2018 ANNUAL ENVIRONMENTAL MONITORING REPORT

Hansville Landfill, Kitsap County, Washington

Prepared for: Kitsap County Public Works - Solid Waste

Project No. 160423-002-2018 • March 1, 2019 Final

Aspect CONSULTING

earth + water

2018 ANNUAL ENVIRONMENTAL MONITORING REPORT

Hansville Landfill, Kitsap County, Washington

Prepared for: Kitsap County Public Works - Solid Waste

Project No. 160423-002-2018 • March 1, 2019 Final

Aspect Consulting, LLC

Meilani Lanier-Kamaha'o, LG
Project Geologist
mlkamahao@aspectconsulting.com

Peter S. Bannister, PE
Associate Engineer
pbannister@aspectconsulting.com

V:\160423 Kitsap County Hansville Landfill\Deliverables\2018 Reports\2018 Annual Report\Hansville LF 2018 Annual Report_Final.docx

Contents

List of Tables

List of Appendices

Acronyms

Aspect	Aspect Consulting, LLC
CAP	Cleanup Action Plan
CMP	Compliance Monitoring Plan
COCs	contaminants of concern
Ecology	Washington Department of Ecology
KCSL	Kitsap County Sanitary Landfill
mg/L	milligrams per liter
µg/L	micrograms per liter
MSW	municipal solid waste
MTCA	Model Toxics Control Act
NAVD88	North American Vertical Datum of 1988
RASR	Remedial Action Status Report
RI/FS	Remedial Investigation/Feasibility Study
Site	Hansville Landfill Site
SHA	Site Hazard Assessment
UCL / LCL	upper confidence limit / lower confidence limit
VOCs	volatile organic compounds
WAC	Washington Administrative Code
WMW	Waste Management of Washington

1 Introduction

This combined fourth quarter 2018 and 2018 annual monitoring report documents site activities conducted at and environmental monitoring results for the Hansville Landfill Site (Site; or the Landfill). This report was prepared by Aspect Consulting, LLC (Aspect) on behalf of Kitsap County (County) Public Works Solid Waste Division and Waste Management of Washington (WMW). Cleanup activities at the Site have been conducted under the Washington State Model Toxics Control Act (MTCA). Ongoing environmental monitoring at the Site supports the remedy of natural attenuation of groundwater with enhanced monitoring and institutional controls that was established with the final Cleanup Action Plan (CAP) provided with the Amended Consent Decree No. 95-2-03005-1 (August 5, 2011). The data sets presented in this report were collected in accordance with the Ecology-approved Compliance Monitoring Plan (CMP; SCS Engineers, 2011; SCS Engineers, 2012), except where otherwise noted.

During 2018, conditions monitored at the Site were consistent with historical trends and continued to show improvements in protection of human health and the environment. This report is organized to include topics listed in the CMP (SCS Engineers, 2011).

- Section 2 summarizes Site background, including general Site information, regulatory framework, surrounding land use, hydrogeologic conditions, the environmental monitoring network, and cleanup criteria.
- Section 3 describes Site activities during the fourth quarter 2018 and provides a summary of previous Site activities in 2018.
- Section 4 describes landfill gas collection activities and monitoring results during the fourth quarter 2018. The landfill gas collection system was safely operated to improve groundwater protection.
- Section 5 describes groundwater and surface water conditions observed during the fourth quarter 2018, including statistical analysis of trends in groundwater concentrations for 2018 and an assessment of natural attenuation processes.
- Section 6 summarizes landfill inspection reports prepared by the Kitsap Public Health District.
- Section 7 summarizes operations and maintenance updates associated with groundwater sampling and the condensate system improvements.

2 Site Background

Details on Site background were provided in the Remedial Investigation (RI) report (Parametrix, 2007), and the Feasibility Study (FS) report (Parametrix, 2009). This section summarizes Site background to provide context for ongoing Site activities and compliance monitoring.

