hart hickman

SMARTER ENVIRONMENTAL SOLUTIONS

Via FedEx

May 22, 2014

Toxics Cleanup Program
State of Washington - Department of Ecology
300 Desmond Drive
Lacy, WA 98503

Attention: Mr. Eugene Radcliff, L.G.

Re: Pilot-Scale Injection Report
Former Clariant Corporation Facility
Kalama, WA
Facility No. 24634187
VCP Project No. SWO492
H&H Job No. CLR-045

Dear Eugene:

On behalf of Clariant Corporation (Clariant), Hart & Hickman, PC (H&H) is submitting the enclosed Pilot-Scale Injection Report (two hard copies and electronic file on CD-ROM) to summarize the results of a pilot-scale injection of ferrous sulfate and magnesium hydroxide and pre- and post-injection ground water monitoring events completed during 2013 at the former Clariant facility located at 404 Hendrickson Drive in Kalama, Washington.

In the report, we have recommended that Ecology approve a new conditional point of compliance located within the surface water in accordance with WAS 173-340-720 (8)(i) and we have recommended that Clariant and Ecology discuss the potential change in the point of compliance.

Should you have any questions or need any additional information, please feel free to contact me at 704-586-0007.

Sincerely,

Hart & Hickman, PC

Steven C. Hart, L.G.
Principal

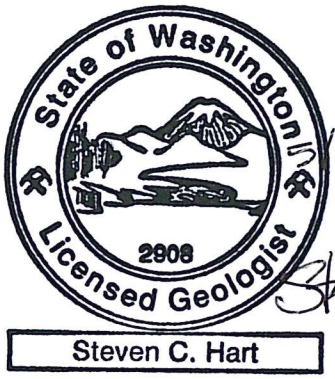
cc: Ron Walton (Clariant Corporation)
Steven Klaeren (Chemtrade Logistics)

Enclosures (3): Pilot-Scale Injection Report (two hard copies and one electronic file on CD-ROM)

Pilot-Scale Injection Report
Former Clariant Corporation Facility

Kalama, Washington
Facility No. 24634187
State of Washington
Department of Ecology
VCP Project No. SWO492

H&H Job No. CLR-045
May 22, 2014



5/22/2014

Steven C. Hart

hart hickman

SMARTER ENVIRONMENTAL SOLUTIONS

2923 South Tryon Street, Suite 100
Charlotte, NC 28203
704.586.0007 main

3334 Hillsborough Street
Raleigh, NC 27607
919.847.4241 main

www.harthickman.com

Table of Contents

List of Tables

List of Figures

List of Appendices

Pilot-Scale Injection Report
Former Clariant Corporation Facility
Kalama, Washington
H&H Job No. CLR-045

1.0 Introduction

Hart & Hickman, PC (H&H) has prepared this report to summarize the results of a pilot-scale injection of ferrous sulfate and magnesium hydroxide and pre- and post-injection ground water monitoring events completed during 2013 at the former Clariant Corporation (Clariant) facility located at 404 Hendrickson Drive in Kalama, Washington. A site location map is provided as Figure 1. The facility is currently owned and operated by Chemtrade Logistics, Inc. (Chemtrade). This report has been prepared on behalf of Clariant under Washington State Department of Ecology's (Ecology) Voluntary Cleanup Program (VCP), VCP number SWO492, facility number 24634187.

The pilot-scale injection and ground water monitoring were completed in general accordance with the *Geochemical Evaluation Summary & 2013 Remedial Action Work Plan* dated March 25, 2013 (H&H, 2013). A brief summary of previous remedial action (RA) activities completed at the site is presented in Section 2.0. A summary of the pilot-scale injection activities completed during 2013 is presented in Section 3.0. A discussion of ground water monitoring completed during 2013 to evaluate site-wide ground water conditions and the effect of the pilot-scale activities is presented in Section 4.0, and conclusions and recommendations are presented in Section 5.0.

2.0 Previous RA and Performance Monitoring Activities

Previous RA activities were completed at the site during August and September 2010 in accordance with H&H's *Remedial Action Work Plan* (RAWP) dated August 6, 2010 (H&H, 2010). The 2010 RA activities were documented in H&H's *Remedial Action Report* (RAR) dated January 19, 2011 (H&H, 2011a). Site background information, including a detailed discussion of cleanup levels (CULs), points of compliance (POCs), and ground water maximum contaminant levels (MCLs) are presented in the RAWP and the RAR.

As described in the RAWP, the objectives of the RA activities were to:

1) Remove soils impacted with cadmium and/or zinc above CULs that remained beneath and to the southeast of a truck access road in the former settling basin #2 (FSB2) area to a) eliminate potential future human health and ecological risks associated with this soil, and b) minimize the potential for future ground water impact from this soil; and,

2) Remediate ground water such that the ground water CULs based upon protection of surface water are met at the ground water POCs adjacent to the Columbia River. Because the site is located adjacent to the Columbia River and because there is communication between site ground water and the river, the CUL for zinc at the site's property boundary with the Columbia River is the calculated surface water standard of 74 micrograms per liter (µg/l) for zinc. The lowest surface water quality standard for cadmium is 0.7 µg/l. As detailed in the RAWP, Ecology has approved monitor wells AB1 and AB2 as alternative ground water POCs for the ground water remedial action. Therefore, the primary goal of RA activities is to remediate ground water such that zinc is at or below 74 µg/l and cadmium is at of below 0.7 µg/l in POC wells AB1 and AB2.

   In accordance with WAC 173-200-060, the applicable CULs for on-site ground water are the MCLs of 5 µg/l for cadmium and 5,000 µg/l for zinc. Because site ground water is not being used for drinking water, a ground water use restriction may be used in lieu of meeting the MCL-based CULs for site ground water.

The RA activities conducted in August and September 2010 included excavation and off-site disposal of approximately 11,500 tons of soil from the FSB2 area, installation of 23 vertical injection wells and six horizontal injection wells, and injection of calcium polysulfide (CaSx) into the injection wells to address dissolved cadmium and/or zinc in ground water. CaSx is a lime-sulfur solution designed to be used in various treatment systems as a metal precipitating agent and has been used for in-situ treatment of ground water impacted with metals. A site map showing the vertical and horizontal injection well locations is included as Figure 2.

Based upon a review of ground water monitoring data collected after completion of the 2010 RA activities and the results of a pilot test performed during September 2011 (documented in the *Pilot Test Report* dated October 28, 2011 (H&H, 2011c)), additional RA activities were completed during November and December 2011 (in accordance with the July 5, 2011 *Post-Injection Monitoring Report & RAWP Addendum* (H&H, 2011b) and a *RAWP Addendum Deviation Request* dated November 10, 2011 (H&H, 2011d)).

The purposes of the additional RA activities were to further remediate dissolved phase ground water impacts and to remediate leachable zinc in soil below the depths of previous soil excavations. The additional RA activities included application of CaSx to the base of a 15 ft bgs soil excavation area in the FSB2 area, installation of seven extraction wells, and CaSx injection and ground water re-circulation in the FSB2 area and in the southern portion of the site (to the west of the manufacturing plant). The area to the west of the manufacturing plant is hereafter referred to as the manufacturing plant area (MPA). The additional RA activities were completed and documented in H&H's *Additional Remedial Action & Performance Monitoring Report* dated October 16, 2012 (H&H, 2012).

Based on the results of monitoring conducted after the additional RA activities, a geochemical evaluation was completed to relate post-RA dissolved zinc concentrations to geochemical processes in the site aquifer. The geochemical evaluation included soil and ground water sample collection and analyses which were used to develop a geochemical system model. The

geochemical evaluation indicated that application of CaSx to the subsurface only temporarily reduced dissolved zinc concentrations in site ground water because produced sulfide and metal sulfides were likely oxidized, primarily because reducing conditions could not be maintained in the aquifer as a result of aquifer fluctuations and interactions with the Columbia River, particularly historic flooding that occurred after the initial RA activities. In addition, it is likely that dissolution of zinc carbonate in areas where ground water pH decreased contributed to the increased dissolved zinc concentrations in site ground water. The geochemical evaluation was documented in H&H's *Geochemical Evaluation Summary & 2013 Remedial Action Work Plan* (H&H, 2013).

A summary of performance ground water monitoring conducted after completion of the 2010 RA activities through March 2011 is included in the *Post-Injection Monitoring Report & RAWP Addendum* (H&H, 2011b), a summary of June and September 2011 performance monitoring is included in the *Pilot Test Report* (H&H, 2011d), and a summary of January, March, June, and October/November 2012 performance monitoring is included in the *Geochemical Evaluation Summary & 2013 Remedial Action Work Plan* (H&H, 2013). Ground water elevation data and ground water zinc and cadmium analytical data from these events are summarized in Table 2 and 3, respectively.

The 2013 RAWP (H&H, 2013) included a plan for pilot-scale injection of ferrous sulfate and magnesium hydroxide to reduce dissolved zinc and cadmium concentrations. This report presents the methods and results of the pilot-scale injection activities.

3.0 Pilot-Scale Injection Activities

Based on the results of the geochemical evaluation discussed in Section 2.0 above, H&H recommended that a pilot-scale injection of ferrous sulfate and magnesium hydroxide be conducted in the vicinity of PZ12 in the FSB2 area. The purpose of the ferrous sulfate injection was to distribute soluble iron in the aquifer which would be oxidized to insoluble iron hydroxide under the oxidizing conditions observed in the site's aquifer. The insoluble iron hydroxide is expected to enhance adsorption and immobilization of dissolved zinc in the aquifer. Injection of magnesium hydroxide was intended to increase the pH of the aquifer in order to enhance precipitation of dissolved zinc as insoluble zinc carbonate and to enhance precipitation of ferrous iron as insoluble iron hydroxide.

The pilot-scale injection was conducted by H&H personnel on June 3-6, 2013. The injection was conducted using existing injection wells IW-8, IW-10, IW-11, and IW-12 under the existing conditional rule authorization issued by Ecology's Underground Injection Control Program for the previous injection activities completed at the site. Ferrous iron concentrations and ground water quality parameters (including temperature, conductivity, pH, dissolved oxygen - DO, oxidation-reduction potential - ORP, and turbidity) were measured in nearby monitor wells OW1 through OW3, PZ1, PZ12, and AB2 during the injection activities to assist in evaluating the effectiveness of the injection in distributing the ferrous sulfate and magnesium hydroxide throughout the pilot-test area of the aquifer. Construction details for the site monitor and remediation wells are summarized in Tables 1A and 1B, respectively. Well locations are shown in Figure 2. Photographs of the injection activities are included in Appendix A.

Ferrous sulfate and magnesium hydroxide chemicals were obtained from Garrison Minerals, LLC of Denver, CO and delivered in solid form to the site in 50-lb bags. The injection fluids were prepared by mixing the chemicals into municipal water obtained from the Chemtrade plant within a 2,500-gallon poly tank. The chemicals were poured into the top of the tank as it was filled with water and the contents of the tank were mixed by re-circulating the solution into and out of the tank using a utility pump and transfer hoses so that the solids were not allowed to settle in the bottom of the tank. After preparation, the injection fluids were pumped from the

mixing tank through hoses to the injection wells using an in-line utility pump. In-line totalizing flow meters were used to monitor injection flow rates and volumes. Individual batches of ferrous sulfate solution and magnesium hydroxide slurry were prepared and injected into each injection well.

First, an approximately 1,500 gallon batch of 8 wt/vol % ferrous sulfate solution was injected into each of the four pilot-scale injection wells. After completing injection of the ferrous sulfate into the four injection wells, an approximately 2,400 gallon batch of 10 wt/vol % magnesium hydroxide slurry was injected into each well. The ferrous sulfate solution was injected prior to injection of the magnesium hydroxide slurry in each well because it was anticipated that the magnesium hydroxide slurry might result in clogging of the injection well.

Injection of the ferrous sulfate solution was conducted at relatively high flow rates of approximately 120-150 gpm and no backpressure was observed while injecting the solution. Injection of the magnesium hydroxide slurry into each well was started at a flow rate of approximately 120 gpm; however, backpressure in each of the injection wells reduced the injection flow rates as the injection progressed so that the injection flow rate was reduced to less than 10 gpm by the time injection into each well was completed.

Field measurements of ground water quality parameters in monitor wells near the injection wells during the injection activities did not provide definitive evidence of influence from the injection activities. Because ferrous iron was detected above the upper range which could be measured by the field test kit (10,000 mg/l) in wells PZ12, OW2, and OW3 prior to the start of, during, and after completing the injection activities, it was not possible to determine if the injection activities contributed to ferrous iron levels in these wells at the time of the injection. A light milky white color indicative of magnesium hydroxide was observed in PZ12 and OW3 during the final purge of these wells during the injection on June 6, 2013; however, there was not a notable increase in the pH measured in these wells. Based on the high flow rates and low backpressures observed during injection of the ferrous sulfate, it is likely that the injection effectively distributed the ferrous sulfate solution into the aquifer. Based on the backpressure observed during injection of the insoluble magnesium hydroxide slurry, we believe that distribution of the bulk of the slurry

was likely restricted to the vicinity of the injection wells.

4.0 Ground Water Monitoring

H&H conducted pre- and post-pilot-scale injection monitoring of ground water in the MPA and FSB2 areas during May, August, and December 2013. The ground water monitoring was performed to evaluate the performance of the pilot-scale injection activities and to evaluate ground water conditions in the former RA areas. The methods and results of the ground water monitoring are presented in the following sections.

4.1 Ground Water Elevations

Water level gauging of all site monitor wells except PZ7 was conducted during each of the pre- and post-pilot-scale injection monitoring events. Ground water elevation data is summarized in Table 3. Ground water elevations during the August and December 2013 monitoring were similar to each other and were approximately 3 to 4 ft lower than the baseline (May 2013) ground water elevations. The 2013 ground water elevations were similar to those considered to be "normal" at the site (i.e., not influenced by flood events).

Consistent with previous sampling events, the 2013 ground water elevation data indicate that shallow ground water 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 hydraulic gradient from east to west toward the river. In the western portion of the site, hydraulic communication between the river and shallow ground water results in a temporal mound in the ground water table near the river that creates a relatively weak hydraulic gradient from west to east in that area. The ground water mound near the river is temporal and its presence depends upon the timing and magnitude of the tides. The converging hydraulic gradients appear to cause ground water in the central portion of the site to be temporally stagnant. Inferred ground water elevation contour maps for the May, August, and December 2013 monitoring events are included as Figures 3A, 3B, and 3C, respectively.

Columbia River elevation/tide data were obtained from the National Oceanic and Atmospheric Administration's (NOAA) NOS/CO-OPs Observational Data Interactive Navigation program

(http://tidesandcurrents.noaa.gov/gmap3). Daily elevation data obtained from the NOAA website indicate that the elevation of the Columbia River fluctuated approximately 5 to 7 ft between low and high tides in the vicinity of the site at the time of the 2013 sampling events. Columbia River elevation data are summarized along with the site ground water elevation data in Table 3.

4.2 Sampling Methods

Each monitoring event consisted of ground water sample collection from the following 12 site monitor wells: PZ1, PZ3, PZ4, PZ5, PZ6, PZ12, PZ13, AB1, AB2, OW1, OW2, and OW3. During each monitoring event, ground water from each of the wells was purged and sampled using standard low-flow/low-stress techniques. Ground water parameters that included pH, conductivity, DO, ORP, and turbidity were measured in the field during the low-flow purging. Total and ferrous iron were measured in the field using a Hach test kit in each of the wells during the May and August 2013 events, and in the FSB2 area wells (PZ1, PZ12, PZ13, AB2, and OW1 through OW3) only during the December 2013 event. Sulfide was also measured in the field using a Hach test kit during the May 2013 event only. A summary of the ground water field parameter data collected during each monitoring event is included along with geochemical analytical data in Table 4.

After ground water parameters stabilized during purging, samples were collected from each monitor well into laboratory-supplied sample containers, placed into laboratory-supplied sample coolers, and covered with ice. Samples collected for dissolved metals were field-filtered using a 0.45-micron filter prior to collection into sample containers. The samples were delivered under standard chain-of-custody protocols to Test America of Nashville, TN for analysis of dissolved cadmium and zinc, and total sulfide, except that, as noted above, sulfide in PZ1, PZ3 through PZ5, AB1, and AB2 was measured in the field using a field kit during the May sampling. In addition, samples collected from PZ1, PZ12, PZ13, AB2, and OW1 through OW3 were analyzed by the laboratory for the following:

- Major ions (cation metals and anions): calcium, magnesium, sodium, potassium,

alkalinity, sulfate, chloride, nitrate + nitrite

- Dissolved metals: aluminum, iron, manganese
- Trace/Minor constituents: ortho-phosphate, silica

4.3 Sampling Results

Dissolved cadmium and zinc analytical results from the May, August, and December 2013 sampling events are summarized along with historical data in Table 3. Geochemical analytical data (including major anions, dissolved metals, and trace/minor constituents) are summarized along with ground water field parameter data collected during each of the monitoring events in Table 4. Zinc isoconcentration maps for the May, August, and December 2013 sampling events are included as Figures 4A, 4B, and 4C, respectively. Analytical data reports for the samples are included in Appendix B.

4.3.1 Manufacturing Plant Area Ground Water Results

In the MPA area wells (PZ3 through PZ6 and AB1), the May, August, and December 2013 ground water sample results indicated that concentrations of zinc and cadmium were generally consistent with historical concentrations and fluctuations detected in the wells. The maximum zinc concentration detected in the MPA area monitor wells during the three sampling events was 6,240 µg/l in PZ6 during May. This was the only zinc detection above the MCL (5,000 µg/l) in the MPA wells during the three sampling events. Zinc concentrations of 1,130 µg/l, 772 µg/l, and 1,380 µg/l were detected in the MPA compliance well AB1 during May, August, and December 2013, respectively. These concentrations are consistent with historical zinc concentrations in AB1.

Cadmium was detected in PZ4 and PZ5 during each of the 2013 sampling events. Cadmium was detected above the MCL (50 µg/l) in PZ5 during August (94.6 µg/l) and December (151 µg/l). PZ5 has historically contained the highest cadmium (up to 1,150 µg/l) detections in the MPA. Cadmium was detected at very low concentrations (above laboratory minimum detection limits, but below laboratory minimum reporting limits) in the August 2013 samples collected from PZ3

and AB1. Cadmium was not detected in MPA compliance well AB1 during May or December.

4.3.2 FSB2 Area Ground Water Results

In the FSB2 area, the 2013 ground water sample results indicated that concentrations of zinc remain elevated. In addition, ground water parameter measurements collected during the 2013 sampling events indicated that pH is low (3-5 s.u.) and oxidizing conditions are present in the FSB2 area wells. As mentioned in Section 2.0 above and as discussed in the *Geochemical Evaluation Summary & 2013 Remedial Action Work Plan* (H&H, 2013), the previously-completed geochemical evaluation indicated that application of CaSx to the subsurface only temporarily reduced of zinc concentrations in site ground water because sulfide and metal sulfides were likely oxidized, primarily because reducing conditions were not maintained in the aquifer as a result of aquifer fluctuations and interactions with the Columbia River, particularly historic flooding after the initial RA activities. The oxidation of CaSx also likely resulted in a reduction of the FSB2 area aquifer pH levels which resulted in increased solubility of zinc compounds (particularly zinc carbonate) that are otherwise relatively insoluble under higher pH conditions (6-7 s.u.) which are typical of pH levels historically measured in non-impacted areas of the site.

The highest zinc concentrations were detected in PZ12 and PZ13 which are located within the extents of FSB2. Following completion of the RA activities, zinc concentrations detected in PZ13 fluctuated significantly between non-detect and 89,000 µg/l and it appeared that the detections correlated well with the presence or absence of residual CaSx (which was evident based on reducing conditions and sulfide detections) in the well. However, during each of the 2013 sampling events, oxidizing conditions were present in the well and these conditions appear to have resulted in an increase in zinc concentrations in the well. A maximum zinc concentration of 749,000 µg/l was detected in PZ13 during May 2013, and zinc was detected at 70,400 µg/l and 208,000 µg/l in the well during August and December 2013, respectively. Zinc was detected in the range of 118,000 µg/l to 175,000 µg/l in PZ12 during the 2013 sampling events.

Outside the extents ofFSB2, zinc concentrations in OW1 increased during the 2013 sampling

from 26,300 µg/l during May to 106,000 µg/l during December. In OW2, zinc was detected at 76,200 µg/l and 77,100 µg/l in May and August, respectively. These detections are similar to zinc concentrations detected in the well during 2012. In December 2013, the zinc concentration in OW2 decreased to 38,100 µg/l. In OW3, zinc was detected at 52,500 µg/l in May before decreasing to 28,800 µg/l and 23,600 µg/l in August and December, respectively. In PZ1, zinc was detected at 85,400 µg/l in May before decreasing to 51,000 µg/l and 44,200 µg/l in August and December, respectively. The range of these concentrations is similar to the range of concentrations detected in PZ1 during 2012.

Dissolved zinc concentrations of 15,300 µg/l, 13,700 µg/l, and 16,900 µg/l were detected in the FSB2 area compliance well AB2 during May, August, and December 2013, respectively. These concentrations are lower than the average of the zinc concentrations detected in the well during 2012; however, they are slightly higher than historical concentrations.

Cadmium was detected at low levels (below the MCL of 50 µg/l) in PZ1, OW1 through OW3, and AB2 during one or more of the 2013 sampling events. The maximum detection of cadmium in these wells was in the May 2013 sample collected from OW2 (2.4 µg/l) Cadmium was also detected below the MCL during each of the 2013 sampling events in the range of 2.9 to 27 µg/l in PZ12.

4.4 Pilot-Scale Injection Evaluation

As discussed in Section 3.0 above, during completion of the pilot-scale injection, field measurements of ground water quality parameters in monitor wells nearby the injection wells did not provide definitive evidence of influence from the injection activities. Based on field high injection flow rates and low backpressures observed during injection of the ferrous sulfate, it appears likely that the ferrous sulfate solution was effectively distributed into the aquifer. Based on the backpressure observed during injection of the insoluble magnesium hydroxide slurry, we believe that distribution of the bulk of the slurry was likely restricted to the vicinity of the injection wells.

4.4.1 Ferrous Sulfate Influence

The results of the 2013 ground water monitoring events provide evidence of influence from the ferrous sulfate injection in the vicinity of OW1 which is located near pilot-scale injection well IW-10. In the May 2013 sample collected from OW1 prior to the pilot-scale injection, iron was detected at a concentration of 193 µg/l. After the injection, iron concentrations of 82,900 µg/l and 52,500 µg/l were detected in the well during August and December 2013, respectively. Sulfate concentrations in the well also increased during this period. Relatively weak oxidizing conditions observed OW1 during August and relatively low pH conditions observed in the well during December may have prevented a larger decrease in the dissolved iron concentrations; however, the decrease between August and December indicates that some oxidation of dissolved iron to relatively insoluble and immobile iron hydroxide likely occurred during the period.

In OW2, which is located downgradient of the pilot-scale injection area, iron was detected at a concentration of 1,090 µg/l in May prior to the injection, then increased to 30,100 µg/l in August, and then was not detected in the well during December. Because ground water quality parameters indicated conditions slightly more favorable for dissolved iron during May than during August, the significant increase in dissolved iron during August provides evidence of influence from the injection. In OW3, iron was detected at concentrations of 21,000 µg/l and 20,300 µg/l in May and August, respectively prior to decreasing to 5,990 µg/l in December. Because ground water quality parameters indicated conditions more favorable for dissolved iron during May than during August, the similarity in the May and August detections in OW3 indicates likely influence from the pilot-scale injection. Iron concentrations in both OW2 and OW3 decreased significantly between August and December, indicating that oxidation of dissolved iron to relatively insoluble and immobile iron hydroxide occurred during the period in both wells.

In PZ12, which is located near pilot-scale injection well IW-8, iron was detected at a concentration of 39,000 µg/l in May prior to the injection, then decreased to 24,700 µg/l and 22,000 µg/l in August and December, respectively. Because ground water quality parameters indicated conditions more favorable for dissolved iron during May than during August and

December, the data do not provide conclusive evidence of influence from the injection. The 2013 sample data do not provide evidence of influence in wells PZ1 and AB2 from injection of the ferrous sulfate solution in the pilot-scale injection wells.

4.4.2 Magnesium Hydroxide Influence

The 2013 ground water pH data indicate that there was a significant increase in pH measured in the pilot-scale injection area monitor wells between May 2013 prior to the pilot-scale injection and August 2013 after the injection. The pH increased from 3.77 to 5.06 in PZ12, from 4.93 to 6.41 in OW1, from 5.13 to 6.55 in OW2, and from 3.37 to 5.06 in OW3 between these sampling events. Smaller pH increases were measured in PZ1 (6.07 to 6.63) and AB2 (6.34 to 6.80). In wells located outside of the pilot-scale injection area, relatively small pH increases were also measured in PZ6 and PZ13 while negligible changes in pH were measured in other sampled wells during the same period. In December 2013, pH in the pilot-scale injection area monitor wells and in PZ6 and PZ13 decreased to levels similar to (or, in some cases lower than) the May pH levels while pH levels in the other wells outside of the pilot-scale injection area remained relatively constant.

It appears the addition of the magnesium hydroxide to the aquifer was at least partially responsible for the increased pH levels in the pilot-scale injection area; however, the decrease in the ground water elevations between the May and August events may have also played a role in the pH changes. It is possible that the ground water elevation decrease may have assisted in distributing the magnesium hydroxide in the area between the May and August events, but such distribution was likely limited due to the relatively low mobility of the magnesium hydroxide slurry emplaced in the aquifer. The decrease in pH levels between August and December at the consistent water elevations between August and December indicates likely dilution or buffering of the available magnesium hydroxide in the area.

4.4.3 Effect on Zinc Concentrations

The 2013 sample data indicate that formation of iron hydroxide and temporary increases in pH

levels occurred as a result of the pilot-scale injection. However, the results do not provide conclusive evidence of a reduction of zinc concentrations as a result of the pilot-scale injection activities. Zinc concentrations decreased in PZ1, OW2, and OW3 which are located nearby or downgradient of the pilot-scale injection area between May (prior to the pilot-scale injection) and December (after the injection). However, zinc concentrations in PZ12 and OW1 (also located in the injection area) increased during this period and remained relatively constant in AB2. It appears that much higher amounts of injectants would be needed to substantially lower zinc concentrations.

5.0 Conclusions and Recommendations

Field observations and ground water sample data indicate that the pilot-scale injection of ferrous sulfate and magnesium hydroxide in a portion of the FSB2 area was likely successful in distributing iron within the aquifer, but distribution of magnesium hydroxide was likely limited and therefore had limited effectiveness in increasing aquifer pH. It is likely that increasing insoluble iron hydroxide in the aquifer has also increased the aquifer's capacity for adsorption and immobilization of dissolved zinc, particularly in the area downgradient of the FSB2 where relatively strong oxidizing conditions exist due to the influence of the Columbia River. Based on observations made during the injection activities, distribution of the insoluble magnesium hydroxide slurry was likely restricted to the vicinity of the injection wells; however, it appears the magnesium hydroxide was at least partially responsible for an increase in pH levels measured in the pilot-scale injection area between May and August 2013.

It appears that increasing aquifer pH is the approach best-suited for reduction of dissolved zinc concentrations in the site's aquifer. As discussed in greater detail in the *Geochemical Evaluation Summary & 2013 Remedial Action Work Plan* (H&H, 2013), dissolved zinc will be converted to relatively insoluble zinc carbonate as pH increases. The calculated solubility of zinc carbonate ($ZnCO_3$) in pure water is shown in the following table:

pH	$ZnCO_3$ Solubility, mg-Zn/l
4	36,600
5	2,603
6	221
7	38
8	6.3

However, due to the interactions of the Columbia River and the site aquifer, the long-term effectiveness of aquifer pH is unknown. During the December 2013 sampling, pH measured in several FSB2 area wells was below 5 and in some cases less than 4.

Based on the limited effectiveness of magnesium hydroxide distribution during the pilot-scale injection, it is apparent that a substantial volume of magnesium hydroxide (or, other suitable chemical) would need to be applied to the subsurface through a high density of injection wells in order to raise the pH of the site aquifer to levels which could effectively reduce ground water concentrations at or below the ground water CUL for zinc based upon protection of surface water at the ground water POCs adjacent to the Columbia River. It is possible that installation of a magnesium hydroxide slurry wall downgradient of the MPA and FSB2 area ground water source zones would be effective in decreasing zinc concentrations at the POCs; however, due to the interaction between the Columbia River and the site aquifer, the long-term effectiveness of such a solution is unknown.

Therefore, at this time, it appears that it may not be practicable to meet the CULs at a point within the groundwater before entering the surface water, within a reasonable restoration time frame. As such, we recommend that Ecology approve a new conditional POC located within surface water in accordance with WAC 173-340-720 (8)(i). We recommend that Clariant and Ecology discuss the potential change in the POC as it may be the most practicable solution for achieving CULs at the site and determine if evaluation of the feasibility of further ground water remediation at the site is warranted.

6.0 References

H&H, 2010. *Removal Action Work Plan,* Former Clariant Corporation Facility, Kalama, Washington. Hart & Hickman, PC. August 6, 2010.

H&H, 2011a. *Remedial Action Report,* Former Clariant Corporation Facility, Kalama, Washington. Hart & Hickman, PC. January 19, 2011.

H&H, 2011b. *Post-Injection Monitoring Report & RAWP Addendum,* Former Clariant Corporation Facility, Kalama, Washington. Hart & Hickman, PC. July 5, 2011.

H&H, 2011c. *Pilot Test Report,* Former Clariant Corporation Facility, Kalama, Washington. Hart & Hickman, PC. October 28, 2011.

H&H, 2011d. *RAWP Addendum Deviation Request,* Clariant Corporation Facility, Kalama, Washington. Hart & Hickman, PC. November 10, 2011.

H&H, 2012. *Additional Remedial Action & Performance Monitoring Report*, Clariant Corporation Facility, Kalama, Washington. Hart & Hickman, PC. October 16, 2012.

H&H, 2012. *Geochemical Evaluation Summary & 2013 Remedial Action Work Plan*, Clariant Corporation Facility, Kalama, Washington. Hart & Hickman, PC. March 25, 2013.

Table 1A
Summary of Site Monitor Well Construction Details
Former Clariant Facility
Kalama, WA
H&H Project No. CLR-045

Well ID	Installation Date	Well Diameter (inches)	Total Depth (ft bgs)	Sceen 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^{o} and 35^{o} angles of installation relative to vertical, respectively.

Table 1B
Summary of Injection & Extraction Well Construction Details
Former Clariant Facility
Kalama, WA
H&H Project No. CLR-045

Well ID	Installation Date	Well Diameter (inches)	Total Depth (ft bgs)	Sceen Interval (ft bgs)
Injection Wells				
IW-1	09/22/10	2	30	20-30
IW-2	09/22/10	2	30	20-30
IW-3	09/24/10	2	30	20-30
IW-4	09/24/10	2	30	20-30
IW-5	09/21/10	2	35	25-35
IW-6	09/21/10	2	35	25-35
IW-7	09/22/10	2	35	23-35
IW-8	09/22/10	2	35	25-35
IW-9	09/24/10	2	35	25-35
IW-10	09/17/10	2	35	25-35
IW-11	09/21/10	2	35	25-35
IW-12	09/21/10	2	35	25-35
IW-13	09/15/10	2	30	20-30
IW-14	09/14/10	2	30	20-30
IW-15	09/13/10	2	30	20-30
IW-16	09/13/10	2	30	20-30
IW-17	09/14/10	2	30	20-30
IW-18	09/14/10	2	30	20-30
IW-19	09/14/10	2	30	20-30
IW-20	09/13/10	2	30	20-30
IW-21	09/15/10	2	35	25-35
IW-22	09/15/10	2	30	20-30
IW-23	09/17/10	2	35	25-35
Extraction Wells				
EW-1	09/26/11	8	35	10-35
EW-2	12/05/11	8	35	10-35
EW-3	12/06/11	8	35	10-35
EW-4	12/06/11	8	35	10-35
EW-5	12/07/11	8	35	10-35
EW-6	12/07/11	8	35	10-35
EW-7	12/05/11	8	35	10-35

Note:
ft bgs = feet below ground surface

Table 2
Summary of Ground Water Elevation Data
Former Clariant Facility
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
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
PZ3	02/04/10	28.47	22.99	5.48	9:19 a.m.	7:39 a.m.	5.47	2.45 p.m.	1.34
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

Table 2
Summary of Ground Water Elevation Data
Former Clariant Facility
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)
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
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
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
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	--	--

Table 2
Summary of Ground Water Elevation Data
Former Clariant Facility
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	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
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
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
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

Table 2
Summary of Ground Water Elevation Data
Former Clariant Facility
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)
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
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
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
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

Table 2
Summary of Ground Water Elevation Data
Former Clariant Facility
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)
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
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
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
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
AB1[3]	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[3]	09/01/10		34.71	2.99	10:27 a.m.	9:42 p.m.	2.62	5.33 a.m.	-0.93
AB1[3]	11/02/10		32.19	4.77	12:03 p.m.	13:15 p.m.	4.42	8:42 a.m.	0.75
AB1[3]	12/20/10		29.08	6.97	11:30 a.m.	--	--	10:09 a.m.	4.25
AB1[3]	12/20/10		28.32	7.50	2:36 p.m.	2:27 p.m.	7.11	--	--

Table 2
Summary of Ground Water Elevation Data
Former Clariant Facility
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[3]	03/21/11		27.65	7.98	4:32 p.m.	--	--	2:15 p.m.	4.77
AB1[3]	03/23/11		27.07	8.39	8:30 a.m.	7:18 a.m.	7.27	--	--
AB1[3]	06/21/11		23.48	10.93	3:36 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39
AB1[3]	06/22/11		23.49	10.92	7:46 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71
AB1[3]	09/23/11		35.19	2.65	8:45 a.m.	--	--	9:06 a.m.	-0.73
AB1[3]	09/28/11		32.64	4.45	3.25 p.m.	5:27 p.m.	4.72	--	--
AB1[3]	01/12/12		31.76	5.07	8:46 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02
AB1[3]	03/20/12		26.52	8.78	9:23 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92
AB1[3]	06/26/12		25.13	9.76	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35
AB1[3]	10/31/12		31.11	5.53	1:45 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67
AB1[3]	05/31/13		28.32	7.50	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80
AB1[3]	08/27/13		32.97	4.22	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01
AB1[3]	12/19/13		32.59	4.49	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69
AB2[3]	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[3]	09/01/10		31.21	2.84	10:30 a.m	9:42 p.m.	2.62	5.33 a.m.	-0.93
AB2[3]	11/02/10		29.56	4.19	11:21 a.m.	13:15 p.m.	4.42	8:42 a.m.	0.75
AB2[3]	12/20/10		26.36	6.82	11:16 a.m.	--	--	10:09 a.m.	4.25
AB2[3]	12/20/10		24.97	7.95	2:26 p.m.	2:27 p.m.	7.11	--	--
AB2[3]	03/21/11		25.20	7.77	3:54 p.m.	--	--	2:15 p.m.	4.77
AB2[3]	03/23/11		24.63	8.23	8:30 a.m.	7:18 a.m.	7.27	--	--
AB2[3]	06/21/11		21.36	10.91	3:21 p.m.	8:48 a.m.	9.36	5:06 p.m.	8.39
AB2[3]	06/22/11		21.35	10.92	8:19 a.m.	9:48 a.m.	9.13	6:54 a.m.	8.71
AB2[3]	09/23/11		31.66	2.47	8:45 a.m.	--	--	9:06 a.m.	-0.73
AB2[3]	09/28/11		29.45	4.28	3.25 p.m.	5:27 p.m.	4.72	--	--
AB2[3]	01/12/12		28.60	4.98	8:25 a.m.	5:57 a.m.	4.01	1:48 p.m.	1.02
AB2[3]	03/20/12		24.03	8.72	9:32 a.m.	4:09 a.m.	7.83	11:24 a.m.	5.92
AB2[3]	06/26/12		22.93	9.63	10:30 a.m.	10:27 p.m.	6.27	5:20 p.m.	3.35
AB2[3]	10/31/12		28.01	5.46	1:23 p.m.	5:42 a.m.	5.17	12:45 p.m.	2.67
AB2[3]	05/31/13		25.56	7.47	1:00 p.m.	5:42 a.m.	10.15	5:00 p.m.	3.80
AB2[3]	08/27/13		29.80	4.00	10:30 a.m.	4:00 p.m.	6.91	8:21 a.m.	2.01
AB2[3]	12/19/13		29.47	4.27	10:00 a.m.	2:39 p.m.	8.48	4:15 a.m.	1.69
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
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

Table 2
Summary of Ground Water Elevation Data
Former Clariant Facility
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)
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
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

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^{o})
AB2 (28.41 - WL COS 35^{o})
ft TOC = feet below top of casing.
CRD = Columbia River Datum.
NM = not measured.
TOC survey data and were obtained from CDM reports or electronic files provided to H&H by Clariant.

