1	6.59	148					
PP-12	08/10/17	13:30:00	140	4.2	6.88	82	0.25	6:04	3.87	14:30	0.24
Surface Water at PP-12			132	9.4	7.72	76					
PP-13	08/10/17	13:45:00	124	3.2	6.91	72	0.50	6:39	4.07	15:00	0.24
Surface Water at PP-13			133	7.2	7.82	71					
PP-14	08/10/17	14:00:00	149	1.3	7.13	62	0.50	6:04	3.87	14:30	0.24
Surface Water at PP-14			133	5.6	7.82	73					
PP-15	08/11/17	13:30:00	134	3.2	7.05	109	0.25	6:39	4.07	15:00	0.24
Surface Water at PP-15			137	9.4	7.61	99					
PP-16	08/10/17	14:20:00	207	1.3	6.61	92	0.75	6:04	3.87	14:30	0.24
Surface Water at PP-16			134	7.0	7.68	96					
PP-17	08/10/17	14:30:00	157	2.6	6.66	105	1.0	6:39	4.07	15:00	0.24
Surface Water at PP-17			133	5.3	7.60	99					
PP-18	08/10/17	14:45:00	191	1.1	6.70	106	0.75	6:04	3.87	14:30	0.24
Surface Water at PP-18			133	5.3	7.51	113					
PP-19	08/10/17	15:15:00	153	1.3	6.71	109	0.50	6:39	4.07	15:00	0.24
Surface Water at PP-19			133	6.2	7.44	124					
PP-20	08/11/17	13:40:00	182	1.7	6.69	101	0.25	6:39	4.07	15:00	0.24
Surface Water at PP-20			150	7.9	7.65	98					
PP-21	08/11/17	13:50:00	179	1.9	6.81	110	0.25	6:39	4.07	15:00	0.24
Surface Water at PP-21			131	7.5	7.63	102					
PP-22	08/11/17	14:00:00	158	2.4	6.75	104	0.25	6:04	3.87	14:30	0.24
Surface Water at PP-22			143	6.4	7.67	99					
PP-US	08/10/17	16:00:00	130	4.7	7.04	118	0.10	6:04	3.87	14:30	0.24
Surface Water at PP-US			140	5.1	7.59	145					
PP-DS	08/11/17	14:45:00	135	4.9	7.21	111	0.25	6:39	4.07	15:00	0.24
Surface Water at PP-DS			137	5.4	7.65	132					

Notes:

PDT = Pacific Daylight Time; LST = local standard time

µs/cm - microsiemens per centimeter; DO = dissolved oxygen; mg/L = milligrams per liter;

ORP - oxidation reduction potential, mV - millivolts

ft ACRS = approximate feet above Columbia River surface

CRD = Columbia River Datum

1) High/Low CRD elevations and times are estimated for the site location using verified Longview and St. Helens station data from NOAA website.

The site is approximately half way between the two stations; therefore, tides for the site were calculated using the difference between the times and water level data at these two stations. The elevations are based on MLLW.

Table 5
Summary of PushPoint Groundwater and Surface Water Cadmium and Zinc Analytical Data
Chemtrade Performance Chemicals US LLC Site
Kalama, WA
H&H Project No. CLR-045

Sample ID	Sample Date	Sample Time (PDT/LST)	Dissolved Cadmium (µg/L)	Dissolved Zinc (µg/L)
PW AB1-A	07/21/15	10:25	<1.0	<50.0
PW AB1-B	07/21/15	11:15	<1.0	<50.0
PW AB1-C	07/21/15	12:00	<1.0	<50.0
PW AB2-A	07/21/15	14:25	<1.0	<50.0
PW AB2-B	07/21/15	15:05	<1.0	<50.0
PW AB2-C	07/21/15	15:35	<1.0	<50.0
PW-US (Background)	07/22/15	10:45	<1.0	<50.0
PW-DS	07/22/15	10:00	<1.0	<50.0
PP-1	08/09/17	13:10	<1.0	<52.0
PP-2	08/09/17	13:15	<1.0	<52.0
PP-3	08/09/17	13:30	<1.0	<52.0
PP-4	08/09/17	13:40	<1.0	<52.0
PP-5	08/09/17	13:55	<1.0	<52.0
PP-6	08/09/17	14:10	<1.0	<52.0
PP-7	08/09/17	14:20	<1.0	<52.0
PP-8	08/09/17	14:40	<1.0	362
PP-9	08/09/17	15:00	<0.1	22.4 J
PP-10	08/09/17	15:10	<1.0	53.4 J
PP-11	08/10/17	13:15	<1.0	<52.0
PP-12	08/10/17	13:30	<1.0	<52.0
PP-13	08/10/17	13:45	<1.0	<52.0
PP-14	08/10/17	14:00	<1.0	<52.0
PP-15	08/11/17	13:30	<1.0	<52.0
PP-16	08/10/17	14:20	<1.0	<52.0
PP-17	08/10/17	14:30	<1.0	<52.0
PP-18	08/10/17	14:45	<1.0	<52.0
PP-19	08/10/17	15:15	<1.0	<52.0
PP-20	08/11/17	13:40	<1.0	58.8 J
PP-21	08/11/17	13:50	<1.0	<52.0
PP-22	08/11/17	14:00	<1.0	<52.0
PP-US (Background)	08/10/17	16:00	<1.0	<52.0
PP-DS	08/11/17	14:45	<1.0	<52.0
SW-1	08/11/17	14:35	<1.0	<52.0
SW-2	08/11/17	14:40	<1.0	<52.0
SW-3	08/11/17	14:45	<1.0	<52.0
Groundwater Cleanup Level*			0.7	66

Notes:

µg/L = micrograms per liter

PDT = Pacific Daylight Time; LST = local standard time

Samples were field-filtered and analyzed by EPA Method 6010/6020 for dissolved cadmium and zinc only

*Potable groundwater cleanup level established for protection of surface water beneficial uses (Chronic freshwater aquatic life protection value established in accordance with WAC 173-201A-240)

Bold concentration exceeds the groundwater cleanup level

"J" indicates result is less than laboratory reporting limit, but greater than or equal to the minimum detection limit and the concentration is approximate

Table 6
Summary of Sediment Analytical Data
Chemtrade Performance Chemicals US LLC Site
Kalama, WA
H&H Project No. CLR-045

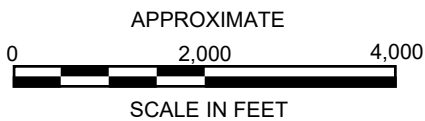
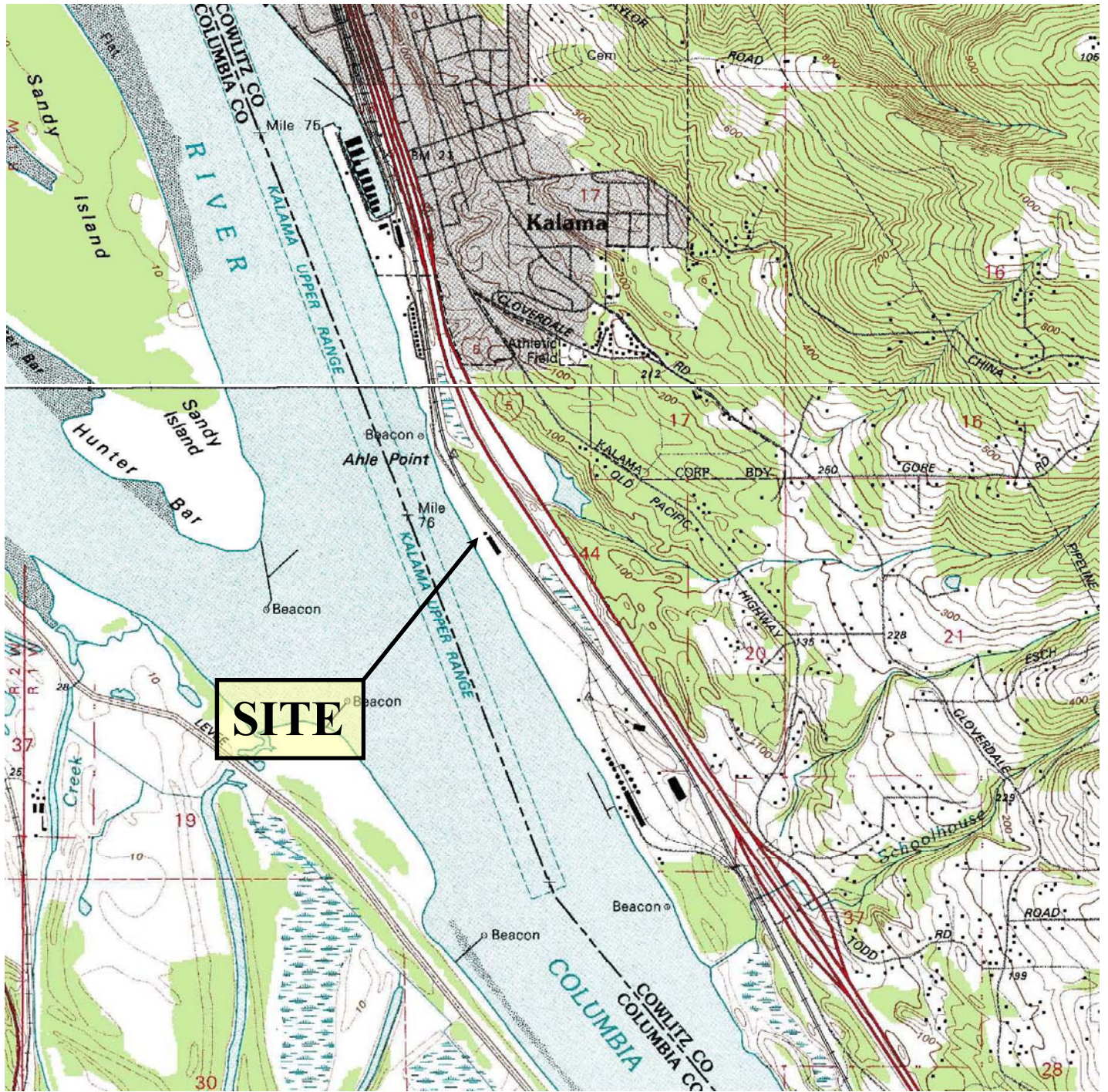
Sample ID	Sample Date	Cadmium (mg/kg)	Zinc (mg/kg)
SED AB1-A	07/21/15	<1.24	47.9
SED AB1-B	07/21/15	<1.29	44.5
SED AB1-C	07/21/15	<1.25	61.9
SED AB2-A	07/21/15	<1.27	55.1
SED AB2-B	07/21/15	<1.22	35.1
SED AB2-C	07/21/15	<1.08	51.7
SED-US (Background)	07/22/15	<1.20	31.1
SED-DS	07/22/15	<1.28	27.4
SD-1	08/11/17	<0.545	16.9
SD-2	08/11/17	<0.773	34.1
SD-3	08/11/17	<0.766	32.8
SD-4	08/11/17	<0.745	26.8
SD-5	08/11/17	<0.669	26.8
SD-6	08/11/17	<0.759	42.4
SD-7	08/11/17	<0.651	17.6
SD-8	08/11/17	<0.624	18.0
SD-9	08/11/17	<0.608	16.2
SD-10	08/11/17	<0.751	26.9
SD-US (Background)	08/11/17	<1.26	250
SD-DS	08/11/17	<0.529	17.8
Sediment Standard*		2.1	3,200

Notes:

mg/kg = milligrams per kilogram

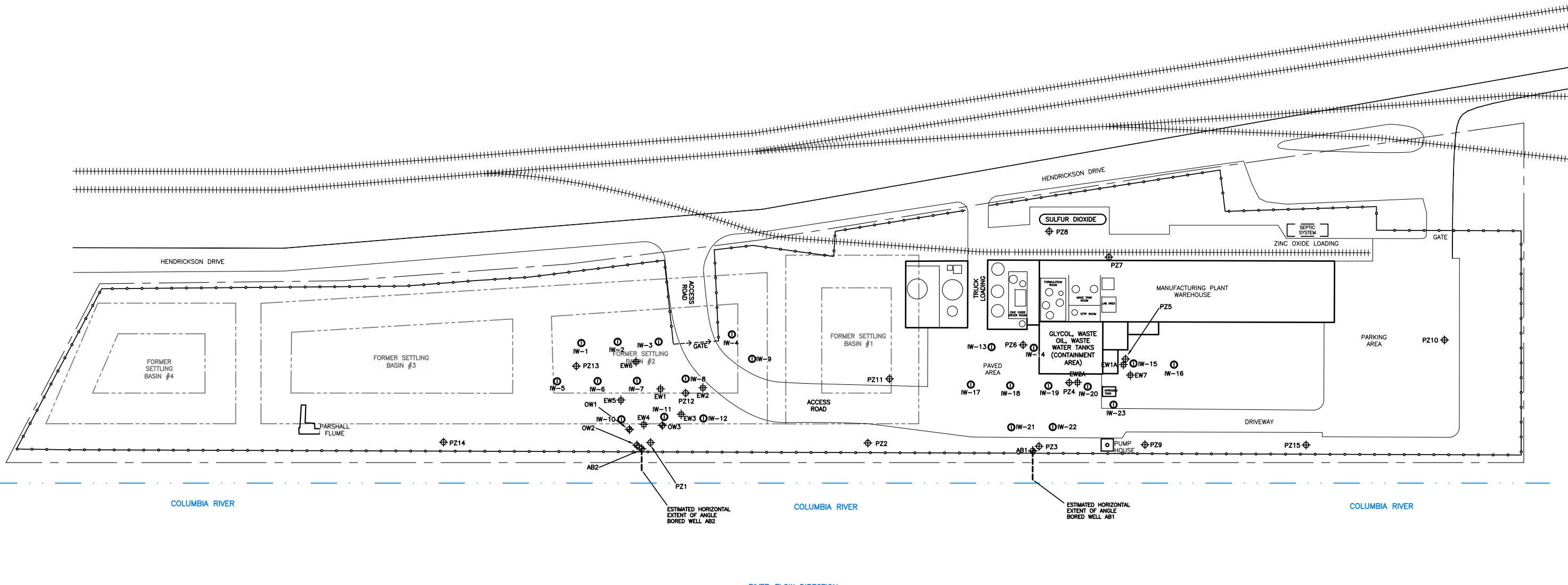
Samples were analyzed by EPA Method 6010/6020 for cadmium and zinc only

*Freshwater Sediment Cleanup Objectives from Table VI of Washington Administrative Code (WAC) 173-204-563 Sediment Management Standards.



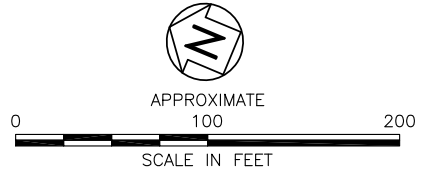
U.S.G.S. QUADRANGLE MAP
DEER ISLAND & KALAMA, WA 7.5 MIN.
TOPOGRAPHIC QUADRANGLES
 QUADRANGLE
 7.5 MINUTE SERIES (TOPOGRAPHIC)

TITLE		SITE LOCATION MAP	
PROJECT		CHEMTRADE PERFORMANCE CHEMICALS SITE FACILITY/SITE ID No. 24634187 KALAMA, WASHINGTON	
		2923 South Tryon Street – Suite 100 Charlotte, North Carolina 28203 704-586-0007 (p) 704-586-0373 (f)	
DATE: 05/12/17		REVISION NO. 0	
JOB NO: CLR-045		FIGURE NO. 1	

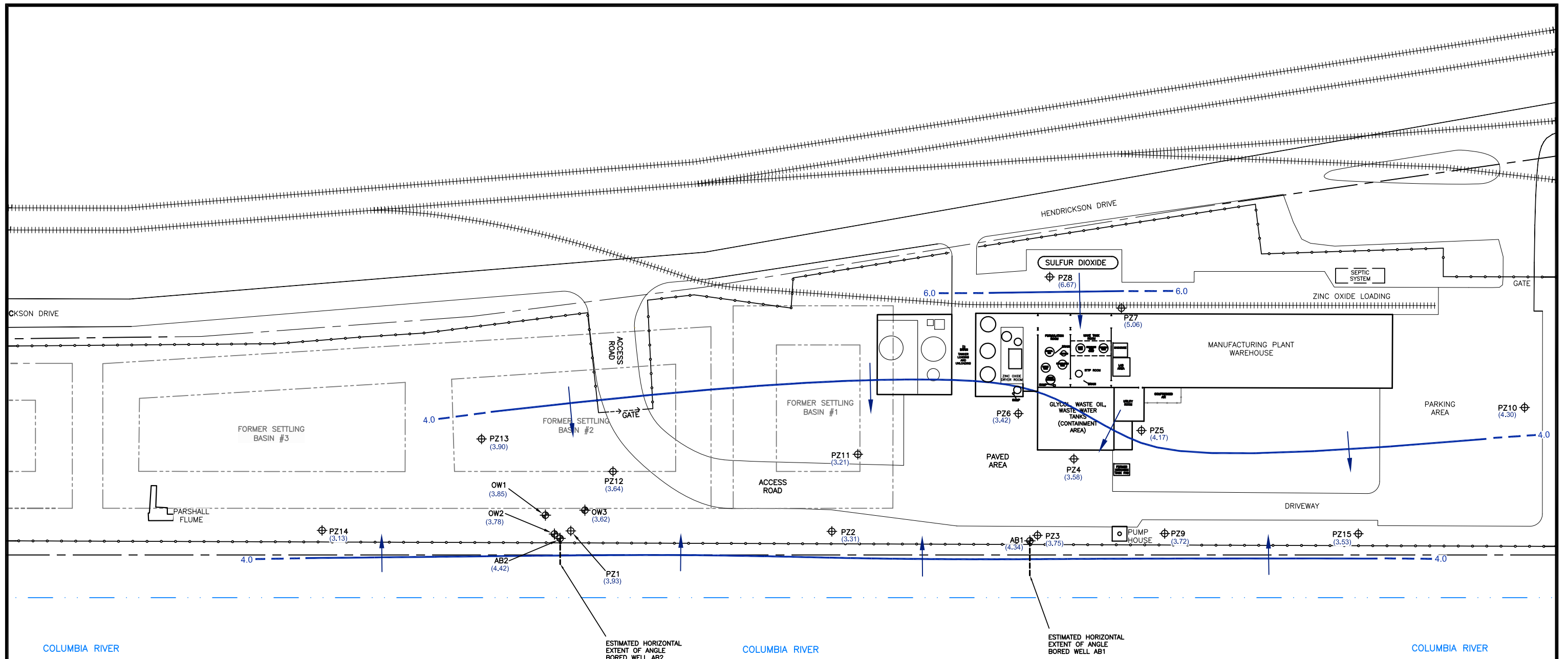


- LEGEND:**
- — — — — PROPERTY LINE
 - ○ — ○ — FENCE LINE
 - + + + + + RAILROAD TRACK
 - · · · — APPROXIMATE EAST EDGE OF COLUMBIA RIVER
 - - - - - EXTENT OF FORMER SETTLING BASIN
 - ⊕ MONITORING/OBSERVATION WELL
 - ⊕ PIEZOMETER
 - ⊙ INJECTION WELL
 - ⊕ RECOVERY WELL

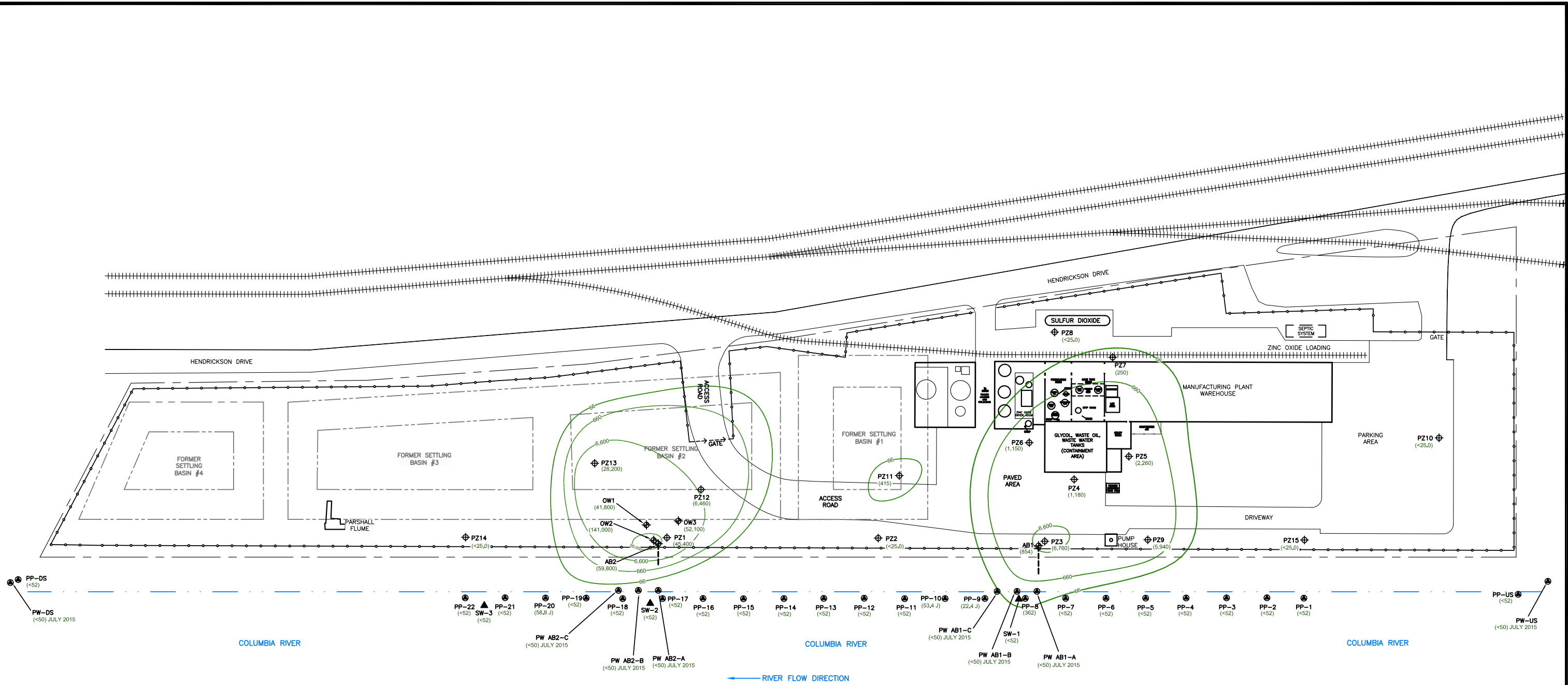
← RIVER FLOW DIRECTION



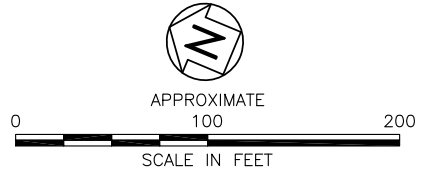
TITLE SITE MAP	
PROJECT CHEMTRADE PERFORMANCE CHEMICALS SITE FACILITY/SITE No. 24634187 KALAMA, WA	
 2923 South Tryon Street-Suite 100 Charlotte, North Carolina 28203 704-586-0007 (p) 704-586-0373 (f) License # C-1269 / #C-245 Geology	
DATE: 10-03-17	REVISION NO. 0
JOB NO. CLR-045	FIGURE NO. 2



TITLE GROUNDWATER ELEVATION CONTOUR MAP (AUGUST 2017)	
PROJECT CHEMTRADE PERFORMANCE CHEMICALS SITE FACILITY/SITE No. 24634187 KALAMA, WA	
 2923 South Tryon Street-Suite 100 Charlotte, North Carolina 28203 704-586-0007 (p) 704-586-0373 (f) License # C-1269 / #C-245 Geology	
DATE: 10-03-17	REVISION NO. 0
JOB NO. CLR-045	FIGURE NO. 3