Table 3
Summary of Ground Water Zinc and Cadmium Analytical Data
Former Clariant Facility
Kalama, WA
H&H Project No. CLR-045

			Zinc		Cadmium	
			Total	Dissolved	Total	Dissolved
Sample ID	Sample Date	Sample Time	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
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

Table 3
Summary of Ground Water Zinc and Cadmium Analytical Data
Former Clariant Facility
Kalama, WA
H&H Project No. CLR-045

Sample ID	Sample Date	Sample Time	Zinc		Cadmium	
			Total	Dissolved	Total	Dissolved
			µg/L			
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 (HT)	--	620	--	7.7
PZ4	07/13/06	1640 (LT)	--	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
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 B	--	13.4
PZ4	12/19/13	1240	--	1,930	--	12.6
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 (HT)	--	3,390	--	152
PZ5	07/13/06	1658 (LT)	--	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

Table 3
Summary of Ground Water Zinc and Cadmium Analytical Data
Former Clariant Facility
Kalama, WA
H&H Project No. CLR-045

Sample ID	Sample Date	Sample Time	Zinc		Cadmium	
			Total	Dissolved	Total	Dissolved
			µg/L			
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 B	--	<1.0
PZ6	12/19/13	1325	--	4,080	--	<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
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

Table 3
Summary of Ground Water Zinc and Cadmium Analytical Data
Former Clariant Facility
Kalama, WA
H&H Project No. CLR-045

Sample ID	Sample Date	Sample Time	Zinc		Cadmium	
			Total	Dissolved	Total	Dissolved
			µg/L			
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 (HT)	--	630	--	0.3
AB1	07/13/06	1612 (LT)	--	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 B	--	0.4 J
AB1	12/19/13	1045	--	1,380	--	<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
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

Table 3
Summary of Ground Water Zinc and Cadmium Analytical Data
Former Clariant Facility
Kalama, WA
H&H Project No. CLR-045

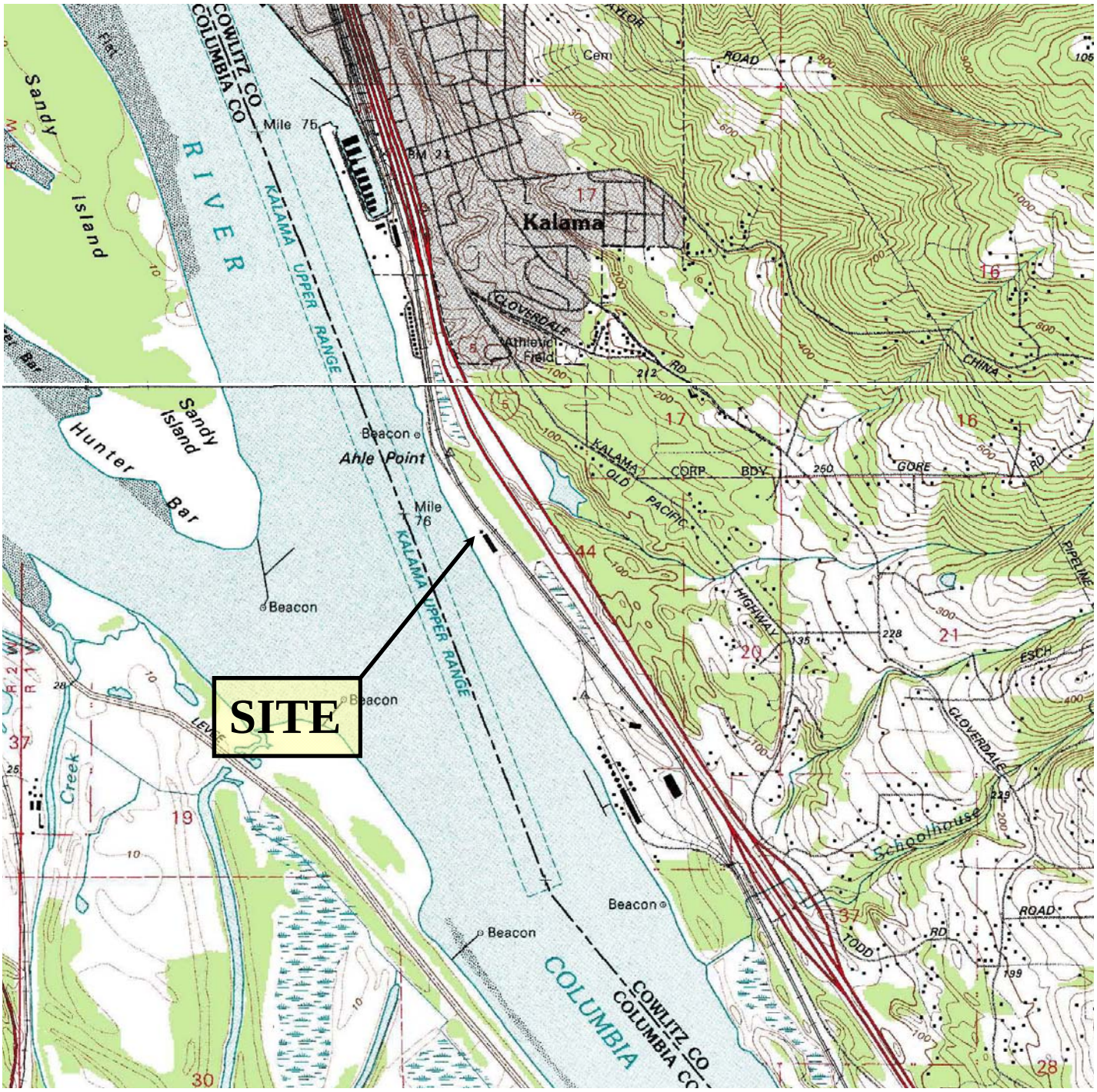
			Zinc		Cadmium	
			Total	Dissolved	Total	Dissolved
Sample ID	Sample Date	Sample Time	µg/L			
OW1	09/23/10	1000	--	15,200	--	<1.0
OW1	11/02/10	1845	--	14,800	--	<1.0
OW1	12/20/10	1545	--	14,600	--	<1.0
OW1	03/22/10	1340	--	12,500	--	<10.0
OW1	06/21/11	1040	--	21,100	--	<10.0
OW1	09/22/11	1305	--	28,600	--	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
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
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

Notes:
Only data for wells used for remedial action performance monitoring are shown
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.
"B" indicates analyte was present in laboratory blank sample
HT - sample collected at high tide, LT - sample collected at low tide

Table 4
Summary of Ground Water Geochemical Analytical and Field Paramater Data
Former Clariant Facility
Kalama, WA
H&H Project No. CLR-045

Well ID	Date Sampled	Zinc	Aluminum	Cadmium	Calcium	Iron	Total Iron*	Ferrous Iron*	Magnesium	Manganese	Potassium	Sodium	Chloride	Sulfate	Alkalinity as Calcium Carbonate	Nitrate + Nitrite as Nitrogen	Orthophosphate as Phosphorus	Sulfide	Silica as Silicon Dioxide	Conductivity (µs/cm)	DO (mg/L)	Ph (s.u.)	ORP (mV)	Turbidity^ (NTU)
		µg/L																						
PZ1	10/31/12	29,900	<100	3.0	4,780	<100	NA	NA	1,780	77.9	<100	10,500	2,010	73,100	18,200	2,260	207	<100	52,800	212	3.60	5.93	190	2.1
	05/30/13	85,400	<100	2.1	57,500	<100	<500*	<500*	12,400	2,000	1,740	16,800	2,210	367,000	22,000	448	<100	<200*	57,500	654	1.44	6.07	151	0.0
	08/28/13	51,000	<100	1.5	29,000	<100	<500*	<500*	6,820 B	438 B	1,780 B	16,400 B	1,790	194,000	20,100	662 B	37.7 J	<5,000	38,900	467	1.00	6.63	239	0.0
	12/20/13	44,200	<1,000	<10	22,000	<1,000	NA	NA	<10,000	377	<10,000	14,700	1,610	67,100	22,300	4,130**	<100	<5,000	50,900	430	2.21	5.89	229	0.0
PZ3	10/31/12	3,530	<100	<1.0	9,740	<100	NA	NA	2,650	<15	1,530	26,800	3,180	98,100	44,200	696	<100	<100	49,500	345	5.03	5.92	178	0.5
	05/30/13	6,240	NA	<1.0	NA	NA	<500*	<500*	NA	NA	NA	NA	NA	NA	NA	NA	NA	<200*	NA	416	2.45	6.53	72	0.0
	08/27/13	4,480	NA	0.7 J	NA	NA	<500*	<500*	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5,000	NA	372	2.82	6.37	184	0.0
	12/19/13	4,570	NA	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5,000	NA	389	2.90	6.69	150	0.0
PZ4	10/31/12	2,770	<100	21.5	7,300	<100	NA	NA	6,070	<15	<1,000	34,900	3,360	129,000	27,300	779	241	<100	57,200	380	1.63	5.23	178	12
	05/30/13	1,720	NA	11.6	NA	NA	500	<500*	NA	NA	NA	NA	NA	NA	NA	NA	NA	<200*	NA	232	1.90	5.89	44	0.0
	08/27/13	1,710 B	NA	13.4	NA	NA	<500*	<500*	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5,000	NA	280	1.21	5.96	206	0.0
	12/19/13	1,930	NA	12.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5,000	NA	224	2.93	6.04	181	0.0
PZ5	10/31/12	141	<100	1.8	5,040	1,360	NA	NA	1,900	208	<1,000	4,440	1,140	17,800	11,500	<100	<100	<100	23,800	89	2.25	5.99	-13	23
	05/30/13	2,110	NA	47.0	NA	NA	1000*	<500*	NA	NA	NA	NA	NA	NA	NA	NA	NA	<200*	NA	211	3.44	6.09	45	1.5
	08/27/13	2,410	NA	94.6	NA	NA	1000*	<500*	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5,000	NA	204	2.27	6.13	149	0.0
	12/19/13	3,480	NA	151	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5,000	NA	226	2.86	6.12	160	0.0
PZ6	11/01/12	6,360	53,700	2.2	116,000	195,000	NA	NA	44,700	4,710	1,150	20,300	5,340	4,720,000	<10,000	<100	<2,000	<100	136,000	2,250	1.94	4.02	158	33
	05/30/13	1,650	NA	<1.0	NA	NA	>10,000*	>10,000*	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5,000	NA	937	0.91	4.63	84	0.0
	08/27/13	565 B	NA	<1.0	NA	NA	>10,000*	>10,000*	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5,000	NA	1,160	0.54	5.46	-21	0.0
	12/19/13	4,080	NA	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5,000	NA	1,111	0.61	4.12	280	0.0
PZ12	11/01/12	68,500	728	1.0	132,000	10,100	NA	NA	10,500	1,440	<1,000	16,400	2,140	687,000	<10,000	275	<100	<100	76,300	1,090	2.06	4.19	254	18
	05/30/13	118,000	8,170	2.9	188,000	39,000	>10,000*	>10,000*	49,700	3,870	1,410	17,900	2,800	1,350,000	<10,000	<200	<100	<200*	99,100	1,690	0.35	3.77	230	0.0
	08/28/13	135,000	32,900	10.9	104,000	24,700	>10,000*	>10,000*	58,700 B	7,120 B	1,240 B	14,900 B	4,110	3,300,000	<10,000	<200	<100	<5,000	42,900	2,150	0.37	5.06	342	0.0
	12/19/13	175,000	39,100	27.0	134,000	22,000	>10,000*	>10,000*	79,400	10,000	<10,000	24,400	3,700	1,490,000	<10,000	2,030**	<100	<5,000	91,500	2,100	0.84	3.43	375	0.0
PZ13	11/01/12	<50	<100	<1.0	82,600	1,640	NA	NA	8,650	192	<1,000	10,100	3,390	194,000	75,800	120	<2,000	3,110	45,200	541	4.27	6.38	-141	360
	05/30/13	749,000	288	<1.0	112,000	2,300	<500*	<500*	93,300	8,260	2,530	<100,000	3,110	2,580,000	27,000	917	<100	<5.000	43,800	2,420	2.84	5.58	109	0.0
	08/28/13	70,400	607	<1.0	66,800	13,600	>10,000*	>10,000*	21,200 B	1,210 B	951 B	10,000 B	4,220	455,000	26,100	163 JB	<100	<5.000	32,500	938	0.34	6.18	111	0.0
	12/19/13	208,000	4,060	<10	36,200	13,800	>10,000*	>10,000*	25,500	1,730	<10,000	11,300	2,380	1,260,000	<10,000	1,580**	<100	<5,000	47,000	2,080	0.73	4.59	231	0.0
AB1	10/31/12	877	<100	<1.0	10,100	<100	NA	NA	2,630	<15	2,000	34,900	2,830	42,400	47,900	557	<100	<100	45,200	319	2.80	6.32	130	3.2
	05/30/13	1,130	NA	<1.0	NA	NA	<500*	<500*	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5.000	NA	389	5.71	6.57	76	0.0
	08/27/13	772 B	NA	0.4 J	NA	NA	<500*	<500*	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5,000	NA	285	7.04	6.71	159	0.1
	12/19/13	1,380	NA	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5,000	NA	236	2.66	6.88	142	0.0
AB2	10/31/12	9,600	<100	<1.0	4,760	<100	NA	NA	1,180	15.5	<1,000	8,990	1,940	12,400	29,800	725	<100	<100	48,700	127	2.82	5.99	166	2.5
	05/30/13	15,300	<100	1.1	11,400	101	<500*	<500*	2,860	<150	1,420	10,700	2,180	53,000	28,100	1,530	<100	<200*	47,600	215	3.52	6.34	116	0.0
	08/27/13	13,700	<100	1.3	7,910	<100	<500*	<500*	2,090 B	3.5 JB	1,440 B	10,100 B	1,840	42,100	23,700	1,400 B	33 J	<5,000	35,600	180	4.98	6.80	220	0.0
	12/20/13	16,900	<1,000	<10	<10,000	<1,000	<500*	<500*	<10,000	<150	<10,000	11,000	1,540	61,200	28,000	3,820**	<100	<5,000	55,600	237	1.35	5.97	197	0.0
OW1	10/31/12	22,200	<100	<1.0	154,000	808	NA	NA	2,830	881	<1,000	13,300	2,080	525,000	32,800	<100	<100	<100	40,600	706	3.82	6.28	95	9.1
	05/30/13	26,300	350	1.4	66,600	193	100*	<500*	17,000	876	2,170	13,300	1,940	318,000	<10,000	1,810	<100	<5,000	52,500	813	4.57	4.93	48	0.0
	08/28/13	68,100	<100	<1.0	131,000	82,900	>10,000*	>10,000*	62,100 B	7,850 B	1,610 B	19,400 B	2,770	1,190,000	16,900	<200	53.3 J	<5,000	<100,000	1,450	0.34	6.41	59	1.5
	12/20/13	106,000	<1,000	<10	105,000	52,500	>10,000*	>10,000*	46,600	6,270	<10,000	19,000	2,190	697,000	<10,000	767**	<100	<5,000	76,900	826	0.50	4.76	233	0.0
OW2	10/31/12	71,800	<100	<1.0	104,000	<100	NA	NA	9,200	2,750	<1,000	12,100	2,770	508,000	14,900	<100	<100	<100	52,800	861	3.60	6.12	134	6.0
	05/30/13	76,200	144	2.4	118,000	1,090	>10,000*	6000*	28,400	6,070	1,670	1,980	2,240	752,000	<10,000	790	<100	<5,000	54,400	1,450	0.40	5.13	83	5.0
	08/28/13	77,100	<100	0.2 J	131,000	30,100	>10,000*	>10,000*	36,300 B	6,700 B	1,530 B	18,000 B	2,280	756,000	15,100	89.9 JB	<100	<5,000	89,500	884	0.55	6.55	98	2.0
	12/20/13	38,100	<1,000	<10	43,800	<1,000	<500*	<500*	12,900	1,880	<10,000	14,200	1,600	265,000	12,900	2,300**	<100	<5,000	57,800	600	2.68	5.60	263	0.0
OW3	10/31/12	10,800	498	3.5	87,000	804	NA	NA	6,030	1,680	1,480	14,200	1,880	426,000	<10,000	578	<100	<100	55,900	643	2.82	4.28	315	12
	05/30/13	52,500	1,270	<1.0	105,000	21,000	>10,000*	>10,000*	40,500	6,050	250,000	16,900	2,250	743,000	<10,000	569	<100	<5,000	70,600	1,220	0.78	3.37	297	0.0
	08/28/13	28,800	1,470	0.6 J	77,400	20,300	>10,000*	>10,000*	44,700 B	7,200 B	2,200 B	17,100 B	2,330	830,000	<10,000	148 JB	23 J	<5,000	51,000	1,230	0.40	5.06	371	0.0
	12/20/13	23,600	2,540	<10	59,100	5,990	>10,000*	8000*	42,800	5,170	<10,000	16,800	2,680	584,000	<10,000	5,900**	<100	<5,000	75,800	1,180	1.98	3.11	467	0.0
River	11/01/12	<50	<100	<1.0	11,200	121	NA	NA	3,260	157	<1,000	4,480	2,550	6,980	41,800	220	<100	<100	12,000	105	9.5	6.56	80	10

Notes:
metals samples were field filtered using a 0.45 micron filter prior to collection
µs/cm - microsiemens per centimeter
DO = dissolved oxygen; ORP - oxidation reduction potential, mV - millivolts
NTU - Nephelometric turbidity units; NA = not analyzed
^Turbidity values were collected prior to field filtering
*Concentration was measured during sampling with a field kit. All Ferrous Iron concentrations were field measured.
** Analytical data for nitrate as NO_3 since nitrate + nitrite as N not reported
"J" indicates result is less than laboratory reporting limit, but greater than or equal to the minimum detection limit and the concentration is approximate.
"B" indicates analyte was present in laboratory blank sample



N

APPROXIMATE

0 2,000 4,000

SCALE IN FEET

U.S.G.S. QUADRANGLE MAP

DEER ISLAND & KALAMA, WA 7.5 MIN. TOPOGRAPHIC QUADRANGLES

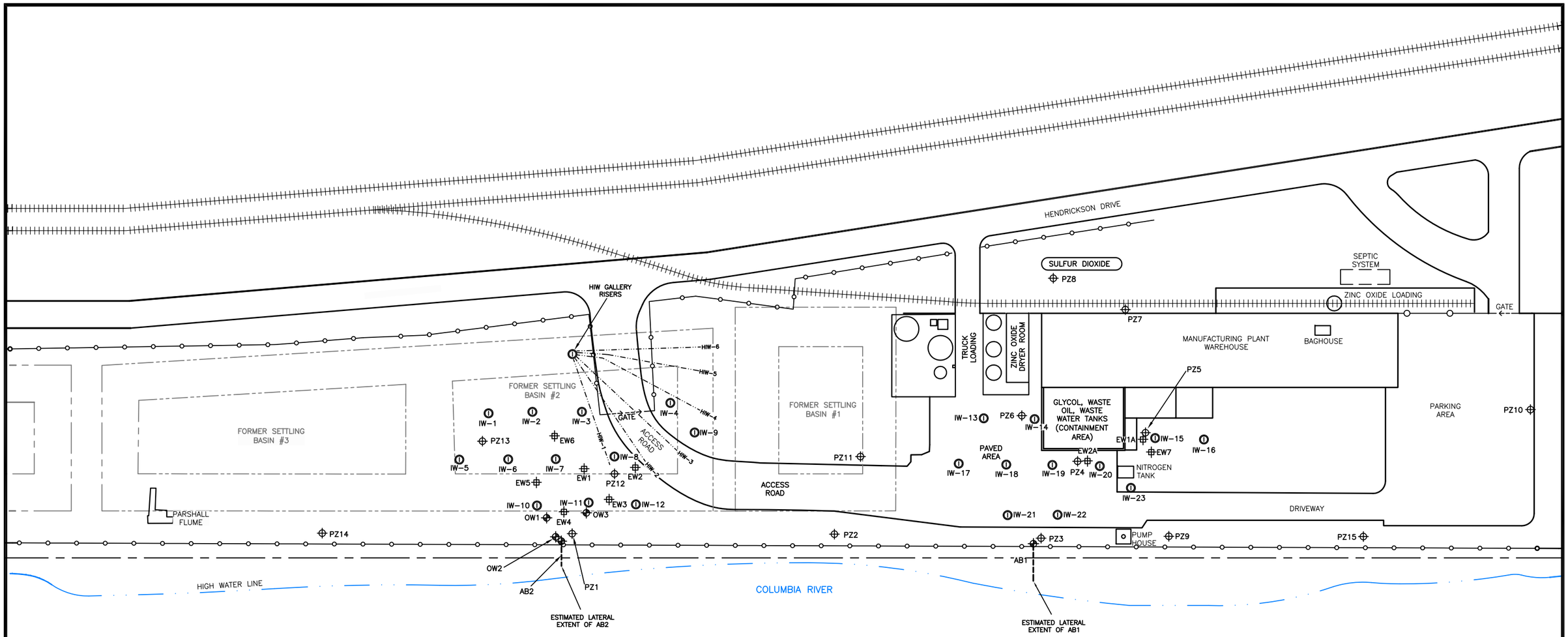
QUADRANGLE
7.5 MINUTE SERIES (TOPOGRAPHIC)

TITLE	SITE LOCATION MAP
PROJECT	CLARIANT CORPORATION KALAMA, WASHINGTON

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

2923 South Tryon Street – Suite 100
Charlotte, North Carolina 28203
704-586-0007 (p) 704-586-0373 (f)

DATE:	09-18-12	REVISION NO:	0
JOB NO:	CLR-045	FIGURE NO:	1



LEGEND:

- PROPERTY LINE
- FENCE LINE
- RAILROAD TRACK
- EAST EDGE OF COLUMBIA RIVER
- EXTENT OF FORMER SETTLING BASIN
- SUBSURFACE EXTENT OF HORIZONTAL INJECTION WELL
- MONITORING/OBSERVATION WELL
- PIEZOMETER
- INJECTION WELL
- EXTRACTION WELL

APPROXIMATE
0 80 160
SCALE IN FEET

NOTES
1. MAP BASED ON CDM SITE PLAN PROVIDED TO HART & HICKMAN BY CLARIANT CORPORATION.
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.

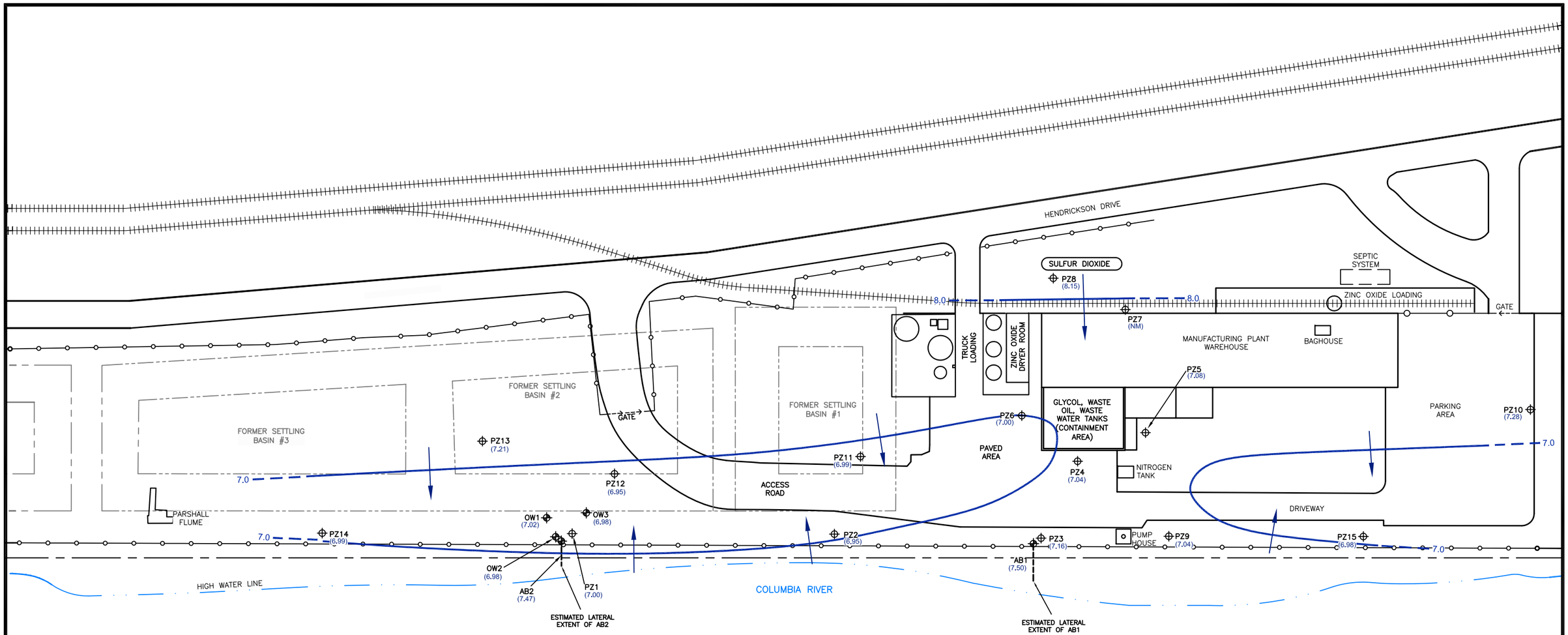
TITLE
SITE MAP

PROJECT
CLARIANT - KALAMA SITE
404 HENDRICKSON DRIVE
KALAMA, WASHINGTON

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
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: 04/29/14	REVISION NO. 0
JOB NO. CLR-045	FIGURE NO. 2

S:\AAA-Master Projects\Clariant - CLR\CLR-045 Kalama, WA RA\2013 Work\Pilot Inj Rpt\Figures.dwg, FIG.2, 4/30/2014 8:20:43 AM, sthury



LEGEND:

- PROPERTY LINE
- FENCE LINE
- RAILROAD TRACK
- EAST EDGE OF COLUMBIA RIVER
- EXTENT OF FORMER SETTLING BASIN
- MONITORING/OBSERVATION WELL
- PIEZOMETER
- (7.00) GROUND WATER ELEVATION (FT CRD)
- 7.0 GROUND WATER ELEVATION CONTOUR IN FT CRD (DASHING INDICATES EXTRAPOLATED CONTOUR)
- INFERRED GROUND WATER FLOW DIRECTION

NOTES
1. 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.

APPROXIMATE
0 80 160
SCALE IN FEET

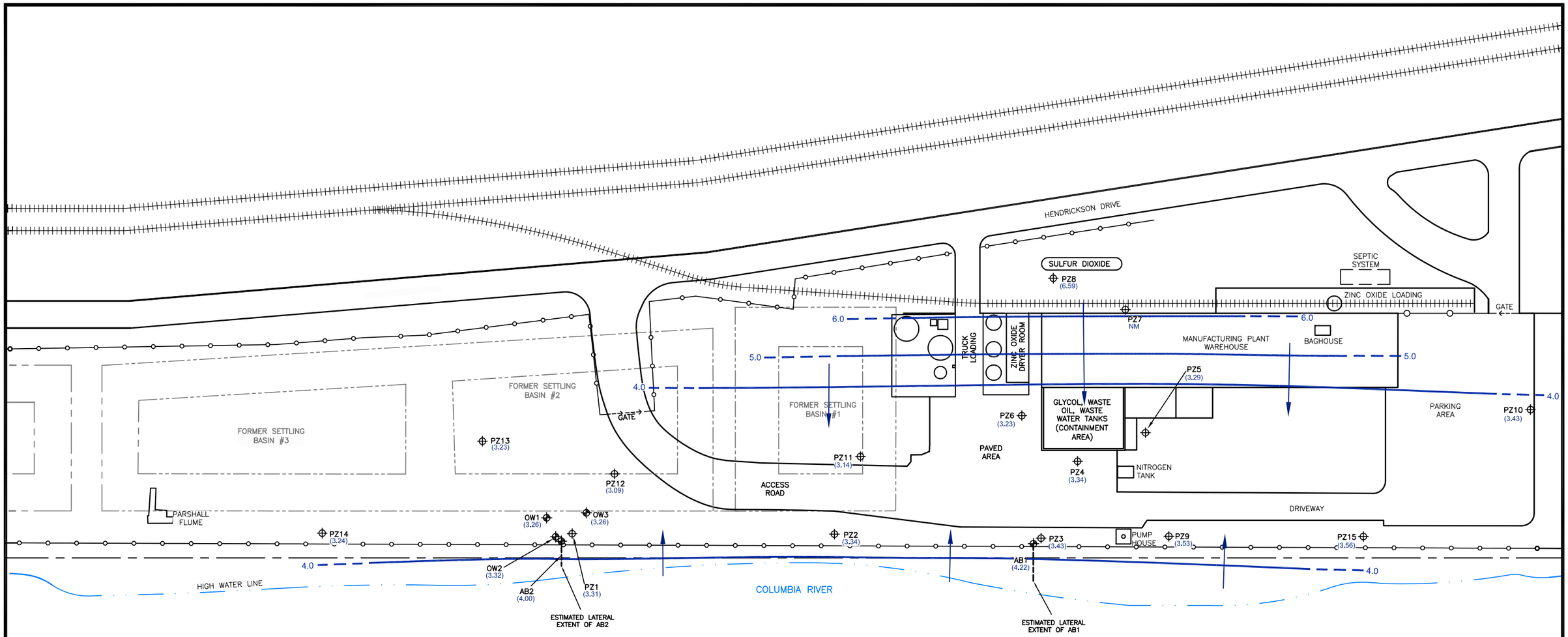
TITLE: GROUND WATER ELEVATION CONTOUR MAP MAY 31, 2013

PROJECT: CLARIANT - KALAMA SITE
404 HENDRICKSON DRIVE
KALAMA, WASHINGTON

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
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: 04/29/14	REVISION NO. 0
JOB NO. CLR–045	FIGURE NO. 3A

S:\AAA-Master Projects\Clariant - CLR\CLR-045 Kalama, WA RA\2013 Work\Pilot Inj Rpt\Figures.dwg, FIG.3A, 5/24/2014 3:34:13 PM, sdrury



LEGEND:

- PROPERTY LINE
- FENCE LINE
- RAILROAD TRACK
- EAST EDGE OF COLUMBIA RIVER
- EXTENT OF FORMER SETTLING BASIN
- MONITORING/OBSERVATION WELL
- PIEZOMETER
- (3.31) GROUND WATER ELEVATION (FT CRD)
- NM NOT MEASURED
- 4.0 GROUND WATER ELEVATION CONTOUR IN FT CRD (DASHING INDICATES EXTRAPOLATED CONTOUR)
- INFERRED GROUND WATER FLOW DIRECTION

NOTES
1. 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.
2. PZ6 AND PZ7 WERE OBSTRUCTED AT THE TIME THAT SITEWIDE GROUND WATER ELEVATION MEASUREMENTS WERE COLLECTED DURING THE JANUARY 12, 2012 SAMPLING EVENT.

APPROXIMATE
0 80 160
SCALE IN FEET

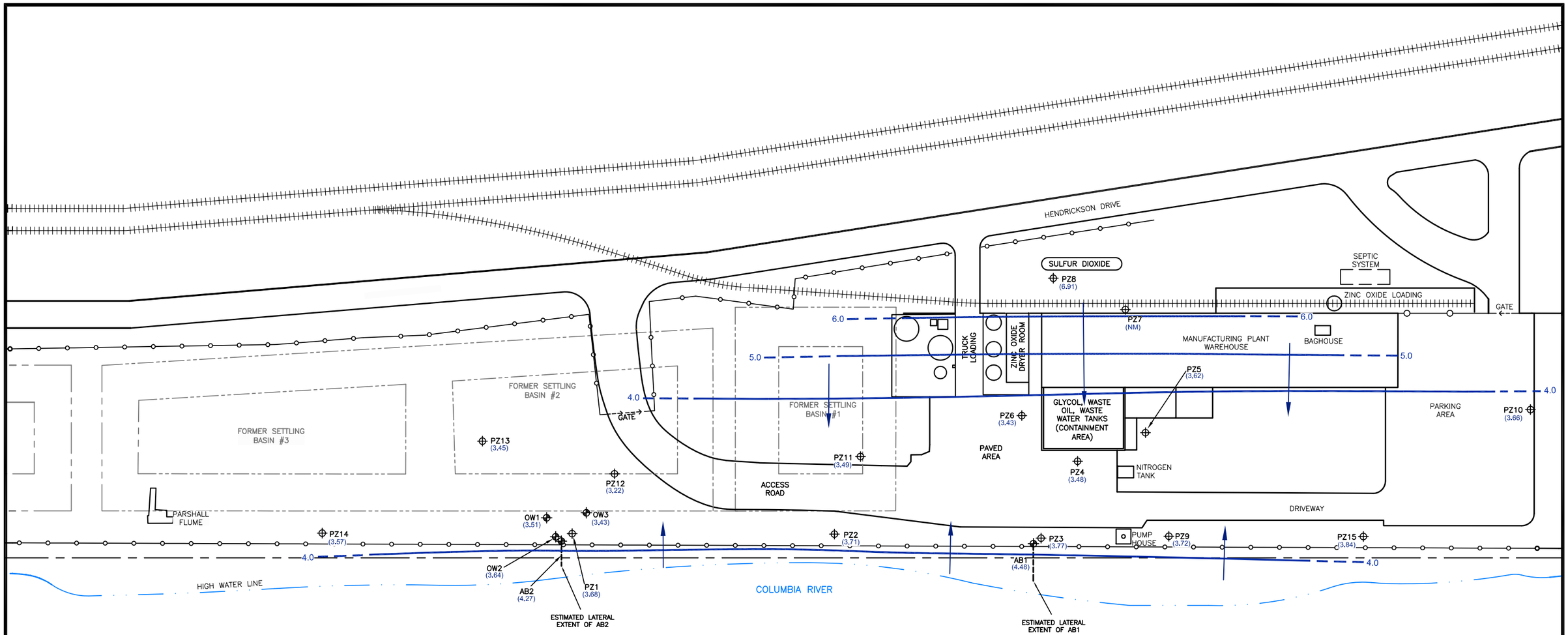
TITLE
GROUND WATER ELEVATION CONTOUR MAP AUGUST 27, 2013

PROJECT
CLARIANT - KALAMA SITE
404 HENDRICKSON DRIVE
KALAMA, WASHINGTON

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
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: 04/29/14	REVISION NO. 0
JOB NO. CLR–045	FIGURE NO. 3B

S:\AAA-Master Projects\Clariant - CLR\CLR-045 Kalama, WA RA\2013 Work\Pilot Inj Rpt\Figures.dwg, FIG.3B, 4/30/2014 4:24:09 PM, sdrury



LEGEND:

- PROPERTY LINE
- FENCE LINE
- RAILROAD TRACK
- EAST EDGE OF COLUMBIA RIVER
- EXTENT OF FORMER SETTLING BASIN
- MONITORING/OBSERVATION WELL
- PIEZOMETER
- (3.68) GROUND WATER ELEVATION (FT CRD)
- 4.0 GROUND WATER ELEVATION CONTOUR IN FT CRD (DASHING INDICATES EXTRAPOLATED CONTOUR)
- INFERRED GROUND WATER FLOW DIRECTION

NOTES
1. 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.

APPROXIMATE
0 80 160
SCALE IN FEET

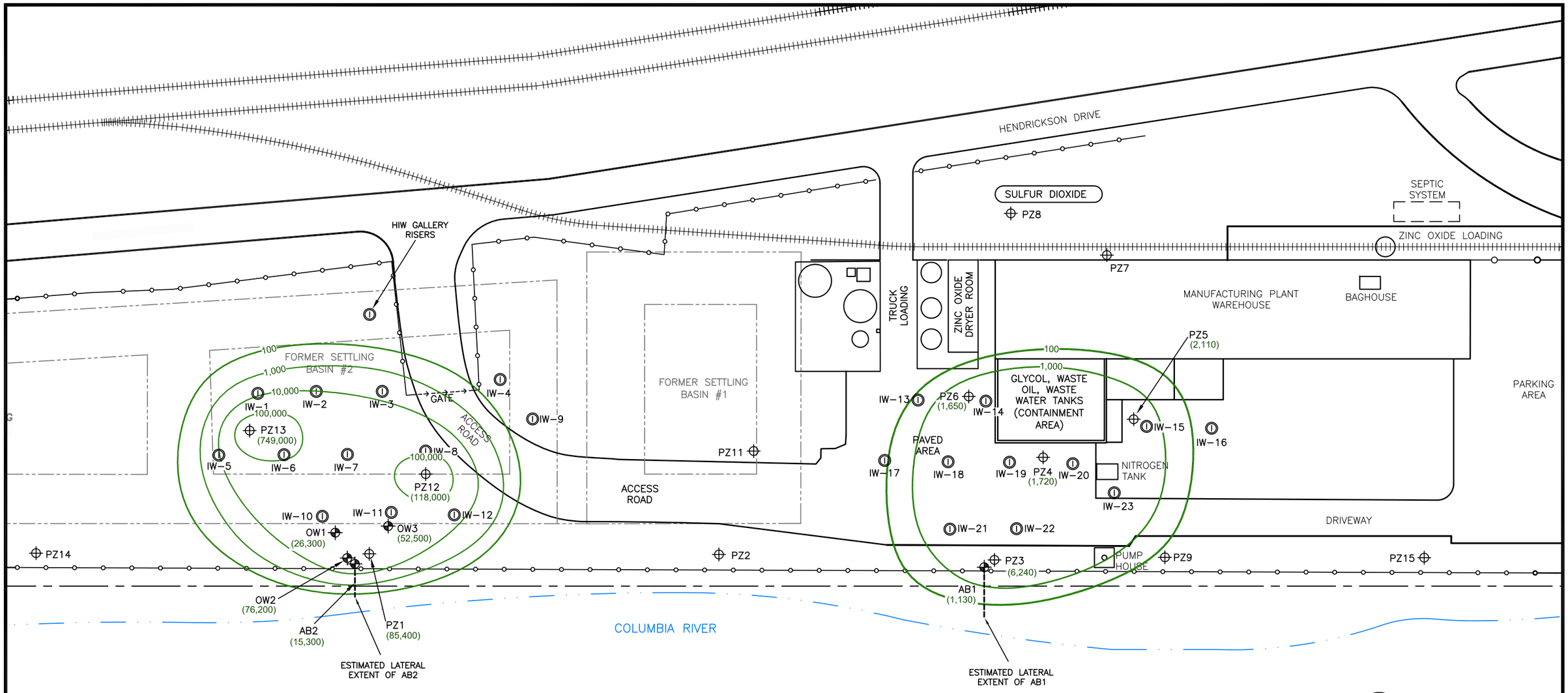
TITLE: GROUND WATER ELEVATION CONTOUR MAP DECEMBER 19, 2013

PROJECT: CLARIANT - KALAMA SITE
404 HENDRICKSON DRIVE
KALAMA, WASHINGTON

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
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: 04/29/14	REVISION NO. 0
JOB NO. CLR-045	FIGURE NO. 3C

S:\AAA-Master Projects\Clariant - CLR\CLR-045 Kalama, WA RA\2013 Work\Pilot Inj Rpt\Figures.dwg, FIG.3C, 4/30/2014 4:24:31 PM, sdrury



LEGEND:

- PROPERTY LINE
- FENCE LINE
- RAILROAD TRACK
- EAST EDGE OF COLUMBIA RIVER
- EXTENT OF FORMER SETTLING BASIN
- MONITORING/OBSERVATION WELL
- PIEZOMETER
- INJECTION WELL
- (1,130) MAY 30, 2013 ZINC CONCENTRATION (µg/L)
- 1,000 ZINC ISOCONCENTRATION CONTOUR IN µg/L

NOTES
1. HISTORICAL GROUND WATER SAMPLE DATA USED TO AID IN CONTOURING.
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 INDICATE THE ESTIMATED LATERAL EXTENT OF EACH WELL IN THAT DIRECTION.

APPROXIMATE
0 60 120
SCALE IN FEET

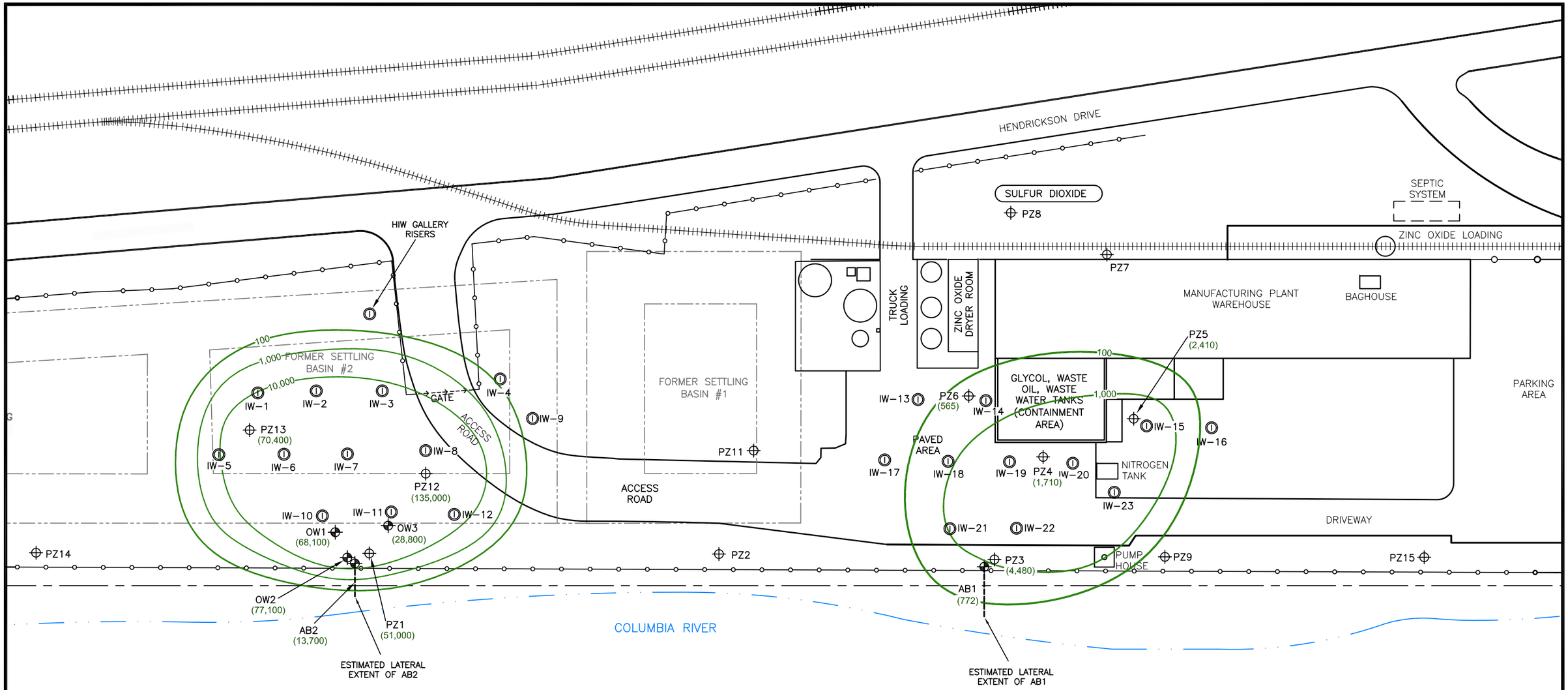
TITLE
MAY 30, 2013
ZINC ISOCONENTRATION MAP

PROJECT
CLARIANT - KALAMA SITE
404 HENDRICKSON DRIVE
KALAMA, WASHINGTON

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
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: 04/21/14	REVISION NO. 0
JOB NO. CLR-045	FIGURE NO. 4A

S:\AAA-Master Projects\Clariant - CLR\CLR-045 Kalama, WA RA\2013 Work\Pilot Inj Rpt\Figures.dwg, FIG.4A, 4/30/2014 4:25:00 PM, sfruiy



LEGEND:

- PROPERTY LINE
- FENCE LINE
- RAILROAD TRACK
- EAST EDGE OF COLUMBIA RIVER
- EXTENT OF FORMER SETTLING BASIN
- MONITORING/OBSERVATION WELL
- PIEZOMETER
- INJECTION WELL
- EXTRACTION WELL
- (772) AUGUST 27–28, 2013 ZINC CONCENTRATION (µg/L)
- 1,000 ZINC ISOCONCENTRATION CONTOUR IN µg/L

NOTES
1. HISTORICAL GROUND WATER SAMPLE DATA USED TO AID IN CONTOURING.
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 INDICATE THE ESTIMATED LATERAL EXTENT OF EACH WELL IN THAT DIRECTION.

APPROXIMATE
0 60 120
SCALE IN FEET

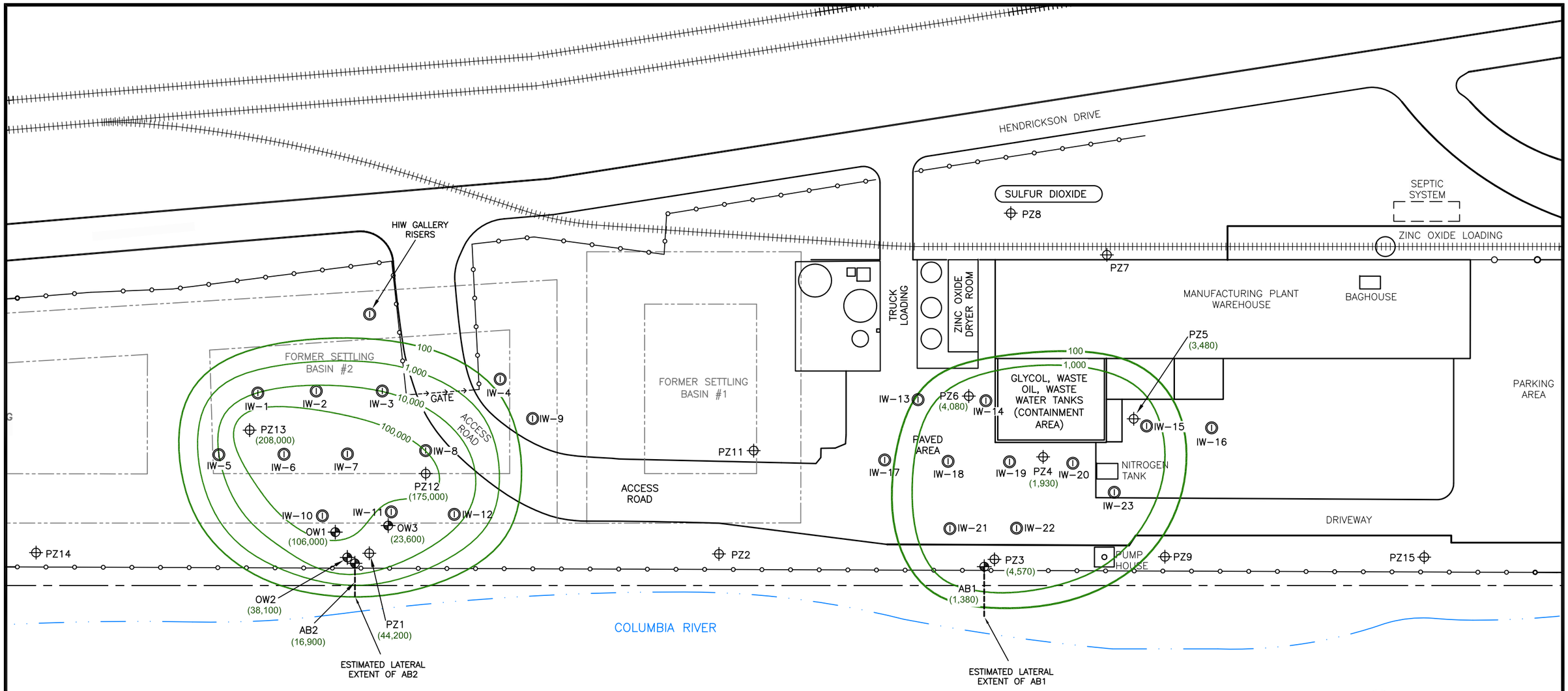
TITLE
AUGUST 27 - 28, 2013
ZINC ISOCONENTRATION MAP

PROJECT
CLARIANT - KALAMA SITE
404 HENDRICKSON DRIVE
KALAMA, WASHINGTON

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
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: 04/21/14	REVISION NO. 0
JOB NO. CLR–045	FIGURE NO. 4B

S:\AAA-Master Projects\Clariant - CLR\CLR-045 Kalama, WA RA\2013 Work\Pilot Inj Rpt\Figures.dwg, FIG-4B, 4/30/2014 4:25:20 PM, sdrury



LEGEND:

- PROPERTY LINE
- FENCE LINE
- RAILROAD TRACK
- EAST EDGE OF COLUMBIA RIVER
- EXTENT OF FORMER SETTLING BASIN
- MONITORING/OBSERVATION WELL
- PIEZOMETER
- INJECTION WELL
- EXTRACTION WELL
- (1,380) DECEMBER 19–20, 2013 ZINC CONCENTRATION (µg/L)
- 1,000 ZINC ISOCONCENTRATION CONTOUR IN µg/L

NOTES
1. HISTORICAL GROUND WATER SAMPLE DATA USED TO AID IN CONTOURING.
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 INDICATE THE ESTIMATED LATERAL EXTENT OF EACH WELL IN THAT DIRECTION.

APPROXIMATE
0 60 120
SCALE IN FEET

TITLE
DECEMBER 19 - 20, 2013
ZINC ISOCONENTRATION MAP

PROJECT
CLARIANT - KALAMA SITE
404 HENDRICKSON DRIVE
KALAMA, WASHINGTON

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
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: 04/21/14 | REVISION NO. 0
JOB NO. CLR–045 | FIGURE NO. 4C

S:\AAA-Master Projects\Clariant - CLR\CLR-045 Kalama, WA RA\2013 Work\Pilot Inj Rpt\Figures.dwg, FIG.4C, 4/30/2014 4:25:41 PM, sdrury

Appendix A

Photographs

Photograph 1: Injection equipment and materials

Photograph 2: Injection equipment and materials

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
2923 South Tryon Street – Suite 100
Charlotte, North Carolina 28203
704-586-0007 (p) 704-586-0373 (f)

Photograph 3: Injection into IW-8

Photograph 4: Injection into IW-12

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
2923 South Tryon Street – Suite 100
Charlotte, North Carolina 28203
704-586-0007 (p) 704-586-0373 (f)

Appendix B
Laboratory Analytical Data 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: 490-27744-1
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

Authorized for release by:
4/30/2014 12:28:49 PM

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

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.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.

Table of Contents

Sample Summary

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-27744-1	PZ1	Water	05/30/13 09:20	05/31/13 08:15
490-27744-2	AB2	Water	05/30/13 10:05	05/31/13 08:15
490-27744-3	OW1	Water	05/30/13 10:40	05/31/13 08:15
490-27744-4	OW2	Water	05/30/13 10:55	05/31/13 08:15
490-27744-5	OW3	Water	05/30/13 11:15	05/31/13 08:15
490-27744-6	PZ12	Water	05/30/13 12:55	05/31/13 08:15
490-27744-7	PZ13	Water	05/30/13 13:30	05/31/13 08:15
490-27744-8	AB1	Water	05/30/13 14:35	05/31/13 08:15
490-27744-9	PZ3	Water	05/30/13 15:05	05/31/13 08:15
490-27744-10	PZ6	Water	05/30/13 15:25	05/31/13 08:15
490-27744-11	PZ4	Water	05/30/13 15:45	05/31/13 08:15
490-27744-12	PZ5	Water	05/30/13 16:05	05/31/13 08:15

Job ID: 490-27744-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-27744-1

REVISED REPORT: Revised to change the client sample id for lab sample id **490-27744-12** from **PZ6** as listed on the COC to **PZ5** at client's request. This report replaces the one generated on 06/07/13 @ 1239.

Comments
No additional comments.

Receipt
The samples were received on 5/31/2013 8:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.3º C.

HPLC
No analytical or quality issues were noted.

Metals
Method(s) 6010C: The serial dilution performed for the following sample(s) associated with batch 83438 was outside control limits for Zinc. (490-27720-1 SD)

No other analytical or quality issues were noted.

General Chemistry
Method(s) SM 2320B: The following samples in batch 83649 had an initial pH below endpoint for total Alkalinity analysis: OW3 (490-27744-5), PZ12 (490-27744-6).

Method(s) SM 2320B: The following sample in batch 83649 had an initial pH below endpoint for total Alkalinity analysis: OW1 (490-27744-3).

No other analytical or quality issues were noted.

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
E	Result exceeded calibration range.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Client Sample ID: PZ1
Date Collected: 05/30/13 09:20
Date Received: 05/31/13 08:15

Lab Sample ID: 490-27744-1
Matrix: Water

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**2.21**		1.00		mg/L			05/31/13 14:21	1
Sulfate	**367**		10.0		mg/L			06/03/13 14:47	10
Nitrate Nitrite as N	**0.448**		0.200		mg/L			05/31/13 14:21	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.100		mg/L		06/03/13 08:41	06/04/13 01:04	1
Cadmium	**0.00210**		0.00100		mg/L		06/03/13 08:41	06/04/13 01:04	1
Calcium	**57.5**		10.0		mg/L		06/03/13 08:41	06/05/13 14:47	10
Iron	ND		0.100		mg/L		06/03/13 08:41	06/04/13 01:04	1
Lead	ND		0.00500		mg/L		06/03/13 08:41	06/04/13 01:04	1
Magnesium	**12.4**		1.00		mg/L		06/03/13 08:41	06/04/13 01:04	1
Manganese	**2.00**		0.0150		mg/L		06/03/13 08:41	06/04/13 01:04	1
Potassium	**1.74**		1.00		mg/L		06/03/13 08:41	06/04/13 01:04	1
Sodium	**16.8**		1.00		mg/L		06/03/13 08:41	06/04/13 01:04	1
Zinc	**85.4**		5.00		mg/L		06/03/13 08:41	06/05/13 14:51	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**22.0**		10.0		mg/L			06/01/13 13:08	1
Orthophosphate as P	ND		0.100		mg/L			05/31/13 17:40	1
Silica	**57.5**		1.00		mg/L			06/04/13 15:00	1

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Client Sample ID: AB2
Date Collected: 05/30/13 10:05
Date Received: 05/31/13 08:15

Lab Sample ID: 490-27744-2
Matrix: Water

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**2.18**		1.00		mg/L			05/31/13 14:40	1
Sulfate	**53.0**		1.00		mg/L			05/31/13 14:40	1
Nitrate Nitrite as N	**1.53**		0.200		mg/L			05/31/13 14:40	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.100		mg/L		06/03/13 08:41	06/04/13 01:07	1
Cadmium	**0.00110**		0.00100		mg/L		06/03/13 08:41	06/04/13 01:07	1
Calcium	**11.4**		10.0		mg/L		06/03/13 08:41	06/05/13 14:55	10
Iron	**0.101**		0.100		mg/L		06/03/13 08:41	06/04/13 01:07	1
Lead	ND		0.00500		mg/L		06/03/13 08:41	06/04/13 01:07	1
Magnesium	**2.86**		1.00		mg/L		06/03/13 08:41	06/04/13 01:07	1
Manganese	ND		0.0150		mg/L		06/03/13 08:41	06/04/13 01:07	1
Potassium	**1.42**		1.00		mg/L		06/03/13 08:41	06/04/13 01:07	1
Sodium	**10.7**		1.00		mg/L		06/03/13 08:41	06/04/13 01:07	1
Zinc	**15.3**		0.500		mg/L		06/03/13 08:41	06/05/13 14:55	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**28.1**		10.0		mg/L			06/01/13 13:22	1
Orthophosphate as P	ND		0.100		mg/L			05/31/13 17:40	1
Silica	**47.6**		1.00		mg/L			06/04/13 15:00	1

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Client Sample ID: OW1
Date Collected: 05/30/13 10:40
Date Received: 05/31/13 08:15

Lab Sample ID: 490-27744-3
Matrix: Water

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.94		1.00		mg/L			05/31/13 14:59	1
Sulfate	318		10.0		mg/L			06/03/13 15:06	10
Nitrate Nitrite as N	1.81		0.200		mg/L			05/31/13 14:59	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	0.350		0.100		mg/L		06/03/13 08:41	06/04/13 01:11	1
Cadmium	0.00140		0.00100		mg/L		06/03/13 08:41	06/04/13 01:11	1
Calcium	66.6		10.0		mg/L		06/03/13 08:41	06/05/13 15:10	10
Iron	0.193		0.100		mg/L		06/03/13 08:41	06/04/13 01:11	1
Lead	ND		0.00500		mg/L		06/03/13 08:41	06/04/13 01:11	1
Magnesium	17.0		1.00		mg/L		06/03/13 08:41	06/04/13 01:11	1
Manganese	0.876		0.0150		mg/L		06/03/13 08:41	06/04/13 01:11	1
Potassium	2.17		1.00		mg/L		06/03/13 08:41	06/04/13 01:11	1
Sodium	13.3		1.00		mg/L		06/03/13 08:41	06/04/13 01:11	1
Zinc	26.3		5.00		mg/L		06/03/13 08:41	06/05/13 15:13	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00		mg/L		06/04/13 13:00	06/04/13 15:00	1
Alkalinity	ND		10.0		mg/L			06/01/13 13:26	1
Orthophosphate as P	ND		0.100		mg/L			05/31/13 17:40	1
Silica	52.5		1.00		mg/L			06/04/13 15:00	1

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Client Sample ID: OW2
Date Collected: 05/30/13 10:55
Date Received: 05/31/13 08:15

Lab Sample ID: 490-27744-4
Matrix: Water

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.24		1.00		mg/L			05/31/13 15:18	1
Sulfate	752		10.0		mg/L			06/03/13 16:04	10
Nitrate Nitrite as N	0.790		0.200		mg/L			05/31/13 15:18	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	0.144		0.100		mg/L		06/03/13 08:41	06/04/13 01:14	1
Cadmium	0.00240		0.00100		mg/L		06/03/13 08:41	06/04/13 01:14	1
Calcium	118		10.0		mg/L		06/03/13 08:41	06/05/13 15:17	10
Iron	1.09		0.100		mg/L		06/03/13 08:41	06/04/13 01:14	1
Lead	ND		0.00500		mg/L		06/03/13 08:41	06/04/13 01:14	1
Magnesium	28.4		1.00		mg/L		06/03/13 08:41	06/04/13 01:14	1
Manganese	6.07		0.0150		mg/L		06/03/13 08:41	06/04/13 01:14	1
Potassium	1.67		1.00		mg/L		06/03/13 08:41	06/04/13 01:14	1
Sodium	19.8		1.00		mg/L		06/03/13 08:41	06/04/13 01:14	1
Zinc	76.2		5.00		mg/L		06/03/13 08:41	06/05/13 15:20	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00		mg/L		06/04/13 13:00	06/04/13 15:00	1
Alkalinity	ND		10.0		mg/L			06/01/13 13:30	1
Orthophosphate as P	ND		0.100		mg/L			05/31/13 17:40	1
Silica	54.4		1.00		mg/L			06/04/13 15:00	1

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Client Sample ID: OW3
Date Collected: 05/30/13 11:15
Date Received: 05/31/13 08:15

Lab Sample ID: 490-27744-5
Matrix: Water

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.25		1.00		mg/L			05/31/13 15:37	1
Sulfate	743		20.0		mg/L			06/03/13 16:23	20
Nitrate Nitrite as N	0.569		0.200		mg/L			05/31/13 15:37	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1.27		0.100		mg/L		06/03/13 08:41	06/04/13 01:18	1
Cadmium	ND		0.00100		mg/L		06/03/13 08:41	06/04/13 01:18	1
Calcium	105		10.0		mg/L		06/03/13 08:41	06/05/13 15:24	10
Iron	21.0		0.100		mg/L		06/03/13 08:41	06/04/13 01:18	1
Lead	ND		0.00500		mg/L		06/03/13 08:41	06/04/13 01:18	1
Magnesium	40.5		1.00		mg/L		06/03/13 08:41	06/04/13 01:18	1
Manganese	6.05		0.0150		mg/L		06/03/13 08:41	06/04/13 01:18	1
Potassium	2.50		1.00		mg/L		06/03/13 08:41	06/04/13 01:18	1
Sodium	16.9		1.00		mg/L		06/03/13 08:41	06/04/13 01:18	1
Zinc	52.5		5.00		mg/L		06/03/13 08:41	06/05/13 15:28	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00		mg/L		06/04/13 13:00	06/04/13 15:00	1
Alkalinity	ND		10.0		mg/L			06/01/13 13:33	1
Orthophosphate as P	ND		0.100		mg/L			05/31/13 17:40	1
Silica	70.6		1.00		mg/L			06/04/13 15:00	1

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Client Sample ID: PZ12
Date Collected: 05/30/13 12:55
Date Received: 05/31/13 08:15

Lab Sample ID: 490-27744-6
Matrix: Water

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**2.80**		1.00		mg/L			05/31/13 15:56	1
Sulfate	**1350**		20.0		mg/L			06/03/13 16:42	20
Nitrate Nitrite as N	ND		0.200		mg/L			05/31/13 15:56	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**8.17**		0.100		mg/L		06/03/13 08:41	06/04/13 01:22	1
Cadmium	**0.00290**		0.00100		mg/L		06/03/13 08:41	06/04/13 01:22	1
Calcium	**188**		10.0		mg/L		06/03/13 08:41	06/05/13 15:31	10
Iron	**39.0**		0.100		mg/L		06/03/13 08:41	06/04/13 01:22	1
Lead	ND		0.00500		mg/L		06/03/13 08:41	06/04/13 01:22	1
Magnesium	**49.7**		1.00		mg/L		06/03/13 08:41	06/04/13 01:22	1
Manganese	**3.87**		0.0150		mg/L		06/03/13 08:41	06/04/13 01:22	1
Potassium	**1.41**		1.00		mg/L		06/03/13 08:41	06/04/13 01:22	1
Sodium	**17.9**		1.00		mg/L		06/03/13 08:41	06/04/13 01:22	1
Zinc	**118**		5.00		mg/L		06/03/13 08:41	06/05/13 15:35	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00		mg/L		06/04/13 13:00	06/04/13 15:00	1
Alkalinity	ND		10.0		mg/L			06/01/13 13:36	1
Orthophosphate as P	ND		0.100		mg/L			05/31/13 17:40	1
Silica	**99.1**		1.00		mg/L			06/04/13 15:00	1

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Client Sample ID: PZ13
Date Collected: 05/30/13 13:30
Date Received: 05/31/13 08:15

Lab Sample ID: 490-27744-7
Matrix: Water

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**3.11**		1.00		mg/L			05/31/13 16:16	1
Sulfate	**2580**		50.0		mg/L			06/03/13 17:01	50
Nitrate Nitrite as N	**0.917**		0.200		mg/L			05/31/13 16:16	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**0.288**		0.100		mg/L		06/03/13 08:41	06/04/13 01:25	1
Cadmium	ND		0.00100		mg/L		06/03/13 08:41	06/04/13 01:25	1
Calcium	**112**		100		mg/L		06/03/13 08:41	06/05/13 15:42	100
Iron	**2.30**		0.100		mg/L		06/03/13 08:41	06/04/13 01:25	1
Lead	ND		0.00500		mg/L		06/03/13 08:41	06/04/13 01:25	1
Magnesium	**93.3**		1.00		mg/L		06/03/13 08:41	06/04/13 01:25	1
Manganese	**8.26**		0.0150		mg/L		06/03/13 08:41	06/04/13 01:25	1
Potassium	**2.53**		1.00		mg/L		06/03/13 08:41	06/04/13 01:25	1
Sodium	ND		100		mg/L		06/03/13 08:41	06/05/13 15:42	100
Zinc	**749**		50.0		mg/L		06/03/13 08:41	06/05/13 15:57	1000

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00		mg/L		06/04/13 13:00	06/04/13 15:00	1
Alkalinity	**27.0**		10.0		mg/L			06/01/13 13:41	1
Orthophosphate as P	ND		0.100		mg/L			05/31/13 17:40	1
Silica	**43.8**		1.00		mg/L			06/04/13 15:00	1

Client Sample Results

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Client Sample ID: AB1
Date Collected: 05/30/13 14:35
Date Received: 05/31/13 08:15

Lab Sample ID: 490-27744-8
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		06/03/13 08:41	06/04/13 01:40	1
Zinc	**1.13**		0.0500		mg/L		06/03/13 08:41	06/04/13 01:40	1

Client Sample Results

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Client Sample ID: PZ3
Date Collected: 05/30/13 15:05
Date Received: 05/31/13 08:15

Lab Sample ID: 490-27744-9
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		06/03/13 08:41	06/04/13 01:44	1
Zinc	**6.24**		0.500		mg/L		06/03/13 08:41	06/05/13 16:00	10

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Client Sample ID: PZ6
Date Collected: 05/30/13 15:25
Date Received: 05/31/13 08:15

Lab Sample ID: 490-27744-10
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		06/03/13 08:41	06/04/13 01:48	1
Zinc	**1.65**		0.0500		mg/L		06/03/13 08:41	06/04/13 01:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00		mg/L		06/04/13 13:00	06/04/13 15:00	1

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Client Sample ID: PZ4
Date Collected: 05/30/13 15:45
Date Received: 05/31/13 08:15

Lab Sample ID: 490-27744-11
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.0116		0.00100		mg/L		06/03/13 08:41	06/04/13 01:51	1
Zinc	1.72		0.0500		mg/L		06/03/13 08:41	06/04/13 01:51	1

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Client Sample ID: PZ5
Date Collected: 05/30/13 16:05
Date Received: 05/31/13 08:15

Lab Sample ID: 490-27744-12
Matrix: Water

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.0470		0.00100		mg/L		06/03/13 08:41	06/04/13 01:55	1
Zinc	2.11		0.100		mg/L		06/03/13 08:41	06/05/13 16:04	2

Method: 9056 - Anions, Ion Chromatography

Lab Sample ID: MB 490-83186/3
Matrix: Water
Analysis Batch: 83186

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	ND		0.200		mg/L			05/31/13 11:29	1

Lab Sample ID: LCS 490-83186/4
Matrix: Water
Analysis Batch: 83186

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrate Nitrite as N			10.0	9.492		mg/L		95	80 - 120		

Lab Sample ID: LCSD 490-83186/5
Matrix: Water
Analysis Batch: 83186

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N			10.0	9.461		mg/L		95	80 - 120	0	20

Lab Sample ID: 490-27748-N-1 MS
Matrix: Water
Analysis Batch: 83186

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrate Nitrite as N	ND		10.0	8.905		mg/L		89	80 - 120		

Lab Sample ID: 490-27748-N-1 MSD
Matrix: Water
Analysis Batch: 83186

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	ND		10.0	8.944		mg/L		89	80 - 120	0	20

Lab Sample ID: 490-27748-N-1 DU
Matrix: Water
Analysis Batch: 83186

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Nitrate Nitrite as N	ND			ND		mg/L				NC	20

Lab Sample ID: MB 490-83187/3
Matrix: Water
Analysis Batch: 83187

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			05/31/13 11:29	1
Sulfate	ND		1.00		mg/L			05/31/13 11:29	1

Method: 9056 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 490-83187/4
Matrix: Water
Analysis Batch: 83187

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			50.0	47.39		mg/L		95	80 - 120		
Sulfate			50.0	50.77		mg/L		102	80 - 120		

Lab Sample ID: LCSD 490-83187/5
Matrix: Water
Analysis Batch: 83187

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			50.0	47.39		mg/L		95	80 - 120	0	20
Sulfate			50.0	50.65		mg/L		101	80 - 120	0	20

Lab Sample ID: 490-27748-N-1 MS
Matrix: Water
Analysis Batch: 83187

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	32.8		50.0	79.85		mg/L		94	80 - 120		
Sulfate	61.0		50.0	105.3	E	mg/L		89	80 - 120		

Lab Sample ID: 490-27748-N-1 MSD
Matrix: Water
Analysis Batch: 83187

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	32.8		50.0	80.09		mg/L		94	80 - 120	0	20
Sulfate	61.0		50.0	105.8	E	mg/L		90	80 - 120	0	20

Lab Sample ID: 490-27748-N-1 DU
Matrix: Water
Analysis Batch: 83187

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chloride	32.8			32.83		mg/L				0.03	20
Sulfate	61.0			60.94		mg/L				0.03	20

Lab Sample ID: MB 490-83540/3
Matrix: Water
Analysis Batch: 83540

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			06/03/13 11:16	1
Sulfate	ND		1.00		mg/L			06/03/13 11:16	1

Lab Sample ID: LCS 490-83540/4
Matrix: Water
Analysis Batch: 83540

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			50.0	47.38		mg/L		95	80 - 120		

Method: 9056 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 490-83540/4
Matrix: Water
Analysis Batch: 83540

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	50.0	49.56		mg/L		99	80 - 120

Lab Sample ID: LCSD 490-83540/5
Matrix: Water
Analysis Batch: 83540

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	50.0	47.38		mg/L		95	80 - 120	0	20
Sulfate	50.0	49.26		mg/L		99	80 - 120	1	20

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 490-83438/1-A
Matrix: Water
Analysis Batch: 83703