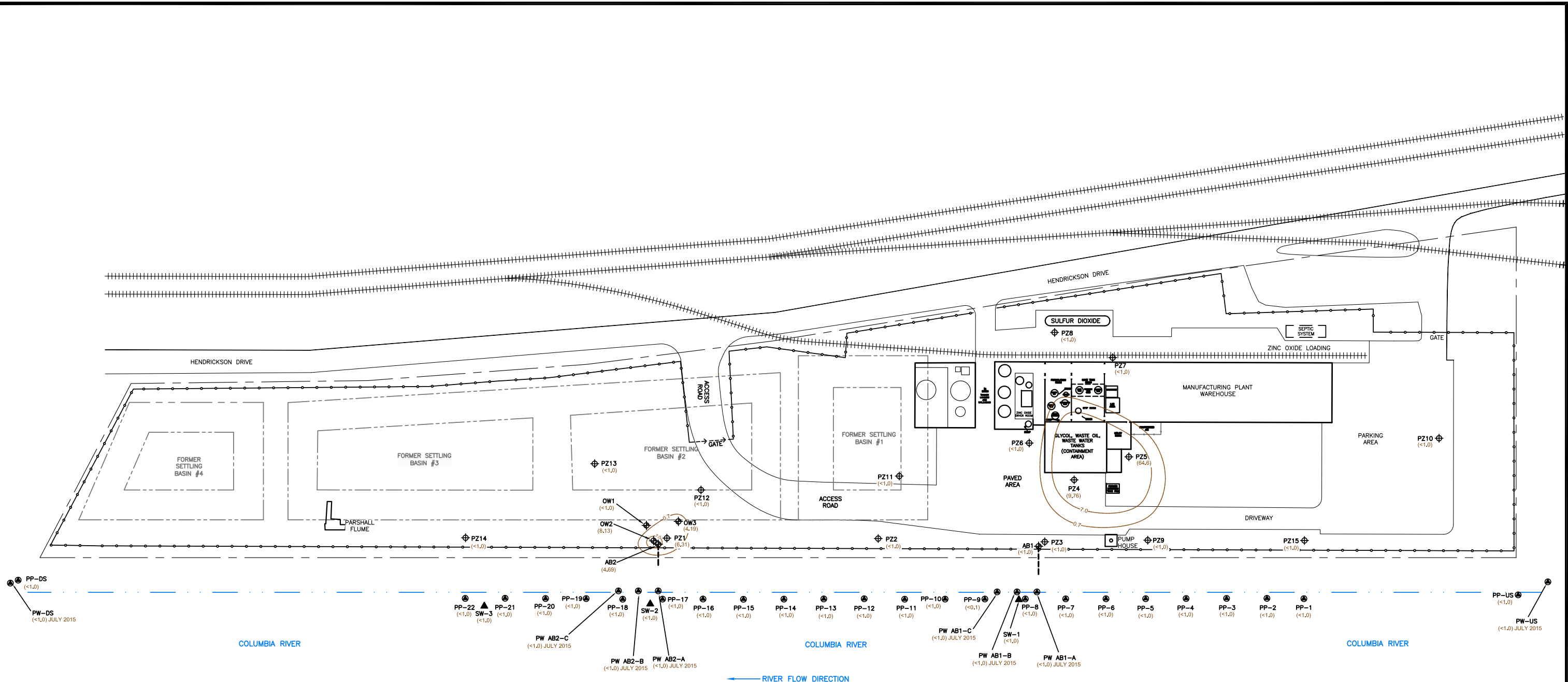
- LEGEND:**
- — — — — PROPERTY LINE
 - ○ — ○ — FENCE LINE
 - + + + + + RAILROAD TRACK
 - · · · — APPROXIMATE EAST EDGE OF COLUMBIA RIVER
 - - - - - EXTENT OF FORMER SETTLING BASIN
 - ⊕ MONITORING/OBSERVATION WELL
 - ⊕ PIEZOMETER
 - PUSHPOINT SAMPLE LOCATION
 - ▲ SURFACE WATER SAMPLE LOCATION
 - (6,460) ZINC CONCENTRATION IN µg/L
 - 660 — INFERRED ZINC ISOCONCENTRATION CONTOUR IN µg/L



NOTES

1. µg/L = MICROGRAMS PER LITER
2. THE BOTTOM OF ANGLE WELLS AB1 AND AB2 ARE LOCATED APPROXIMATELY 30 AND 20 FEET (RESPECTIVELY) SOUTHWEST OF THE WELL LOCATION DEPICTED ON THE MAP. THE DASHED LINES EXTENDING TOWARD THE COLUMBIA RIVER FROM THOSE WELLS INDICATES THE ESTIMATED LATERAL EXTENT OF EACH WELL IN THAT DIRECTION.
3. DATA IS FROM AUGUST 2017 UNLESS OTHERWISE INDICATED

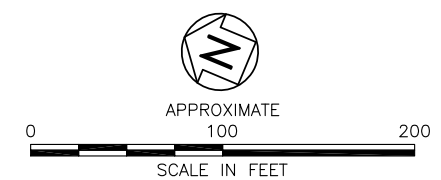
TITLE ZINC ISOCONCENTRATION MAP (AUGUST 2017)	
PROJECT CHEMTRADE PERFORMANCE CHEMICALS SITE FACILITY/SITE No. 24634187 KALAMA, WA	
 2923 South Tryon Street-Suite 100 Charlotte, North Carolina 28203 704-586-0007(p) 704-586-0373(f) License # C-1269 / #C-245 Geology	
DATE: 10-03-17	REVISION NO. 0
JOB NO. CLR-045	FIGURE NO. 4A



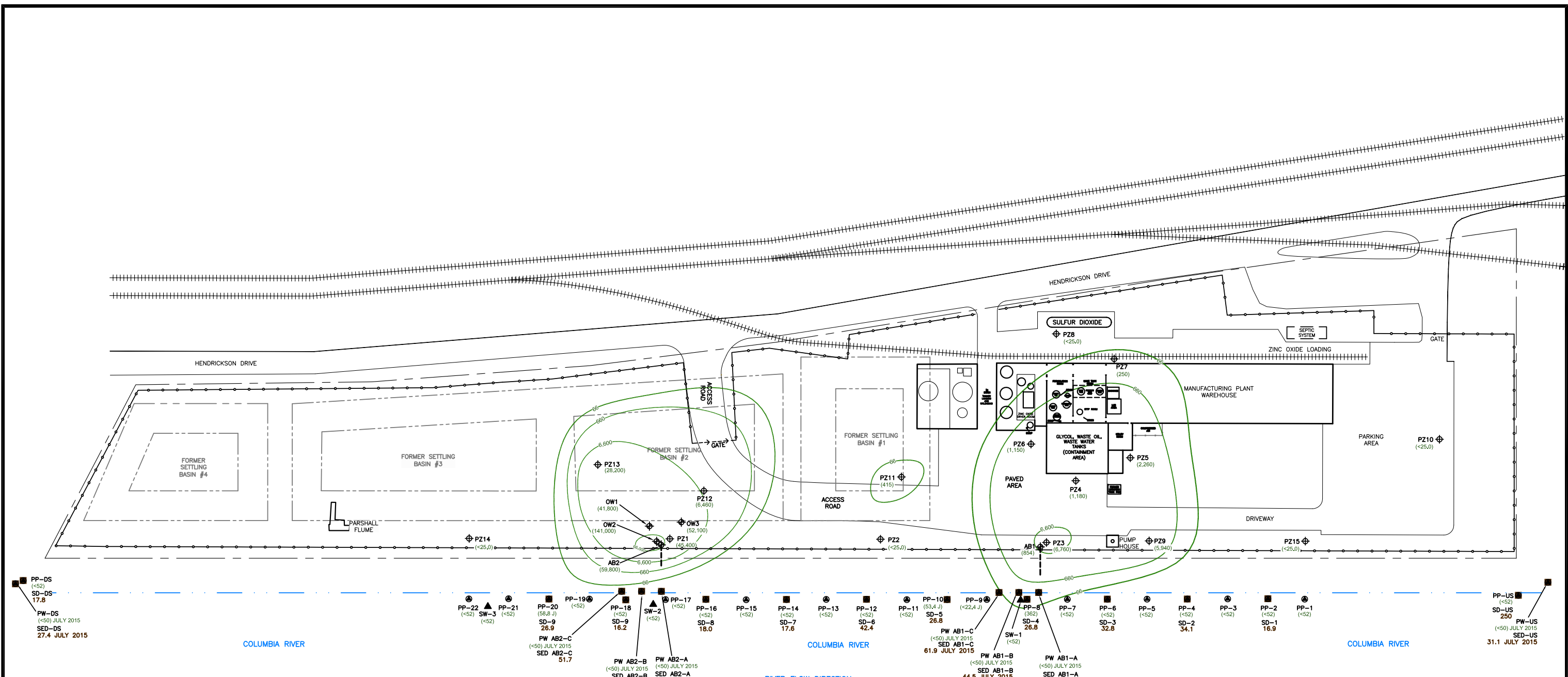
- LEGEND:**
- — — — — PROPERTY LINE
 - ○ — ○ — FENCE LINE
 - + + + + + RAILROAD TRACK
 - · · · — APPROXIMATE EAST EDGE OF COLUMBIA RIVER
 - - - - - EXTENT OF FORMER SETTLING BASIN
 - ⊕ MONITORING/OBSERVATION WELL
 - ⊕ PIEZOMETER
 - PUSHPOINT SAMPLE LOCATION
 - ▲ SURFACE WATER SAMPLE LOCATION
 - (4.19) CADMIUM CONCENTRATION IN µg/L
 - 0.7 — INFERRED CADMIUM ISOCONCENTRATION CONTOUR IN µg/L

NOTES

1. µg/L = MICROGRAMS PER LITER
2. THE BOTTOM OF ANGLE WELLS AB1 AND AB2 ARE LOCATED APPROXIMATELY 30 AND 20 FEET (RESPECTIVELY) SOUTHWEST OF THE WELL LOCATION DEPICTED ON THE MAP. THE DASHED LINES EXTENDING TOWARD THE COLUMBIA RIVER FROM THOSE WELLS INDICATES THE ESTIMATED LATERAL EXTENT OF EACH WELL IN THAT DIRECTION.
3. DATA IS FROM AUGUST 2017 UNLESS OTHERWISE INDICATED



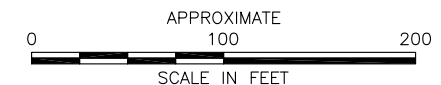
TITLE CADMIUM ISOCONCENTRATION MAP (AUGUST 2017)	
PROJECT CHEMTRADE PERFORMANCE CHEMICALS SITE FACILITY/SITE No. 24634187 KALAMA, WA	
 2923 South Tryon Street-Suite 100 Charlotte, North Carolina 28203 704-586-0007(p) 704-586-0373(f) License # C-1269 / #C-245 Geology	
DATE: 10-03-17	REVISION NO. 0
JOB NO. CLR-045	FIGURE NO. 4B




LEGEND:

- — — — — PROPERTY LINE
- ○ — ○ — FENCE LINE
- +++++ RAILROAD TRACK
- · — · — · — APPROXIMATE EAST EDGE OF COLUMBIA RIVER
- - - - - EXTENT OF FORMER SETTLING BASIN
- ⊕ MONITORING/OBSERVATION WELL
- ⊕ PIEZOMETER
- PUSHPOINT SAMPLE LOCATION
- ▲ SURFACE WATER SAMPLE LOCATION
- (447) ZINC CONCENTRATION (µg/L)
- 1,000 — ZINC ISOCONCENTRATION CONTOUR IN µg/L
- SEDIMENT SAMPLE LOCATION
- 27.4 SEDIMENT SAMPLE ZINC CONCENTRATION (mg/kg)

← RIVER FLOW DIRECTION



NOTES
 1. µg/L = MICROGRAMS PER LITER; mg/kg = MILLIGRAMS PER KILOGRAM
 2. THE BOTTOM OF ANGLE WELLS AB1 AND AB2 ARE LOCATED APPROXIMATELY 30 AND 20 FEET (RESPECTIVELY) SOUTHWEST OF THE WELL LOCATION DEPICTED ON THE MAP. THE DASHED LINES EXTENDING TOWARD THE COLUMBIA RIVER FROM THOSE WELLS INDICATES THE ESTIMATED LATERAL EXTENT OF EACH WELL IN THAT DIRECTION.
 3. DATA IS FROM AUGUST 2017 UNLESS OTHERWISE INDICATED

TITLE SEDIMENT SAMPLE ZINC CONCENTRATION AND GROUND WATER ZINC ISOCONCENTRATION OVERLAY MAP	
PROJECT CHEMTRADE PERFORMANCE CHEMICALS SITE FACILITY/SITE No. 24634187 KALAMA, WA	
 2923 South Tryon Street-Suite 100 Charlotte, North Carolina 28203 704-586-0007(p) 704-586-0373(f) License # C-1269 / #C-245 Geology	
DATE: 10-03-17	REVISION NO. 0
JOB NO. CLR-045	FIGURE NO. 5

Appendix A
Laboratory Analytical Reports

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-134616-1
TestAmerica Sample Delivery Group: CLR.045
Client Project/Site: Clariant Kalama
Revision: 1

For:
Hart & Hickman, PC
2923 S Tryon Street
Suite 100
Charlotte, North Carolina 28203

Attn: Mr. Scott Drury

Roxanne Cisneros

Authorized for release by:
9/29/2017 6:06:25 PM
Roxanne Cisneros, Senior Project Manager
(615)301-5761
roxanne.cisneros@testamericainc.com

Designee for
Ken Hayes, Project Manager II
(615)301-5035
ken.hayes@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

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Certification Summary	35
Chain of Custody	36
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Sample Summary

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-134616-1	PZ1	Water	08/07/17 10:15	08/12/17 10:15
490-134616-2	PZ2	Water	08/07/17 16:25	08/12/17 10:15
490-134616-3	PZ3	Water	08/08/17 08:45	08/12/17 10:15
490-134616-4	PZ4	Water	08/07/17 17:15	08/12/17 10:15
490-134616-5	PZ5	Water	08/08/17 09:35	08/12/17 10:15
490-134616-6	PZ6	Water	08/07/17 17:15	08/12/17 10:15
490-134616-7	PZ7	Water	08/08/17 15:45	08/12/17 10:15
490-134616-8	PZ8	Water	08/09/17 09:45	08/12/17 10:15
490-134616-9	PZ9	Water	08/08/17 09:25	08/12/17 10:15
490-134616-10	PZ10	Water	08/08/17 10:10	08/12/17 10:15
490-134616-11	PZ11	Water	08/07/17 16:30	08/12/17 10:15
490-134616-12	PZ12	Water	08/07/17 15:35	08/12/17 10:15
490-134616-13	PZ13	Water	08/07/17 11:55	08/12/17 10:15
490-134616-14	PZ14	Water	08/07/17 15:45	08/12/17 10:15
490-134616-15	PZ15	Water	08/08/17 16:35	08/12/17 10:15
490-134616-16	AB1	Water	08/08/17 08:50	08/12/17 10:15
490-134616-17	AB2	Water	08/07/17 10:00	08/12/17 10:15
490-134616-18	OW1	Water	08/07/17 11:05	08/12/17 10:15
490-134616-19	OW2	Water	08/07/17 11:05	08/12/17 10:15
490-134616-20	OW3	Water	08/07/17 11:40	08/12/17 10:15

Case Narrative

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Job ID: 490-134616-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-134616-1

Comments

Revised Report 9/29/2017 to report corrected dilution factors for 6020A metals analysis.