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 83438

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.100		mg/L		06/03/13 08:41	06/04/13 00:16	1
Cadmium	ND		0.00100		mg/L		06/03/13 08:41	06/04/13 00:16	1
Iron	ND		0.100		mg/L		06/03/13 08:41	06/04/13 00:16	1
Lead	ND		0.00500		mg/L		06/03/13 08:41	06/04/13 00:16	1
Magnesium	ND		1.00		mg/L		06/03/13 08:41	06/04/13 00:16	1
Manganese	ND		0.0150		mg/L		06/03/13 08:41	06/04/13 00:16	1
Potassium	ND		1.00		mg/L		06/03/13 08:41	06/04/13 00:16	1
Sodium	ND		1.00		mg/L		06/03/13 08:41	06/04/13 00:16	1
Zinc	ND		0.0500		mg/L		06/03/13 08:41	06/04/13 00:16	1

Lab Sample ID: MB 490-83438/1-A
Matrix: Water
Analysis Batch: 84264

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 83438

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		1.00		mg/L		06/03/13 08:41	06/05/13 14:22	1

Lab Sample ID: LCS 490-83438/2-A
Matrix: Water
Analysis Batch: 83703

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 83438

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	2.00	1.992		mg/L		100	80 - 120
Cadmium	0.0500	0.05100		mg/L		102	80 - 120
Iron	1.00	1.029		mg/L		103	80 - 120
Lead	0.0500	0.05310		mg/L		106	80 - 120
Magnesium	5.00	5.063		mg/L		101	80 - 120
Manganese	0.500	0.5176		mg/L		104	80 - 120
Potassium	5.00	4.800		mg/L		96	80 - 120
Sodium	5.00	5.102		mg/L		102	80 - 120
Zinc	0.500	0.4965		mg/L		99	80 - 120

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 490-83438/2-A
Matrix: Water
Analysis Batch: 84264

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 83438

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	5.00	5.109		mg/L		102	80 - 120

Lab Sample ID: 490-27720-B-1-B MS
Matrix: Water
Analysis Batch: 83703

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 83438

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	ND		2.00	1.980		mg/L		99	75 - 125
Cadmium	ND		0.0500	0.05020		mg/L		100	75 - 125
Iron	ND		1.00	1.057		mg/L		101	75 - 125
Lead	ND		0.0500	0.05360		mg/L		104	75 - 125
Magnesium	ND		5.00	4.987		mg/L		100	75 - 125
Manganese	ND		0.500	0.5188		mg/L		103	75 - 125
Potassium	ND		5.00	4.803		mg/L		96	75 - 125
Sodium	ND		5.00	5.047		mg/L		100	75 - 125
Zinc	0.0548		0.500	0.5427		mg/L		98	75 - 125

Lab Sample ID: 490-27720-B-1-B MS
Matrix: Water
Analysis Batch: 84264

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 83438

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	ND		5.00	5.036		mg/L		101	75 - 125

Lab Sample ID: 490-27720-B-1-C MSD
Matrix: Water
Analysis Batch: 83703

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 83438

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	ND		2.00	1.963		mg/L		98	75 - 125	1	20
Cadmium	ND		0.0500	0.05100		mg/L		102	75 - 125	2	20
Iron	ND		1.00	1.069		mg/L		102	75 - 125	1	20
Lead	ND		0.0500	0.05400		mg/L		104	75 - 125	1	20
Magnesium	ND		5.00	4.971		mg/L		99	75 - 125	0	20
Manganese	ND		0.500	0.5268		mg/L		104	75 - 125	2	20
Potassium	ND		5.00	4.822		mg/L		96	75 - 125	0	20
Sodium	ND		5.00	5.138		mg/L		102	75 - 125	2	20
Zinc	0.0548		0.500	0.5467		mg/L		98	75 - 125	1	20

Lab Sample ID: 490-27720-B-1-C MSD
Matrix: Water
Analysis Batch: 84264

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 83438

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Calcium	ND		5.00	5.075		mg/L		102	75 - 125	1	20

Method: 9034 - Sulfide, Acid soluble and Insoluble (Titrimetric)

Lab Sample ID: MB 490-83845/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 83867 — **Prep Batch: 83845**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00		mg/L		06/04/13 13:00	06/04/13 15:00	1

Lab Sample ID: LCS 490-83845/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 83867 — **Prep Batch: 83845**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	20.0	20.03		mg/L		100	80 - 120

Lab Sample ID: 490-27646-K-1-B MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 83867 — **Prep Batch: 83845**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	ND		20.0	19.87		mg/L		99	70 - 130

Lab Sample ID: 490-27646-K-1-C MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 83867 — **Prep Batch: 83845**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfide	ND		20.0	19.78		mg/L		99	70 - 130	0	10

Lab Sample ID: 490-27744-10 DU — **Client Sample ID: PZ6**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 83867 — **Prep Batch: 83845**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfide	ND		ND		mg/L		NC	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 490-83649/3 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 83649

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	ND		10.0		mg/L			06/01/13 12:57	1

Lab Sample ID: LCS 490-83649/4 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 83649

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	106.1		mg/L		106	90 - 110

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: 490-27744-1 MS
Matrix: Water
Analysis Batch: 83649

Client Sample ID: PZ1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Alkalinity	22.0		100	118.6		mg/L		97	80 - 120		

Lab Sample ID: 490-27744-1 DU
Matrix: Water
Analysis Batch: 83649

Client Sample ID: PZ1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity	22.0			21.45		mg/L				2	20

Lab Sample ID: 490-27759-L-1 DU
Matrix: Water
Analysis Batch: 83649

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Alkalinity	26.1			26.49		mg/L				2	20

Method: SM 4500 P E - Orthophosphate

Lab Sample ID: MB 490-83214/4
Matrix: Water
Analysis Batch: 83214

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Orthophosphate as P	ND		0.100		mg/L			05/31/13 17:13	1

Lab Sample ID: LCS 490-83214/7
Matrix: Water
Analysis Batch: 83214

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Orthophosphate as P			0.250	0.2347		mg/L		94	90 - 110		

Lab Sample ID: 490-27744-1 MS
Matrix: Water
Analysis Batch: 83214

Client Sample ID: PZ1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Orthophosphate as P	ND		0.250	0.2586		mg/L		89	72 - 129		

Lab Sample ID: 490-27744-1 MSD
Matrix: Water
Analysis Batch: 83214

Client Sample ID: PZ1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Orthophosphate as P	ND		0.250	0.2572		mg/L		89	72 - 129	1	20

Method: SM 4500 P E - Orthophosphate (Continued)

Lab Sample ID: 490-27744-1 DU — **Client Sample ID: PZ1**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 83214

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Orthophosphate as P	ND			ND		mg/L				NC	20

Method: SM4500 SiO2 C - Silica, Molybdosilicate Method

Lab Sample ID: MB 490-83856/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 83856

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silica	ND		1.00		mg/L			06/04/13 13:44	1

Lab Sample ID: LCS 490-83856/7 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 83856

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Silica			25.0	24.64		mg/L		99	90 - 110		

Lab Sample ID: 490-27744-1 MS — **Client Sample ID: PZ1**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 83856

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Silica	57.5		25.0	82.39		mg/L		99	80 - 120		

Lab Sample ID: 490-27744-1 MSD — **Client Sample ID: PZ1**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 83856

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica	57.5		25.0	80.42		mg/L		92	80 - 120	2	20

Lab Sample ID: 490-27744-1 DU — **Client Sample ID: PZ1**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 83856

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Silica	57.5			55.66		mg/L				3	20

HPLC/IC

Analysis Batch: 83186

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-27744-1	PZ1	Total/NA	Water	9056	
490-27744-2	AB2	Total/NA	Water	9056	
490-27744-3	OW1	Total/NA	Water	9056	
490-27744-4	OW2	Total/NA	Water	9056	
490-27744-5	OW3	Total/NA	Water	9056	
490-27744-6	PZ12	Total/NA	Water	9056	
490-27744-7	PZ13	Total/NA	Water	9056	
490-27748-N-1 DU	Duplicate	Total/NA	Water	9056	
490-27748-N-1 MS	Matrix Spike	Total/NA	Water	9056	
490-27748-N-1 MSD	Matrix Spike Duplicate	Total/NA	Water	9056	
LCS 490-83186/4	Lab Control Sample	Total/NA	Water	9056	
LCSD 490-83186/5	Lab Control Sample Dup	Total/NA	Water	9056	
MB 490-83186/3	Method Blank	Total/NA	Water	9056	

Analysis Batch: 83187

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-27744-1	PZ1	Total/NA	Water	9056	
490-27744-2	AB2	Total/NA	Water	9056	
490-27744-3	OW1	Total/NA	Water	9056	
490-27744-4	OW2	Total/NA	Water	9056	
490-27744-5	OW3	Total/NA	Water	9056	
490-27744-6	PZ12	Total/NA	Water	9056	
490-27744-7	PZ13	Total/NA	Water	9056	
490-27748-N-1 DU	Duplicate	Total/NA	Water	9056	
490-27748-N-1 MS	Matrix Spike	Total/NA	Water	9056	
490-27748-N-1 MSD	Matrix Spike Duplicate	Total/NA	Water	9056	
LCS 490-83187/4	Lab Control Sample	Total/NA	Water	9056	
LCSD 490-83187/5	Lab Control Sample Dup	Total/NA	Water	9056	
MB 490-83187/3	Method Blank	Total/NA	Water	9056	

Analysis Batch: 83540

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-27744-1	PZ1	Total/NA	Water	9056	
490-27744-3	OW1	Total/NA	Water	9056	
490-27744-4	OW2	Total/NA	Water	9056	
490-27744-5	OW3	Total/NA	Water	9056	
490-27744-6	PZ12	Total/NA	Water	9056	
490-27744-7	PZ13	Total/NA	Water	9056	
LCS 490-83540/4	Lab Control Sample	Total/NA	Water	9056	
LCSD 490-83540/5	Lab Control Sample Dup	Total/NA	Water	9056	
MB 490-83540/3	Method Blank	Total/NA	Water	9056	

Metals

Prep Batch: 83438

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-27720-B-1-B MS	Matrix Spike	Total/NA	Water	3010A	
490-27720-B-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	3010A	
490-27744-1	PZ1	Total/NA	Water	3010A	
490-27744-2	AB2	Total/NA	Water	3010A	

Metals (Continued)

Prep Batch: 83438 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-27744-3	OW1	Total/NA	Water	3010A	
490-27744-4	OW2	Total/NA	Water	3010A	
490-27744-5	OW3	Total/NA	Water	3010A	
490-27744-6	PZ12	Total/NA	Water	3010A	
490-27744-7	PZ13	Total/NA	Water	3010A	
490-27744-8	AB1	Total/NA	Water	3010A	
490-27744-9	PZ3	Total/NA	Water	3010A	
490-27744-10	PZ6	Total/NA	Water	3010A	
490-27744-11	PZ4	Total/NA	Water	3010A	
490-27744-12	PZ5	Total/NA	Water	3010A	
LCS 490-83438/2-A	Lab Control Sample	Total/NA	Water	3010A	
MB 490-83438/1-A	Method Blank	Total/NA	Water	3010A	

Analysis Batch: 83703

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-27720-B-1-B MS	Matrix Spike	Total/NA	Water	6010C	83438
490-27720-B-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	6010C	83438
490-27744-1	PZ1	Total/NA	Water	6010C	83438
490-27744-2	AB2	Total/NA	Water	6010C	83438
490-27744-3	OW1	Total/NA	Water	6010C	83438
490-27744-4	OW2	Total/NA	Water	6010C	83438
490-27744-5	OW3	Total/NA	Water	6010C	83438
490-27744-6	PZ12	Total/NA	Water	6010C	83438
490-27744-7	PZ13	Total/NA	Water	6010C	83438
490-27744-8	AB1	Total/NA	Water	6010C	83438
490-27744-9	PZ3	Total/NA	Water	6010C	83438
490-27744-10	PZ6	Total/NA	Water	6010C	83438
490-27744-11	PZ4	Total/NA	Water	6010C	83438
490-27744-12	PZ5	Total/NA	Water	6010C	83438
LCS 490-83438/2-A	Lab Control Sample	Total/NA	Water	6010C	83438
MB 490-83438/1-A	Method Blank	Total/NA	Water	6010C	83438

Analysis Batch: 84264

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-27720-B-1-B MS	Matrix Spike	Total/NA	Water	6010C	83438
490-27720-B-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	6010C	83438
490-27744-1	PZ1	Total/NA	Water	6010C	83438
490-27744-1	PZ1	Total/NA	Water	6010C	83438
490-27744-2	AB2	Total/NA	Water	6010C	83438
490-27744-3	OW1	Total/NA	Water	6010C	83438
490-27744-3	OW1	Total/NA	Water	6010C	83438
490-27744-4	OW2	Total/NA	Water	6010C	83438
490-27744-4	OW2	Total/NA	Water	6010C	83438
490-27744-5	OW3	Total/NA	Water	6010C	83438
490-27744-5	OW3	Total/NA	Water	6010C	83438
490-27744-6	PZ12	Total/NA	Water	6010C	83438
490-27744-6	PZ12	Total/NA	Water	6010C	83438
490-27744-7	PZ13	Total/NA	Water	6010C	83438
490-27744-7	PZ13	Total/NA	Water	6010C	83438
490-27744-9	PZ3	Total/NA	Water	6010C	83438
490-27744-12	PZ5	Total/NA	Water	6010C	83438

Metals (Continued)

Analysis Batch: 84264 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 490-83438/2-A	Lab Control Sample	Total/NA	Water	6010C	83438
MB 490-83438/1-A	Method Blank	Total/NA	Water	6010C	83438

General Chemistry

Analysis Batch: 83214

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-27744-1	PZ1	Total/NA	Water	SM 4500 P E	
490-27744-1 DU	PZ1	Total/NA	Water	SM 4500 P E	
490-27744-1 MS	PZ1	Total/NA	Water	SM 4500 P E	
490-27744-1 MSD	PZ1	Total/NA	Water	SM 4500 P E	
490-27744-2	AB2	Total/NA	Water	SM 4500 P E	
490-27744-3	OW1	Total/NA	Water	SM 4500 P E	
490-27744-4	OW2	Total/NA	Water	SM 4500 P E	
490-27744-5	OW3	Total/NA	Water	SM 4500 P E	
490-27744-6	PZ12	Total/NA	Water	SM 4500 P E	
490-27744-7	PZ13	Total/NA	Water	SM 4500 P E	
LCS 490-83214/7	Lab Control Sample	Total/NA	Water	SM 4500 P E	
MB 490-83214/4	Method Blank	Total/NA	Water	SM 4500 P E	

Analysis Batch: 83649

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-27744-1	PZ1	Total/NA	Water	SM 2320B	
490-27744-1 DU	PZ1	Total/NA	Water	SM 2320B	
490-27744-1 MS	PZ1	Total/NA	Water	SM 2320B	
490-27744-2	AB2	Total/NA	Water	SM 2320B	
490-27744-3	OW1	Total/NA	Water	SM 2320B	
490-27744-4	OW2	Total/NA	Water	SM 2320B	
490-27744-5	OW3	Total/NA	Water	SM 2320B	
490-27744-6	PZ12	Total/NA	Water	SM 2320B	
490-27744-7	PZ13	Total/NA	Water	SM 2320B	
490-27759-L-1 DU	Duplicate	Total/NA	Water	SM 2320B	
LCS 490-83649/4	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 490-83649/3	Method Blank	Total/NA	Water	SM 2320B	

Prep Batch: 83845

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-27646-K-1-B MS	Matrix Spike	Total/NA	Water	9030B	
490-27646-K-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	9030B	
490-27744-3	OW1	Total/NA	Water	9030B	
490-27744-4	OW2	Total/NA	Water	9030B	
490-27744-5	OW3	Total/NA	Water	9030B	
490-27744-6	PZ12	Total/NA	Water	9030B	
490-27744-7	PZ13	Total/NA	Water	9030B	
490-27744-10	PZ6	Total/NA	Water	9030B	
490-27744-10 DU	PZ6	Total/NA	Water	9030B	
LCS 490-83845/2-A	Lab Control Sample	Total/NA	Water	9030B	
MB 490-83845/1-A	Method Blank	Total/NA	Water	9030B	

General Chemistry (Continued)

Analysis Batch: 83856

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-27744-1	PZ1	Total/NA	Water	SM4500 SiO2 C	
490-27744-1 DU	PZ1	Total/NA	Water	SM4500 SiO2 C	
490-27744-1 MS	PZ1	Total/NA	Water	SM4500 SiO2 C	
490-27744-1 MSD	PZ1	Total/NA	Water	SM4500 SiO2 C	
490-27744-2	AB2	Total/NA	Water	SM4500 SiO2 C	
490-27744-3	OW1	Total/NA	Water	SM4500 SiO2 C	
490-27744-4	OW2	Total/NA	Water	SM4500 SiO2 C	
490-27744-5	OW3	Total/NA	Water	SM4500 SiO2 C	
490-27744-6	PZ12	Total/NA	Water	SM4500 SiO2 C	
490-27744-7	PZ13	Total/NA	Water	SM4500 SiO2 C	
LCS 490-83856/7	Lab Control Sample	Total/NA	Water	SM4500 SiO2 C	
MB 490-83856/4	Method Blank	Total/NA	Water	SM4500 SiO2 C	

Analysis Batch: 83867

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-27646-K-1-B MS	Matrix Spike	Total/NA	Water	9034	83845
490-27646-K-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	9034	83845
490-27744-3	OW1	Total/NA	Water	9034	83845
490-27744-4	OW2	Total/NA	Water	9034	83845
490-27744-5	OW3	Total/NA	Water	9034	83845
490-27744-6	PZ12	Total/NA	Water	9034	83845
490-27744-7	PZ13	Total/NA	Water	9034	83845
490-27744-10	PZ6	Total/NA	Water	9034	83845
490-27744-10 DU	PZ6	Total/NA	Water	9034	83845
LCS 490-83845/2-A	Lab Control Sample	Total/NA	Water	9034	83845
MB 490-83845/1-A	Method Blank	Total/NA	Water	9034	83845

Client Sample ID: PZ1

Lab Sample ID: 490-27744-1

Date Collected: 05/30/13 09:20

Matrix: Water

Date Received: 05/31/13 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1	10 mL		83186	05/31/13 14:21	JHS	TAL NSH
Total/NA	Analysis	9056		1	10 mL		83187	05/31/13 14:21	JHS	TAL NSH
Total/NA	Analysis	9056		10	10 mL		83540	06/03/13 14:47	JHS	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		1	50 mL	50 mL	83703	06/04/13 01:04	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		10	50 mL	50 mL	84264	06/05/13 14:47	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		100	50 mL	50 mL	84264	06/05/13 14:51	KDJ	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	83649	06/01/13 13:08	DMT	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	83214	05/31/13 17:40	DMT	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10	10	83856	06/04/13 15:00	DMT	TAL NSH

Client Sample ID: AB2

Lab Sample ID: 490-27744-2

Date Collected: 05/30/13 10:05

Matrix: Water

Date Received: 05/31/13 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1	10 mL		83186	05/31/13 14:40	JHS	TAL NSH
Total/NA	Analysis	9056		1	10 mL		83187	05/31/13 14:40	JHS	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		1	50 mL	50 mL	83703	06/04/13 01:07	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		10	50 mL	50 mL	84264	06/05/13 14:55	KDJ	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	83649	06/01/13 13:22	DMT	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	83214	05/31/13 17:40	DMT	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10	10	83856	06/04/13 15:00	DMT	TAL NSH

Client Sample ID: OW1

Lab Sample ID: 490-27744-3

Date Collected: 05/30/13 10:40

Matrix: Water

Date Received: 05/31/13 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1	10 mL		83186	05/31/13 14:59	JHS	TAL NSH
Total/NA	Analysis	9056		1	10 mL		83187	05/31/13 14:59	JHS	TAL NSH
Total/NA	Analysis	9056		10	10 mL		83540	06/03/13 15:06	JHS	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		1	50 mL	50 mL	83703	06/04/13 01:11	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		10	50 mL	50 mL	84264	06/05/13 15:10	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		100	50 mL	50 mL	84264	06/05/13 15:13	KDJ	TAL NSH

Client Sample ID: OW1

Lab Sample ID: 490-27744-3

Date Collected: 05/30/13 10:40

Matrix: Water

Date Received: 05/31/13 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	9030B			50 mL	50 mL	83845	06/04/13 13:00	COC	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	83867	06/04/13 15:00	COC	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	83649	06/01/13 13:26	DMT	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	83214	05/31/13 17:40	DMT	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10	10	83856	06/04/13 15:00	DMT	TAL NSH

Client Sample ID: OW2

Lab Sample ID: 490-27744-4

Date Collected: 05/30/13 10:55

Matrix: Water

Date Received: 05/31/13 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1	10 mL		83186	05/31/13 15:18	JHS	TAL NSH
Total/NA	Analysis	9056		1	10 mL		83187	05/31/13 15:18	JHS	TAL NSH
Total/NA	Analysis	9056		10	10 mL		83540	06/03/13 16:04	JHS	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		1	50 mL	50 mL	83703	06/04/13 01:14	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		10	50 mL	50 mL	84264	06/05/13 15:17	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		100	50 mL	50 mL	84264	06/05/13 15:20	KDJ	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	83845	06/04/13 13:00	COC	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	83867	06/04/13 15:00	COC	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	83649	06/01/13 13:30	DMT	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	83214	05/31/13 17:40	DMT	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10	10	83856	06/04/13 15:00	DMT	TAL NSH

Client Sample ID: OW3

Lab Sample ID: 490-27744-5

Date Collected: 05/30/13 11:15

Matrix: Water

Date Received: 05/31/13 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1	10 mL		83186	05/31/13 15:37	JHS	TAL NSH
Total/NA	Analysis	9056		1	10 mL		83187	05/31/13 15:37	JHS	TAL NSH
Total/NA	Analysis	9056		20	10 mL		83540	06/03/13 16:23	JHS	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		1	50 mL	50 mL	83703	06/04/13 01:18	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		10	50 mL	50 mL	84264	06/05/13 15:24	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		100	50 mL	50 mL	84264	06/05/13 15:28	KDJ	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	83845	06/04/13 13:00	COC	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	83867	06/04/13 15:00	COC	TAL NSH

Client Sample ID: OW3

Lab Sample ID: 490-27744-5

Date Collected: 05/30/13 11:15

Matrix: Water

Date Received: 05/31/13 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	83649	06/01/13 13:33	DMT	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	83214	05/31/13 17:40	DMT	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10	10	83856	06/04/13 15:00	DMT	TAL NSH

Client Sample ID: PZ12

Lab Sample ID: 490-27744-6

Date Collected: 05/30/13 12:55

Matrix: Water

Date Received: 05/31/13 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1	10 mL		83186	05/31/13 15:56	JHS	TAL NSH
Total/NA	Analysis	9056		1	10 mL		83187	05/31/13 15:56	JHS	TAL NSH
Total/NA	Analysis	9056		20	10 mL		83540	06/03/13 16:42	JHS	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		1	50 mL	50 mL	83703	06/04/13 01:22	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		10	50 mL	50 mL	84264	06/05/13 15:31	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		100	50 mL	50 mL	84264	06/05/13 15:35	KDJ	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	83845	06/04/13 13:00	COC	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	83867	06/04/13 15:00	COC	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	83649	06/01/13 13:36	DMT	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	83214	05/31/13 17:40	DMT	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10	10	83856	06/04/13 15:00	DMT	TAL NSH

Client Sample ID: PZ13

Lab Sample ID: 490-27744-7

Date Collected: 05/30/13 13:30

Matrix: Water

Date Received: 05/31/13 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1	10 mL		83186	05/31/13 16:16	JHS	TAL NSH
Total/NA	Analysis	9056		1	10 mL		83187	05/31/13 16:16	JHS	TAL NSH
Total/NA	Analysis	9056		50	10 mL		83540	06/03/13 17:01	JHS	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		1	50 mL	50 mL	83703	06/04/13 01:25	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		100	50 mL	50 mL	84264	06/05/13 15:42	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		1000	50 mL	50 mL	84264	06/05/13 15:57	KDJ	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	83845	06/04/13 13:00	COC	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	83867	06/04/13 15:00	COC	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	83649	06/01/13 13:41	DMT	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	83214	05/31/13 17:40	DMT	TAL NSH

Client Sample ID: PZ13

Lab Sample ID: 490-27744-7

Date Collected: 05/30/13 13:30

Matrix: Water

Date Received: 05/31/13 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM4500 SiO2 C		1	10	10	83856	06/04/13 15:00	DMT	TAL NSH

Client Sample ID: AB1

Lab Sample ID: 490-27744-8

Date Collected: 05/30/13 14:35

Matrix: Water

Date Received: 05/31/13 08:15

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	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		1	50 mL	50 mL	83703	06/04/13 01:40	KDJ	TAL NSH

Client Sample ID: PZ3

Lab Sample ID: 490-27744-9

Date Collected: 05/30/13 15:05

Matrix: Water

Date Received: 05/31/13 08:15

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	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		1	50 mL	50 mL	83703	06/04/13 01:44	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		10	50 mL	50 mL	84264	06/05/13 16:00	KDJ	TAL NSH

Client Sample ID: PZ6

Lab Sample ID: 490-27744-10

Date Collected: 05/30/13 15:25

Matrix: Water

Date Received: 05/31/13 08:15

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	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		1	50 mL	50 mL	83703	06/04/13 01:48	KDJ	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	83845	06/04/13 13:00	COC	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	83867	06/04/13 15:00	COC	TAL NSH

Client Sample ID: PZ4

Lab Sample ID: 490-27744-11

Date Collected: 05/30/13 15:45

Matrix: Water

Date Received: 05/31/13 08:15

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	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		1	50 mL	50 mL	83703	06/04/13 01:51	KDJ	TAL NSH

Lab Chronicle

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Client Sample ID: PZ5
Date Collected: 05/30/13 16:05
Date Received: 05/31/13 08:15

Lab Sample ID: 490-27744-12
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	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		1	50 mL	50 mL	83703	06/04/13 01:55	KDJ	TAL NSH
Total/NA	Prep	3010A			50 mL	50 mL	83438	06/03/13 08:41	NLI	TAL NSH
Total/NA	Analysis	6010C		2	50 mL	50 mL	84264	06/05/13 16:04	KDJ	TAL NSH

Laboratory References:

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

Method Summary

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Method	Method Description	Protocol	Laboratory
9056	Anions, Ion Chromatography	SW846	TAL NSH
6010C	Metals (ICP)	SW846	TAL NSH
9034	Sulfide, Acid soluble and Insoluble (Titrimetric)	SW846	TAL NSH
SM 2320B	Alkalinity	SM	TAL NSH
SM 4500 P E	Orthophosphate	SM	TAL NSH
SM4500 SiO2 C	Silica, Molybdosilicate Method	SM	TAL NSH

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater",

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

Certification Summary

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

TestAmerica Job ID: 490-27744-1
SDG: CLR.045

Laboratory: TestAmerica Nashville

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	ISO/IEC 17025		0453.07	12-31-15
AIHA	IHLAP		100790	09-01-13
Alaska (UST)	State Program	10	UST-087	07-24-14
Arizona	State Program	9	AZ0473	05-05-15
Arkansas DEQ	State Program	6	88-0737	04-25-15
California	NELAP	9	1168CA	10-31-14
Canadian Assoc Lab Accred (CALA)	Canada		3744	03-08-14
Connecticut	State Program	1	PH-0220	12-31-15
Florida	NELAP	4	E87358	06-30-14
Illinois	NELAP	5	200010	12-09-14
Iowa	State Program	7	131	05-01-14 *
Kansas	NELAP	7	E-10229	10-31-14
Kentucky (UST)	State Program	4	19	06-30-14
Louisiana	NELAP	6	30613	06-30-14
Maryland	State Program	3	316	03-31-15
Massachusetts	State Program	1	M-TN032	06-30-14
Minnesota	NELAP	5	047-999-345	12-31-14
Mississippi	State Program	4	N/A	06-30-14
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-14
New Hampshire	NELAP	1	2963	10-09-14
New Jersey	NELAP	2	TN965	06-30-14
New York	NELAP	2	11342	03-31-15
North Carolina DENR	State Program	4	387	12-31-14
North Dakota	State Program	8	R-146	06-30-14
Ohio VAP	State Program	5	CL0033	10-16-15
Oklahoma	State Program	6	9412	08-31-14
Oregon	NELAP	10	TN200001	04-29-15
Pennsylvania	NELAP	3	68-00585	06-30-14
Rhode Island	State Program	1	LAO00268	12-30-14
South Carolina	State Program	4	84009 (002)	02-23-17
Tennessee	State Program	4	2008	02-23-17
Texas	NELAP	6	T104704077	08-31-14
USDA	Federal		S-48469	10-30-16
Utah	NELAP	8	TN00032	07-31-14
Virginia	NELAP	3	460152	06-14-14
Washington	State Program	10	C789	07-19-14
West Virginia DEP	State Program	3	219	02-28-15
Wisconsin	State Program	5	998020430	08-31-14
Wyoming (UST)	A2LA	8	453.07	12-31-15

* Expired certification is currently pending renewal and is considered valid.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT F

490-27744 Chain of Custody

Cooler Received/Opened On 5/31/2013 @ 0815

1. Tracking # 7395 (last 4 digits, FedEx)

Courier: FedEx IR Gun ID 94660220

2. Temperature of rep. sample or temp blank when opened: 1.3 *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) front

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 (intial) _____

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 # NA

I certify that I unloaded the cooler and answered questions 7-14 (intial) _____

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES NO NA _____ 5-31-13

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 (intial) _____

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 (intial) _____

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

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

BIS = Broken in shipment

TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Phone (615) 726-0177 Fax (615) 726-0954

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Scott Drury, Chad Hearn	Lab PM: Hayes, Ken	Carrier Tracking No(s):	COC No: 490-11738-5219.1
Client Contact: Mr. Scott Drury	Phone: 704-586-0007	E-Mail: ken.hayes@testamericainc.com		Page: Page 1 of 2
Company: Hart & Hickman, PC				Job #:
Address: 2923 S Tryon Street Suite 100	Due Date Requested:			
City: Charlotte	TAT Requested (days): STD TO 10 DAY (No Hurry)			
State, Zip: NC, 28203				
Phone: 704-586-0007	PO #: Purchase Order not required			
Email: sdrury@harthickman.com	WO #:			
Project Name: WA site - GW	Project #: 49000951			
Site: Clariant Kalama (CLR.045)	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C - Cd + Zn	9034_Calc - Sulfide	4500_P_E_Ortho, 9066_ORGFM_28D, 9066_ORGFM_48Hr, SM4500_SiO2_C	6010C - Custom Metals List (10)	2320B - Alkalinity									Total Number of containers	Special Instructions/Note:
				Preservation Code:				D	CB	N	D	N										
1	PZ1	5/30/13	920	G	Water					✓	✓	✓										
2	AB2		1005	G	Water					✓	✓	✓										
3	OW1		1040	G	Water				✓	✓	✓	✓										
4	OW2		1055	G	Water				✓	✓	✓	✓										
5	OW3		1115	G	Water				✓	✓	✓	✓										
6	PZ12		1255	G	Water				✓	✓	✓	✓										
7	PZ 13		1330	G	Water				✓	✓	✓	✓										
8	AB1		1435	G	Water			✓														
9	PZ3		1505	G	Water			✓														
10	PZ6		1525	G	Water			✓	✓													
11	PZ4	↓	1545	G	Water			✓														

Loc: 490
27744

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Scott Drury	5/30/13	HH		1.3 5-31-13 08:15	TAN
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: △ Yes △ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

4/30/2014

TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Phone (615) 726-0177 Fax (615) 726-0954

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4/30/2014

Client Information	Sampler: Scott Drury / Chad Hearn	Lab PM: Hayes, Ken	Carrier Tracking No(s):	COC No: 490-11738-5219.2
Client Contact: Mr. Scott Drury	Phone: 704-586-0007	E-Mail: ken.hayes@testamericainc.com		Page: Page 2 of 2
Company: Hart & Hickman, PC				Job #:

Address: 2923 S Tryon Street Suite 100	Due Date Requested:	Analysis Requested
City: Charlotte	TAT Requested (days): STD	
State, Zip: NC, 28203		
Phone: 704-586-0007	PO #: Purchase Order not required	
Email: sdrury@harthickman.com	WO #:	
Project Name: WA site - GW	Project #: 49000951	
Site: Clariant Kalama (CLR.045)	SSOW#:	

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C - Cd + Zn	9034_Calc - Sulfide	4500_P_E_Ortho, 9066_ORGFM_28D, 9066_ORGFM_48Hr, SM4500_SiO2_C	6010C - Custom Metals List (10)	2320B - Alkalinity	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	CB	N	D	N		
PZ6	5/30/13	1605	G	Water			✓						
				Water									

Loc: 490
27744

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Scott	5/31/13 17:00		1.3	5-31-13 08:15	TAN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Hart & Hickman, PC

Job Number: 490-27744-1
SDG Number: CLR.045

Login Number: 27744
List Number: 1
Creator: Ford, Easton

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
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.	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 <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

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: 490-34183-1
TestAmerica Sample Delivery Group: CLR.045
Client Project/Site: Clariant Kalama

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

Attn: Mr. Scott Drury

Roxanne L Connor

Authorized for release by:
9/11/2013 3:28:41 PM
Roxanne Connor, Senior Project Manager
(615)301-5761
roxanne.connor@testamericainc.com

Designee for

Ken Hayes, Project Manager I
ken.hayes@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.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.

Table of Contents

Sample Summary

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-34183-1	AB-1	Water	08/27/13 11:00	08/29/13 08:30
490-34183-2	PZ 3	Water	08/27/13 11:40	08/29/13 08:30
490-34183-3	PZ 6	Water	08/27/13 12:15	08/29/13 08:30
490-34183-4	PZ 4	Water	08/27/13 13:40	08/29/13 08:30
490-34183-5	PZ 5	Water	08/27/13 14:05	08/29/13 08:30
490-34183-6	AB 2	Water	08/28/13 08:15	08/29/13 08:30
490-34183-7	PZ 1	Water	08/28/13 08:55	08/29/13 08:30
490-34183-8	OW 2	Water	08/28/13 09:35	08/29/13 08:30
490-34183-9	OW 1	Water	08/28/13 10:20	08/29/13 08:30
490-34183-10	OW 3	Water	08/28/13 11:05	08/29/13 08:30
490-34183-11	PZ 12	Water	08/28/13 11:50	08/29/13 08:30
490-34183-12	PZ 13	Water	08/28/13 12:35	08/29/13 08:30

Job ID: 490-34183-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-34183-1

Comments
No additional comments.

Receipt
The samples were received on 8/29/2013 8:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.6º C.

HPLC
Method(s) 9056A: Nitrate and Nitrite were detected above the reporting limit (RL) in the method blank associated with batch 103690 as well as in the following sample: AB 2 (490-34183-6), OW 2 (490-34183-8), OW 3 (490-34183-10), PZ 1 (490-34183-7), PZ 12 (490-34183-11), PZ 13 (490-34183-12). All affected samples were re-analyzed outside of holding time. Both sets of data have been reported.

Method(s) 9056A: The method blank for batch 103690 contained nitrate and nitrite above the reporting limit (RL). None of the following samples associated with this method blank contained the target compound; therefore, re-analysis of sample was not performed: OW 1 (490-34183-9).

No other analytical or quality issues were noted.

Metals
Method(s) 6010C: The method blank for batch 103814 contained K, Mg, Mn, Na, Zn above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

Method(s) 6010C: The post digestion spike % recovery for Al, Ca, Zn associated with batch 103814 was outside of control limits.

No other analytical or quality issues were noted.

Field Service / Mobile Lab
No analytical or quality issues were noted.

General Chemistry
Method(s) SM 2320B: The following sample(s) had an initial pH below endpoint for total alkalinity analysis: OW 3 (490-34183-10), PZ 12 (490-34183-11).

Method(s) SM 4500 P E: Reanalysis of the following sample(s) was performed outside of the analytical holding time: PZ 12 (490-34183-11).

Method(s) SM 4500 P E: The following sample(s) was analyzed outside of analytical holding time: PZ 13 (490-34183-12).

Method(s) SM4500 SiO2 C: Matrix spikes for batch 104995 could not be recovered due to sample matrix interferences which required sample dilution. The associated laboratory control sample (LCS) met acceptance criteria.

Method(s) SM4500 SiO2 C: The following sample(s) was diluted due to the nature of the sample matrix: OW 1 (490-34183-9). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
H	Sample was prepped or analyzed beyond the specified holding time

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

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.
H	Sample was prepped or analyzed beyond the specified holding time
F	MS/MSD Recovery and/or RPD exceeds the control limits
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC exceeds the control limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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: Hart & Hickman, PC
Project/Site: Clariant Kalama

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Client Sample ID: AB-1
Date Collected: 08/27/13 11:00
Date Received: 08/29/13 08:30

Lab Sample ID: 490-34183-1
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.000400	J	0.00100	0.000200	mg/L		08/30/13 08:37	09/03/13 21:35	1
Zinc	0.772	B	0.0500	0.000400	mg/L		08/30/13 08:37	09/03/13 21:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00	0.700	mg/L		08/31/13 18:00	08/31/13 19:00	1

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Client Sample ID: PZ 3
Date Collected: 08/27/13 11:40
Date Received: 08/29/13 08:30

Lab Sample ID: 490-34183-2
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.000700	J	0.00100	0.000200	mg/L		08/30/13 08:37	09/03/13 21:39	1
Zinc	4.48		0.500	0.00400	mg/L		08/30/13 08:37	09/05/13 01:10	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00	0.700	mg/L		08/31/13 18:00	08/31/13 19:00	1

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Client Sample ID: PZ 6
Date Collected: 08/27/13 12:15
Date Received: 08/29/13 08:30

Lab Sample ID: 490-34183-3
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100	0.000200	mg/L		08/30/13 08:37	09/03/13 21:42	1
Zinc	**0.565**	**B**	0.0500	0.000400	mg/L		08/30/13 08:37	09/03/13 21:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00	0.700	mg/L		08/31/13 18:00	08/31/13 19:00	1

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Client Sample ID: PZ 4
Date Collected: 08/27/13 13:40
Date Received: 08/29/13 08:30

Lab Sample ID: 490-34183-4
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.0134		0.00100	0.000200	mg/L		08/30/13 08:37	09/03/13 21:46	1
Zinc	1.71	B	0.0500	0.000400	mg/L		08/30/13 08:37	09/03/13 21:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00	0.700	mg/L		08/31/13 18:00	08/31/13 19:00	1

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Client Sample ID: PZ 5
Date Collected: 08/27/13 14:05
Date Received: 08/29/13 08:30

Lab Sample ID: 490-34183-5
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.0946		0.00100	0.000200	mg/L		08/30/13 08:37	09/03/13 21:49	1
Zinc	2.41		0.500	0.00400	mg/L		08/30/13 08:37	09/05/13 01:14	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00	0.700	mg/L		08/31/13 18:00	08/31/13 19:00	1

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Client Sample ID: AB 2

Date Collected: 08/28/13 08:15
Date Received: 08/29/13 08:30

Lab Sample ID: 490-34183-6

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1.84**		1.00	0.500	mg/L			09/07/13 22:28	1
Nitrate as N	**1.40**	**B**	0.100	0.0500	mg/L			08/29/13 18:34	1
Nitrate as N	**1.33**	**H**	0.100	0.0500	mg/L			08/31/13 01:05	1
Nitrate Nitrite as N	**1.40**	**B**	0.200	0.110	mg/L			08/29/13 18:34	1
Nitrate Nitrite as N	**1.33**	**H**	0.200	0.110	mg/L			08/31/13 01:05	1
Sulfate	**42.1**		1.00	0.600	mg/L			09/07/13 22:28	1
Nitrite as N	ND		0.100	0.0600	mg/L			08/29/13 18:34	1
Nitrite as N	ND	H	0.100	0.0600	mg/L			08/31/13 01:05	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.100	0.0680	mg/L		08/30/13 08:37	09/03/13 22:04	1
Cadmium	**0.00130**		0.00100	0.000200	mg/L		08/30/13 08:37	09/03/13 22:04	1
Calcium	**7.91**		1.00	0.150	mg/L		08/30/13 08:37	09/03/13 22:04	1
Iron	ND		0.100	0.00560	mg/L		08/30/13 08:37	09/03/13 22:04	1
Magnesium	**2.09**	**B**	1.00	0.0530	mg/L		08/30/13 08:37	09/03/13 22:04	1
Manganese	**0.00350**	**J B**	0.0150	0.000300	mg/L		08/30/13 08:37	09/03/13 22:04	1
Potassium	**1.44**	**B**	1.00	0.0880	mg/L		08/30/13 08:37	09/03/13 22:04	1
Sodium	**10.1**	**B**	1.00	0.0210	mg/L		08/30/13 08:37	09/03/13 22:04	1
Zinc	**13.7**		0.500	0.00400	mg/L		08/30/13 08:37	09/05/13 01:17	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00	0.700	mg/L		09/04/13 10:00	09/04/13 11:15	1
Alkalinity	**23.7**		10.0	3.50	mg/L			08/29/13 17:23	1
Orthophosphate as P	**0.0330**	**J**	0.100	0.0200	mg/L			08/30/13 09:11	1
Silica	**35.6**		10.0	8.00	mg/L			09/05/13 15:26	10

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Client Sample ID: PZ 1

Date Collected: 08/28/13 08:55
Date Received: 08/29/13 08:30

Lab Sample ID: 490-34183-7

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1.79**		1.00	0.500	mg/L			09/07/13 23:28	1
Nitrate as N	**0.662**	**B**	0.100	0.0500	mg/L			08/29/13 19:31	1
Nitrate as N	**0.631**	**H**	0.100	0.0500	mg/L			08/31/13 01:27	1
Nitrate Nitrite as N	**0.662**	**B**	0.200	0.110	mg/L			08/29/13 19:31	1
Nitrate Nitrite as N	**0.631**	**H**	0.200	0.110	mg/L			08/31/13 01:27	1
Sulfate	**194**		5.00	3.00	mg/L			09/07/13 23:48	5
Nitrite as N	ND		0.100	0.0600	mg/L			08/29/13 19:31	1
Nitrite as N	ND	H	0.100	0.0600	mg/L			08/31/13 01:27	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.100	0.0680	mg/L		08/30/13 08:37	09/03/13 22:08	1
Cadmium	**0.00150**		0.00100	0.000200	mg/L		08/30/13 08:37	09/03/13 22:08	1
Calcium	**29.0**		1.00	0.150	mg/L		08/30/13 08:37	09/03/13 22:08	1
Iron	ND		0.100	0.00560	mg/L		08/30/13 08:37	09/03/13 22:08	1
Magnesium	**6.82**	**B**	1.00	0.0530	mg/L		08/30/13 08:37	09/03/13 22:08	1
Manganese	**0.438**	**B**	0.0150	0.000300	mg/L		08/30/13 08:37	09/03/13 22:08	1
Potassium	**1.78**	**B**	1.00	0.0880	mg/L		08/30/13 08:37	09/03/13 22:08	1
Sodium	**16.4**	**B**	1.00	0.0210	mg/L		08/30/13 08:37	09/03/13 22:08	1
Zinc	**51.0**		5.00	0.0400	mg/L		08/30/13 08:37	09/05/13 01:21	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00	0.700	mg/L		09/04/13 10:00	09/04/13 11:15	1
Alkalinity	**20.1**		10.0	3.50	mg/L			08/29/13 17:27	1
Orthophosphate as P	**0.0377**	**J**	0.100	0.0200	mg/L			08/30/13 09:11	1
Silica	**38.9**		10.0	8.00	mg/L			09/05/13 15:26	10

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Client Sample ID: OW 2
Date Collected: 08/28/13 09:35
Date Received: 08/29/13 08:30

Lab Sample ID: 490-34183-8
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**2.28**		1.00	0.500	mg/L			09/08/13 00:08	1
Nitrate as N	**0.0899**	**J B**	0.100	0.0500	mg/L			08/29/13 19:50	1
Nitrate as N	**0.0656**	**J H**	0.100	0.0500	mg/L			08/31/13 02:09	1
Nitrate Nitrite as N	ND		0.200	0.110	mg/L			08/29/13 19:50	1
Nitrate Nitrite as N	ND	H	0.200	0.110	mg/L			08/31/13 02:09	1
Sulfate	**756**		10.0	6.00	mg/L			09/08/13 00:28	10
Nitrite as N	ND		0.100	0.0600	mg/L			08/29/13 19:50	1
Nitrite as N	ND	H	0.100	0.0600	mg/L			08/31/13 02:09	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.100	0.0680	mg/L		08/30/13 08:37	09/03/13 22:11	1
Cadmium	**0.000200**	**J**	0.00100	0.000200	mg/L		08/30/13 08:37	09/03/13 22:11	1
Calcium	**131**		1.00	0.150	mg/L		08/30/13 08:37	09/03/13 22:11	1
Iron	**30.1**		0.100	0.00560	mg/L		08/30/13 08:37	09/03/13 22:11	1
Magnesium	**36.3**	**B**	1.00	0.0530	mg/L		08/30/13 08:37	09/03/13 22:11	1
Manganese	**6.70**	**B**	0.0150	0.000300	mg/L		08/30/13 08:37	09/03/13 22:11	1
Potassium	**1.53**	**B**	1.00	0.0880	mg/L		08/30/13 08:37	09/03/13 22:11	1
Sodium	**18.0**	**B**	1.00	0.0210	mg/L		08/30/13 08:37	09/03/13 22:11	1
Zinc	**77.1**		5.00	0.0400	mg/L		08/30/13 08:37	09/05/13 01:25	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00	0.700	mg/L		09/04/13 10:00	09/04/13 11:15	1
Alkalinity	**15.1**		10.0	3.50	mg/L			08/29/13 17:32	1
Orthophosphate as P	ND		0.100	0.0200	mg/L			08/30/13 09:11	1
Silica	**89.5**		10.0	8.00	mg/L			09/05/13 15:26	10

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Client Sample ID: OW 1
Date Collected: 08/28/13 10:20
Date Received: 08/29/13 08:30

Lab Sample ID: 490-34183-9
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**2.77**		1.00	0.500	mg/L			09/08/13 00:48	1
Nitrate as N	ND		0.100	0.0500	mg/L			08/29/13 20:09	1
Nitrate Nitrite as N	ND		0.200	0.110	mg/L			08/29/13 20:09	1
Sulfate	**1190**		20.0	12.0	mg/L			09/08/13 01:08	20
Nitrite as N	ND		0.100	0.0600	mg/L			08/29/13 20:09	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.100	0.0680	mg/L		08/30/13 08:37	09/03/13 22:15	1
Cadmium	ND		0.00100	0.000200	mg/L		08/30/13 08:37	09/03/13 22:15	1
Calcium	**131**		1.00	0.150	mg/L		08/30/13 08:37	09/03/13 22:15	1
Iron	**82.9**		0.100	0.00560	mg/L		08/30/13 08:37	09/03/13 22:15	1
Magnesium	**62.1**	**B**	1.00	0.0530	mg/L		08/30/13 08:37	09/03/13 22:15	1
Manganese	**7.85**	**B**	0.0150	0.000300	mg/L		08/30/13 08:37	09/03/13 22:15	1
Potassium	**1.61**	**B**	1.00	0.0880	mg/L		08/30/13 08:37	09/03/13 22:15	1
Sodium	**19.4**	**B**	1.00	0.0210	mg/L		08/30/13 08:37	09/03/13 22:15	1
Zinc	**68.1**		5.00	0.0400	mg/L		08/30/13 08:37	09/05/13 01:28	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00	0.700	mg/L		09/04/13 10:00	09/04/13 11:15	1
Alkalinity	**16.9**		10.0	3.50	mg/L			08/29/13 17:37	1
Orthophosphate as P	**0.0533**	**J**	0.100	0.0200	mg/L			08/30/13 09:11	1
Silica	ND		100	80.0	mg/L			09/05/13 15:26	100

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Client Sample ID: OW 3

Date Collected: 08/28/13 11:05
Date Received: 08/29/13 08:30

Lab Sample ID: 490-34183-10

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.33		1.00	0.500	mg/L			09/08/13 01:28	1
Nitrate as N	0.148	B	0.100	0.0500	mg/L			08/29/13 20:28	1
Nitrate as N	0.117	H	0.100	0.0500	mg/L			08/31/13 03:33	1
Nitrate Nitrite as N	0.148	J B	0.200	0.110	mg/L			08/29/13 20:28	1
Nitrate Nitrite as N	0.117	J H	0.200	0.110	mg/L			08/31/13 03:33	1
Sulfate	830		20.0	12.0	mg/L			09/08/13 01:48	20
Nitrite as N	ND		0.100	0.0600	mg/L			08/29/13 20:28	1
Nitrite as N	ND	H	0.100	0.0600	mg/L			08/31/13 03:33	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1.47		0.100	0.0680	mg/L		08/30/13 08:37	09/03/13 22:18	1
Cadmium	0.000600	J	0.00100	0.000200	mg/L		08/30/13 08:37	09/03/13 22:18	1
Calcium	77.4		1.00	0.150	mg/L		08/30/13 08:37	09/03/13 22:18	1
Iron	20.3		0.100	0.00560	mg/L		08/30/13 08:37	09/03/13 22:18	1
Magnesium	44.7	B	1.00	0.0530	mg/L		08/30/13 08:37	09/03/13 22:18	1
Manganese	7.20	B	0.0150	0.000300	mg/L		08/30/13 08:37	09/03/13 22:18	1
Potassium	2.20	B	1.00	0.0880	mg/L		08/30/13 08:37	09/03/13 22:18	1
Sodium	17.1	B	1.00	0.0210	mg/L		08/30/13 08:37	09/03/13 22:18	1
Zinc	28.8		5.00	0.0400	mg/L		08/30/13 08:37	09/05/13 01:32	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00	0.700	mg/L		09/04/13 10:00	09/04/13 11:15	1
Alkalinity	ND		10.0	3.50	mg/L			08/29/13 17:40	1
Orthophosphate as P	0.0230	J	0.100	0.0200	mg/L			08/30/13 09:11	1
Silica	51.0		10.0	8.00	mg/L			09/05/13 15:26	10

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Client Sample ID: PZ 12

Date Collected: 08/28/13 11:50
Date Received: 08/29/13 08:30

Lab Sample ID: 490-34183-11

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**4.10**		1.00	0.500	mg/L			09/04/13 17:48	1
Nitrate as N	**0.0840**	**J B**	0.100	0.0500	mg/L			08/29/13 20:47	1
Nitrate as N	**0.107**	**H**	0.100	0.0500	mg/L			09/08/13 02:09	1
Nitrate Nitrite as N	ND		0.200	0.110	mg/L			08/29/13 20:47	1
Nitrate Nitrite as N	ND	H	0.200	0.110	mg/L			09/08/13 02:09	1
Sulfate	**3300**		50.0	30.0	mg/L			09/08/13 03:29	50
Nitrite as N	ND		0.100	0.0600	mg/L			08/29/13 20:47	1
Nitrite as N	ND	H	0.100	0.0600	mg/L			09/08/13 02:09	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**32.9**		0.100	0.0680	mg/L		08/30/13 08:37	09/03/13 22:22	1
Cadmium	**0.0109**		0.00100	0.000200	mg/L		08/30/13 08:37	09/03/13 22:22	1
Calcium	**104**		1.00	0.150	mg/L		08/30/13 08:37	09/03/13 22:22	1
Iron	**24.7**		0.100	0.00560	mg/L		08/30/13 08:37	09/03/13 22:22	1
Magnesium	**58.7**	**B**	1.00	0.0530	mg/L		08/30/13 08:37	09/03/13 22:22	1
Manganese	**7.12**	**B**	0.0150	0.000300	mg/L		08/30/13 08:37	09/03/13 22:22	1
Potassium	**1.24**	**B**	1.00	0.0880	mg/L		08/30/13 08:37	09/03/13 22:22	1
Sodium	**14.9**	**B**	1.00	0.0210	mg/L		08/30/13 08:37	09/03/13 22:22	1
Zinc	**135**		5.00	0.0400	mg/L		08/30/13 08:37	09/05/13 01:48	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00	0.700	mg/L		09/04/13 10:00	09/04/13 11:15	1
Alkalinity	ND		10.0	3.50	mg/L			08/29/13 17:42	1
Orthophosphate as P	ND	H	0.100	0.0200	mg/L			09/07/13 10:14	1
Silica	**42.9**		10.0	8.00	mg/L			09/05/13 15:26	10

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Client Sample ID: PZ 13

Date Collected: 08/28/13 12:35
Date Received: 08/29/13 08:30

Lab Sample ID: 490-34183-12

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**4.22**		1.00	0.500	mg/L			09/04/13 18:28	1
Nitrate as N	**0.163**	**B**	0.100	0.0500	mg/L			08/29/13 21:07	1
Nitrate as N	**0.217**	**H**	0.100	0.0500	mg/L			09/08/13 03:49	1
Nitrate Nitrite as N	**0.163**	**J B**	0.200	0.110	mg/L			08/29/13 21:07	1
Nitrate Nitrite as N	**0.217**	**H**	0.200	0.110	mg/L			09/08/13 03:49	1
Sulfate	**455**		10.0	6.00	mg/L			09/08/13 04:09	10
Nitrite as N	ND		0.100	0.0600	mg/L			08/29/13 21:07	1
Nitrite as N	ND	H	0.100	0.0600	mg/L			09/08/13 03:49	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**0.607**		0.100	0.0680	mg/L		08/30/13 08:37	09/03/13 22:26	1
Cadmium	ND		0.00100	0.000200	mg/L		08/30/13 08:37	09/03/13 22:26	1
Calcium	**66.8**		1.00	0.150	mg/L		08/30/13 08:37	09/03/13 22:26	1
Iron	**13.6**		0.100	0.00560	mg/L		08/30/13 08:37	09/03/13 22:26	1
Magnesium	**21.2**	**B**	1.00	0.0530	mg/L		08/30/13 08:37	09/03/13 22:26	1
Manganese	**1.21**	**B**	0.0150	0.000300	mg/L		08/30/13 08:37	09/03/13 22:26	1
Potassium	**0.951**	**J B**	1.00	0.0880	mg/L		08/30/13 08:37	09/03/13 22:26	1
Sodium	**10.0**	**B**	1.00	0.0210	mg/L		08/30/13 08:37	09/03/13 22:26	1
Zinc	**70.4**		5.00	0.0400	mg/L		08/30/13 08:37	09/05/13 01:51	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00	0.700	mg/L		09/04/13 10:00	09/04/13 11:15	1
Alkalinity	**26.1**		10.0	3.50	mg/L			08/29/13 17:47	1
Orthophosphate as P	ND	H	0.100	0.0200	mg/L			09/10/13 15:28	1
Silica	**32.5**		10.0	8.00	mg/L			09/05/13 15:26	10

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 490-103690/3
Matrix: Water
Analysis Batch: 103690

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	4.717		0.100	0.0500	mg/L			08/29/13 17:35	1
Nitrate Nitrite as N	9.484		0.200	0.110	mg/L			08/29/13 17:35	1
Nitrite as N	4.767		0.100	0.0600	mg/L			08/29/13 17:35	1

Lab Sample ID: LCS 490-103690/4
Matrix: Water
Analysis Batch: 103690

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	5.00	4.732		mg/L		95	80 - 120
Nitrate Nitrite as N	10.0	9.497		mg/L		95	80 - 120
Nitrite as N	5.00	4.765		mg/L		95	80 - 120

Lab Sample ID: LCSD 490-103690/5
Matrix: Water
Analysis Batch: 103690

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	5.00	4.735		mg/L		95	80 - 120	0	20
Nitrate Nitrite as N	10.0	9.491		mg/L		95	80 - 120	0	20
Nitrite as N	5.00	4.756		mg/L		95	80 - 120	0	20

Lab Sample ID: 490-34183-6 MS
Matrix: Water
Analysis Batch: 103690

Client Sample ID: AB 2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	1.40	B	5.00	6.132		mg/L		95	80 - 120
Nitrate Nitrite as N	1.40	B	10.0	11.03		mg/L		96	80 - 120
Nitrite as N	ND		5.00	4.894		mg/L		98	80 - 120

Lab Sample ID: 490-34183-6 MSD
Matrix: Water
Analysis Batch: 103690

Client Sample ID: AB 2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	1.40	B	5.00	6.105		mg/L		94	80 - 120	0	20
Nitrate Nitrite as N	1.40	B	10.0	10.86		mg/L		95	80 - 120	2	20
Nitrite as N	ND		5.00	4.754		mg/L		95	80 - 120	3	20

Lab Sample ID: MB 490-103974/3
Matrix: Water
Analysis Batch: 103974

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.100	0.0500	mg/L			08/31/13 00:02	1
Nitrate Nitrite as N	ND		0.200	0.110	mg/L			08/31/13 00:02	1
Nitrite as N	ND		0.100	0.0600	mg/L			08/31/13 00:02	1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 490-103974/4
Matrix: Water
Analysis Batch: 103974

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	5.00	4.891		mg/L		98	80 - 120
Nitrate Nitrite as N	10.0	10.20		mg/L		102	80 - 120
Nitrite as N	5.00	5.311		mg/L		106	80 - 120

Lab Sample ID: LCSD 490-103974/5
Matrix: Water
Analysis Batch: 103974

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	5.00	4.831		mg/L		97	80 - 120	1	20
Nitrate Nitrite as N	10.0	10.13		mg/L		101	80 - 120	1	20
Nitrite as N	5.00	5.297		mg/L		106	80 - 120	0	20

Lab Sample ID: MB 490-104666/3
Matrix: Water
Analysis Batch: 104666

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00	0.500	mg/L			09/04/13 16:48	1
Sulfate	ND		1.00	0.600	mg/L			09/04/13 16:48	1

Lab Sample ID: LCS 490-104666/4
Matrix: Water
Analysis Batch: 104666

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.06		mg/L		100	80 - 120
Sulfate	50.0	51.01		mg/L		102	80 - 120

Lab Sample ID: LCSD 490-104666/5
Matrix: Water
Analysis Batch: 104666

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	50.0	50.23		mg/L		100	80 - 120	0	20
Sulfate	50.0	50.76		mg/L		102	80 - 120	0	20

Lab Sample ID: MB 490-105415/3
Matrix: Water
Analysis Batch: 105415

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00	0.500	mg/L			09/07/13 21:28	1
Sulfate	ND		1.00	0.600	mg/L			09/07/13 21:28	1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 490-105415/4
Matrix: Water
Analysis Batch: 105415

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	46.93		mg/L		94	80 - 120
Sulfate	50.0	47.12		mg/L		94	80 - 120

Lab Sample ID: LCSD 490-105415/5
Matrix: Water
Analysis Batch: 105415

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	50.0	46.98		mg/L		94	80 - 120	0	20
Sulfate	50.0	46.87		mg/L		94	80 - 120	1	20

Lab Sample ID: 490-34183-6 MS
Matrix: Water
Analysis Batch: 105415

Client Sample ID: AB 2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	1.84		50.0	47.15		mg/L		91	80 - 120
Sulfate	42.1		50.0	83.17		mg/L		82	80 - 120

Lab Sample ID: 490-34183-6 MSD
Matrix: Water
Analysis Batch: 105415

Client Sample ID: AB 2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	1.84		50.0	46.72		mg/L		90	80 - 120	1	20
Sulfate	42.1		50.0	82.70		mg/L		81	80 - 120	1	20

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 490-103814/1-A
Matrix: Water
Analysis Batch: 104481

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 103814

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.100	0.0680	mg/L		08/30/13 08:37	09/03/13 21:17	1
Cadmium	ND		0.00100	0.000200	mg/L		08/30/13 08:37	09/03/13 21:17	1
Calcium	ND		1.00	0.150	mg/L		08/30/13 08:37	09/03/13 21:17	1
Iron	ND		0.100	0.00560	mg/L		08/30/13 08:37	09/03/13 21:17	1
Magnesium	0.07290	J	1.00	0.0530	mg/L		08/30/13 08:37	09/03/13 21:17	1
Manganese	0.0004000	J	0.0150	0.000300	mg/L		08/30/13 08:37	09/03/13 21:17	1
Potassium	0.1462	J	1.00	0.0880	mg/L		08/30/13 08:37	09/03/13 21:17	1
Sodium	0.2531	J	1.00	0.0210	mg/L		08/30/13 08:37	09/03/13 21:17	1
Zinc	0.001500	J	0.0500	0.000400	mg/L		08/30/13 08:37	09/03/13 21:17	1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 490-103814/2-A
Matrix: Water
Analysis Batch: 104481

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 103814

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	2.00	1.892		mg/L		95	80 - 120
Cadmium	0.0500	0.05250		mg/L		105	80 - 120
Calcium	5.00	4.850		mg/L		97	80 - 120
Iron	1.00	1.008		mg/L		101	80 - 120
Magnesium	5.00	4.941		mg/L		99	80 - 120
Manganese	0.500	0.5170		mg/L		103	80 - 120
Potassium	5.00	5.104		mg/L		102	80 - 120
Sodium	5.00	5.238		mg/L		105	80 - 120
Zinc	0.500	0.4988		mg/L		100	80 - 120

Lab Sample ID: 490-34152-A-1-B MS
Matrix: Water
Analysis Batch: 104481

Client Sample ID: Matrix Spike
Prep Type: Dissolved
Prep Batch: 103814

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	11.1		2.00	12.42	4	mg/L		68	75 - 125
Cadmium	0.00360		0.0500	0.05200		mg/L		97	75 - 125
Calcium	46.5		5.00	50.37	4	mg/L		78	75 - 125
Iron	0.00990		1.00	0.9650		mg/L		96	75 - 125
Magnesium	4.65		5.00	9.119		mg/L		89	75 - 125
Manganese	6.64		0.500	6.955	4	mg/L		64	75 - 125
Potassium	2.76		5.00	7.362		mg/L		92	75 - 125
Sodium	9.16		5.00	13.60		mg/L		89	75 - 125
Zinc	1.20	B	0.500	1.606		mg/L		81	75 - 125

Lab Sample ID: 490-34152-A-1-C MSD
Matrix: Water
Analysis Batch: 104481

Client Sample ID: Matrix Spike Duplicate
Prep Type: Dissolved
Prep Batch: 103814

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	11.1		2.00	12.92	4	mg/L		93	75 - 125	4	20
Cadmium	0.00360		0.0500	0.05220		mg/L		97	75 - 125	0	20
Calcium	46.5		5.00	50.96	4	mg/L		90	75 - 125	1	20
Iron	0.00990		1.00	0.9825		mg/L		97	75 - 125	2	20
Magnesium	4.65		5.00	9.315		mg/L		93	75 - 125	2	20
Manganese	6.64		0.500	6.946	4	mg/L		62	75 - 125	0	20
Potassium	2.76		5.00	7.449		mg/L		94	75 - 125	1	20
Sodium	9.16		5.00	13.75		mg/L		92	75 - 125	1	20
Zinc	1.20	B	0.500	1.617		mg/L		83	75 - 125	1	20

Method: 9034 - Sulfide, Acid soluble and Insoluble (Titrimetric)

Lab Sample ID: MB 490-104188/1-A
Matrix: Water
Analysis Batch: 104189

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 104188

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00	0.700	mg/L		08/31/13 18:00	08/31/13 19:00	1

Method: 9034 - Sulfide, Acid soluble and Insoluble (Titrimetric) (Continued)

Lab Sample ID: LCS 490-104188/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 104189 — **Prep Batch: 104188**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfide			20.0	20.47		mg/L		102	80 - 120		

Lab Sample ID: 490-33976-B-1-B MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 104189 — **Prep Batch: 104188**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfide	ND		20.0	19.75		mg/L		99	70 - 130		

Lab Sample ID: 490-33976-B-1-C MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 104189 — **Prep Batch: 104188**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfide	ND		20.0	19.58		mg/L		98	70 - 130	1	10

Lab Sample ID: 490-34183-1 DU — **Client Sample ID: AB-1**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 104189 — **Prep Batch: 104188**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfide	ND		ND		mg/L		NC	20

Lab Sample ID: MB 490-104574/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 104576 — **Prep Batch: 104574**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00	0.700	mg/L		09/04/13 10:00	09/04/13 11:15	1

Lab Sample ID: LCS 490-104574/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 104576 — **Prep Batch: 104574**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfide			20.0	20.82		mg/L		104	80 - 120		

Lab Sample ID: 490-34159-B-1-B MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 104576 — **Prep Batch: 104574**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfide	ND		20.0	20.66		mg/L		103	70 - 130		

Lab Sample ID: 490-34159-B-1-C MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 104576 — **Prep Batch: 104574**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfide	ND		20.0	20.82		mg/L		104	70 - 130	1	10

Lab Sample ID: 490-34183-6 DU
Matrix: Water
Analysis Batch: 104576

Client Sample ID: AB 2
Prep Type: Total/NA
Prep Batch: 104574

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfide	ND		ND		mg/L		NC	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 490-103817/3
Matrix: Water
Analysis Batch: 103817

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	ND		10.0	3.50	mg/L			08/29/13 16:32	1

Lab Sample ID: LCS 490-103817/4
Matrix: Water
Analysis Batch: 103817

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	92.78		mg/L		93	90 - 110

Lab Sample ID: LCSD 490-103817/5
Matrix: Water
Analysis Batch: 103817

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Alkalinity	100	93.43		mg/L		93	90 - 110	1	20

Lab Sample ID: 490-34183-12 MS
Matrix: Water
Analysis Batch: 103817

Client Sample ID: PZ 13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	26.1		100	112.0		mg/L		86	80 - 120

Lab Sample ID: 490-34183-12 DU
Matrix: Water
Analysis Batch: 103817

Client Sample ID: PZ 13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	26.1		26.91		mg/L		3	20

Method: SM 4500 P E - Orthophosphate

Lab Sample ID: MB 490-103932/9
Matrix: Water
Analysis Batch: 103932

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Orthophosphate as P	ND	^	0.100	0.0200	mg/L			08/30/13 08:41	1

Method: SM 4500 P E - Orthophosphate (Continued)

Lab Sample ID: LCS 490-103932/12
Matrix: Water
Analysis Batch: 103932

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Orthophosphate as P			0.250	0.2424		mg/L		97	90 - 110		

Lab Sample ID: 490-34183-6 MS
Matrix: Water
Analysis Batch: 103932

Client Sample ID: AB 2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Orthophosphate as P	0.0330	J	0.250	0.2662		mg/L		93	72 - 129		

Lab Sample ID: 490-34183-6 MSD
Matrix: Water
Analysis Batch: 103932

Client Sample ID: AB 2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Orthophosphate as P	0.0330	J	0.250	0.2672		mg/L		94	72 - 129	0	20

Lab Sample ID: 490-34183-6 DU
Matrix: Water
Analysis Batch: 103932

Client Sample ID: AB 2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Orthophosphate as P	0.0330	J	0.03390	J	mg/L		3	20

Lab Sample ID: MB 490-105417/4
Matrix: Water
Analysis Batch: 105417

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Orthophosphate as P	ND		0.100	0.0200	mg/L			09/07/13 09:40	1

Lab Sample ID: LCS 490-105417/7
Matrix: Water
Analysis Batch: 105417

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Orthophosphate as P			0.250	0.2422		mg/L		97	90 - 110		

Lab Sample ID: 490-33604-D-1 MS
Matrix: Water
Analysis Batch: 105417

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Orthophosphate as P	ND		0.250	0.2501		mg/L		100	72 - 129		

Lab Sample ID: 490-33604-D-1 MSD
Matrix: Water
Analysis Batch: 105417

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Orthophosphate as P	ND		0.250	0.2433		mg/L		97	72 - 129	3	20

Lab Sample ID: 490-33604-D-1 DU
Matrix: Water
Analysis Batch: 105417

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Orthophosphate as P	ND			ND		mg/L				NC	20

Lab Sample ID: MB 490-106057/62
Matrix: Water
Analysis Batch: 106057

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Orthophosphate as P	ND		0.100	0.0200	mg/L			09/10/13 15:28	1

Lab Sample ID: LCS 490-106057/73
Matrix: Water
Analysis Batch: 106057

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Orthophosphate as P			0.250	0.2603		mg/L		104	90 - 110		

Lab Sample ID: 490-34063-D-8 MS
Matrix: Water
Analysis Batch: 106057

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Orthophosphate as P	0.0400	J	0.250	0.2922		mg/L		101	72 - 129		

Lab Sample ID: 490-34063-D-8 MSD
Matrix: Water
Analysis Batch: 106057

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Orthophosphate as P	0.0400	J	0.250	0.2922		mg/L		101	72 - 129	0	20

Lab Sample ID: 490-34063-D-8 DU
Matrix: Water
Analysis Batch: 106057

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Orthophosphate as P	0.0400	J		0.03830	J	mg/L				4	20

Method: SM4500 SiO2 C - Silica, Molybdosilicate Method

Lab Sample ID: MB 490-104995/2
Matrix: Water
Analysis Batch: 104995

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silica	ND		1.00	0.800	mg/L			09/05/13 15:26	1

Method: SM4500 SiO2 C - Silica, Molybdosilicate Method (Continued)

Lab Sample ID: LCS 490-104995/3
Matrix: Water
Analysis Batch: 104995

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Silica			2.00	1.951		mg/L		98	90 - 110		

Lab Sample ID: 490-34183-6 MS
Matrix: Water
Analysis Batch: 104995

Client Sample ID: AB 2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Silica	35.6		20.0	34.23	F	mg/L		-7	80 - 120		

Lab Sample ID: 490-34183-6 MSD
Matrix: Water
Analysis Batch: 104995

Client Sample ID: AB 2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica	35.6		20.0	34.56	F	mg/L		-5	80 - 120	1	20

Lab Sample ID: 490-34183-6 DU
Matrix: Water
Analysis Batch: 104995

Client Sample ID: AB 2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Silica	35.6		36.15		mg/L		2	20

HPLC/IC

Analysis Batch: 103690

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34183-6	AB 2	Total/NA	Water	9056A	
490-34183-6 MS	AB 2	Total/NA	Water	9056A	
490-34183-6 MSD	AB 2	Total/NA	Water	9056A	
490-34183-7	PZ 1	Total/NA	Water	9056A	
490-34183-8	OW 2	Total/NA	Water	9056A	
490-34183-9	OW 1	Total/NA	Water	9056A	
490-34183-10	OW 3	Total/NA	Water	9056A	
490-34183-11	PZ 12	Total/NA	Water	9056A	
490-34183-12	PZ 13	Total/NA	Water	9056A	
LCS 490-103690/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 490-103690/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MB 490-103690/3	Method Blank	Total/NA	Water	9056A	

Analysis Batch: 103974

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34183-6	AB 2	Total/NA	Water	9056A	
490-34183-7	PZ 1	Total/NA	Water	9056A	
490-34183-8	OW 2	Total/NA	Water	9056A	
490-34183-10	OW 3	Total/NA	Water	9056A	
LCS 490-103974/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 490-103974/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MB 490-103974/3	Method Blank	Total/NA	Water	9056A	