Receipt

The samples were received on 8/12/2017 10:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.2° C.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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Definitions/Glossary

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ1
Date Collected: 08/07/17 10:15
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-1
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.00631		0.00100		mg/L		09/27/17 07:32	09/27/17 15:40	1
Zinc	45.4		1.25		mg/L		09/27/17 07:32	09/29/17 13:10	50

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ2
Date Collected: 08/07/17 16:25
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-2
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 15:25	1
Zinc	ND		0.0250		mg/L		09/27/17 07:32	09/27/17 15:25	1

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Client Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
 SDG: CLR.045

Client Sample ID: PZ3

Date Collected: 08/08/17 08:45

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-3

Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 15:43	1
Zinc	6.76		0.125		mg/L		09/27/17 07:32	09/28/17 11:44	5

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- 10
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- 13

Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ4
Date Collected: 08/07/17 17:15
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-4
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.00976		0.00100		mg/L		09/27/17 07:32	09/27/17 15:46	1
Zinc	1.18		0.0250		mg/L		09/27/17 07:32	09/27/17 15:46	1

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ5

Date Collected: 08/08/17 09:35

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-5

Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.0646		0.00100		mg/L		09/27/17 07:32	09/27/17 15:55	1
Zinc	2.26		0.125		mg/L		09/27/17 07:32	09/28/17 11:47	5

Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ6
Date Collected: 08/07/17 17:15
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-6
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 15:58	1
Zinc	1.15		0.0250		mg/L		09/27/17 07:32	09/27/17 15:58	1

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ7
Date Collected: 08/08/17 15:45
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-7
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 16:01	1
Zinc	0.250		0.0250		mg/L		09/27/17 07:32	09/27/17 16:01	1

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ8
Date Collected: 08/09/17 09:45
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-8
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 16:04	1
Zinc	ND		0.0250		mg/L		09/27/17 07:32	09/27/17 16:04	1

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ9
Date Collected: 08/08/17 09:25
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-9
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 16:07	1
Zinc	5.94		0.125		mg/L		09/27/17 07:32	09/28/17 11:50	5

Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ10
Date Collected: 08/08/17 10:10
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-10
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 16:10	1
Zinc	ND		0.0250		mg/L		09/27/17 07:32	09/27/17 16:10	1

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ11
Date Collected: 08/07/17 16:30
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-11
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 16:13	1
Zinc	0.415		0.0250		mg/L		09/27/17 07:32	09/27/17 16:13	1

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Client Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
 SDG: CLR.045

Client Sample ID: PZ12
Date Collected: 08/07/17 15:35
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-12
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 16:16	1
Zinc	6.46		0.250		mg/L		09/27/17 07:32	09/28/17 11:53	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ13
Date Collected: 08/07/17 11:55
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-13
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 16:19	1
Zinc	28.2		2.50		mg/L		09/27/17 07:32	09/28/17 12:29	100

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ14
Date Collected: 08/07/17 15:45
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-14
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 16:22	1
Zinc	ND		0.0250		mg/L		09/27/17 07:32	09/27/17 16:22	1

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ15
Date Collected: 08/08/17 16:35
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-15
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 16:31	1
Zinc	ND		0.0250		mg/L		09/27/17 07:32	09/27/17 16:31	1

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: AB1

Date Collected: 08/08/17 08:50

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-16

Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 16:34	1
Zinc	0.854		0.0250		mg/L		09/27/17 07:32	09/27/17 16:34	1

Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: AB2
Date Collected: 08/07/17 10:00
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-17
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.00469		0.00100		mg/L		09/27/17 07:32	09/27/17 16:37	1
Zinc	59.8		25.0		mg/L		09/27/17 07:32	09/28/17 11:59	1000

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: OW1
Date Collected: 08/07/17 11:05
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-18
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 16:40	1
Zinc	41.8		25.0		mg/L		09/27/17 07:32	09/28/17 12:02	1000

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: OW2
Date Collected: 08/07/17 11:05
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-19
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.00813		0.00100		mg/L		09/27/17 07:32	09/27/17 16:43	1
Zinc	141		25.0		mg/L		09/27/17 07:32	09/28/17 12:05	1000

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: OW3
Date Collected: 08/07/17 11:40
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-20
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.00419		0.00100		mg/L		09/27/17 07:32	09/27/17 16:46	1
Zinc	52.1		25.0		mg/L		09/27/17 07:32	09/28/17 12:08	1000

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QC Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
 SDG: CLR.045

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 490-463273/1-A
Matrix: Water
Analysis Batch: 463664

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 463273

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		09/27/17 07:32	09/27/17 15:19	1
Zinc	ND		0.0250		mg/L		09/27/17 07:32	09/27/17 15:19	1

Lab Sample ID: LCS 490-463273/2-A
Matrix: Water
Analysis Batch: 463664

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 463273

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	0.100	0.09603		mg/L		96	80 - 120
Zinc	0.100	0.09655		mg/L		97	80 - 120

Lab Sample ID: 490-134616-2 MS
Matrix: Water
Analysis Batch: 463664

Client Sample ID: PZZ
Prep Type: Total/NA
Prep Batch: 463273

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	ND		0.100	0.09760		mg/L		98	75 - 125
Zinc	ND		0.100	0.1033		mg/L		95	75 - 125

Lab Sample ID: 490-134616-2 MSD
Matrix: Water
Analysis Batch: 463664

Client Sample ID: PZZ
Prep Type: Total/NA
Prep Batch: 463273

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Cadmium	ND		0.100	0.09886		mg/L		99	75 - 125	1	20
Zinc	ND		0.100	0.1051		mg/L		97	75 - 125	2	20

QC Association Summary

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
 SDG: CLR.045

Metals

Prep Batch: 463273

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134616-1	PZ1	Total/NA	Water	3010A	
490-134616-2	PZ2	Total/NA	Water	3010A	
490-134616-3	PZ3	Total/NA	Water	3010A	
490-134616-4	PZ4	Total/NA	Water	3010A	
490-134616-5	PZ5	Total/NA	Water	3010A	
490-134616-6	PZ6	Total/NA	Water	3010A	
490-134616-7	PZ7	Total/NA	Water	3010A	
490-134616-8	PZ8	Total/NA	Water	3010A	
490-134616-9	PZ9	Total/NA	Water	3010A	
490-134616-10	PZ10	Total/NA	Water	3010A	
490-134616-11	PZ11	Total/NA	Water	3010A	
490-134616-12	PZ12	Total/NA	Water	3010A	
490-134616-13	PZ13	Total/NA	Water	3010A	
490-134616-14	PZ14	Total/NA	Water	3010A	
490-134616-15	PZ15	Total/NA	Water	3010A	
490-134616-16	AB1	Total/NA	Water	3010A	
490-134616-17	AB2	Total/NA	Water	3010A	
490-134616-18	OW1	Total/NA	Water	3010A	
490-134616-19	OW2	Total/NA	Water	3010A	
490-134616-20	OW3	Total/NA	Water	3010A	
MB 490-463273/1-A	Method Blank	Total/NA	Water	3010A	
LCS 490-463273/2-A	Lab Control Sample	Total/NA	Water	3010A	
490-134616-2 MS	PZ2	Total/NA	Water	3010A	
490-134616-2 MSD	PZ2	Total/NA	Water	3010A	

Analysis Batch: 463664

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134616-1	PZ1	Total/NA	Water	6020A	463273
490-134616-2	PZ2	Total/NA	Water	6020A	463273
490-134616-3	PZ3	Total/NA	Water	6020A	463273
490-134616-4	PZ4	Total/NA	Water	6020A	463273
490-134616-5	PZ5	Total/NA	Water	6020A	463273
490-134616-6	PZ6	Total/NA	Water	6020A	463273
490-134616-7	PZ7	Total/NA	Water	6020A	463273
490-134616-8	PZ8	Total/NA	Water	6020A	463273
490-134616-9	PZ9	Total/NA	Water	6020A	463273
490-134616-10	PZ10	Total/NA	Water	6020A	463273
490-134616-11	PZ11	Total/NA	Water	6020A	463273
490-134616-12	PZ12	Total/NA	Water	6020A	463273
490-134616-13	PZ13	Total/NA	Water	6020A	463273
490-134616-14	PZ14	Total/NA	Water	6020A	463273
490-134616-15	PZ15	Total/NA	Water	6020A	463273
490-134616-16	AB1	Total/NA	Water	6020A	463273
490-134616-17	AB2	Total/NA	Water	6020A	463273
490-134616-18	OW1	Total/NA	Water	6020A	463273
490-134616-19	OW2	Total/NA	Water	6020A	463273
490-134616-20	OW3	Total/NA	Water	6020A	463273
MB 490-463273/1-A	Method Blank	Total/NA	Water	6020A	463273
LCS 490-463273/2-A	Lab Control Sample	Total/NA	Water	6020A	463273
490-134616-2 MS	PZ2	Total/NA	Water	6020A	463273
490-134616-2 MSD	PZ2	Total/NA	Water	6020A	463273

TestAmerica Nashville

QC Association Summary

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Analysis Batch: 464030

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134616-3	PZ3	Total/NA	Water	6020A	463273
490-134616-5	PZ5	Total/NA	Water	6020A	463273
490-134616-9	PZ9	Total/NA	Water	6020A	463273
490-134616-12	PZ12	Total/NA	Water	6020A	463273
490-134616-13	PZ13	Total/NA	Water	6020A	463273
490-134616-17	AB2	Total/NA	Water	6020A	463273
490-134616-18	OW1	Total/NA	Water	6020A	463273
490-134616-19	OW2	Total/NA	Water	6020A	463273
490-134616-20	OW3	Total/NA	Water	6020A	463273

Analysis Batch: 464179

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134616-1	PZ1	Total/NA	Water	6020A	463273

Lab Chronicle

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ1

Date Collected: 08/07/17 10:15

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 15:40	BLG	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		50			464179	09/29/17 13:10	BLG	TAL NSH

Client Sample ID: PZ2

Date Collected: 08/07/17 16:25

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 15:25	BLG	TAL NSH

Client Sample ID: PZ3

Date Collected: 08/08/17 08:45

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 15:43	BLG	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		5			464030	09/28/17 11:44	BLG	TAL NSH

Client Sample ID: PZ4

Date Collected: 08/07/17 17:15

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 15:46	BLG	TAL NSH

Client Sample ID: PZ5

Date Collected: 08/08/17 09:35

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 15:55	BLG	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		5			464030	09/28/17 11:47	BLG	TAL NSH

TestAmerica Nashville

Lab Chronicle

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ6

Date Collected: 08/07/17 17:15

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 15:58	BLG	TAL NSH

Client Sample ID: PZ7

Date Collected: 08/08/17 15:45

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 16:01	BLG	TAL NSH

Client Sample ID: PZ8

Date Collected: 08/09/17 09:45

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 16:04	BLG	TAL NSH

Client Sample ID: PZ9

Date Collected: 08/08/17 09:25

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 16:07	BLG	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		5			464030	09/28/17 11:50	BLG	TAL NSH

Client Sample ID: PZ10

Date Collected: 08/08/17 10:10

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 16:10	BLG	TAL NSH

Client Sample ID: PZ11

Date Collected: 08/07/17 16:30

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH

TestAmerica Nashville

Lab Chronicle

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: PZ11

Lab Sample ID: 490-134616-11

Date Collected: 08/07/17 16:30

Matrix: Water

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6020A		1			463664	09/27/17 16:13	BLG	TAL NSH

Client Sample ID: PZ12

Lab Sample ID: 490-134616-12

Date Collected: 08/07/17 15:35

Matrix: Water

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 16:16	BLG	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		10			464030	09/28/17 11:53	BLG	TAL NSH

Client Sample ID: PZ13

Lab Sample ID: 490-134616-13

Date Collected: 08/07/17 11:55

Matrix: Water

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 16:19	BLG	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		100			464030	09/28/17 12:29	BLG	TAL NSH

Client Sample ID: PZ14

Lab Sample ID: 490-134616-14

Date Collected: 08/07/17 15:45

Matrix: Water

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 16:22	BLG	TAL NSH

Client Sample ID: PZ15

Lab Sample ID: 490-134616-15

Date Collected: 08/08/17 16:35

Matrix: Water

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 16:31	BLG	TAL NSH

Lab Chronicle

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Client Sample ID: AB1
Date Collected: 08/08/17 08:50
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-16
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 16:34	BLG	TAL NSH

Client Sample ID: AB2
Date Collected: 08/07/17 10:00
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-17
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 16:37	BLG	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1000			464030	09/28/17 11:59	BLG	TAL NSH

Client Sample ID: OW1
Date Collected: 08/07/17 11:05
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-18
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 16:40	BLG	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1000			464030	09/28/17 12:02	BLG	TAL NSH

Client Sample ID: OW2
Date Collected: 08/07/17 11:05
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-19
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 16:43	BLG	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1000			464030	09/28/17 12:05	BLG	TAL NSH

Client Sample ID: OW3
Date Collected: 08/07/17 11:40
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134616-20
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1			463664	09/27/17 16:46	BLG	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	463273	09/27/17 07:32	JLJ	TAL NSH
Total/NA	Analysis	6020A		1000			464030	09/28/17 12:08	BLG	TAL NSH

TestAmerica Nashville

Lab Chronicle

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

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Method Summary

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL NSH

Protocol References:

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

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

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Accreditation/Certification Summary

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-134616-1
SDG: CLR.045

Laboratory: TestAmerica Nashville

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

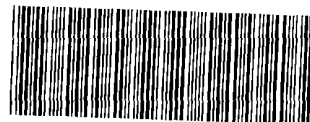
Authority	Program	EPA Region	Identification Number	Expiration Date
North Carolina (WW/SW)	State Program	4	387	12-31-17

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6020A	3010A	Water	Cadmium
6020A	3010A	Water	Zinc



COOLER RECEIPT FORM



490-134616 Chain of Custody

Cooler Received/Opened On 8/12/2017 @01015

Time Samples Removed From Cooler 12:49 Time Samples Placed In Storage 14:29 (2 Hour Window)

1. Tracking # 02417 (last 4 digits, FedEx) Courier: FEDEX
IR Gun ID 17960358 _____ pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 1.2 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: 1 from

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) WR

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial) JJ

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) JS

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) JS

I certify that I attached a label with the unique LIMS number to each container (initial) JS

21. Were there Non-Conformance issues at login? YES NO Was a NCM generated? YES...NO...# _____

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes No

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client: HART + HICKMAN Project Manager: Scott Dunn Date: _____
 Address: 2923 S. Tryon St. STE 100 Telephone Number (Area Code)/Fax Number: 919 414 0750 Lab Number: 282715
 City: Charlotte State: NC Zip Code: 28203 Carrier/Waybill Number: Felix 81139253466 Chain of Custody Number: 282715

Project Name and Location (State): CLAMMUS KILMER WA
 Contract/Purchase Order/Quote No.: CLR.045
 Matrix: _____ Containers & Preservatives: _____
 Analysis (Attach list if more space is needed): _____
 Page 1 of 2

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix			Containers & Preservatives						Analysis (Attach list if more space is needed)		Special Instructions/ Conditions of Receipt			
			Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Zinc (Total)		Cadmium (Total)		
1 PZ1	080717	1015	X														
2 PZ2	080717	1625	X														
3 PZ3	080817	0845	X														
4 PZ4	080717	1715	X														
5 PZ5	080817	0935	X														
6 PZ6	080717	1715	X														
7 PZ7	080817	1545	X														
8 PZ8	080917	0945	X														
9 PZ9	080817	0925	X														
10 PZ10	080817	1010	X														
11 PZ11	080717	1630	X														
PZ12	080717	1535	X														

490-134616

FL ONLY
 Cold or Cold
 Lower RL

Possible Hazard Identification: Non-Hazard Flammable Skin Irritant Poison B Unknown Return To Client Disposal By Lab Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: 24 Hours 48 Hours 7 Days 14 Days 21 Days Other: STD H+H

1. Relinquished By: See Date: _____ Time: _____
 2. Relinquished By: _____ Date: _____ Time: _____
 3. Relinquished By: _____ Date: _____ Time: _____

Comments: _____

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Login Sample Receipt Checklist

Client: Hart & Hickman, PC

Job Number: 490-134616-1

SDG Number: CLR.045

Login Number: 134616

List Number: 1

Creator: Vest, Laura E

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
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	
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 (excluding tests with immediate HTs)	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	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-134608-1
TestAmerica Sample Delivery Group: CLR.045
Client Project/Site: Clariant Kalama (WA)
Revision: 1

For:
Hart & Hickman, PC
2923 S Tryon Street
Suite 100
Charlotte, North Carolina 28203

Attn: Mr. Scott Drury

Roxanne Cisneros

Authorized for release by:
9/29/2017 5:13:35 PM
Roxanne Cisneros, Senior Project Manager
(615)301-5761
roxanne.cisneros@testamericainc.com

Designee for
Ken Hayes, Project Manager II
(615)301-5035
ken.hayes@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



LINKS

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results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

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Sample Summary

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-134608-1	PP-1	Water	08/09/17 13:10	08/12/17 10:15
490-134608-2	PP-2	Water	08/09/17 13:15	08/12/17 10:15
490-134608-3	PP-3	Water	08/09/17 13:30	08/12/17 10:15
490-134608-4	PP-4	Water	08/09/17 13:40	08/12/17 10:15
490-134608-5	PP-5	Water	08/09/17 13:55	08/12/17 10:15
490-134608-6	PP-6	Water	08/09/17 14:10	08/12/17 10:15
490-134608-7	PP-7	Water	08/09/17 14:20	08/12/17 10:15
490-134608-8	PP-8	Water	08/09/17 14:40	08/12/17 10:15
490-134608-9	PP-9	Water	08/09/17 15:00	08/12/17 10:15
490-134608-10	PP-10	Water	08/09/17 15:10	08/12/17 10:15
490-134608-11	PP-11	Water	08/10/17 13:15	08/12/17 10:15
490-134608-12	PP-12	Water	08/10/17 13:30	08/12/17 10:15
490-134608-13	PP-13	Water	08/10/17 13:45	08/12/17 10:15
490-134608-14	PP-14	Water	08/10/17 14:00	08/12/17 10:15
490-134608-15	PP-15	Water	08/10/17 13:30	08/12/17 10:15
490-134608-16	PP-16	Water	08/10/17 14:20	08/12/17 10:15
490-134608-17	PP-17	Water	08/10/17 14:30	08/12/17 10:15
490-134608-18	PP-18	Water	08/10/17 14:45	08/12/17 10:15
490-134608-19	PP-19	Water	08/10/17 15:15	08/12/17 10:15
490-134608-20	PP-20	Water	08/11/17 13:40	08/12/17 10:15
490-134608-21	PP-21	Water	08/11/17 13:50	08/12/17 10:15
490-134608-22	PP-22	Water	08/11/17 14:00	08/12/17 10:15
490-134608-23	PP-US	Water	08/10/17 16:00	08/12/17 10:15
490-134608-24	PP-DS	Water	08/11/17 14:25	08/12/17 10:15
490-134608-25	SW-1	Water	08/11/17 14:35	08/12/17 10:15
490-134608-26	SW-2	Water	08/11/17 14:40	08/12/17 10:15
490-134608-27	SW-3	Water	08/11/17 14:45	08/12/17 10:15
490-134608-29	SD-1	Solid	08/11/17 11:15	08/12/17 10:15
490-134608-30	SD-2	Solid	08/11/17 11:20	08/12/17 10:15
490-134608-31	SD-3	Solid	08/11/17 11:25	08/12/17 10:15
490-134608-32	SD-4	Solid	08/11/17 11:30	08/12/17 10:15
490-134608-33	SD-5	Solid	08/11/17 11:35	08/12/17 10:15
490-134608-34	SD-6	Solid	08/11/17 11:40	08/12/17 10:15
490-134608-35	SD-7	Solid	08/11/17 11:45	08/12/17 10:15
490-134608-36	SD-8	Solid	08/11/17 11:50	08/12/17 10:15
490-134608-37	SD-9	Solid	08/11/17 11:55	08/12/17 10:15
490-134608-38	SD-10	Solid	08/11/17 12:00	08/12/17 10:15
490-134608-39	SD-DS	Solid	08/11/17 14:25	08/12/17 10:15
490-134608-40	SD-US	Solid	08/11/17 16:00	08/12/17 10:15

Case Narrative

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Job ID: 490-134608-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-134608-1

Comments

Revised Report 9/29/2017 to report to the MDL per client request.

Receipt

The samples were received on 8/12/2017 10:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.4° C.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Field Service / Mobile Lab

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.



Definitions/Glossary

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-1
Date Collected: 08/09/17 13:10
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-1
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 00:57	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 00:57	10

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- 12
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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-2
Date Collected: 08/09/17 13:15
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-2
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 01:02	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 01:02	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-3
Date Collected: 08/09/17 13:30
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-3
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 01:08	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 01:08	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-4
Date Collected: 08/09/17 13:40
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-4
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 01:25	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 01:25	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-5
Date Collected: 08/09/17 13:55
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-5
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 01:30	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 01:30	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-6
Date Collected: 08/09/17 14:10
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-6
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 01:36	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 01:36	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-7
Date Collected: 08/09/17 14:20
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-7
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 01:42	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 01:42	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-8
Date Collected: 08/09/17 14:40
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-8
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 01:47	10
Zinc	0.362		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 01:47	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-9
Date Collected: 08/09/17 15:00
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-9
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100	0.000100	mg/L		08/16/17 13:39	08/28/17 22:29	1
Zinc	0.0224	J	0.0250	0.00520	mg/L		08/16/17 13:39	08/28/17 22:29	1

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-10
Date Collected: 08/09/17 15:10
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-10
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 00:29	10
Zinc	0.0534	J	0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 00:29	10

Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-11
Date Collected: 08/10/17 13:15
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-11
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 01:53	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 01:53	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-12
Date Collected: 08/10/17 13:30
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-12
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 01:58	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 01:58	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-13
Date Collected: 08/10/17 13:45
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-13
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 02:04	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 02:04	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-14
Date Collected: 08/10/17 14:00
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-14
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 02:10	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 02:10	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-15
Date Collected: 08/10/17 13:30
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-15
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 02:15	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 02:15	10

Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-16
Date Collected: 08/10/17 14:20
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-16
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 02:32	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 02:32	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-17
Date Collected: 08/10/17 14:30
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-17
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 02:38	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 02:38	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-18
Date Collected: 08/10/17 14:45
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-18
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 02:43	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 02:43	10

Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-19
Date Collected: 08/10/17 15:15
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-19
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:39	08/19/17 02:49	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:39	08/19/17 02:49	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-20
Date Collected: 08/11/17 13:40
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-20
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:46	08/19/17 04:07	10
Zinc	0.0588	J	0.250	0.0520	mg/L		08/16/17 13:46	08/19/17 04:07	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-21
Date Collected: 08/11/17 13:50
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-21
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:46	08/19/17 04:35	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:46	08/19/17 04:35	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-22
Date Collected: 08/11/17 14:00
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-22
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:46	08/19/17 04:40	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:46	08/19/17 04:40	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-US

Date Collected: 08/10/17 16:00

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-23

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:46	08/19/17 04:46	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:46	08/19/17 04:46	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-DS

Date Collected: 08/11/17 14:25

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-24

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:46	08/19/17 05:03	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:46	08/19/17 05:03	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: SW-1

Date Collected: 08/11/17 14:35

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-25

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:46	08/19/17 05:08	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:46	08/19/17 05:08	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: SW-2
Date Collected: 08/11/17 14:40
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-26
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:46	08/19/17 05:14	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:46	08/19/17 05:14	10

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Client Sample Results

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: SW-3
Date Collected: 08/11/17 14:45
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-27
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0100	0.00100	mg/L		08/16/17 13:46	08/19/17 05:19	10
Zinc	ND		0.250	0.0520	mg/L		08/16/17 13:46	08/19/17 05:19	10

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Client Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Client Sample ID: SD-1

Date Collected: 08/11/17 11:15

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-29

Matrix: Solid

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.36	0.545	mg/Kg	☼	08/15/17 13:54	08/19/17 05:53	5
Zinc	16.9		13.6	5.45	mg/Kg	☼	08/15/17 13:54	08/19/17 05:53	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	88.3		0.1	0.1	%	-		08/15/17 07:04	1

- 1
- 2
- 3
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- 13

Client Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Client Sample ID: SD-2
Date Collected: 08/11/17 11:20
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-30
Matrix: Solid