Analysis Batch: 104666

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34183-11	PZ 12	Total/NA	Water	9056A	
490-34183-12	PZ 13	Total/NA	Water	9056A	
LCS 490-104666/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 490-104666/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MB 490-104666/3	Method Blank	Total/NA	Water	9056A	

Analysis Batch: 105415

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34183-6	AB 2	Total/NA	Water	9056A	
490-34183-6 MS	AB 2	Total/NA	Water	9056A	
490-34183-6 MSD	AB 2	Total/NA	Water	9056A	
490-34183-7	PZ 1	Total/NA	Water	9056A	
490-34183-7	PZ 1	Total/NA	Water	9056A	
490-34183-8	OW 2	Total/NA	Water	9056A	
490-34183-8	OW 2	Total/NA	Water	9056A	
490-34183-9	OW 1	Total/NA	Water	9056A	
490-34183-9	OW 1	Total/NA	Water	9056A	
490-34183-10	OW 3	Total/NA	Water	9056A	
490-34183-10	OW 3	Total/NA	Water	9056A	
490-34183-11	PZ 12	Total/NA	Water	9056A	
490-34183-12	PZ 13	Total/NA	Water	9056A	
LCS 490-105415/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 490-105415/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MB 490-105415/3	Method Blank	Total/NA	Water	9056A	

HPLC/IC (Continued)

Analysis Batch: 105588

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34183-11	PZ 12	Total/NA	Water	9056A	
490-34183-12	PZ 13	Total/NA	Water	9056A	

Metals

Prep Batch: 103814

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34152-A-1-B MS	Matrix Spike	Dissolved	Water	3005A	
490-34152-A-1-C MSD	Matrix Spike Duplicate	Dissolved	Water	3005A	
490-34183-1	AB-1	Dissolved	Water	3005A	
490-34183-2	PZ 3	Dissolved	Water	3005A	
490-34183-3	PZ 6	Dissolved	Water	3005A	
490-34183-4	PZ 4	Dissolved	Water	3005A	
490-34183-5	PZ 5	Dissolved	Water	3005A	
490-34183-6	AB 2	Dissolved	Water	3005A	
490-34183-7	PZ 1	Dissolved	Water	3005A	
490-34183-8	OW 2	Dissolved	Water	3005A	
490-34183-9	OW 1	Dissolved	Water	3005A	
490-34183-10	OW 3	Dissolved	Water	3005A	
490-34183-11	PZ 12	Dissolved	Water	3005A	
490-34183-12	PZ 13	Dissolved	Water	3005A	
LCS 490-103814/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 490-103814/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 104481

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34152-A-1-B MS	Matrix Spike	Dissolved	Water	6010C	103814
490-34152-A-1-C MSD	Matrix Spike Duplicate	Dissolved	Water	6010C	103814
490-34183-1	AB-1	Dissolved	Water	6010C	103814
490-34183-2	PZ 3	Dissolved	Water	6010C	103814
490-34183-3	PZ 6	Dissolved	Water	6010C	103814
490-34183-4	PZ 4	Dissolved	Water	6010C	103814
490-34183-5	PZ 5	Dissolved	Water	6010C	103814
490-34183-6	AB 2	Dissolved	Water	6010C	103814
490-34183-7	PZ 1	Dissolved	Water	6010C	103814
490-34183-8	OW 2	Dissolved	Water	6010C	103814
490-34183-9	OW 1	Dissolved	Water	6010C	103814
490-34183-10	OW 3	Dissolved	Water	6010C	103814
490-34183-11	PZ 12	Dissolved	Water	6010C	103814
490-34183-12	PZ 13	Dissolved	Water	6010C	103814
LCS 490-103814/2-A	Lab Control Sample	Total Recoverable	Water	6010C	103814
MB 490-103814/1-A	Method Blank	Total Recoverable	Water	6010C	103814

Analysis Batch: 104778

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34183-2	PZ 3	Dissolved	Water	6010C	103814
490-34183-5	PZ 5	Dissolved	Water	6010C	103814
490-34183-6	AB 2	Dissolved	Water	6010C	103814
490-34183-7	PZ 1	Dissolved	Water	6010C	103814
490-34183-8	OW 2	Dissolved	Water	6010C	103814

Metals (Continued)

Analysis Batch: 104778 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34183-9	OW 1	Dissolved	Water	6010C	103814
490-34183-10	OW 3	Dissolved	Water	6010C	103814
490-34183-11	PZ 12	Dissolved	Water	6010C	103814
490-34183-12	PZ 13	Dissolved	Water	6010C	103814

General Chemistry

Analysis Batch: 103817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34183-6	AB 2	Total/NA	Water	SM 2320B	
490-34183-7	PZ 1	Total/NA	Water	SM 2320B	
490-34183-8	OW 2	Total/NA	Water	SM 2320B	
490-34183-9	OW 1	Total/NA	Water	SM 2320B	
490-34183-10	OW 3	Total/NA	Water	SM 2320B	
490-34183-11	PZ 12	Total/NA	Water	SM 2320B	
490-34183-12	PZ 13	Total/NA	Water	SM 2320B	
490-34183-12 DU	PZ 13	Total/NA	Water	SM 2320B	
490-34183-12 MS	PZ 13	Total/NA	Water	SM 2320B	
LCS 490-103817/4	Lab Control Sample	Total/NA	Water	SM 2320B	
LCSD 490-103817/5	Lab Control Sample Dup	Total/NA	Water	SM 2320B	
MB 490-103817/3	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 103932

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34183-6	AB 2	Total/NA	Water	SM 4500 P E	
490-34183-6 DU	AB 2	Total/NA	Water	SM 4500 P E	
490-34183-6 MS	AB 2	Total/NA	Water	SM 4500 P E	
490-34183-6 MSD	AB 2	Total/NA	Water	SM 4500 P E	
490-34183-7	PZ 1	Total/NA	Water	SM 4500 P E	
490-34183-8	OW 2	Total/NA	Water	SM 4500 P E	
490-34183-9	OW 1	Total/NA	Water	SM 4500 P E	
490-34183-10	OW 3	Total/NA	Water	SM 4500 P E	
LCS 490-103932/12	Lab Control Sample	Total/NA	Water	SM 4500 P E	
MB 490-103932/9	Method Blank	Total/NA	Water	SM 4500 P E	

Prep Batch: 104188

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-33976-B-1-B MS	Matrix Spike	Total/NA	Water	9030B	
490-33976-B-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	9030B	
490-34183-1	AB-1	Total/NA	Water	9030B	
490-34183-1 DU	AB-1	Total/NA	Water	9030B	
490-34183-2	PZ 3	Total/NA	Water	9030B	
490-34183-3	PZ 6	Total/NA	Water	9030B	
490-34183-4	PZ 4	Total/NA	Water	9030B	
490-34183-5	PZ 5	Total/NA	Water	9030B	
LCS 490-104188/2-A	Lab Control Sample	Total/NA	Water	9030B	
MB 490-104188/1-A	Method Blank	Total/NA	Water	9030B	

General Chemistry (Continued)

Analysis Batch: 104189

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-33976-B-1-B MS	Matrix Spike	Total/NA	Water	9034	104188
490-33976-B-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	9034	104188
490-34183-1	AB-1	Total/NA	Water	9034	104188
490-34183-1 DU	AB-1	Total/NA	Water	9034	104188
490-34183-2	PZ 3	Total/NA	Water	9034	104188
490-34183-3	PZ 6	Total/NA	Water	9034	104188
490-34183-4	PZ 4	Total/NA	Water	9034	104188
490-34183-5	PZ 5	Total/NA	Water	9034	104188
LCS 490-104188/2-A	Lab Control Sample	Total/NA	Water	9034	104188
MB 490-104188/1-A	Method Blank	Total/NA	Water	9034	104188

Prep Batch: 104574

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34159-B-1-B MS	Matrix Spike	Total/NA	Water	9030B	
490-34159-B-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	9030B	
490-34183-6	AB 2	Total/NA	Water	9030B	
490-34183-6 DU	AB 2	Total/NA	Water	9030B	
490-34183-7	PZ 1	Total/NA	Water	9030B	
490-34183-8	OW 2	Total/NA	Water	9030B	
490-34183-9	OW 1	Total/NA	Water	9030B	
490-34183-10	OW 3	Total/NA	Water	9030B	
490-34183-11	PZ 12	Total/NA	Water	9030B	
490-34183-12	PZ 13	Total/NA	Water	9030B	
LCS 490-104574/2-A	Lab Control Sample	Total/NA	Water	9030B	
MB 490-104574/1-A	Method Blank	Total/NA	Water	9030B	

Analysis Batch: 104576

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34159-B-1-B MS	Matrix Spike	Total/NA	Water	9034	104574
490-34159-B-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	9034	104574
490-34183-6	AB 2	Total/NA	Water	9034	104574
490-34183-6 DU	AB 2	Total/NA	Water	9034	104574
490-34183-7	PZ 1	Total/NA	Water	9034	104574
490-34183-8	OW 2	Total/NA	Water	9034	104574
490-34183-9	OW 1	Total/NA	Water	9034	104574
490-34183-10	OW 3	Total/NA	Water	9034	104574
490-34183-11	PZ 12	Total/NA	Water	9034	104574
490-34183-12	PZ 13	Total/NA	Water	9034	104574
LCS 490-104574/2-A	Lab Control Sample	Total/NA	Water	9034	104574
MB 490-104574/1-A	Method Blank	Total/NA	Water	9034	104574

Analysis Batch: 104995

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34183-6	AB 2	Total/NA	Water	SM4500 SiO2 C	
490-34183-6 DU	AB 2	Total/NA	Water	SM4500 SiO2 C	
490-34183-6 MS	AB 2	Total/NA	Water	SM4500 SiO2 C	
490-34183-6 MSD	AB 2	Total/NA	Water	SM4500 SiO2 C	
490-34183-7	PZ 1	Total/NA	Water	SM4500 SiO2 C	
490-34183-8	OW 2	Total/NA	Water	SM4500 SiO2 C	
490-34183-9	OW 1	Total/NA	Water	SM4500 SiO2 C	
490-34183-10	OW 3	Total/NA	Water	SM4500 SiO2 C	

General Chemistry (Continued)

Analysis Batch: 104995 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34183-11	PZ 12	Total/NA	Water	SM4500 SiO2 C	
490-34183-12	PZ 13	Total/NA	Water	SM4500 SiO2 C	
LCS 490-104995/3	Lab Control Sample	Total/NA	Water	SM4500 SiO2 C	
MB 490-104995/2	Method Blank	Total/NA	Water	SM4500 SiO2 C	

Analysis Batch: 105417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-33604-D-1 DU	Duplicate	Total/NA	Water	SM 4500 P E	
490-33604-D-1 MS	Matrix Spike	Total/NA	Water	SM 4500 P E	
490-33604-D-1 MSD	Matrix Spike Duplicate	Total/NA	Water	SM 4500 P E	
490-34183-11	PZ 12	Total/NA	Water	SM 4500 P E	
LCS 490-105417/7	Lab Control Sample	Total/NA	Water	SM 4500 P E	
MB 490-105417/4	Method Blank	Total/NA	Water	SM 4500 P E	

Analysis Batch: 106057

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-34063-D-8 DU	Duplicate	Total/NA	Water	SM 4500 P E	
490-34063-D-8 MS	Matrix Spike	Total/NA	Water	SM 4500 P E	
490-34063-D-8 MSD	Matrix Spike Duplicate	Total/NA	Water	SM 4500 P E	
490-34183-12	PZ 13	Total/NA	Water	SM 4500 P E	
LCS 490-106057/73	Lab Control Sample	Total/NA	Water	SM 4500 P E	
MB 490-106057/62	Method Blank	Total/NA	Water	SM 4500 P E	

Client Sample ID: AB-1

Lab Sample ID: 490-34183-1

Date Collected: 08/27/13 11:00

Matrix: Water

Date Received: 08/29/13 08:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		1	104481	09/03/13 21:35	KDJ	TAL NSH
Total/NA	Prep	9030B			104188	08/31/13 18:00	WEC	TAL NSH
Total/NA	Analysis	9034		1	104189	08/31/13 19:00	WEC	TAL NSH

Client Sample ID: PZ 3

Lab Sample ID: 490-34183-2

Date Collected: 08/27/13 11:40

Matrix: Water

Date Received: 08/29/13 08:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		1	104481	09/03/13 21:39	KDJ	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		10	104778	09/05/13 01:10	DEB	TAL NSH
Total/NA	Prep	9030B			104188	08/31/13 18:00	WEC	TAL NSH
Total/NA	Analysis	9034		1	104189	08/31/13 19:00	WEC	TAL NSH

Client Sample ID: PZ 6

Lab Sample ID: 490-34183-3

Date Collected: 08/27/13 12:15

Matrix: Water

Date Received: 08/29/13 08:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		1	104481	09/03/13 21:42	KDJ	TAL NSH
Total/NA	Prep	9030B			104188	08/31/13 18:00	WEC	TAL NSH
Total/NA	Analysis	9034		1	104189	08/31/13 19:00	WEC	TAL NSH

Client Sample ID: PZ 4

Lab Sample ID: 490-34183-4

Date Collected: 08/27/13 13:40

Matrix: Water

Date Received: 08/29/13 08:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		1	104481	09/03/13 21:46	KDJ	TAL NSH
Total/NA	Prep	9030B			104188	08/31/13 18:00	WEC	TAL NSH
Total/NA	Analysis	9034		1	104189	08/31/13 19:00	WEC	TAL NSH

Client Sample ID: PZ 5

Lab Sample ID: 490-34183-5

Date Collected: 08/27/13 14:05

Matrix: Water

Date Received: 08/29/13 08:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH

Client Sample ID: PZ 5

Lab Sample ID: 490-34183-5

Date Collected: 08/27/13 14:05

Matrix: Water

Date Received: 08/29/13 08:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Analysis	6010C		1	104481	09/03/13 21:49	KDJ	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		10	104778	09/05/13 01:14	DEB	TAL NSH
Total/NA	Prep	9030B			104188	08/31/13 18:00	WEC	TAL NSH
Total/NA	Analysis	9034		1	104189	08/31/13 19:00	WEC	TAL NSH

Client Sample ID: AB 2

Lab Sample ID: 490-34183-6

Date Collected: 08/28/13 08:15

Matrix: Water

Date Received: 08/29/13 08:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	103690	08/29/13 18:34	ASL	TAL NSH
Total/NA	Analysis	9056A		1	103974	08/31/13 01:05	ASL	TAL NSH
Total/NA	Analysis	9056A		1	105415	09/07/13 22:28	JHS	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		1	104481	09/03/13 22:04	KDJ	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		10	104778	09/05/13 01:17	DEB	TAL NSH
Total/NA	Analysis	SM 2320B		1	103817	08/29/13 17:23	JMR	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	103932	08/30/13 09:11	CRM	TAL NSH
Total/NA	Prep	9030B			104574	09/04/13 10:00	WEC	TAL NSH
Total/NA	Analysis	9034		1	104576	09/04/13 11:15	WEC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		10	104995	09/05/13 15:26	AMB	TAL NSH

Client Sample ID: PZ 1

Lab Sample ID: 490-34183-7

Date Collected: 08/28/13 08:55

Matrix: Water

Date Received: 08/29/13 08:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	103690	08/29/13 19:31	ASL	TAL NSH
Total/NA	Analysis	9056A		1	103974	08/31/13 01:27	ASL	TAL NSH
Total/NA	Analysis	9056A		5	105415	09/07/13 23:48	JHS	TAL NSH
Total/NA	Analysis	9056A		1	105415	09/07/13 23:28	JHS	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		1	104481	09/03/13 22:08	KDJ	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		100	104778	09/05/13 01:21	DEB	TAL NSH
Total/NA	Analysis	SM 2320B		1	103817	08/29/13 17:27	JMR	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	103932	08/30/13 09:11	CRM	TAL NSH
Total/NA	Prep	9030B			104574	09/04/13 10:00	WEC	TAL NSH
Total/NA	Analysis	9034		1	104576	09/04/13 11:15	WEC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		10	104995	09/05/13 15:26	AMB	TAL NSH

Client Sample ID: OW 2

Lab Sample ID: 490-34183-8

Date Collected: 08/28/13 09:35

Matrix: Water

Date Received: 08/29/13 08:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	103690	08/29/13 19:50	ASL	TAL NSH
Total/NA	Analysis	9056A		1	103974	08/31/13 02:09	ASL	TAL NSH
Total/NA	Analysis	9056A		1	105415	09/08/13 00:08	JHS	TAL NSH
Total/NA	Analysis	9056A		10	105415	09/08/13 00:28	JHS	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		1	104481	09/03/13 22:11	KDJ	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		100	104778	09/05/13 01:25	DEB	TAL NSH
Total/NA	Analysis	SM 2320B		1	103817	08/29/13 17:32	JMR	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	103932	08/30/13 09:11	CRM	TAL NSH
Total/NA	Prep	9030B			104574	09/04/13 10:00	WEC	TAL NSH
Total/NA	Analysis	9034		1	104576	09/04/13 11:15	WEC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		10	104995	09/05/13 15:26	AMB	TAL NSH

Client Sample ID: OW 1

Lab Sample ID: 490-34183-9

Date Collected: 08/28/13 10:20

Matrix: Water

Date Received: 08/29/13 08:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	103690	08/29/13 20:09	ASL	TAL NSH
Total/NA	Analysis	9056A		1	105415	09/08/13 00:48	JHS	TAL NSH
Total/NA	Analysis	9056A		20	105415	09/08/13 01:08	JHS	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		1	104481	09/03/13 22:15	KDJ	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		100	104778	09/05/13 01:28	DEB	TAL NSH
Total/NA	Analysis	SM 2320B		1	103817	08/29/13 17:37	JMR	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	103932	08/30/13 09:11	CRM	TAL NSH
Total/NA	Prep	9030B			104574	09/04/13 10:00	WEC	TAL NSH
Total/NA	Analysis	9034		1	104576	09/04/13 11:15	WEC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		100	104995	09/05/13 15:26	AMB	TAL NSH

Client Sample ID: OW 3

Lab Sample ID: 490-34183-10

Date Collected: 08/28/13 11:05

Matrix: Water

Date Received: 08/29/13 08:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	103690	08/29/13 20:28	ASL	TAL NSH
Total/NA	Analysis	9056A		1	103974	08/31/13 03:33	ASL	TAL NSH
Total/NA	Analysis	9056A		1	105415	09/08/13 01:28	JHS	TAL NSH
Total/NA	Analysis	9056A		20	105415	09/08/13 01:48	JHS	TAL NSH

Client Sample ID: OW 3

Lab Sample ID: 490-34183-10

Date Collected: 08/28/13 11:05

Matrix: Water

Date Received: 08/29/13 08:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		1	104481	09/03/13 22:18	KDJ	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		100	104778	09/05/13 01:32	DEB	TAL NSH
Total/NA	Analysis	SM 2320B		1	103817	08/29/13 17:40	JMR	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	103932	08/30/13 09:11	CRM	TAL NSH
Total/NA	Prep	9030B			104574	09/04/13 10:00	WEC	TAL NSH
Total/NA	Analysis	9034		1	104576	09/04/13 11:15	WEC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		10	104995	09/05/13 15:26	AMB	TAL NSH

Client Sample ID: PZ 12

Lab Sample ID: 490-34183-11

Date Collected: 08/28/13 11:50

Matrix: Water

Date Received: 08/29/13 08:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	103690	08/29/13 20:47	ASL	TAL NSH
Total/NA	Analysis	9056A		1	104666	09/04/13 17:48	ASL	TAL NSH
Total/NA	Analysis	9056A		50	105415	09/08/13 03:29	JHS	TAL NSH
Total/NA	Analysis	9056A		1	105588	09/08/13 02:09	JHS	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		1	104481	09/03/13 22:22	KDJ	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		100	104778	09/05/13 01:48	DEB	TAL NSH
Total/NA	Analysis	SM 2320B		1	103817	08/29/13 17:42	JMR	TAL NSH
Total/NA	Prep	9030B			104574	09/04/13 10:00	WEC	TAL NSH
Total/NA	Analysis	9034		1	104576	09/04/13 11:15	WEC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		10	104995	09/05/13 15:26	AMB	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	105417	09/07/13 10:14	CRM	TAL NSH

Client Sample ID: PZ 13

Lab Sample ID: 490-34183-12

Date Collected: 08/28/13 12:35

Matrix: Water

Date Received: 08/29/13 08:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	103690	08/29/13 21:07	ASL	TAL NSH
Total/NA	Analysis	9056A		1	104666	09/04/13 18:28	ASL	TAL NSH
Total/NA	Analysis	9056A		10	105415	09/08/13 04:09	JHS	TAL NSH
Total/NA	Analysis	9056A		1	105588	09/08/13 03:49	JHS	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		1	104481	09/03/13 22:26	KDJ	TAL NSH
Dissolved	Prep	3005A			103814	08/30/13 08:37	JBD	TAL NSH
Dissolved	Analysis	6010C		100	104778	09/05/13 01:51	DEB	TAL NSH

Lab Chronicle

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Client Sample ID: PZ 13
Date Collected: 08/28/13 12:35
Date Received: 08/29/13 08:30

Lab Sample ID: 490-34183-12
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2320B		1	103817	08/29/13 17:47	JMR	TAL NSH
Total/NA	Prep	9030B			104574	09/04/13 10:00	WEC	TAL NSH
Total/NA	Analysis	9034		1	104576	09/04/13 11:15	WEC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		10	104995	09/05/13 15:26	AMB	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	106057	09/10/13 15:28	CRM	TAL NSH

Laboratory References:

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

Method Summary

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL NSH
6010C	Metals (ICP)	SW846	TAL NSH
9034	Sulfide, Acid soluble and Insoluble (Titrimetric)	SW846	TAL NSH
SM 2320B	Alkalinity	SM	TAL NSH
SM 4500 P E	Orthophosphate	SM	TAL NSH
SM4500 SiO2 C	Silica, Molybdosilicate Method	SM	TAL NSH

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater",

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

Certification Summary

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

TestAmerica Job ID: 490-34183-1
SDG: CLR.045

Laboratory: TestAmerica Nashville

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	ISO/IEC 17025		0453.07	12-31-13
Alaska (UST)	State Program	10	UST-087	07-24-14
Arizona	State Program	9	AZ0473	05-05-14
Arizona	State Program	9	AZ0473	05-05-14 *
Arkansas DEQ	State Program	6	88-0737	04-25-14
California	NELAP	9	1168CA	10-31-13
Canadian Assoc Lab Accred (CALA)	Canada		3744	03-08-14
Connecticut	State Program	1	PH-0220	12-31-13
Florida	NELAP	4	E87358	06-30-14
Illinois	NELAP	5	200010	12-09-13
Iowa	State Program	7	131	05-01-14
Kansas	NELAP	7	E-10229	10-31-13
Kentucky (UST)	State Program	4	19	06-30-14
Louisiana	NELAP	6	30613	06-30-14
Maryland	State Program	3	316	03-31-14
Massachusetts	State Program	1	M-TN032	06-30-14
Minnesota	NELAP	5	047-999-345	12-31-13
Mississippi	State Program	4	N/A	06-30-14
Montana (UST)	State Program	8	NA	01-01-15
Nevada	State Program	9	TN00032	07-31-14
New Hampshire	NELAP	1	2963	10-10-13
New Jersey	NELAP	2	TN965	06-30-14
New York	NELAP	2	11342	04-01-14
North Carolina DENR	State Program	4	387	12-31-13
North Dakota	State Program	8	R-146	06-30-14
Ohio VAP	State Program	5	CL0033	01-19-14
Oklahoma	State Program	6	9412	08-31-14
Oregon	NELAP	10	TN200001	04-29-14
Pennsylvania	NELAP	3	68-00585	06-30-14
Rhode Island	State Program	1	LAO00268	12-30-13
South Carolina	State Program	4	84009 (001)	02-28-14
Tennessee	State Program	4	2008	02-23-14
Texas	NELAP	6	T104704077-09-TX	08-31-14
USDA	Federal		S-48469	11-02-13
Utah	NELAP	8	TN00032	07-31-14
Virginia	NELAP	3	460152	06-14-14
Washington	State Program	10	C789	07-19-14
West Virginia DEP	State Program	3	219	02-28-14
Wisconsin	State Program	5	998020430	08-31-14
Wyoming (UST)	A2LA	8	453.07	12-31-13

* Expired certification is currently pending renewal and is considered valid.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

Charlotte


490-34183 Chain of Custody

Cooler Received/Opened On 8/29/2013 @ 0830

1. Tracking # 2160 (last 4 digits, FedEx)

Courier: FedEx IR Gun ID 94660220

2. Temperature of rep. sample or temp blank when opened: 2.6 *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)Front

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 (intial) mdm

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 (intial) mdm

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 (intial) mdm

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 (intial) mdm

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

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

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 11/28/12

TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRO

Loc: 490
34183

9/1/2013

Client Information	Sampler: Chad Fleming	Lab PM: Hayes, Ken	Carrier Tracking No(s):	COC No: 490-11738-5219.2
Client Contact: Mr. Scott Drury	Phone: 704-586-0007	E-Mail: ken.hayes@testamericainc.com		Page: Page 1 of 2
Company: Hart & Hickman, PC				Job #:
Address: 2923 S Tryon Street Suite 100	Due Date Requested:			
City: Charlotte	TAT Requested (days): Standard			
State, Zip: NC, 28203				
Phone: 704-586-0007	PO #: Purchase Order not required			
Email: sdrury@harthickman.com	WO #:			
Project Name: WA site - GW	Project #: 49000951			
Site: Clariant Kalama (CLR.0045)	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C - Cd + Zn	9034_Calc - Sulfide	4500_P_E_Ortho, 9056_ORGFM_28D, 9066_ORGFM_48Hr, SM4500_SiO2_C	6010C - Custom Metals List (10)	2320B - Alkalinity											Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	CB	N	D	N												
AB-1	8/27/13	1100	G	Water	Y		✓	✓														2	only metals field filtered
PZ3	8/27/13	1140	G	Water	Y		✓	✓														2	" "
PZ6	8/27/13	1215	G	W	Y		✓	✓														2	" "
PZ4	8/27/13	1340	G	W	Y		✓	✓														2	" "
PZ5	8/27/13	1405	G	W	Y		✓	✓														2	" "
AB2	8/28/13	0815	G	W	Y			✓	✓	✓	✓											4	" "
PZ1		0855	G	W	Y			✓	✓	✓	✓											4	" "
OW2		0935	G	W	Y			✓	✓	✓	✓											4	" "
OW1		1020	G	W	Y			✓	✓	✓	✓											4	" "
OW3		1105	G	W	Y			✓	✓	✓	✓											4	" "
PZ12		1150	G	W	Y			✓	✓	✓	✓											4	" "

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by: Chad Fleming	Date/Time: 8/28/13 1425	Company H+H	Received by:		Date/Time: 8-29-13 @ 0830	Company TAN	
Relinquished by:	Date/Time:	Company	Received by:		Date/Time:	Company	
Relinquished by:	Date/Time:	Company	Received by:		Date/Time:	Company	

Custody Seals Intact: △ Yes △ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2.6c

TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

490 - 34183

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

9/11/2013

Client Information	Sampler: Chad Henn	Lab PM: Hayes, Ken	Carrier Tracking No(s):	COC No: 490-11738-5219.2
Client Contact: Mr. Scott Drury	Phone: 704-586-0007	E-Mail: ken.hayes@testamericainc.com		Page: Page 2 of 2
Company: Hart & Hickman, PC				Job #:
Address: 2923 S Tryon Street Suite 100	Due Date Requested:			
City: Charlotte	TAT Requested (days): Standard			
State, Zip: NC, 28203				
Phone: 704-586-0007	PO #: Purchase Order not required			
Email: sdrury@harthickman.com	WO #:			
Project Name: WA site - GW	Project #: 49000951			
Site: Clariant Kalama (CLR,045)	SSOW#:			

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C - Cd + Zn	9034_Calc - Sulfide	4500_P_E_Ortho, 9056_ORGFM_28D, 9056_ORGFM_48Hr, SM4500_SiO2_C	6010C - Custom Metals List (10)	2320B - Alkalinity	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	CB	N	D	N		
PZ 13	8/28/13	1235	G	Water	Y			✓	✓	✓	✓	12	only metals field filtered
				Water									

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: Chad Henn	Date/Time: 8/28/13 1425	Company H+H	Received by:	Date/Time: 8.29.13 @ 0830	Company TAN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: △ Yes △ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2.6 c

Login Sample Receipt Checklist

Client: Hart & Hickman, PC

Job Number: 490-34183-1
SDG Number: CLR.045

Login Number: 34183
List Number: 1
Creator: McBride, Mike

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
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.	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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

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: 490-43287-1
TestAmerica Sample Delivery Group: CIR.045
Client Project/Site: Clariant Kalama

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

Attn: Mr. Scott Drury

Authorized for release by:
1/7/2014 4:34:49 PM

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

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.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.

Table of Contents

Sample Summary

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-43287-1	AB-1	Water	12/19/13 10:45	12/21/13 09:10
490-43287-2	PZ-3	Water	12/19/13 11:20	12/21/13 09:10
490-43287-3	PZ-5	Water	12/19/13 12:00	12/21/13 09:10
490-43287-4	PZ-4	Water	12/19/13 12:40	12/21/13 09:10
490-43287-5	PZ-6	Water	12/19/13 13:25	12/21/13 09:10
490-43287-6	PZ-12	Water	12/19/13 14:15	12/21/13 09:10
490-43287-7	PZ-13	Water	12/19/13 15:15	12/21/13 09:10
490-43287-8	PZ-1	Water	12/20/13 08:30	12/21/13 09:10
490-43287-9	AB-2	Water	12/20/13 09:30	12/21/13 09:10
490-43287-10	OW-2	Water	12/20/13 10:30	12/21/13 09:10
490-43287-11	OW-1	Water	12/20/13 11:30	12/21/13 09:10
490-43287-12	OW-3	Water	12/20/13 12:30	12/21/13 09:10

Job ID: 490-43287-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-43287-1

Comments
No additional comments.

Receipt
The samples were received on 12/21/2013 9:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.7º C and 1.5º C.

Except:

The following sample(s) was listed on the Chain of Custody (COC); however, no sample(s) was initially received due to a delivery delay. They were received at a later date: PZ-13, PZ-1, AB-2 and OW-2.

The following sample(s) was received outside of holding time: AB-2 (490-43287-9), OW-1 (490-43287-11), OW-2 (490-43287-10), OW-3 (490-43287-12), PZ-1 (490-43287-8), PZ-13 (490-43287-7).

HPLC
Method(s) 9056: Due to the nature of the sample matrix, a matrix spike / matrix spike duplicate (MS/MSD) was not analyzed with batch 131778. However, the laboratory control sample / laboratory control sample duplicate (LCS/LCSD) recoveries met the acceptance criteria. (LCS 490-131778/4), (LCSD 490-131778/5)

Method(s) 9056: The calibration blank (CCB) for batch 132406 contained sulfate above the reporting limits (RL). Associated samples were not re-analyzed because results were greater than 10X the value found in the method blank.

Method(s) 9056: The following sample was received with less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: PZ-12 (490-43287-6).

Method(s) 9056: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch <<131343>> were outside the control limits for nitrite. Sample matrix interference is suspected because the associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) recoveries were within acceptance limits. (490-42671-2 MS), (490-42671-2 MSD)

Method(s) 9056: The following sample was analyzed outside the method defined holding time because the request for the sample was received after the holding time for the sample expired: OW-3 (490-43287-12).

Method(s) 9056: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 131558 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 9056: The following samples were received with less than 2 days remaining on the holding time or less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: AB-2 (490-43287-9), OW-1 (490-43287-11), OW-2 (490-43287-10), PZ-1 (490-43287-8), PZ-13 (490-43287-7).

No other analytical or quality issues were noted.

Metals
Method(s) 6010C: The following sample(s) was diluted due to the abundance of analyte Zn: PZ-12 (490-43287-6). Elevated reporting limits (RLs) are provided.

Method(s) 6010C: Matrix spikes for batch 131718 could not be recovered due to sample matrix interferences which required sample dilution. The associated laboratory control sample (LCS) met acceptance criteria.

Method(s) 6010C: The following sample(s) was diluted due to the abundance of analytes: Zn AB-2 (490-43287-9), OW-1 (490-43287-11), OW-2 (490-43287-10), OW-3 (490-43287-12), PZ-1 (490-43287-8), PZ-13 (490-43287-7). Elevated reporting limits (RLs) are provided.

Job ID: 490-43287-1 (Continued)

Laboratory: TestAmerica Nashville (Continued)

No other analytical or quality issues were noted.

Field Service / Mobile Lab
No analytical or quality issues were noted.

General Chemistry
Method(s) SM 2320B: The following sample(s) had an initial pH below endpoint for total alkalinity analysis: OW-3 (490-43287-12), PZ-12 (490-43287-6), PZ-13 (490-43287-7).

Method(s) SM 4500 P E: Reanalysis of the following sample(s) was performed outside of the analytical holding time due to QC failure: PZ-12 (490-43287-6).

Method(s) 9034: Reanalysis of the following sample(s) was performed outside of the analytical holding time due to LCS failure : AB-1 (490-43287-1), PZ-12 (490-43287-6), PZ-3 (490-43287-2), PZ-4 (490-43287-4), PZ-5 (490-43287-3), PZ-6 (490-43287-5).

Method(s) 9034: Reanalysis of the following sample(s) was performed outside of the analytical holding time due to LCS failure : PZ-13 (490-43287-7).

No other analytical or quality issues were noted.

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
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.
E	Result exceeded calibration range.
F	MS/MSD Recovery and/or RPD exceeds the control limits
H	Sample was prepped or analyzed beyond the specified holding time
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC exceeds the control limits.