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.93	0.773	mg/Kg	☼	08/15/17 13:54	08/19/17 06:21	5
Zinc	34.1		19.3	7.73	mg/Kg	☼	08/15/17 13:54	08/19/17 06:21	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	61.6		0.1	0.1	%	-		08/15/17 07:04	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Client Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Client Sample ID: SD-3
Date Collected: 08/11/17 11:25
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-31
Matrix: Solid

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.92	0.766	mg/Kg	☼	08/15/17 13:54	08/19/17 06:26	5
Zinc	32.8		19.2	7.66	mg/Kg	☼	08/15/17 13:54	08/19/17 06:26	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	62.9		0.1	0.1	%			08/15/17 07:04	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Client Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Client Sample ID: SD-4

Date Collected: 08/11/17 11:30

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-32

Matrix: Solid

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.86	0.745	mg/Kg	☼	08/15/17 13:54	08/19/17 06:32	5
Zinc	26.8		18.6	7.45	mg/Kg	☼	08/15/17 13:54	08/19/17 06:32	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	65.9		0.1	0.1	%			08/15/17 07:04	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Client Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Client Sample ID: SD-5
Date Collected: 08/11/17 11:35
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-33
Matrix: Solid

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.67	0.669	mg/Kg	☼	08/15/17 13:54	08/19/17 06:48	5
Zinc	26.8		16.7	6.69	mg/Kg	☼	08/15/17 13:54	08/19/17 06:48	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	72.4		0.1	0.1	%	-		08/15/17 07:04	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Client Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Client Sample ID: SD-6
Date Collected: 08/11/17 11:40
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-34
Matrix: Solid

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.90	0.759	mg/Kg	☼	08/15/17 13:54	08/19/17 06:54	5
Zinc	42.4		19.0	7.59	mg/Kg	☼	08/15/17 13:54	08/19/17 06:54	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	63.5		0.1	0.1	%	—		08/15/17 07:04	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Client Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Client Sample ID: SD-7
Date Collected: 08/11/17 11:45
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-35
Matrix: Solid

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.63	0.651	mg/Kg	☒	08/15/17 13:54	08/19/17 07:00	5
Zinc	17.6		16.3	6.51	mg/Kg	☒	08/15/17 13:54	08/19/17 07:00	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	73.1		0.1	0.1	%	---		08/15/17 07:04	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Client Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Client Sample ID: SD-8

Date Collected: 08/11/17 11:50

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-36

Matrix: Solid

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.56	0.624	mg/Kg	☼	08/15/17 13:54	08/19/17 07:05	5
Zinc	18.0		15.6	6.24	mg/Kg	☼	08/15/17 13:54	08/19/17 07:05	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	77.1		0.1	0.1	%	-		08/15/17 07:04	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Client Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Client Sample ID: SD-9

Date Collected: 08/11/17 11:55

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-37

Matrix: Solid

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.52	0.608	mg/Kg	☼	08/15/17 13:54	08/19/17 07:11	5
Zinc	16.2		15.2	6.08	mg/Kg	☼	08/15/17 13:54	08/19/17 07:11	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	78.3		0.1	0.1	%	-		08/15/17 07:04	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Client Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Client Sample ID: SD-10
Date Collected: 08/11/17 12:00
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-38
Matrix: Solid

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.88	0.751	mg/Kg	☼	08/15/17 13:54	08/19/17 07:16	5
Zinc	26.9		18.8	7.51	mg/Kg	☼	08/15/17 13:54	08/19/17 07:16	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	66.3		0.1	0.1	%	-		08/15/17 07:04	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Client Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Client Sample ID: SD-DS

Date Collected: 08/11/17 14:25

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-39

Matrix: Solid

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		1.32	0.529	mg/Kg	☼	08/15/17 13:54	08/19/17 07:22	5
Zinc	17.8		13.2	5.29	mg/Kg	☼	08/15/17 13:54	08/19/17 07:22	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	90.7		0.1	0.1	%	-		08/15/17 07:04	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Client Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Client Sample ID: SD-US
Date Collected: 08/11/17 16:00
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-40
Matrix: Solid

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND	F1	3.16	1.26	mg/Kg	☼	08/31/17 16:43	08/31/17 18:24	5
Zinc	250	F2	31.6	12.6	mg/Kg	☼	08/31/17 16:43	08/31/17 18:24	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	78.7		0.1	0.1	%			09/01/17 15:48	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

QC Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 490-452838/1-A
Matrix: Solid
Analysis Batch: 453884

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 452838

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.247	0.0988	mg/Kg		08/15/17 13:54	08/19/17 05:42	1
Zinc	ND		2.47	0.988	mg/Kg		08/15/17 13:54	08/19/17 05:42	1

Lab Sample ID: LCS 490-452838/2-A
Matrix: Solid
Analysis Batch: 453884

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 452838

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Cadmium	9.75	8.663		mg/Kg		89	80 - 120
Zinc	9.75	8.794		mg/Kg		90	80 - 120

Lab Sample ID: 490-134608-29 MS
Matrix: Solid
Analysis Batch: 453884

Client Sample ID: SD-1
Prep Type: Total/NA
Prep Batch: 452838

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Cadmium	ND		11.2	10.35		mg/Kg	☼	93	75 - 125
Zinc	16.9		11.2	30.58		mg/Kg	☼	122	75 - 125

Lab Sample ID: 490-134608-29 MSD
Matrix: Solid
Analysis Batch: 453884

Client Sample ID: SD-1
Prep Type: Total/NA
Prep Batch: 452838

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Cadmium	ND		11.3	10.29		mg/Kg	☼	91	75 - 125	1	20
Zinc	16.9		11.3	27.35		mg/Kg	☼	92	75 - 125	11	20

Lab Sample ID: MB 490-457032/1-A
Matrix: Solid
Analysis Batch: 457101

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 457032

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.480	0.192	mg/Kg		08/31/17 16:43	08/31/17 18:08	1
Zinc	ND		4.80	1.92	mg/Kg		08/31/17 16:43	08/31/17 18:08	1

Lab Sample ID: LCS 490-457032/2-A
Matrix: Solid
Analysis Batch: 457101

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 457032

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Cadmium	19.0	18.62		mg/Kg		98	80 - 120
Zinc	19.0	19.08		mg/Kg		100	80 - 120

Lab Sample ID: 490-134608-40 MS
Matrix: Solid
Analysis Batch: 457101

Client Sample ID: SD-US
Prep Type: Total/NA
Prep Batch: 457032

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Cadmium	ND	F1	25.3	589.4	F1	mg/Kg	☼	2330	75 - 125

TestAmerica Nashville

QC Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 490-134608-40 MS
Matrix: Solid
Analysis Batch: 457101

Client Sample ID: SD-US
Prep Type: Total/NA
Prep Batch: 457032
 %Rec.

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Zinc	250	F2	25.3	1839	4	mg/Kg	☼	6283	75 - 125

Lab Sample ID: 490-134608-40 MSD
Matrix: Solid
Analysis Batch: 457101

Client Sample ID: SD-US
Prep Type: Total/NA
Prep Batch: 457032
 %Rec. RPD

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Cadmium	ND	F1	25.0	538.1	F1	mg/Kg	☼	2152	75 - 125	9	20
Zinc	250	F2	25.0	1091	4 F2	mg/Kg	☼	3366	75 - 125	51	20

Lab Sample ID: MB 490-453134/1-A
Matrix: Water
Analysis Batch: 453884

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 453134

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100	0.000100	mg/L		08/16/17 13:39	08/19/17 00:18	1
Zinc	ND		0.0250	0.00520	mg/L		08/16/17 13:39	08/19/17 00:18	1

Lab Sample ID: LCS 490-453134/2-A
Matrix: Water
Analysis Batch: 453884

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 453134
 %Rec.

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Cadmium	0.100	0.09631		mg/L		96	80 - 120
Zinc	0.100	0.1025		mg/L		103	80 - 120

Lab Sample ID: MB 490-453137/1-A
Matrix: Water
Analysis Batch: 453884

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 453137

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100	0.000100	mg/L		08/16/17 13:46	08/19/17 03:56	1
Zinc	ND		0.0250	0.00520	mg/L		08/16/17 13:46	08/19/17 03:56	1

Lab Sample ID: LCS 490-453137/2-A
Matrix: Water
Analysis Batch: 453884

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 453137
 %Rec.

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Cadmium	0.100	0.09662		mg/L		97	80 - 120
Zinc	0.100	0.1005		mg/L		101	80 - 120

Lab Sample ID: 490-134608-10 MS
Matrix: Water
Analysis Batch: 453884

Client Sample ID: PP-10
Prep Type: Dissolved
Prep Batch: 453134
 %Rec.

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Cadmium	ND		0.100	0.09500		mg/L		95	75 - 125
Zinc	0.0534	J	0.100	0.1345	J	mg/L		81	75 - 125

TestAmerica Nashville

QC Sample Results

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 490-134608-10 MSD
Matrix: Water
Analysis Batch: 453884

Client Sample ID: PP-10
Prep Type: Dissolved
Prep Batch: 453134

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD		Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
				Result	Qualifier						
Cadmium	ND		0.100	0.09875		mg/L		99	75 - 125	4	20
Zinc	0.0534	J	0.100	0.1358	J	mg/L		82	75 - 125	1	20

Lab Sample ID: 490-134608-20 MS
Matrix: Water
Analysis Batch: 453884

Client Sample ID: PP-20
Prep Type: Dissolved
Prep Batch: 453137

Analyte	Sample Result	Sample Qualifier	Spike Added	MS		Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
				Result	Qualifier						
Cadmium	ND		0.100	0.1000		mg/L		100	75 - 125		
Zinc	0.0588	J	0.100	0.1622	J	mg/L		103	75 - 125		

Lab Sample ID: 490-134608-20 MSD
Matrix: Water
Analysis Batch: 453884

Client Sample ID: PP-20
Prep Type: Dissolved
Prep Batch: 453137

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD		Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
				Result	Qualifier						
Cadmium	ND		0.100	0.09727		mg/L		97	75 - 125	3	20
Zinc	0.0588	J	0.100	0.1646	J	mg/L		106	75 - 125	1	20

Method: Moisture - Percent Moisture

Lab Sample ID: 490-134608-29 DU
Matrix: Solid
Analysis Batch: 452657

Client Sample ID: SD-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU		Unit	D	RPD	RPD Limit
			Result	Qualifier				
Percent Solids	88.3		89.5		%		1	20

Lab Sample ID: 490-135734-A-1 DU
Matrix: Solid
Analysis Batch: 457326

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU		Unit	D	RPD	RPD Limit
			Result	Qualifier				
Percent Solids	98.0		98.0		%		0	20

QC Association Summary

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Metals

Prep Batch: 452838

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134608-29	SD-1	Total/NA	Solid	3051A	
490-134608-30	SD-2	Total/NA	Solid	3051A	
490-134608-31	SD-3	Total/NA	Solid	3051A	
490-134608-32	SD-4	Total/NA	Solid	3051A	
490-134608-33	SD-5	Total/NA	Solid	3051A	
490-134608-34	SD-6	Total/NA	Solid	3051A	
490-134608-35	SD-7	Total/NA	Solid	3051A	
490-134608-36	SD-8	Total/NA	Solid	3051A	
490-134608-37	SD-9	Total/NA	Solid	3051A	
490-134608-38	SD-10	Total/NA	Solid	3051A	
490-134608-39	SD-DS	Total/NA	Solid	3051A	
MB 490-452838/1-A	Method Blank	Total/NA	Solid	3051A	
LCS 490-452838/2-A	Lab Control Sample	Total/NA	Solid	3051A	
490-134608-29 MS	SD-1	Total/NA	Solid	3051A	
490-134608-29 MSD	SD-1	Total/NA	Solid	3051A	

Prep Batch: 453134

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134608-1	PP-1	Dissolved	Water	3005A	
490-134608-2	PP-2	Dissolved	Water	3005A	
490-134608-3	PP-3	Dissolved	Water	3005A	
490-134608-4	PP-4	Dissolved	Water	3005A	
490-134608-5	PP-5	Dissolved	Water	3005A	
490-134608-6	PP-6	Dissolved	Water	3005A	
490-134608-7	PP-7	Dissolved	Water	3005A	
490-134608-8	PP-8	Dissolved	Water	3005A	
490-134608-9	PP-9	Dissolved	Water	3005A	
490-134608-10	PP-10	Dissolved	Water	3005A	
490-134608-11	PP-11	Dissolved	Water	3005A	
490-134608-12	PP-12	Dissolved	Water	3005A	
490-134608-13	PP-13	Dissolved	Water	3005A	
490-134608-14	PP-14	Dissolved	Water	3005A	
490-134608-15	PP-15	Dissolved	Water	3005A	
490-134608-16	PP-16	Dissolved	Water	3005A	
490-134608-17	PP-17	Dissolved	Water	3005A	
490-134608-18	PP-18	Dissolved	Water	3005A	
490-134608-19	PP-19	Dissolved	Water	3005A	
MB 490-453134/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 490-453134/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
490-134608-10 MS	PP-10	Dissolved	Water	3005A	
490-134608-10 MSD	PP-10	Dissolved	Water	3005A	

Prep Batch: 453137

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134608-20	PP-20	Dissolved	Water	3005A	
490-134608-21	PP-21	Dissolved	Water	3005A	
490-134608-22	PP-22	Dissolved	Water	3005A	
490-134608-23	PP-US	Dissolved	Water	3005A	
490-134608-24	PP-DS	Dissolved	Water	3005A	
490-134608-25	SW-1	Dissolved	Water	3005A	
490-134608-26	SW-2	Dissolved	Water	3005A	

TestAmerica Nashville

QC Association Summary

Client: Hart & Hickman, PC
 Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
 SDG: CLR.045

Metals (Continued)

Prep Batch: 453137 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134608-27	SW-3	Dissolved	Water	3005A	
MB 490-453137/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 490-453137/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
490-134608-20 MS	PP-20	Dissolved	Water	3005A	
490-134608-20 MSD	PP-20	Dissolved	Water	3005A	

Analysis Batch: 453884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134608-1	PP-1	Dissolved	Water	6020A	453134
490-134608-2	PP-2	Dissolved	Water	6020A	453134
490-134608-3	PP-3	Dissolved	Water	6020A	453134
490-134608-4	PP-4	Dissolved	Water	6020A	453134
490-134608-5	PP-5	Dissolved	Water	6020A	453134
490-134608-6	PP-6	Dissolved	Water	6020A	453134
490-134608-7	PP-7	Dissolved	Water	6020A	453134
490-134608-8	PP-8	Dissolved	Water	6020A	453134
490-134608-10	PP-10	Dissolved	Water	6020A	453134
490-134608-11	PP-11	Dissolved	Water	6020A	453134
490-134608-12	PP-12	Dissolved	Water	6020A	453134
490-134608-13	PP-13	Dissolved	Water	6020A	453134
490-134608-14	PP-14	Dissolved	Water	6020A	453134
490-134608-15	PP-15	Dissolved	Water	6020A	453134
490-134608-16	PP-16	Dissolved	Water	6020A	453134
490-134608-17	PP-17	Dissolved	Water	6020A	453134
490-134608-18	PP-18	Dissolved	Water	6020A	453134
490-134608-19	PP-19	Dissolved	Water	6020A	453134
490-134608-20	PP-20	Dissolved	Water	6020A	453137
490-134608-21	PP-21	Dissolved	Water	6020A	453137
490-134608-22	PP-22	Dissolved	Water	6020A	453137
490-134608-23	PP-US	Dissolved	Water	6020A	453137
490-134608-24	PP-DS	Dissolved	Water	6020A	453137
490-134608-25	SW-1	Dissolved	Water	6020A	453137
490-134608-26	SW-2	Dissolved	Water	6020A	453137
490-134608-27	SW-3	Dissolved	Water	6020A	453137
490-134608-29	SD-1	Total/NA	Solid	6020A	452838
490-134608-30	SD-2	Total/NA	Solid	6020A	452838
490-134608-31	SD-3	Total/NA	Solid	6020A	452838
490-134608-32	SD-4	Total/NA	Solid	6020A	452838
490-134608-33	SD-5	Total/NA	Solid	6020A	452838
490-134608-34	SD-6	Total/NA	Solid	6020A	452838
490-134608-35	SD-7	Total/NA	Solid	6020A	452838
490-134608-36	SD-8	Total/NA	Solid	6020A	452838
490-134608-37	SD-9	Total/NA	Solid	6020A	452838
490-134608-38	SD-10	Total/NA	Solid	6020A	452838
490-134608-39	SD-DS	Total/NA	Solid	6020A	452838
MB 490-452838/1-A	Method Blank	Total/NA	Solid	6020A	452838
MB 490-453134/1-A	Method Blank	Total Recoverable	Water	6020A	453134
MB 490-453137/1-A	Method Blank	Total Recoverable	Water	6020A	453137
LCS 490-452838/2-A	Lab Control Sample	Total/NA	Solid	6020A	452838
LCS 490-453134/2-A	Lab Control Sample	Total Recoverable	Water	6020A	453134
LCS 490-453137/2-A	Lab Control Sample	Total Recoverable	Water	6020A	453137

TestAmerica Nashville

QC Association Summary

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Metals (Continued)

Analysis Batch: 453884 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134608-10 MS	PP-10	Dissolved	Water	6020A	453134
490-134608-10 MSD	PP-10	Dissolved	Water	6020A	453134
490-134608-20 MS	PP-20	Dissolved	Water	6020A	453137
490-134608-20 MSD	PP-20	Dissolved	Water	6020A	453137
490-134608-29 MS	SD-1	Total/NA	Solid	6020A	452838
490-134608-29 MSD	SD-1	Total/NA	Solid	6020A	452838

Analysis Batch: 456156

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134608-9	PP-9	Dissolved	Water	6020A	453134

Prep Batch: 457032

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134608-40	SD-US	Total/NA	Solid	3051A	
MB 490-457032/1-A	Method Blank	Total/NA	Solid	3051A	
LCS 490-457032/2-A	Lab Control Sample	Total/NA	Solid	3051A	
490-134608-40 MS	SD-US	Total/NA	Solid	3051A	
490-134608-40 MSD	SD-US	Total/NA	Solid	3051A	

Analysis Batch: 457101

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134608-40	SD-US	Total/NA	Solid	6020A	457032
MB 490-457032/1-A	Method Blank	Total/NA	Solid	6020A	457032
LCS 490-457032/2-A	Lab Control Sample	Total/NA	Solid	6020A	457032
490-134608-40 MS	SD-US	Total/NA	Solid	6020A	457032
490-134608-40 MSD	SD-US	Total/NA	Solid	6020A	457032

General Chemistry

Analysis Batch: 452657

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134608-29	SD-1	Total/NA	Solid	Moisture	
490-134608-30	SD-2	Total/NA	Solid	Moisture	
490-134608-31	SD-3	Total/NA	Solid	Moisture	
490-134608-32	SD-4	Total/NA	Solid	Moisture	
490-134608-33	SD-5	Total/NA	Solid	Moisture	
490-134608-34	SD-6	Total/NA	Solid	Moisture	
490-134608-35	SD-7	Total/NA	Solid	Moisture	
490-134608-36	SD-8	Total/NA	Solid	Moisture	
490-134608-37	SD-9	Total/NA	Solid	Moisture	
490-134608-38	SD-10	Total/NA	Solid	Moisture	
490-134608-39	SD-DS	Total/NA	Solid	Moisture	
490-134608-29 DU	SD-1	Total/NA	Solid	Moisture	

Analysis Batch: 457326

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-134608-40	SD-US	Total/NA	Solid	Moisture	
490-135734-A-1 DU	Duplicate	Total/NA	Solid	Moisture	

TestAmerica Nashville

Lab Chronicle

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-1

Date Collected: 08/09/17 13:10

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 00:57	BLG	TAL NSH

Client Sample ID: PP-2

Date Collected: 08/09/17 13:15

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 01:02	BLG	TAL NSH

Client Sample ID: PP-3

Date Collected: 08/09/17 13:30

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 01:08	BLG	TAL NSH

Client Sample ID: PP-4

Date Collected: 08/09/17 13:40

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 01:25	BLG	TAL NSH

Client Sample ID: PP-5

Date Collected: 08/09/17 13:55

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 01:30	BLG	TAL NSH

Client Sample ID: PP-6

Date Collected: 08/09/17 14:10

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 01:36	BLG	TAL NSH

TestAmerica Nashville

Lab Chronicle

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-7

Date Collected: 08/09/17 14:20
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 01:42	BLG	TAL NSH

Client Sample ID: PP-8

Date Collected: 08/09/17 14:40
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 01:47	BLG	TAL NSH

Client Sample ID: PP-9

Date Collected: 08/09/17 15:00
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		1			456156	08/28/17 22:29	BLG	TAL NSH

Client Sample ID: PP-10

Date Collected: 08/09/17 15:10
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 00:29	BLG	TAL NSH

Client Sample ID: PP-11

Date Collected: 08/10/17 13:15
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 01:53	BLG	TAL NSH

Client Sample ID: PP-12

Date Collected: 08/10/17 13:30
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-12

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 01:58	BLG	TAL NSH

TestAmerica Nashville

Lab Chronicle

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-13

Date Collected: 08/10/17 13:45
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-13

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 02:04	BLG	TAL NSH

Client Sample ID: PP-14

Date Collected: 08/10/17 14:00
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-14

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 02:10	BLG	TAL NSH

Client Sample ID: PP-15

Date Collected: 08/10/17 13:30
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-15

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 02:15	BLG	TAL NSH

Client Sample ID: PP-16

Date Collected: 08/10/17 14:20
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-16

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 02:32	BLG	TAL NSH

Client Sample ID: PP-17

Date Collected: 08/10/17 14:30
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-17

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 02:38	BLG	TAL NSH

Client Sample ID: PP-18

Date Collected: 08/10/17 14:45
Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-18

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 02:43	BLG	TAL NSH

TestAmerica Nashville

Lab Chronicle

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: PP-19

Lab Sample ID: 490-134608-19

Date Collected: 08/10/17 15:15

Matrix: Water

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453134	08/16/17 13:39	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 02:49	BLG	TAL NSH

Client Sample ID: PP-20

Lab Sample ID: 490-134608-20

Date Collected: 08/11/17 13:40

Matrix: Water

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453137	08/16/17 13:46	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 04:07	BLG	TAL NSH

Client Sample ID: PP-21

Lab Sample ID: 490-134608-21

Date Collected: 08/11/17 13:50

Matrix: Water

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453137	08/16/17 13:46	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 04:35	BLG	TAL NSH

Client Sample ID: PP-22

Lab Sample ID: 490-134608-22

Date Collected: 08/11/17 14:00

Matrix: Water

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453137	08/16/17 13:46	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 04:40	BLG	TAL NSH

Client Sample ID: PP-US

Lab Sample ID: 490-134608-23

Date Collected: 08/10/17 16:00

Matrix: Water

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453137	08/16/17 13:46	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 04:46	BLG	TAL NSH

Client Sample ID: PP-DS

Lab Sample ID: 490-134608-24

Date Collected: 08/11/17 14:25

Matrix: Water

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453137	08/16/17 13:46	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 05:03	BLG	TAL NSH

TestAmerica Nashville

Lab Chronicle

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: SW-1

Lab Sample ID: 490-134608-25

Date Collected: 08/11/17 14:35

Matrix: Water

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453137	08/16/17 13:46	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 05:08	BLG	TAL NSH

Client Sample ID: SW-2

Lab Sample ID: 490-134608-26

Date Collected: 08/11/17 14:40

Matrix: Water

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453137	08/16/17 13:46	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 05:14	BLG	TAL NSH

Client Sample ID: SW-3

Lab Sample ID: 490-134608-27

Date Collected: 08/11/17 14:45

Matrix: Water

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			50 mL	50 mL	453137	08/16/17 13:46	AAA	TAL NSH
Dissolved	Analysis	6020A		10			453884	08/19/17 05:19	BLG	TAL NSH

Client Sample ID: SD-1

Lab Sample ID: 490-134608-29

Date Collected: 08/11/17 11:15

Matrix: Solid

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			0.519 g	50 mL	452838	08/15/17 13:54	BVH	TAL NSH
Total/NA	Analysis	6020A		5			453884	08/19/17 05:53	BLG	TAL NSH
Total/NA	Analysis	Moisture		1			452657	08/15/17 07:04	BAA	TAL NSH

Client Sample ID: SD-2

Lab Sample ID: 490-134608-30

Date Collected: 08/11/17 11:20

Matrix: Solid

Date Received: 08/12/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			0.525 g	50 mL	452838	08/15/17 13:54	BVH	TAL NSH
Total/NA	Analysis	6020A		5			453884	08/19/17 06:21	BLG	TAL NSH
Total/NA	Analysis	Moisture		1			452657	08/15/17 07:04	BAA	TAL NSH

Lab Chronicle

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: SD-3

Date Collected: 08/11/17 11:25

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-31

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			0.519 g	50 mL	452838	08/15/17 13:54	BVH	TAL NSH
Total/NA	Analysis	6020A		5			453884	08/19/17 06:26	BLG	TAL NSH
Total/NA	Analysis	Moisture		1			452657	08/15/17 07:04	BAA	TAL NSH

Client Sample ID: SD-4

Date Collected: 08/11/17 11:30

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-32

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			0.509 g	50 mL	452838	08/15/17 13:54	BVH	TAL NSH
Total/NA	Analysis	6020A		5			453884	08/19/17 06:32	BLG	TAL NSH
Total/NA	Analysis	Moisture		1			452657	08/15/17 07:04	BAA	TAL NSH