Metals

Qualifier	Qualifier Description
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.
E	Result exceeded calibration range.
*	LCS or LCSD exceeds the control limits

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
F	MS/MSD Recovery and/or RPD exceeds the control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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: 490-43287-1
SDG: CIR.045

Client Sample ID: AB-1
Date Collected: 12/19/13 10:45
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-1
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		12/24/13 10:57	01/01/14 00:07	1
Zinc	**1.38**		0.0500		mg/L		12/24/13 10:57	01/01/14 00:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND	H	5.00		mg/L		01/02/14 14:55	01/02/14 17:43	1

Client Sample Results

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Client Sample ID: PZ-3
Date Collected: 12/19/13 11:20
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-2
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		12/24/13 10:57	01/01/14 00:11	1
Zinc	**4.57**		0.0500		mg/L		12/24/13 10:57	01/01/14 00:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND	H	5.00		mg/L		01/02/14 14:55	01/02/14 17:43	1

Client Sample Results

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Client Sample ID: PZ-5
Date Collected: 12/19/13 12:00
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-3
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.151		0.00100		mg/L		12/24/13 10:57	01/01/14 00:14	1
Zinc	3.48		0.0500		mg/L		12/24/13 10:57	01/01/14 00:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND	H	5.00		mg/L		01/02/14 14:55	01/02/14 17:43	1

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Client Sample ID: PZ-4
Date Collected: 12/19/13 12:40
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-4
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.0126		0.00100		mg/L		12/24/13 10:57	01/01/14 00:18	1
Zinc	1.93		0.0500		mg/L		12/24/13 10:57	01/01/14 00:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND	H	5.00		mg/L		01/02/14 14:55	01/02/14 17:43	1

Client Sample Results

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Client Sample ID: PZ-6
Date Collected: 12/19/13 13:25
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-5
Matrix: Water

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.00100		mg/L		12/24/13 10:57	01/01/14 00:21	1
Zinc	**4.08**		0.0500		mg/L		12/24/13 10:57	01/01/14 00:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND	H	5.00		mg/L		01/02/14 14:55	01/02/14 17:43	1

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Client Sample ID: PZ-12
Date Collected: 12/19/13 14:15
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-6
Matrix: Water

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**3.70**		1.00		mg/L			12/23/13 22:40	1
Nitrite as NO2	ND	H	0.330		mg/L			12/23/13 22:40	1
Nitrate as NO3	**2.30**	**H**	0.440		mg/L			12/23/13 22:40	1
Sulfate	**1490**	**^**	50.0		mg/L			12/31/13 11:25	50

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**39.1**		1.00		mg/L		12/24/13 10:57	01/02/14 12:09	10
Cadmium	**0.0270**		0.0100		mg/L		12/24/13 10:57	01/02/14 12:09	10
Calcium	**134**		10.0		mg/L		12/24/13 10:57	01/02/14 12:09	10
Iron	**22.0**		1.00		mg/L		12/24/13 10:57	01/02/14 12:09	10
Lead	ND		0.0500		mg/L		12/24/13 10:57	01/02/14 12:09	10
Magnesium	**79.4**		10.0		mg/L		12/24/13 10:57	01/02/14 12:09	10
Manganese	**10.0**		0.150		mg/L		12/24/13 10:57	01/02/14 12:09	10
Potassium	ND		10.0		mg/L		12/24/13 10:57	01/02/14 12:09	10
Sodium	**24.4**		10.0		mg/L		12/24/13 10:57	01/02/14 12:09	10
Zinc	**175**		5.00		mg/L		12/24/13 10:57	01/02/14 12:12	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND	H	5.00		mg/L		01/02/14 14:55	01/02/14 17:43	1
Alkalinity	ND		10.0		mg/L			12/27/13 20:55	1
Orthophosphate as P	ND	H	0.100		mg/L			12/24/13 12:28	1
Silica	**91.5**		1.00		mg/L			12/27/13 11:13	1

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Client Sample ID: PZ-13
Date Collected: 12/19/13 15:15
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-7
Matrix: Water

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**2.38**		1.00		mg/L			12/24/13 18:58	1
Nitrite as NO2	ND	H	0.330		mg/L			12/24/13 18:58	1
Nitrate as NO3	**1.58**	**H**	0.440		mg/L			12/24/13 18:58	1
Sulfate	**1260**		20.0		mg/L			12/27/13 12:28	20

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**4.06**		1.00		mg/L		12/26/13 15:02	01/03/14 12:48	10
Cadmium	ND		0.0100		mg/L		12/26/13 15:02	01/03/14 12:48	10
Calcium	**36.2**		10.0		mg/L		12/26/13 15:02	01/03/14 12:48	10
Iron	**13.8**		1.00		mg/L		12/26/13 15:02	01/03/14 12:48	10
Lead	ND		0.0500		mg/L		12/26/13 15:02	01/03/14 12:48	10
Magnesium	**25.5**		10.0		mg/L		12/26/13 15:02	01/03/14 12:48	10
Manganese	**1.73**		0.150		mg/L		12/26/13 15:02	01/03/14 12:48	10
Potassium	ND		10.0		mg/L		12/26/13 15:02	01/03/14 12:48	10
Sodium	**11.3**		10.0		mg/L		12/26/13 15:02	01/03/14 12:48	10
Zinc	**208**	**E**	5.00		mg/L		12/26/13 15:02	01/03/14 12:52	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND	H	5.00		mg/L		01/02/14 14:55	01/02/14 17:43	1
Alkalinity	ND		10.0		mg/L			12/27/13 20:57	1
Orthophosphate as P	ND	H	0.100		mg/L			12/24/13 12:28	1
Silica	**47.0**		1.00		mg/L			12/27/13 11:13	1

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Client Sample ID: PZ-1
Date Collected: 12/20/13 08:30
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-8
Matrix: Water

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1.61**		1.00		mg/L			12/24/13 19:18	1
Nitrite as NO2	ND	H	0.330		mg/L			12/24/13 19:18	1
Nitrate as NO3	**4.13**	**H**	0.440		mg/L			12/24/13 19:18	1
Sulfate	**67.1**		5.00		mg/L			12/27/13 12:48	5

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		1.00		mg/L		12/26/13 15:02	01/03/14 12:55	10
Cadmium	ND		0.0100		mg/L		12/26/13 15:02	01/03/14 12:55	10
Calcium	**22.0**		10.0		mg/L		12/26/13 15:02	01/03/14 12:55	10
Iron	ND		1.00		mg/L		12/26/13 15:02	01/03/14 12:55	10
Lead	ND		0.0500		mg/L		12/26/13 15:02	01/03/14 12:55	10
Magnesium	ND		10.0		mg/L		12/26/13 15:02	01/03/14 12:55	10
Manganese	**0.377**		0.150		mg/L		12/26/13 15:02	01/03/14 12:55	10
Potassium	ND		10.0		mg/L		12/26/13 15:02	01/03/14 12:55	10
Sodium	**14.7**		10.0		mg/L		12/26/13 15:02	01/03/14 12:55	10
Zinc	**44.2**		0.500		mg/L		12/26/13 15:02	01/03/14 12:55	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00		mg/L		12/27/13 15:36	12/27/13 16:50	1
Alkalinity	**22.3**		10.0		mg/L			12/27/13 21:01	1
Orthophosphate as P	ND	H	0.100		mg/L			12/24/13 12:28	1
Silica	**50.9**		1.00		mg/L			12/27/13 11:13	1

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Client Sample ID: AB-2
Date Collected: 12/20/13 09:30
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-9
Matrix: Water

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1.54**		1.00		mg/L			12/24/13 19:38	1
Nitrite as NO2	ND	H	0.330		mg/L			12/24/13 19:38	1
Nitrate as NO3	**3.82**	**H**	0.440		mg/L			12/24/13 19:38	1
Sulfate	**61.2**		1.00		mg/L			12/24/13 19:38	1

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		1.00		mg/L		12/26/13 15:02	01/03/14 12:59	10
Cadmium	ND		0.0100		mg/L		12/26/13 15:02	01/03/14 12:59	10
Calcium	ND		10.0		mg/L		12/26/13 15:02	01/03/14 12:59	10
Iron	ND		1.00		mg/L		12/26/13 15:02	01/03/14 12:59	10
Lead	ND		0.0500		mg/L		12/26/13 15:02	01/03/14 12:59	10
Magnesium	ND		10.0		mg/L		12/26/13 15:02	01/03/14 12:59	10
Manganese	ND		0.150		mg/L		12/26/13 15:02	01/03/14 12:59	10
Potassium	ND		10.0		mg/L		12/26/13 15:02	01/03/14 12:59	10
Sodium	**11.0**		10.0		mg/L		12/26/13 15:02	01/03/14 12:59	10
Zinc	**16.9**		0.500		mg/L		12/26/13 15:02	01/03/14 12:59	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00		mg/L		12/27/13 15:36	12/27/13 16:50	1
Alkalinity	**28.0**		10.0		mg/L			12/27/13 21:05	1
Orthophosphate as P	ND	H	0.100		mg/L			12/24/13 12:28	1
Silica	**55.6**		1.00		mg/L			12/27/13 11:13	1

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Client Sample ID: OW-2

Date Collected: 12/20/13 10:30
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-10

Matrix: Water

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1.60**		1.00		mg/L			12/24/13 19:59	1
Nitrite as NO2	ND	H	0.330		mg/L			12/24/13 19:59	1
Nitrate as NO3	**2.30**	**H**	0.440		mg/L			12/24/13 19:59	1
Sulfate	**265**		5.00		mg/L			12/27/13 13:08	5

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		1.00		mg/L		12/26/13 15:02	01/03/14 13:03	10
Cadmium	ND		0.0100		mg/L		12/26/13 15:02	01/03/14 13:03	10
Calcium	**43.8**		10.0		mg/L		12/26/13 15:02	01/03/14 13:03	10
Iron	ND		1.00		mg/L		12/26/13 15:02	01/03/14 13:03	10
Lead	ND		0.0500		mg/L		12/26/13 15:02	01/03/14 13:03	10
Magnesium	**12.9**		10.0		mg/L		12/26/13 15:02	01/03/14 13:03	10
Manganese	**1.88**		0.150		mg/L		12/26/13 15:02	01/03/14 13:03	10
Potassium	ND		10.0		mg/L		12/26/13 15:02	01/03/14 13:03	10
Sodium	**14.2**		10.0		mg/L		12/26/13 15:02	01/03/14 13:03	10
Zinc	**38.1**		0.500		mg/L		12/26/13 15:02	01/03/14 13:03	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00		mg/L		12/27/13 15:36	12/27/13 16:50	1
Alkalinity	**12.9**		10.0		mg/L			12/27/13 21:09	1
Orthophosphate as P	ND	H	0.100		mg/L			12/24/13 12:28	1
Silica	**57.8**		1.00		mg/L			12/27/13 11:13	1

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Client Sample ID: OW-1
Date Collected: 12/20/13 11:30
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-11
Matrix: Water

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**2.19**		1.00		mg/L			12/24/13 20:19	1
Nitrite as NO2	ND	H	0.330		mg/L			12/24/13 20:19	1
Nitrate as NO3	**0.767**	**H**	0.440		mg/L			12/24/13 20:19	1
Sulfate	**697**		20.0		mg/L			12/28/13 01:40	20

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		1.00		mg/L		12/26/13 15:02	01/03/14 13:07	10
Cadmium	ND		0.0100		mg/L		12/26/13 15:02	01/03/14 13:07	10
Calcium	**105**		10.0		mg/L		12/26/13 15:02	01/03/14 13:07	10
Iron	**52.5**		1.00		mg/L		12/26/13 15:02	01/03/14 13:07	10
Lead	ND		0.0500		mg/L		12/26/13 15:02	01/03/14 13:07	10
Magnesium	**46.6**		10.0		mg/L		12/26/13 15:02	01/03/14 13:07	10
Manganese	**6.27**		0.150		mg/L		12/26/13 15:02	01/03/14 13:07	10
Potassium	ND		10.0		mg/L		12/26/13 15:02	01/03/14 13:07	10
Sodium	**19.0**		10.0		mg/L		12/26/13 15:02	01/03/14 13:07	10
Zinc	**106**		5.00		mg/L		12/26/13 15:02	01/03/14 13:10	100

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00		mg/L		12/27/13 15:36	12/27/13 16:50	1
Alkalinity	ND		10.0		mg/L			12/27/13 21:13	1
Orthophosphate as P	ND	H	0.100		mg/L			12/24/13 12:28	1
Silica	**76.9**		1.00		mg/L			12/27/13 11:13	1

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Client Sample ID: OW-3
Date Collected: 12/20/13 12:30
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-12
Matrix: Water

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**2.68**		1.00		mg/L			12/26/13 09:51	1
Nitrite as NO2	ND	H	0.330		mg/L			12/26/13 09:51	1
Nitrate as NO3	**5.90**	**H**	0.440		mg/L			12/26/13 09:51	1
Sulfate	**584**	**^**	20.0		mg/L			12/31/13 12:22	20

Method: 6010C - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**2.54**		1.00		mg/L		12/26/13 15:02	01/03/14 13:14	10
Cadmium	ND		0.0100		mg/L		12/26/13 15:02	01/03/14 13:14	10
Calcium	**59.1**		10.0		mg/L		12/26/13 15:02	01/03/14 13:14	10
Iron	**5.99**		1.00		mg/L		12/26/13 15:02	01/03/14 13:14	10
Lead	ND		0.0500		mg/L		12/26/13 15:02	01/03/14 13:14	10
Magnesium	**42.8**		10.0		mg/L		12/26/13 15:02	01/03/14 13:14	10
Manganese	**5.17**		0.150		mg/L		12/26/13 15:02	01/03/14 13:14	10
Potassium	ND		10.0		mg/L		12/26/13 15:02	01/03/14 13:14	10
Sodium	**16.8**		10.0		mg/L		12/26/13 15:02	01/03/14 13:14	10
Zinc	**23.6**		0.500		mg/L		12/26/13 15:02	01/03/14 13:14	10

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00		mg/L		12/27/13 15:36	12/27/13 16:50	1
Alkalinity	ND		10.0		mg/L			12/27/13 21:36	1
Orthophosphate as P	ND	H	0.100		mg/L			12/24/13 12:28	1
Silica	**75.8**		1.00		mg/L			12/27/13 11:13	1

Method: 9056 - Anions, Ion Chromatography

Lab Sample ID: MB 490-130870/4
Matrix: Water
Analysis Batch: 130870

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			12/23/13 21:40	1
Sulfate	ND		1.00		mg/L			12/23/13 21:40	1

Lab Sample ID: LCS 490-130870/5
Matrix: Water
Analysis Batch: 130870

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.03		mg/L		102	80 - 120
Sulfate	50.0	50.66		mg/L		101	80 - 120

Lab Sample ID: LCSD 490-130870/6
Matrix: Water
Analysis Batch: 130870

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	50.0	50.94		mg/L		102	80 - 120	0	20
Sulfate	50.0	52.11		mg/L		104	80 - 120	3	20

Lab Sample ID: 490-43287-6 MS
Matrix: Water
Analysis Batch: 130870

Client Sample ID: PZ-12
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	3.70		50.0	55.24		mg/L		103	80 - 120
Sulfate	1370		50.0	1472	E 4	mg/L		202	80 - 120

Lab Sample ID: 490-43287-6 MSD
Matrix: Water
Analysis Batch: 130870

Client Sample ID: PZ-12
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	3.70		50.0	54.58		mg/L		102	80 - 120	1	20
Sulfate	1370		50.0	1333	E 4	mg/L		-75	80 - 120	10	20

Lab Sample ID: MB 490-130871/4
Matrix: Water
Analysis Batch: 130871

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as NO2	ND		0.330		mg/L			12/23/13 21:40	1
Nitrate as NO3	ND		0.440		mg/L			12/23/13 21:40	1

Lab Sample ID: LCS 490-130871/5
Matrix: Water
Analysis Batch: 130871

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as NO2	16.5	16.54		mg/L		100	80 - 120

Method: 9056 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 490-130871/5
Matrix: Water
Analysis Batch: 130871

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as NO3	22.0	22.25		mg/L		101	80 - 120

Lab Sample ID: LCSD 490-130871/6
Matrix: Water
Analysis Batch: 130871

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrite as NO2	16.5	16.50		mg/L		100	80 - 120	0	20
Nitrate as NO3	22.0	22.26		mg/L		101	80 - 120	0	20

Lab Sample ID: 490-43287-6 MS
Matrix: Water
Analysis Batch: 130871

Client Sample ID: PZ-12
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as NO2	ND	H	16.5	16.70		mg/L		101	80 - 120
Nitrate as NO3	2.30	H	22.0	24.36		mg/L		100	80 - 120

Lab Sample ID: 490-43287-6 MSD
Matrix: Water
Analysis Batch: 130871

Client Sample ID: PZ-12
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrite as NO2	ND	H	16.5	16.84		mg/L		102	80 - 120	1	20
Nitrate as NO3	2.30	H	22.0	24.22		mg/L		100	80 - 120	1	20

Lab Sample ID: MB 490-131342/5
Matrix: Water
Analysis Batch: 131342

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			12/24/13 11:37	1
Sulfate	ND		1.00		mg/L			12/24/13 11:37	1

Lab Sample ID: LCS 490-131342/6
Matrix: Water
Analysis Batch: 131342

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	49.57		mg/L		99	80 - 120
Sulfate	50.0	46.51		mg/L		93	80 - 120

Lab Sample ID: LCSD 490-131342/7
Matrix: Water
Analysis Batch: 131342

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	50.0	49.51		mg/L		99	80 - 120	0	20
Sulfate	50.0	46.66		mg/L		93	80 - 120	0	20

Method: 9056 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 490-42671-I-2 MS
Matrix: Water
Analysis Batch: 131342

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	1220		50.0	1150	E 4	mg/L		-142	80 - 120
Sulfate	307		50.0	321.0	E 4	mg/L		29	80 - 120

Lab Sample ID: 490-42671-I-2 MSD
Matrix: Water
Analysis Batch: 131342

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	1220		50.0	1148	E 4	mg/L		-145	80 - 120	0	20
Sulfate	307		50.0	321.1	E 4	mg/L		29	80 - 120	0	20

Lab Sample ID: MB 490-131343/5
Matrix: Water
Analysis Batch: 131343

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as NO2	ND		0.330		mg/L			12/24/13 11:37	1
Nitrate as NO3	ND		0.440		mg/L			12/24/13 11:37	1

Lab Sample ID: LCS 490-131343/6
Matrix: Water
Analysis Batch: 131343

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as NO2	16.5	15.99		mg/L		97	80 - 120
Nitrate as NO3	22.0	21.47		mg/L		98	80 - 120

Lab Sample ID: LCSD 490-131343/7
Matrix: Water
Analysis Batch: 131343

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrite as NO2	16.5	16.00		mg/L		97	80 - 120	0	20
Nitrate as NO3	22.0	21.50		mg/L		98	80 - 120	0	20

Lab Sample ID: 490-42671-I-2 MS
Matrix: Water
Analysis Batch: 131343

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as NO2	ND		16.5	23.65	F	mg/L		143	80 - 120
Nitrate as NO3	2.65		22.0	21.37		mg/L		85	80 - 120

Lab Sample ID: 490-42671-I-2 MSD
Matrix: Water
Analysis Batch: 131343

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrite as NO2	ND		16.5	23.66	F	mg/L		143	80 - 120	0	20

Method: 9056 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 490-42671-I-2 MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 131343

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as NO3	2.65		22.0	21.66		mg/L		86	80 - 120	1	20

Lab Sample ID: MB 490-131557/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 131557

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			12/26/13 08:51	1
Sulfate	ND		1.00		mg/L			12/26/13 08:51	1

Lab Sample ID: LCS 490-131557/6 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 131557

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	48.86		mg/L		98	80 - 120
Sulfate	50.0	45.99		mg/L		92	80 - 120

Lab Sample ID: LCSD 490-131557/7 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 131557

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	50.0	48.98		mg/L		98	80 - 120	0	20
Sulfate	50.0	45.95		mg/L		92	80 - 120	0	20

Lab Sample ID: 490-43287-12 MS — **Client Sample ID: OW-3**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 131557

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.68		50.0	56.83		mg/L		108	80 - 120
Sulfate	745		50.0	716.9	E 4	mg/L		-57	80 - 120

Lab Sample ID: 490-43287-12 MSD — **Client Sample ID: OW-3**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 131557

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	2.68		50.0	56.65		mg/L		108	80 - 120	0	20
Sulfate	745		50.0	718.5	E 4	mg/L		-54	80 - 120	0	20

Lab Sample ID: MB 490-131558/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 131558

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrite as NO2	ND		6.60		mg/L			12/26/13 08:51	20
Nitrate as NO3	ND		8.80		mg/L			12/26/13 08:51	20

Method: 9056 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 490-131558/6
Matrix: Water
Analysis Batch: 131558

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as NO2	16.5	16.08		mg/L		97	80 - 120
Nitrate as NO3	22.0	21.08		mg/L		96	80 - 120

Lab Sample ID: LCSD 490-131558/7
Matrix: Water
Analysis Batch: 131558

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrite as NO2	16.5	16.12		mg/L		98	80 - 120	0	20
Nitrate as NO3	22.0	20.92		mg/L		95	80 - 120	1	20

Lab Sample ID: 490-43287-12 MS
Matrix: Water
Analysis Batch: 131558

Client Sample ID: OW-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrite as NO2	ND	H	16.5	11.11	F	mg/L		67	80 - 120
Nitrate as NO3	5.90	H	22.0	31.14		mg/L		115	80 - 120

Lab Sample ID: 490-43287-12 MSD
Matrix: Water
Analysis Batch: 131558

Client Sample ID: OW-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrite as NO2	ND	H	16.5	11.58	F	mg/L		70	80 - 120	4	20
Nitrate as NO3	5.90	H	22.0	31.21		mg/L		115	80 - 120	0	20

Lab Sample ID: MB 490-131778/3
Matrix: Water
Analysis Batch: 131778

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			12/27/13 05:46	1
Sulfate	ND		1.00		mg/L			12/27/13 05:46	1

Lab Sample ID: LCS 490-131778/4
Matrix: Water
Analysis Batch: 131778

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	50.45		mg/L		101	80 - 120
Sulfate	50.0	49.33		mg/L		99	80 - 120

Lab Sample ID: LCSD 490-131778/5
Matrix: Water
Analysis Batch: 131778

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	50.0	49.42		mg/L		99	80 - 120	2	20

Method: 9056 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCSD 490-131778/5
Matrix: Water
Analysis Batch: 131778

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate			50.0	49.26		mg/L		99	80 - 120	0	20

Lab Sample ID: MB 490-131972/3
Matrix: Water
Analysis Batch: 131972

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			12/27/13 17:42	1
Sulfate	ND		1.00		mg/L			12/27/13 17:42	1

Lab Sample ID: LCS 490-131972/4
Matrix: Water
Analysis Batch: 131972

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			50.0	49.15		mg/L		98	80 - 120		
Sulfate			50.0	49.43		mg/L		99	80 - 120		

Lab Sample ID: LCSD 490-131972/5
Matrix: Water
Analysis Batch: 131972

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			50.0	47.05		mg/L		94	80 - 120	4	20
Sulfate			50.0	48.52		mg/L		97	80 - 120	2	20

Lab Sample ID: 490-43561-E-2 MS
Matrix: Water
Analysis Batch: 131972

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	469		50.0	415.5	E 4	mg/L		-106	80 - 120		
Sulfate	1440		50.0	1391	E 4	mg/L		-99	80 - 120		

Lab Sample ID: 490-43561-E-2 MSD
Matrix: Water
Analysis Batch: 131972

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	469		50.0	416.3	E 4	mg/L		-105	80 - 120	0	20
Sulfate	1440		50.0	1352	E 4	mg/L		-177	80 - 120	3	20

Lab Sample ID: MB 490-132406/3
Matrix: Water
Analysis Batch: 132406

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00		mg/L			12/31/13 07:35	1
Sulfate	ND		1.00		mg/L			12/31/13 07:35	1

Method: 9056 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 490-132406/4
Matrix: Water
Analysis Batch: 132406

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	47.22		mg/L		94	80 - 120
Sulfate	50.0	48.86		mg/L		98	80 - 120

Lab Sample ID: LCSD 490-132406/5
Matrix: Water
Analysis Batch: 132406

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	50.0	47.03		mg/L		94	80 - 120	0	20
Sulfate	50.0	50.69		mg/L		101	80 - 120	4	20

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 490-131338/1-A
Matrix: Water
Analysis Batch: 132747

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 131338

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.100		mg/L		12/24/13 10:57	12/31/13 22:34	1
Cadmium	ND		0.00100		mg/L		12/24/13 10:57	12/31/13 22:34	1
Calcium	ND		1.00		mg/L		12/24/13 10:57	12/31/13 22:34	1
Iron	ND		0.100		mg/L		12/24/13 10:57	12/31/13 22:34	1
Lead	ND		0.00500		mg/L		12/24/13 10:57	12/31/13 22:34	1
Magnesium	ND		1.00		mg/L		12/24/13 10:57	12/31/13 22:34	1
Manganese	ND		0.0150		mg/L		12/24/13 10:57	12/31/13 22:34	1
Potassium	ND		1.00		mg/L		12/24/13 10:57	12/31/13 22:34	1
Sodium	1.199		1.00		mg/L		12/24/13 10:57	12/31/13 22:34	1
Zinc	ND		0.0500		mg/L		12/24/13 10:57	12/31/13 22:34	1

Lab Sample ID: MB 490-131338/1-A
Matrix: Water
Analysis Batch: 132870

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 131338

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	ND		1.00		mg/L		12/24/13 10:57	01/02/14 11:33	1

Lab Sample ID: LCS 490-131338/2-A
Matrix: Water
Analysis Batch: 132747

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 131338

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	2.00	2.075		mg/L		104	80 - 120
Cadmium	0.0500	0.05410		mg/L		108	80 - 120
Calcium	5.00	5.045		mg/L		101	80 - 120
Iron	1.00	1.104		mg/L		110	80 - 120
Lead	0.0500	0.05380		mg/L		108	80 - 120
Magnesium	5.00	5.459		mg/L		109	80 - 120
Manganese	0.500	0.5439		mg/L		109	80 - 120
Potassium	5.00	5.144		mg/L		103	80 - 120

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 490-131338/2-A
Matrix: Water
Analysis Batch: 132747

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 131338

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sodium	5.00	6.043	*	mg/L		121	80 - 120
Zinc	0.500	0.5456		mg/L		109	80 - 120

Lab Sample ID: LCS 490-131338/2-A
Matrix: Water
Analysis Batch: 132870

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 131338

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sodium	5.00	5.805		mg/L		116	80 - 120

Lab Sample ID: LCSD 490-131338/3-A
Matrix: Water
Analysis Batch: 132747

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 131338

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	2.00	2.099		mg/L		105	80 - 120	1	20
Cadmium	0.0500	0.05280		mg/L		106	80 - 120	2	20
Calcium	5.00	5.065		mg/L		101	80 - 120	0	20
Iron	1.00	1.112		mg/L		111	80 - 120	1	20
Lead	0.0500	0.05270		mg/L		105	80 - 120	2	20
Magnesium	5.00	5.471		mg/L		109	80 - 120	0	20
Manganese	0.500	0.5331		mg/L		107	80 - 120	2	20
Potassium	5.00	5.155		mg/L		103	80 - 120	0	20
Sodium	5.00	5.982		mg/L		120	80 - 120	1	20
Zinc	0.500	0.5343		mg/L		107	80 - 120	2	20

Lab Sample ID: MB 490-131718/1-A
Matrix: Water
Analysis Batch: 132944

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 131718

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.100		mg/L		12/26/13 15:02	01/02/14 14:57	1
Cadmium	ND		0.00100		mg/L		12/26/13 15:02	01/02/14 14:57	1
Calcium	ND		1.00		mg/L		12/26/13 15:02	01/02/14 14:57	1
Iron	ND		0.100		mg/L		12/26/13 15:02	01/02/14 14:57	1
Lead	ND		0.00500		mg/L		12/26/13 15:02	01/02/14 14:57	1
Magnesium	ND		1.00		mg/L		12/26/13 15:02	01/02/14 14:57	1
Manganese	ND		0.0150		mg/L		12/26/13 15:02	01/02/14 14:57	1
Potassium	ND		1.00		mg/L		12/26/13 15:02	01/02/14 14:57	1
Zinc	ND		0.0500		mg/L		12/26/13 15:02	01/02/14 14:57	1

Lab Sample ID: MB 490-131718/1-A
Matrix: Water
Analysis Batch: 133156

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 131718

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	ND		1.00		mg/L		12/26/13 15:02	01/03/14 12:32	1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 490-131718/2-A
Matrix: Water
Analysis Batch: 132944

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 131718

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	2.00	2.171		mg/L		109	80 - 120
Cadmium	0.0500	0.04730		mg/L		95	80 - 120
Calcium	5.00	4.681		mg/L		94	80 - 120
Iron	1.00	1.014		mg/L		101	80 - 120
Lead	0.0500	0.04490		mg/L		90	80 - 120
Magnesium	5.00	5.424		mg/L		108	80 - 120
Manganese	0.500	0.4801		mg/L		96	80 - 120
Potassium	5.00	5.402		mg/L		108	80 - 120
Sodium	5.00	5.772		mg/L		115	80 - 120
Zinc	0.500	0.4763		mg/L		95	80 - 120

Lab Sample ID: 440-65087-B-1-B MS
Matrix: Water
Analysis Batch: 132747

Client Sample ID: Matrix Spike
Prep Type: Dissolved
Prep Batch: 131338

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	30.1		2.00	31.41	4	mg/L		67	75 - 125
Cadmium	0.0162		0.0500	0.06070		mg/L		89	75 - 125
Calcium	302		5.00	301.0	4	mg/L		-10	75 - 125
Iron	362		1.00	354.9	E 4	mg/L		-700	75 - 125
Lead	0.0282		0.0500	0.07600		mg/L		96	75 - 125
Magnesium	68.9		5.00	72.14	4	mg/L		64	75 - 125
Manganese	14.5		0.500	15.09	E 4	mg/L		124	75 - 125
Potassium	16.3		5.00	20.92		mg/L		93	75 - 125
Sodium	22.1		5.00	24.95	4	mg/L		57	75 - 125
Zinc	0.335		0.500	0.8034		mg/L		94	75 - 125

Lab Sample ID: 440-65087-B-1-C MSD
Matrix: Water
Analysis Batch: 132747

Client Sample ID: Matrix Spike Duplicate
Prep Type: Dissolved
Prep Batch: 131338

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	30.1		2.00	32.06	4	mg/L		100	75 - 125	2	20
Cadmium	0.0162		0.0500	0.06400		mg/L		96	75 - 125	5	20
Calcium	302		5.00	307.2	4	mg/L		114	75 - 125	2	20
Iron	362		1.00	362.7	E 4	mg/L		80	75 - 125	2	20
Lead	0.0282		0.0500	0.07900		mg/L		102	75 - 125	4	20
Magnesium	68.9		5.00	73.31	4	mg/L		88	75 - 125	2	20
Manganese	14.5		0.500	15.52	E 4	mg/L		210	75 - 125	3	20
Potassium	16.3		5.00	21.31		mg/L		101	75 - 125	2	20
Sodium	22.1		5.00	26.77	4	mg/L		93	75 - 125	7	20
Zinc	0.335		0.500	0.8497		mg/L		103	75 - 125	6	20

Lab Sample ID: 490-43287-A-7-B MS
Matrix: Water
Analysis Batch: 132944

Client Sample ID: 490-43287-A-7-B MS
Prep Type: Dissolved
Prep Batch: 131718

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	5.11		2.00	7.136		mg/L		102	75 - 125

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 490-43287-A-7-B MS | **Client Sample ID: 490-43287-A-7-B MS**
Matrix: Water | **Prep Type: Dissolved**
Analysis Batch: 132944 | **Prep Batch: 131718**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	5.11		2.00	7.136		mg/L		102	75 - 125
Cadmium	ND		0.0500	0.04890		mg/L		97	75 - 125
Cadmium	ND		0.0500	0.04890		mg/L		97	75 - 125
Calcium	37.8		5.00	42.22	4	mg/L		89	75 - 125
Calcium	37.8		5.00	42.22	4	mg/L		89	75 - 125
Iron	13.3		1.00	14.03	4	mg/L		76	75 - 125
Iron	13.3		1.00	14.03	4	mg/L		76	75 - 125
Lead	ND		0.0500	0.05070		mg/L		94	75 - 125
Lead	ND		0.0500	0.05070		mg/L		94	75 - 125
Magnesium	25.5		5.00	30.15	4	mg/L		94	75 - 125
Magnesium	25.5		5.00	30.15	4	mg/L		94	75 - 125
Manganese	1.65		0.500	2.100		mg/L		90	75 - 125
Manganese	1.65		0.500	2.100		mg/L		90	75 - 125
Potassium	1.56		5.00	6.604		mg/L		101	75 - 125
Potassium	1.56		5.00	6.604		mg/L		101	75 - 125
Sodium	10.9		5.00	15.58		mg/L		95	75 - 125
Sodium	10.9		5.00	15.58		mg/L		95	75 - 125
Zinc	63.1		0.500	62.55	E 4	mg/L		-106	75 - 125
Zinc	63.1		0.500	62.55	E 4	mg/L		-106	75 - 125

Lab Sample ID: 490-43287-A-7-C MSD | **Client Sample ID: 490-43287-A-7-C MSD**
Matrix: Water | **Prep Type: Dissolved**
Analysis Batch: 132944 | **Prep Batch: 131718**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	5.11		2.00	7.249		mg/L		107	75 - 125	2	20
Aluminum	5.11		2.00	7.249		mg/L		107	75 - 125	2	20
Cadmium	ND		0.0500	0.04910		mg/L		97	75 - 125	0	20
Cadmium	ND		0.0500	0.04910		mg/L		97	75 - 125	0	20
Calcium	37.8		5.00	43.47	4	mg/L		114	75 - 125	3	20
Calcium	37.8		5.00	43.47	4	mg/L		114	75 - 125	3	20
Iron	13.3		1.00	14.45	4	mg/L		118	75 - 125	3	20
Iron	13.3		1.00	14.45	4	mg/L		118	75 - 125	3	20
Lead	ND		0.0500	0.05140		mg/L		96	75 - 125	1	20
Lead	ND		0.0500	0.05140		mg/L		96	75 - 125	1	20
Magnesium	25.5		5.00	31.05	4	mg/L		112	75 - 125	3	20
Magnesium	25.5		5.00	31.05	4	mg/L		112	75 - 125	3	20
Manganese	1.65		0.500	2.140		mg/L		98	75 - 125	2	20
Manganese	1.65		0.500	2.140		mg/L		98	75 - 125	2	20
Potassium	1.56		5.00	6.618		mg/L		101	75 - 125	0	20
Potassium	1.56		5.00	6.618		mg/L		101	75 - 125	0	20
Sodium	10.9		5.00	15.81		mg/L		99	75 - 125	1	20
Sodium	10.9		5.00	15.81		mg/L		99	75 - 125	1	20
Zinc	63.1		0.500	62.30	E 4	mg/L		-156	75 - 125	0	20
Zinc	63.1		0.500	62.30	E 4	mg/L		-156	75 - 125	0	20

Method: 9034 - Sulfide, Acid soluble and Insoluble (Titrimetric)

Lab Sample ID: MB 490-132011/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 132424 — **Prep Batch: 132011**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00		mg/L		12/27/13 15:36	12/27/13 16:50	1

Lab Sample ID: LCS 490-132011/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 132424 — **Prep Batch: 132011**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	20.0	18.49		mg/L		92	80 - 120

Lab Sample ID: 490-43287-8 MS — **Client Sample ID: PZ-1**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 132424 — **Prep Batch: 132011**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	ND		20.0	15.28		mg/L		76	70 - 130

Lab Sample ID: 490-43287-8 MSD — **Client Sample ID: PZ-1**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 132424 — **Prep Batch: 132011**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfide	ND		20.0	14.81		mg/L		74	70 - 130	3	10

Lab Sample ID: 490-43299-B-1-B DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 132424 — **Prep Batch: 132011**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfide	ND		ND		mg/L		NC	20

Lab Sample ID: MB 490-132878/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 132928 — **Prep Batch: 132878**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		5.00		mg/L		01/02/14 14:55	01/02/14 17:43	1

Lab Sample ID: LCS 490-132878/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 132928 — **Prep Batch: 132878**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	20.0	18.78		mg/L		94	80 - 120

Lab Sample ID: 490-42813-B-1-C MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 132928 — **Prep Batch: 132878**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	ND		20.0	22.66		mg/L		113	70 - 130

Lab Sample ID: 490-42813-B-1-D MSD
Matrix: Water
Analysis Batch: 132928

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 132878

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfide	ND		20.0	22.50		mg/L		112	70 - 130	1	10

Lab Sample ID: 490-43528-B-1-D DU
Matrix: Water
Analysis Batch: 132928

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 132878

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sulfide	ND		ND		mg/L		NC	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 490-132128/3
Matrix: Water
Analysis Batch: 132128

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	ND		10.0		mg/L			12/27/13 19:20	1

Lab Sample ID: MB 490-132128/30
Matrix: Water
Analysis Batch: 132128

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	ND		10.0		mg/L			12/27/13 21:27	1

Lab Sample ID: LCS 490-132128/31
Matrix: Water
Analysis Batch: 132128

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	93.08		mg/L		93	90 - 110

Lab Sample ID: LCS 490-132128/4
Matrix: Water
Analysis Batch: 132128

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	104.7		mg/L		105	90 - 110

Lab Sample ID: 490-42944-I-1 DU
Matrix: Water
Analysis Batch: 132128

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	241		217.2		mg/L		10	20

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: 490-43410-I-1 DU
Matrix: Water
Analysis Batch: 132128

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	115		129.4		mg/L		12	20

Method: SM 4500 P E - Orthophosphate

Lab Sample ID: MB 490-131423/21
Matrix: Water
Analysis Batch: 131423

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Orthophosphate as P	ND		0.100		mg/L			12/24/13 12:05	1

Lab Sample ID: LCS 490-131423/24
Matrix: Water
Analysis Batch: 131423

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Orthophosphate as P	0.250	0.2600		mg/L		104	90 - 110

Lab Sample ID: 490-43287-8 MS
Matrix: Water
Analysis Batch: 131423

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Orthophosphate as P	ND	H	0.250	0.2871		mg/L		102	72 - 129

Lab Sample ID: 490-43287-8 MSD
Matrix: Water
Analysis Batch: 131423

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Orthophosphate as P	ND	H	0.250	0.2874		mg/L		102	72 - 129	0	20

Lab Sample ID: 490-43287-8 DU
Matrix: Water
Analysis Batch: 131423

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Orthophosphate as P	ND	H	ND		mg/L		NC	20

Method: SM4500 SiO2 C - Silica, Molybdosilicate Method

Lab Sample ID: MB 490-132095/1
Matrix: Water
Analysis Batch: 132095

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silica	ND		1.00		mg/L			12/27/13 11:13	1

Method: SM4500 SiO2 C - Silica, Molybdosilicate Method (Continued)

Lab Sample ID: MB 490-132095/25
Matrix: Water
Analysis Batch: 132095

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silica	ND		1.00		mg/L			12/27/13 11:13	1

Lab Sample ID: LCS 490-132095/26
Matrix: Water
Analysis Batch: 132095

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silica	25.0	23.92		mg/L		96	90 - 110

Lab Sample ID: LCS 490-132095/4
Matrix: Water
Analysis Batch: 132095

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silica	25.0	23.82		mg/L		95	90 - 110

Lab Sample ID: LCSD 490-132095/27
Matrix: Water
Analysis Batch: 132095

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica	25.0	23.94		mg/L		96	90 - 110	0	10

Lab Sample ID: LCSD 490-132095/5
Matrix: Water
Analysis Batch: 132095

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica	25.0	23.77		mg/L		95	90 - 110	0	10

Lab Sample ID: 490-43287-8 MS
Matrix: Water
Analysis Batch: 132095

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Silica	50.9		25.0	81.68	F	mg/L		123	80 - 120

Lab Sample ID: 490-43287-8 MSD
Matrix: Water
Analysis Batch: 132095

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica	50.9		25.0	81.90	F	mg/L		124	80 - 120	0	20

Lab Sample ID: 490-43287-8 DU
Matrix: Water
Analysis Batch: 132095

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Silica	50.9		50.88		mg/L		0.02	20

HPLC/IC

Analysis Batch: 130870

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-6	PZ-12	Total/NA	Water	9056	
490-43287-6 MS	PZ-12	Total/NA	Water	9056	
490-43287-6 MSD	PZ-12	Total/NA	Water	9056	
LCS 490-130870/5	Lab Control Sample	Total/NA	Water	9056	
LCSD 490-130870/6	Lab Control Sample Dup	Total/NA	Water	9056	
MB 490-130870/4	Method Blank	Total/NA	Water	9056	

Analysis Batch: 130871

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-6	PZ-12	Total/NA	Water	9056	
490-43287-6 MS	PZ-12	Total/NA	Water	9056	
490-43287-6 MSD	PZ-12	Total/NA	Water	9056	
LCS 490-130871/5	Lab Control Sample	Total/NA	Water	9056	
LCSD 490-130871/6	Lab Control Sample Dup	Total/NA	Water	9056	
MB 490-130871/4	Method Blank	Total/NA	Water	9056	

Analysis Batch: 131342

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-42671-I-2 MS	Matrix Spike	Total/NA	Water	9056	
490-42671-I-2 MSD	Matrix Spike Duplicate	Total/NA	Water	9056	
490-43287-7	PZ-13	Total/NA	Water	9056	
490-43287-8	PZ-1	Total/NA	Water	9056	
490-43287-9	AB-2	Total/NA	Water	9056	
490-43287-10	OW-2	Total/NA	Water	9056	
490-43287-11	OW-1	Total/NA	Water	9056	
LCS 490-131342/6	Lab Control Sample	Total/NA	Water	9056	
LCSD 490-131342/7	Lab Control Sample Dup	Total/NA	Water	9056	
MB 490-131342/5	Method Blank	Total/NA	Water	9056	

Analysis Batch: 131343

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-42671-I-2 MS	Matrix Spike	Total/NA	Water	9056	
490-42671-I-2 MSD	Matrix Spike Duplicate	Total/NA	Water	9056	
490-43287-7	PZ-13	Total/NA	Water	9056	
490-43287-8	PZ-1	Total/NA	Water	9056	
490-43287-9	AB-2	Total/NA	Water	9056	
490-43287-10	OW-2	Total/NA	Water	9056	
490-43287-11	OW-1	Total/NA	Water	9056	
LCS 490-131343/6	Lab Control Sample	Total/NA	Water	9056	
LCSD 490-131343/7	Lab Control Sample Dup	Total/NA	Water	9056	
MB 490-131343/5	Method Blank	Total/NA	Water	9056	

Analysis Batch: 131557

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-12	OW-3	Total/NA	Water	9056	
490-43287-12 MS	OW-3	Total/NA	Water	9056	
490-43287-12 MSD	OW-3	Total/NA	Water	9056	
LCS 490-131557/6	Lab Control Sample	Total/NA	Water	9056	
LCSD 490-131557/7	Lab Control Sample Dup	Total/NA	Water	9056	
MB 490-131557/5	Method Blank	Total/NA	Water	9056	

HPLC/IC (Continued)

Analysis Batch: 131558

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-12	OW-3	Total/NA	Water	9056	
490-43287-12 MS	OW-3	Total/NA	Water	9056	
490-43287-12 MSD	OW-3	Total/NA	Water	9056	
LCS 490-131558/6	Lab Control Sample	Total/NA	Water	9056	
LCSD 490-131558/7	Lab Control Sample Dup	Total/NA	Water	9056	
MB 490-131558/5	Method Blank	Total/NA	Water	9056	

Analysis Batch: 131778

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-7	PZ-13	Total/NA	Water	9056	
490-43287-8	PZ-1	Total/NA	Water	9056	
490-43287-10	OW-2	Total/NA	Water	9056	
LCS 490-131778/4	Lab Control Sample	Total/NA	Water	9056	
LCSD 490-131778/5	Lab Control Sample Dup	Total/NA	Water	9056	
MB 490-131778/3	Method Blank	Total/NA	Water	9056	

Analysis Batch: 131972

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-11	OW-1	Total/NA	Water	9056	
490-43561-E-2 MS	Matrix Spike	Total/NA	Water	9056	
490-43561-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	9056	
LCS 490-131972/4	Lab Control Sample	Total/NA	Water	9056	
LCSD 490-131972/5	Lab Control Sample Dup	Total/NA	Water	9056	
MB 490-131972/3	Method Blank	Total/NA	Water	9056	

Analysis Batch: 132406

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-6	PZ-12	Total/NA	Water	9056	
490-43287-12	OW-3	Total/NA	Water	9056	
LCS 490-132406/4	Lab Control Sample	Total/NA	Water	9056	
LCSD 490-132406/5	Lab Control Sample Dup	Total/NA	Water	9056	
MB 490-132406/3	Method Blank	Total/NA	Water	9056	

Metals

Prep Batch: 131338

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-65087-B-1-B MS	Matrix Spike	Dissolved	Water	3005A	
440-65087-B-1-C MSD	Matrix Spike Duplicate	Dissolved	Water	3005A	
490-43287-1	AB-1	Dissolved	Water	3005A	
490-43287-2	PZ-3	Dissolved	Water	3005A	
490-43287-3	PZ-5	Dissolved	Water	3005A	
490-43287-4	PZ-4	Dissolved	Water	3005A	
490-43287-5	PZ-6	Dissolved	Water	3005A	
490-43287-6	PZ-12	Dissolved	Water	3005A	
LCS 490-131338/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 490-131338/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
MB 490-131338/1-A	Method Blank	Total Recoverable	Water	3005A	

Metals (Continued)

Prep Batch: 131718

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-7	PZ-13	Dissolved	Water	3005A	
490-43287-8	PZ-1	Dissolved	Water	3005A	
490-43287-9	AB-2	Dissolved	Water	3005A	
490-43287-10	OW-2	Dissolved	Water	3005A	
490-43287-11	OW-1	Dissolved	Water	3005A	
490-43287-12	OW-3	Dissolved	Water	3005A	
490-43287-A-7-B MS	490-43287-A-7-B MS	Dissolved	Water	3005A	
490-43287-A-7-C MSD	490-43287-A-7-C MSD	Dissolved	Water	3005A	
LCS 490-131718/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 490-131718/1-A	Method Blank	Total Recoverable	Water	3005A	

Analysis Batch: 132747

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-65087-B-1-B MS	Matrix Spike	Dissolved	Water	6010C	131338
440-65087-B-1-C MSD	Matrix Spike Duplicate	Dissolved	Water	6010C	131338
490-43287-1	AB-1	Dissolved	Water	6010C	131338
490-43287-2	PZ-3	Dissolved	Water	6010C	131338
490-43287-3	PZ-5	Dissolved	Water	6010C	131338
490-43287-4	PZ-4	Dissolved	Water	6010C	131338
490-43287-5	PZ-6	Dissolved	Water	6010C	131338
LCS 490-131338/2-A	Lab Control Sample	Total Recoverable	Water	6010C	131338
LCSD 490-131338/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010C	131338
MB 490-131338/1-A	Method Blank	Total Recoverable	Water	6010C	131338

Analysis Batch: 132870

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-6	PZ-12	Dissolved	Water	6010C	131338
490-43287-6	PZ-12	Dissolved	Water	6010C	131338
LCS 490-131338/2-A	Lab Control Sample	Total Recoverable	Water	6010C	131338
MB 490-131338/1-A	Method Blank	Total Recoverable	Water	6010C	131338

Analysis Batch: 132944

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-A-7-B MS	490-43287-A-7-B MS	Dissolved	Water	6010C	131718
490-43287-A-7-C MSD	490-43287-A-7-C MSD	Dissolved	Water	6010C	131718
LCS 490-131718/2-A	Lab Control Sample	Total Recoverable	Water	6010C	131718
MB 490-131718/1-A	Method Blank	Total Recoverable	Water	6010C	131718

Analysis Batch: 133156

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-7	PZ-13	Dissolved	Water	6010C	131718
490-43287-7	PZ-13	Dissolved	Water	6010C	131718
490-43287-8	PZ-1	Dissolved	Water	6010C	131718
490-43287-9	AB-2	Dissolved	Water	6010C	131718
490-43287-10	OW-2	Dissolved	Water	6010C	131718
490-43287-11	OW-1	Dissolved	Water	6010C	131718
490-43287-11	OW-1	Dissolved	Water	6010C	131718
490-43287-12	OW-3	Dissolved	Water	6010C	131718
MB 490-131718/1-A	Method Blank	Total Recoverable	Water	6010C	131718

General Chemistry

Analysis Batch: 131423

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-6	PZ-12	Total/NA	Water	SM 4500 P E	
490-43287-7	PZ-13	Total/NA	Water	SM 4500 P E	
490-43287-8	PZ-1	Total/NA	Water	SM 4500 P E	
490-43287-8 DU	PZ-1	Total/NA	Water	SM 4500 P E	
490-43287-8 MS	PZ-1	Total/NA	Water	SM 4500 P E	
490-43287-8 MSD	PZ-1	Total/NA	Water	SM 4500 P E	
490-43287-9	AB-2	Total/NA	Water	SM 4500 P E	
490-43287-10	OW-2	Total/NA	Water	SM 4500 P E	
490-43287-11	OW-1	Total/NA	Water	SM 4500 P E	
490-43287-12	OW-3	Total/NA	Water	SM 4500 P E	
LCS 490-131423/24	Lab Control Sample	Total/NA	Water	SM 4500 P E	
MB 490-131423/21	Method Blank	Total/NA	Water	SM 4500 P E	

Prep Batch: 132011

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-8	PZ-1	Total/NA	Water	9030B	
490-43287-8 MS	PZ-1	Total/NA	Water	9030B	
490-43287-8 MSD	PZ-1	Total/NA	Water	9030B	
490-43287-9	AB-2	Total/NA	Water	9030B	
490-43287-10	OW-2	Total/NA	Water	9030B	
490-43287-11	OW-1	Total/NA	Water	9030B	
490-43287-12	OW-3	Total/NA	Water	9030B	
490-43299-B-1-B DU	Duplicate	Total/NA	Water	9030B	
LCS 490-132011/2-A	Lab Control Sample	Total/NA	Water	9030B	
MB 490-132011/1-A	Method Blank	Total/NA	Water	9030B	

Analysis Batch: 132095

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-6	PZ-12	Total/NA	Water	SM4500 SiO2 C	
490-43287-7	PZ-13	Total/NA	Water	SM4500 SiO2 C	
490-43287-8	PZ-1	Total/NA	Water	SM4500 SiO2 C	
490-43287-8 DU	PZ-1	Total/NA	Water	SM4500 SiO2 C	
490-43287-8 MS	PZ-1	Total/NA	Water	SM4500 SiO2 C	
490-43287-8 MSD	PZ-1	Total/NA	Water	SM4500 SiO2 C	
490-43287-9	AB-2	Total/NA	Water	SM4500 SiO2 C	
490-43287-10	OW-2	Total/NA	Water	SM4500 SiO2 C	
490-43287-11	OW-1	Total/NA	Water	SM4500 SiO2 C	
490-43287-12	OW-3	Total/NA	Water	SM4500 SiO2 C	
LCS 490-132095/26	Lab Control Sample	Total/NA	Water	SM4500 SiO2 C	
LCS 490-132095/4	Lab Control Sample	Total/NA	Water	SM4500 SiO2 C	
LCSD 490-132095/27	Lab Control Sample Dup	Total/NA	Water	SM4500 SiO2 C	
LCSD 490-132095/5	Lab Control Sample Dup	Total/NA	Water	SM4500 SiO2 C	
MB 490-132095/1	Method Blank	Total/NA	Water	SM4500 SiO2 C	
MB 490-132095/25	Method Blank	Total/NA	Water	SM4500 SiO2 C	

Analysis Batch: 132128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-42944-I-1 DU	Duplicate	Total/NA	Water	SM 2320B	
490-43287-6	PZ-12	Total/NA	Water	SM 2320B	
490-43287-7	PZ-13	Total/NA	Water	SM 2320B	
490-43287-8	PZ-1	Total/NA	Water	SM 2320B	

General Chemistry (Continued)

Analysis Batch: 132128 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-9	AB-2	Total/NA	Water	SM 2320B	
490-43287-10	OW-2	Total/NA	Water	SM 2320B	
490-43287-11	OW-1	Total/NA	Water	SM 2320B	
490-43287-12	OW-3	Total/NA	Water	SM 2320B	
490-43410-I-1 DU	Duplicate	Total/NA	Water	SM 2320B	
LCS 490-132128/31	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 490-132128/4	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 490-132128/3	Method Blank	Total/NA	Water	SM 2320B	
MB 490-132128/30	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 132424

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-43287-8	PZ-1	Total/NA	Water	9034	132011
490-43287-8 MS	PZ-1	Total/NA	Water	9034	132011
490-43287-8 MSD	PZ-1	Total/NA	Water	9034	132011
490-43287-9	AB-2	Total/NA	Water	9034	132011
490-43287-10	OW-2	Total/NA	Water	9034	132011
490-43287-11	OW-1	Total/NA	Water	9034	132011
490-43287-12	OW-3	Total/NA	Water	9034	132011
490-43299-B-1-B DU	Duplicate	Total/NA	Water	9034	132011
LCS 490-132011/2-A	Lab Control Sample	Total/NA	Water	9034	132011
MB 490-132011/1-A	Method Blank	Total/NA	Water	9034	132011

Prep Batch: 132878

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-42813-B-1-C MS	Matrix Spike	Total/NA	Water	9030B	
490-42813-B-1-D MSD	Matrix Spike Duplicate	Total/NA	Water	9030B	
490-43287-1	AB-1	Total/NA	Water	9030B	
490-43287-2	PZ-3	Total/NA	Water	9030B	
490-43287-3	PZ-5	Total/NA	Water	9030B	
490-43287-4	PZ-4	Total/NA	Water	9030B	
490-43287-5	PZ-6	Total/NA	Water	9030B	
490-43287-6	PZ-12	Total/NA	Water	9030B	
490-43287-7	PZ-13	Total/NA	Water	9030B	
490-43528-B-1-D DU	Duplicate	Total/NA	Water	9030B	
LCS 490-132878/2-A	Lab Control Sample	Total/NA	Water	9030B	
MB 490-132878/1-A	Method Blank	Total/NA	Water	9030B	

Analysis Batch: 132928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-42813-B-1-C MS	Matrix Spike	Total/NA	Water	9034	132878
490-42813-B-1-D MSD	Matrix Spike Duplicate	Total/NA	Water	9034	132878
490-43287-1	AB-1	Total/NA	Water	9034	132878
490-43287-2	PZ-3	Total/NA	Water	9034	132878
490-43287-3	PZ-5	Total/NA	Water	9034	132878
490-43287-4	PZ-4	Total/NA	Water	9034	132878
490-43287-5	PZ-6	Total/NA	Water	9034	132878
490-43287-6	PZ-12	Total/NA	Water	9034	132878
490-43287-7	PZ-13	Total/NA	Water	9034	132878
490-43528-B-1-D DU	Duplicate	Total/NA	Water	9034	132878
LCS 490-132878/2-A	Lab Control Sample	Total/NA	Water	9034	132878

General Chemistry (Continued)

Analysis Batch: 132928 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 490-132878/1-A	Method Blank	Total/NA	Water	9034	132878

Lab Chronicle

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Client Sample ID: AB-1

Lab Sample ID: 490-43287-1

Date Collected: 12/19/13 10:45
Matrix: Water
Date Received: 12/21/13 09:10

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	131338	12/24/13 10:57	JBD	TAL NSH
Dissolved	Analysis	6010C		1	50 mL	50 mL	132747	01/01/14 00:07	DBK	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	132878	01/02/14 14:55	SDJ	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	132928	01/02/14 17:43	SDJ	TAL NSH

Client Sample ID: PZ-3

Lab Sample ID: 490-43287-2

Date Collected: 12/19/13 11:20
Matrix: Water
Date Received: 12/21/13 09:10

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	131338	12/24/13 10:57	JBD	TAL NSH
Dissolved	Analysis	6010C		1	50 mL	50 mL	132747	01/01/14 00:11	DBK	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	132878	01/02/14 14:55	SDJ	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	132928	01/02/14 17:43	SDJ	TAL NSH

Client Sample ID: PZ-5

Lab Sample ID: 490-43287-3

Date Collected: 12/19/13 12:00
Matrix: Water
Date Received: 12/21/13 09:10

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	131338	12/24/13 10:57	JBD	TAL NSH
Dissolved	Analysis	6010C		1	50 mL	50 mL	132747	01/01/14 00:14	DBK	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	132878	01/02/14 14:55	SDJ	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	132928	01/02/14 17:43	SDJ	TAL NSH

Client Sample ID: PZ-4

Lab Sample ID: 490-43287-4

Date Collected: 12/19/13 12:40
Matrix: Water
Date Received: 12/21/13 09:10

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	131338	12/24/13 10:57	JBD	TAL NSH
Dissolved	Analysis	6010C		1	50 mL	50 mL	132747	01/01/14 00:18	DBK	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	132878	01/02/14 14:55	SDJ	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	132928	01/02/14 17:43	SDJ	TAL NSH

Client Sample ID: PZ-6

Lab Sample ID: 490-43287-5

Date Collected: 12/19/13 13:25
Matrix: Water
Date Received: 12/21/13 09:10

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	131338	12/24/13 10:57	JBD	TAL NSH
Dissolved	Analysis	6010C		1	50 mL	50 mL	132747	01/01/14 00:21	DBK	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	132878	01/02/14 14:55	SDJ	TAL NSH

Lab Chronicle

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Client Sample ID: PZ-6

Date Collected: 12/19/13 13:25
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9034		1	50 mL	50 mL	132928	01/02/14 17:43	SDJ	TAL NSH

Client Sample ID: PZ-12

Date Collected: 12/19/13 14:15
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1	10 mL		130870	12/23/13 22:40	HMT	TAL NSH
Total/NA	Analysis	9056		1	10 mL		130871	12/23/13 22:40	HMT	TAL NSH
Total/NA	Analysis	9056		50	10 mL		132406	12/31/13 11:25	ASL	TAL NSH
Dissolved	Analysis	6010C		10	50 mL	50 mL	132870	01/02/14 12:09	DBK	TAL NSH
Dissolved	Prep	3005A			50 mL	50 mL	131338	12/24/13 10:57	JBD	TAL NSH
Dissolved	Analysis	6010C		100	50 mL	50 mL	132870	01/02/14 12:12	DBK	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	131423	12/24/13 12:28	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	132095	12/27/13 11:13	BLM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	132128	12/27/13 20:55	PHB	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	132878	01/02/14 14:55	SDJ	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	132928	01/02/14 17:43	SDJ	TAL NSH

Client Sample ID: PZ-13

Date Collected: 12/19/13 15:15
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1	10 mL		131342	12/24/13 18:58	JHS	TAL NSH
Total/NA	Analysis	9056		1	10 mL		131343	12/24/13 18:58	JHS	TAL NSH
Total/NA	Analysis	9056		20	10 mL		131778	12/27/13 12:28	JHS	TAL NSH
Dissolved	Prep	3005A			50 mL	50 mL	131718	12/26/13 15:02	JBD	TAL NSH
Dissolved	Analysis	6010C		10	50 mL	50 mL	133156	01/03/14 12:48	LTB	TAL NSH
Dissolved	Analysis	6010C		100	50 mL	50 mL	133156	01/03/14 12:52	LTB	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	131423	12/24/13 12:28	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	132095	12/27/13 11:13	BLM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	132128	12/27/13 20:57	PHB	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	132878	01/02/14 14:55	SDJ	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	132928	01/02/14 17:43	SDJ	TAL NSH

Client Sample ID: PZ-1

Lab Sample ID: 490-43287-8

Date Collected: 12/20/13 08:30

Matrix: Water

Date Received: 12/21/13 09:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1	10 mL		131342	12/24/13 19:18	JHS	TAL NSH
Total/NA	Analysis	9056		1	10 mL		131343	12/24/13 19:18	JHS	TAL NSH
Total/NA	Analysis	9056		5	10 mL		131778	12/27/13 12:48	JHS	TAL NSH
Dissolved	Prep	3005A			50 mL	50 mL	131718	12/26/13 15:02	JBD	TAL NSH
Dissolved	Analysis	6010C		10	50 mL	50 mL	133156	01/03/14 12:55	LTB	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	131423	12/24/13 12:28	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	132095	12/27/13 11:13	BLM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	132128	12/27/13 21:01	PHB	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	132011	12/27/13 15:36	SJF	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	132424	12/27/13 16:50	SDJ	TAL NSH

Client Sample ID: AB-2

Lab Sample ID: 490-43287-9

Date Collected: 12/20/13 09:30

Matrix: Water

Date Received: 12/21/13 09:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1	10 mL		131342	12/24/13 19:38	JHS	TAL NSH
Total/NA	Analysis	9056		1	10 mL		131343	12/24/13 19:38	JHS	TAL NSH
Dissolved	Prep	3005A			50 mL	50 mL	131718	12/26/13 15:02	JBD	TAL NSH
Dissolved	Analysis	6010C		10	50 mL	50 mL	133156	01/03/14 12:59	LTB	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	131423	12/24/13 12:28	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	132095	12/27/13 11:13	BLM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	132128	12/27/13 21:05	PHB	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	132011	12/27/13 15:36	SJF	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	132424	12/27/13 16:50	SDJ	TAL NSH

Client Sample ID: OW-2

Lab Sample ID: 490-43287-10

Date Collected: 12/20/13 10:30

Matrix: Water

Date Received: 12/21/13 09:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1	10 mL		131342	12/24/13 19:59	JHS	TAL NSH
Total/NA	Analysis	9056		1	10 mL		131343	12/24/13 19:59	JHS	TAL NSH
Total/NA	Analysis	9056		5	10 mL		131778	12/27/13 13:08	JHS	TAL NSH
Dissolved	Prep	3005A			50 mL	50 mL	131718	12/26/13 15:02	JBD	TAL NSH
Dissolved	Analysis	6010C		10	50 mL	50 mL	133156	01/03/14 13:03	LTB	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	131423	12/24/13 12:28	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	132095	12/27/13 11:13	BLM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	132128	12/27/13 21:09	PHB	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	132011	12/27/13 15:36	SJF	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	132424	12/27/13 16:50	SDJ	TAL NSH

Lab Chronicle

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Client Sample ID: OW-1

Date Collected: 12/20/13 11:30
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1	10 mL		131342	12/24/13 20:19	JHS	TAL NSH
Total/NA	Analysis	9056		1	10 mL		131343	12/24/13 20:19	JHS	TAL NSH
Total/NA	Analysis	9056		20	10 mL		131972	12/28/13 01:40	HMT	TAL NSH
Dissolved	Analysis	6010C		10	50 mL	50 mL	133156	01/03/14 13:07	LTB	TAL NSH
Dissolved	Prep	3005A			50 mL	50 mL	131718	12/26/13 15:02	JBD	TAL NSH
Dissolved	Analysis	6010C		100	50 mL	50 mL	133156	01/03/14 13:10	LTB	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	131423	12/24/13 12:28	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	132095	12/27/13 11:13	BLM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	132128	12/27/13 21:13	PHB	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	132011	12/27/13 15:36	SJF	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	132424	12/27/13 16:50	SDJ	TAL NSH

Client Sample ID: OW-3

Date Collected: 12/20/13 12:30
Date Received: 12/21/13 09:10

Lab Sample ID: 490-43287-12

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1	10 mL		131557	12/26/13 09:51	HMT	TAL NSH
Total/NA	Analysis	9056		1	10 mL		131558	12/26/13 09:51	HMT	TAL NSH
Total/NA	Analysis	9056		20	10 mL		132406	12/31/13 12:22	ASL	TAL NSH
Dissolved	Prep	3005A			50 mL	50 mL	131718	12/26/13 15:02	JBD	TAL NSH
Dissolved	Analysis	6010C		10	50 mL	50 mL	133156	01/03/14 13:14	LTB	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	131423	12/24/13 12:28	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	132095	12/27/13 11:13	BLM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	132128	12/27/13 21:36	PHB	TAL NSH
Total/NA	Prep	9030B			50 mL	50 mL	132011	12/27/13 15:36	SJF	TAL NSH
Total/NA	Analysis	9034		1	50 mL	50 mL	132424	12/27/13 16:50	SDJ	TAL NSH

Laboratory References:

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

Method Summary

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Method	Method Description	Protocol	Laboratory
9056	Anions, Ion Chromatography	SW846	TAL NSH
6010C	Metals (ICP)	SW846	TAL NSH
9034	Sulfide, Acid soluble and Insoluble (Titrimetric)	SW846	TAL NSH
SM 2320B	Alkalinity	SM	TAL NSH
SM 4500 P E	Orthophosphate	SM	TAL NSH
SM4500 SiO2 C	Silica, Molybdosilicate Method	SM	TAL NSH

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater",

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

Certification Summary

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

TestAmerica Job ID: 490-43287-1
SDG: CIR.045

Laboratory: TestAmerica Nashville

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	ISO/IEC 17025		0453.07	12-31-15
Alaska (UST)	State Program	10	UST-087	07-24-14
Arizona	State Program	9	AZ0473	05-05-14
Arizona	State Program	9	AZ0473	05-05-14 *
Arkansas DEQ	State Program	6	88-0737	04-25-14
California	NELAP	9	1168CA	10-31-14
Canadian Assoc Lab Accred (CALA)	Canada		3744	03-08-14
Connecticut	State Program	1	PH-0220	12-31-15
Florida	NELAP	4	E87358	06-30-14
Illinois	NELAP	5	200010	12-09-14
Iowa	State Program	7	131	05-01-14
Kansas	NELAP	7	E-10229	10-31-14
Kentucky (UST)	State Program	4	19	06-30-14
Louisiana	NELAP	6	30613	06-30-14
Maryland	State Program	3	316	03-31-14
Massachusetts	State Program	1	M-TN032	06-30-14
Minnesota	NELAP	5	047-999-345	12-31-14
Mississippi	State Program	4	N/A	06-30-14
Montana (UST)	State Program	8	NA	01-01-20
Nevada	State Program	9	TN00032	07-31-14
New Hampshire	NELAP	1	2963	10-10-14
New Jersey	NELAP	2	TN965	06-30-14
New York	NELAP	2	11342	04-01-14
North Carolina DENR	State Program	4	387	12-31-14
North Dakota	State Program	8	R-146	06-30-14
Ohio VAP	State Program	5	CL0033	10-16-15
Oklahoma	State Program	6	9412	08-31-14
Oregon	NELAP	10	TN200001	04-29-14
Pennsylvania	NELAP	3	68-00585	06-30-14
Rhode Island	State Program	1	LAO00268	12-30-13 *
South Carolina	State Program	4	84009 (001)	02-28-14
Tennessee	State Program	4	2008	02-23-14
Texas	NELAP	6	T104704077-09-TX	08-31-14
USDA	Federal		S-48469	10-30-16
Utah	NELAP	8	TN00032	07-31-14
Virginia	NELAP	3	460152	06-14-14
Washington	State Program	10	C789	07-19-14
West Virginia DEP	State Program	3	219	02-28-14
Wisconsin	State Program	5	998020430	08-31-14
Wyoming (UST)	A2LA	8	453.07	12-31-15

* Expired certification is currently pending renewal and is considered valid.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-43287 Chain of Custody

Cooler Received/Opened On 12/21/2013 @ 9:10

1. Tracking # 7128 (last 4 digits, FedEx)

Courier: FedEx IR Gun ID 17610176

2. Temperature of rep. sample or temp blank when opened: 0.7 *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 Front

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 (intial) AJH

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 (intial) AJH

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 (intial) AJH

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 (intial) AJH

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

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

Did not receive every sample listed on chain

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 11/28/12

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

Charlotte
Loc: 490
43287

Cooler Received/Opened On 12/23/2013 @ 0845

1. Tracking # 7139 (last 4 digits, FedEx)

Courier: FedEx IR Gun ID 92610146

2. Temperature of rep. sample or temp blank when opened: 1.5 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 front

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 (intial) M

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 # NA

I certify that I unloaded the cooler and answered questions 7-14 (intial) M

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 (intial) M

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 (intial) M

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

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...# 98225

out of hold

samples 7 → 12

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 11/28/12
1/7/2014

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

TestAmerica Laboratory location: _____

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other _____

COC No: 060550

1 of 2 COCs

Client Contact	Client Project Manager:	Site Contact:	Lab Contact:
Company Name: Hart & Hickman	Scott Drury		
Address: 3923 S Tryon St	Telephone: 704 586 0007	Telephone:	Telephone:
City/State/Zip: Charlotte NC 28203	Email: Sdrury@hartnickman	Analysis Turnaround Time (in BUSdays)	Analyses
Phone: 704 586 0007		TAT if different from below 3 wd	
Project Name: Clariant Kalama	Method of Shipment/Carrier: Fed EX	☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day	
Project Number: CIR.045	Shipping/Tracking No:		
PO# Washington			

	Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite (C) / Grab (G)	Sulfide	Cd, Zn	SO4, Cl, PO4	* Metals	NO3, NO2	Dissolved Silica	Alkalinity				For Lab Use Only: Walk-in Client / Lab Courier / At Sampling / Job/SDG No.	Sample Specific Notes / Special Instructions:
1	AB-1	12/19/13	1045		X				X	X			X			Y	G	X	X										
2	PZ-3		1120		X				X	X			X					X	X										
3	PZ-5		1200		X				X	X			X					X	X										
4	PZ-4		1240		X				X	X			X					X	X										
5	PZ-6		1325		X				X	X			X					X	X										
6	PZ-12		1415		X				X	X			X					X	X	X	X	X	X	X						
7	PZ-13	12/19/13	1515		X				X	X			X					X	X	X	X	X	X	X						
8	PZ-1	12/20/13	830		X				X	X			X					X	X	X	X	X	X	X						
9	AB-2	12/20/13	930		X				X	X			X					X	X	X	X	X	X	X						
10	OW-2	12/20/13	1630		X				X	X			X					X	X	X	X	X	X	X						

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:

Only Metals Field Filtered *Metals Al, Ca, Cd, Fe, K, Mg, Mn, Na, Pb, Si, Zn

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company: H&H	Date/Time: 12/20/13 1330	Received by: Fed EX	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TAL	Date/Time: 12/21/13 9:10

Loc: 490
43287

©2008 TestAmerica Laboratories, Inc. All rights reserved
TestAmerica & Design ™ are trademarks of TestAmerica Laboratories, Inc.

TAL 0018- 1 (04/10)

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: _____
Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other _____

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager:	Site Contact:	Lab Contact:	COC No:
Company Name: Hart & Hickman	Scott Drury			060549
Address: 2923 S Tryon St	Telephone: 704 586 0007	Telephone:	Telephone:	2 of 2 COCs
City/State/Zip: Charlotte NC 28203	Email: sdrury@hartHickman	Analysis Turnaround Time (in BUS days)	Analyses	For lab use only
Phone: 704 586 0007		TAT if different from below Stnd		Walk-in client ☐
Project Name: Clariant Kalama	Method of Shipment/Carrier: Fed EX	☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Lab pickup ☐ Lab sampling ☐
Project Number: CLR. 045	Shipping/Tracking No:			Job/SDG No:
PO#				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Sulfide	SO4, Cl, PO4	Metals	NO2, NO3	Dissolved Silica	Alkalinity					Sample Specific Notes / Special Instructions:
11 OW-1	12/20/13	1130		X				X	X			X			Y	G	X	X	X	X	X	X					
12 OW-3	12/20/13	1230		X				X	X			X			Y	G	X	X	X	X	X	X					Loc: 490 43287

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:

Only Metals Field Filtered * metals Al, Ca, Cd, Fe, K, Mg, Mn, Na, Pb, Si, Zn

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company: H&H	Date/Time: 12/20/13 1330	Received by: Fed EX	Company: 12/20/13	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: 12/23/13	Date/Time: 0845 1.5

©2008 TestAmerica Laboratories, Inc. All rights reserved
TestAmerica & Design ™ are trademarks of TestAmerica Laboratories, Inc.

TAL 0018- 1 (04/10)

Login Sample Receipt Checklist

Client: Hart & Hickman, PC

Job Number: 490-43287-1
SDG Number: CIR.045

Login Number: 43287
List Number: 1
Creator: Huskey, Adam

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
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.	False	
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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	