Client Sample ID: SD-5

Date Collected: 08/11/17 11:35

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-33

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			0.516 g	50 mL	452838	08/15/17 13:54	BVH	TAL NSH
Total/NA	Analysis	6020A		5			453884	08/19/17 06:48	BLG	TAL NSH
Total/NA	Analysis	Moisture		1			452657	08/15/17 07:04	BAA	TAL NSH

Client Sample ID: SD-6

Date Collected: 08/11/17 11:40

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-34

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			0.519 g	50 mL	452838	08/15/17 13:54	BVH	TAL NSH
Total/NA	Analysis	6020A		5			453884	08/19/17 06:54	BLG	TAL NSH
Total/NA	Analysis	Moisture		1			452657	08/15/17 07:04	BAA	TAL NSH

Client Sample ID: SD-7

Date Collected: 08/11/17 11:45

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-35

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			0.525 g	50 mL	452838	08/15/17 13:54	BVH	TAL NSH
Total/NA	Analysis	6020A		5			453884	08/19/17 07:00	BLG	TAL NSH
Total/NA	Analysis	Moisture		1			452657	08/15/17 07:04	BAA	TAL NSH

TestAmerica Nashville

Lab Chronicle

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Client Sample ID: SD-8

Date Collected: 08/11/17 11:50

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-36

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			0.520 g	50 mL	452838	08/15/17 13:54	BVH	TAL NSH
Total/NA	Analysis	6020A		5			453884	08/19/17 07:05	BLG	TAL NSH
Total/NA	Analysis	Moisture		1			452657	08/15/17 07:04	BAA	TAL NSH

Client Sample ID: SD-9

Date Collected: 08/11/17 11:55

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-37

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			0.525 g	50 mL	452838	08/15/17 13:54	BVH	TAL NSH
Total/NA	Analysis	6020A		5			453884	08/19/17 07:11	BLG	TAL NSH
Total/NA	Analysis	Moisture		1			452657	08/15/17 07:04	BAA	TAL NSH

Client Sample ID: SD-10

Date Collected: 08/11/17 12:00

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-38

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			0.502 g	50 mL	452838	08/15/17 13:54	BVH	TAL NSH
Total/NA	Analysis	6020A		5			453884	08/19/17 07:16	BLG	TAL NSH
Total/NA	Analysis	Moisture		1			452657	08/15/17 07:04	BAA	TAL NSH

Client Sample ID: SD-DS

Date Collected: 08/11/17 14:25

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-39

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			0.521 g	50 mL	452838	08/15/17 13:54	BVH	TAL NSH
Total/NA	Analysis	6020A		5			453884	08/19/17 07:22	BLG	TAL NSH
Total/NA	Analysis	Moisture		1			452657	08/15/17 07:04	BAA	TAL NSH

Client Sample ID: SD-US

Date Collected: 08/11/17 16:00

Date Received: 08/12/17 10:15

Lab Sample ID: 490-134608-40

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3051A			0.503 g	100 mL	457032	08/31/17 16:43	BVH	TAL NSH
Total/NA	Analysis	6020A		5			457101	08/31/17 18:24	BLG	TAL NSH
Total/NA	Analysis	Moisture		1			457326	09/01/17 15:48	AAB	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TestAmerica Nashville

Method Summary

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL NSH
Moisture	Percent Moisture	EPA	TAL NSH

Protocol References:

EPA = US Environmental Protection Agency

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

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177



Accreditation/Certification Summary

Client: Hart & Hickman, PC
Project/Site: Clariant Kalama (WA)

TestAmerica Job ID: 490-134608-1
SDG: CLR.045

Laboratory: TestAmerica Nashville

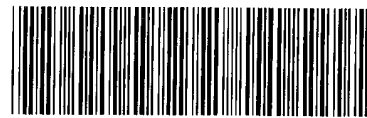
Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
North Carolina (WW/SW)	State Program	4	387	12-31-17

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6020A	3005A	Water	Cadmium
6020A	3005A	Water	Zinc
6020A	3051A	Solid	Cadmium
6020A	3051A	Solid	Zinc
Moisture		Solid	Percent Solids

COOLER RECEIPT FORM



490-134608 Chain of Custody

Cooler Received/Opened On 08-12-2017 @ 10:15

Time Samples Removed From Cooler 1242 Time Samples Placed In Storage 1249 (2 Hour Window)

1. Tracking # 0428 (last 4 digits, FedEx) Courier: FedEx
IR Gun ID 31470366 pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 3.4 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO NA

4. Were custody seals on outside of cooler? YES...NO...NA YES

If yes, how many and where: 1 (front)

5. Were the seals intact, signed, and dated correctly? YES...NO...NA YES

6. Were custody papers inside cooler? YES...NO...NA YES

I certify that I opened the cooler and answered questions 1-6 (initial) KD

7. Were custody seals on containers: YES NO and Intact YES...NO...NA YES

Were these signed and dated correctly? YES...NO...NA YES

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA YES

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA YES

12. Did all container labels and tags agree with custody papers? YES...NO...NA YES

13a. Were VOA vials received? YES...NO...NA YES

b. Was there any observable headspace present in any VOA vial? YES...NO...NA YES

14. Was there a Trip Blank in this cooler? YES...NO...NA NO If multiple coolers, sequence # 1

I certify that I unloaded the cooler and answered questions 7-14 (initial) MR

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA YES

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA YES

16. Was residual chlorine present? YES...NO...NA YES

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) HKG

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA YES

18. Did you sign the custody papers in the appropriate place? YES...NO...NA YES

19. Were correct containers used for the analysis requested? YES...NO...NA YES

20. Was sufficient amount of sample sent in each container? YES...NO...NA YES

I certify that I entered this project into LIMS and answered questions 17-20 (initial) HKG

I certify that I attached a label with the unique LIMS number to each container (initial) HKG

21. Were there Non-Conformance issues at login? YES...NO NO Was a NCM generated? YES...NO...# 326526

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes No

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TEL-4124 (1007)

Client: Hunter & Hickman Project Manager: Scott Drury sdcrury@charhickman.com Date: _____ Chain of Custody Number: 282717

Address: 2923 S. Tryon St Ste 100 Telephone Number (Area Code)/Fax Number: 9194140750 Lab Number: _____ Page 1 of 9

City: Charlotte State: NC Zip Code: 28205 Site Contact: _____ Lab Contact: _____

Project Name and Location (State): CLARKSON KENNEX (WA) Carrier/Waybill Number: FEDEX

Contract/Purchase Order/Quote No.: CLR.045 Matrix: _____ Containers & Preservatives: _____

Sample ID, No. and Description (Containers for each sample may be combined on one line): _____ Date: _____ Time: _____ Air: _____ Aqueous: _____ Sed.: _____ Soil: _____ Unpres.: _____ H2SO4: _____ HNO3: _____ HCl: _____ NaOH: _____ ZnAc/NaOH: _____

Sample ID, No. and Description	Date	Time	Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis (Attach list if more space is needed)	Special Instructions/ Conditions of Receipt
1 PP-1	080917	1310	X										ZINC (DISSOLVED)	6010 on 6010 container R
2 PP-2	080917	1315	X										CADMIUM (DISSOLVED)	REPORT PL
3 PP-3	080917	1330	X											All Samples Filed
4 PP-4	080917	1340	X											
5 PP-5	080917	1355	X											
6 PP-6	080917	1410	X											
7 PP-7	080917	1420	X											
8 PP-8	080917	1440	X											
9 PP-9	080917	1500	X											
10 PP-10	080917	1510	X											
11 PP-11	081017	1315	X											
12 PP-12	081017	1330	X											

Possible Hazard Identification: Non-Hazard Flammable Skin Irritant Poison B Unknown Return To Client Disposal By Lab Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: 24 Hours 48 Hours 7 Days 14 Days 21 Days Other: STD WITH

1. Relinquished By: Scott Drury Date: _____ Time: _____ 1. Received By: Z. Drake Date: 8/11/17 Time: 1015

2. Relinquished By: _____ Date: _____ Time: _____ 2. Received By: _____ Date: _____ Time: _____

3. Relinquished By: _____ Date: _____ Time: _____ 3. Received By: _____ Date: _____ Time: _____

Comments: _____

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Samples; PINK - Field Copy

Chain of Custody Record

TestAmerica

Temperature on Receipt _____
 Drinking Water? Yes No

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1/07)

Client: Hart + Williams Project Manager: _____ Date: _____
 Chain of Custody Number: 282718

Address: 2923 S. Trypan St Ste 100 Telephone Number (Area Code)/Fax Number: _____
 Lab Number: _____

City: Charlotte State: NC Zip Code: 28203 Site Contact: _____
 Lab Contact: _____

Project Name and Location (State): CLMPLANT KALMAN (WH) Carrier/Waybill Number: _____

Contract/Purchase Order/Quote No.: CLR,045 Matrix: _____
 Containers & Preservatives: _____

Sample I.D. No. and Description (Containers for each sample may be combined on one line) Date Time Air Aqueous Sed. Soil Unpres. H2SO4 HNO3 HCl NaOH ZnAc/NaOH
 Analysis (Attach list if more space is needed)
 LOC: 490
134608
 Special Instructions/ Conditions of Receipt: 6010/6020 (Master RL)
Report to RL
All Samples Fines

Sample I.D. No. and Description	Date	Time	Matrix	Containers & Preservatives	Analysis
13 PP-13	08/10/17	1345	X	X	Zn/C (DISCOVERED)
14 PP-14	08/10/17	1400	X	X	Cadmium (DIS)
15 PP-15	08/11/17	1330	X	X	
16 PP-16	08/10/17	1420	X	X	
17 PP-17	08/10/17	1430	X	X	
18 PP-18	08/10/17	1445	X	X	
19 PP-19	08/10/17	1515	X	X	
20 PP-20	08/10/17	1340	X	X	
21 PP-21	08/11/17	1350	X	X	
22 PP-22	08/11/17	1400	X	X	
23 PP-23	08/10/17	1600	X	X	
24 PP-24	08/11/17	1425	X	X	

Possible Hazard Identification: Non-Hazard Flammable Skin Irritant Poison B Unknown Sample Disposal Return to Client Disposal By Lab Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: 24 Hours 48 Hours 7 Days 14 Days 21 Days Other: STD H+H

1. Relinquished By: S. D. Date: _____ Time: _____
 1. Received By: _____ Date: 8/12/17 Time: 1015

2. Relinquished By: _____ Date: _____ Time: _____
 2. Received By: _____ Date: _____ Time: _____

3. Relinquished By: _____ Date: _____ Time: _____
 3. Received By: _____ Date: _____ Time: _____

Comments: _____
 DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Chain of Custody Record

Temperature on Receipt
 Drinking Water? Yes No

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client: Hart + Hickman Project Manager: Scott Denny Date: 8/11/17 Chain of Custody Number: 282724

Address: 2423 S. Tryon St State: NC Zip Code: 28203 Telephone Number (Area Code)/Fax Number: 919 414 0750 Lab Number: 134608 Page 5 of 64

City: Charlotte Site Contact: Sammy Bartholomew Lab Contact: Sammy Bartholomew Analysis (Attach list if more space is needed)

Project Name and Location (State): Charlotte Carrier/Weight Number: 134608 Special Instructions/Conditions of Receipt:

Contract/Purchase Order/Quote No. 134608

Sample I.D. No. and Description (Containers for each sample may be combined on one line)

Sample I.D. No. and Description	Date	Time	Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Containers & Preservatives	Analysis (Attach list if more space is needed)
37 SB-9	8/11/17	1155			1		1						Zinc (ppb)	X
38 SB-10	8/11/17	1200			1		1						Cadmium (ppb)	X

Turn Around Time Required	24 Hours	48 Hours	7 Days	14 Days	21 Days	Other	1. Received By	Date	Time	2. Received By	Date	Time	3. Received By	Date	Time
1. Relinquished By	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Sammy</u>	<u>8/11/17</u>	<u>1900</u>	<u>Sammy</u>	<u>8/11/17</u>	<u>1015</u>	<u>Sammy</u>	<u>8/11/17</u>	<u>1015</u>
2. Relinquished By	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>									
3. Relinquished By	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>									

Possible Hazard Identification: Non-Hazard Flammable Skin Irritant Poison B Unknown Sample Disposal: Return To Client Disposal By Lab Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

QC Requirements (Specify): _____

Comments: _____

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Login Sample Receipt Checklist

Client: Hart & Hickman, PC

Job Number: 490-134608-1

SDG Number: CLR.045

Login Number: 134608

List Number: 1

Creator: Gundi, Hozar K

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
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	
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 (excluding tests with immediate HTs)	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	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Appendix B
Photographs



Photograph 1: Columbia River bank adjacent to site (view to north/downstream)



Photograph 2: PushPoint Sampler



Photograph 3: PushPoint groundwater sampling



Photograph 4: PushPoint potentiometric surface



Photograph 5: PushPoint Sampler



Photograph 6: PushPoint Sampler