2.1 Site Location and Description

The closed Hansville Landfill is located on an approximately 73-acre parcel within the northeast quarter of Section 9, Township 27 North, Range 2 East of the Willamette Meridian, in Kitsap County, Washington. The Landfill is approximately five miles south of the unincorporated community of Hansville on the northernmost reach of the Kitsap Peninsula, and is situated on the upper portions of several sloping drainages with perennial creeks that ultimately discharge into Port Gamble Bay. The topography ranges between approximately 310 and 390 feet elevation North American Vertical Datum of 1988 (NAVD88). A Site location map is provided in Figure B-1, showing property boundaries and other Site features.

The Site includes the Landfill, the Landfill property (Property), and a portion of land owned by the Port Gamble S'Klallam Tribe. The Landfill was active between 1962 and 1989, and consists of three separate disposal areas, or cells. These include the following:

1. 13-acre municipal solid waste disposal cell (main municipal solid waste (MSW) cell) situated within the central portion of the Property.
2. 4-acre demolition disposal cell situated on the northeast corner of the property, which accepted construction, demolition, and land clearing wastes.
3. 1/3-acre septage lagoon located immediately southwest of the demolition disposal area, which accepted residential septic tank waste until 1982. A second septage disposal area was reportedly located near the northeast corner of the demolition disposal area.

2.1.1 Engineering Controls

The engineering controls at the Landfill include engineered cover systems and an active landfill gas collection system. The engineered cover systems incorporate a geomembrane, vegetated surface, and integrated surface water control to prevent erosion. The layout of the landfill gas collection system is shown on Figure A-1, and includes:

- 13 vertical collection wells installed within the main MSW cell.
- 10 perimeter collection wells installed outside the western edge of the main MSW cell.
- Approximately 3,200 feet of horizontal collector trench installed below the engineered cover system at the main MSW cell and the demolition disposal cell with 8 monitoring and control points.
- Laterals and a perimeter header leading to the blower and flare compound.

2.1.2 Current Property Uses

The County owns the Property, and has operated a transfer station east of the Landfill for solid waste transfer and/or recycling operations since 1989. The remaining portions of the Property are largely comprised of a former soil borrow area and wooded land. Prior to development of the landfill, the Property was undeveloped forested land.

2.2 Regulatory Framework

The Hansville Landfill is a former MSW landfill that stopped accepting waste and closed in 1989. The closure met requirements of Chapter 173-304 of the Washington Administrative Code (WAC), and included the following engineering controls (for example):

- Installation of horizontal gas collector trenches in the main MSW cells and the demolition disposal cell to prevent landfill gas migration.
- Installation of an engineered cover system over all three distinct disposal areas to reduce or eliminate precipitation infiltration through refuse.

In 1991, the Bremerton-Kitsap County Health Department required corrective actions to better control landfill gas migration and prevent groundwater impacts. Kitsap County Sanitary Landfill[1] (KCSL) converted the landfill gas collection system from passive to active. KCSL also conducted additional investigations, continued environmental monitoring, and implemented additional improvements at the Site as part of a corrective action program. The active landfill gas collection and flare system has been in operation since 1991.

Also, in 1991, the Washington Department of Ecology (Ecology) performed a Site Hazard Assessment (SHA) under MTCA, which resulted in an initial ranking of 3. In 1992, this ranking was subsequently changed to a 1 (the highest rank on a scale of 1 to 5) based on changes in the state ranking model.

In October 1995, Ecology signed a consent decree with the County and KCSL to conduct a RI/FS for the Site. The RI/FS reports (Parametrix, 2007; Parametrix, 2009) identified contaminants of concern (COCs) related to the landfill in groundwater and in seepage to surface water. Based on these findings, Site-specific cleanup levels were developed for arsenic, vinyl chloride, and manganese in groundwater, and arsenic and vinyl chloride in surface water. The highest concentrations of these COCs were observed adjacent to the waste disposal areas, with decreasing concentrations at increasing distances to the landfill.

In preparing the 2011 Amended Consent Decree and CAP, Ecology selected the remedy involving natural attenuation of groundwater with enhanced monitoring and institutional controls (including a restrictive covenant for the Landfill Property). A CMP (SCS Engineers, 2011; SCS Engineers, 2012) provides monitoring program details, including the Sampling and Analysis Plan and the Quality Assurance Plan. Ongoing compliance monitoring under the CAP has been conducted since the fourth quarter of 2011.

[1] By 1998, WMW assumed control of KCSL through a series of sales, mergers, and acquisitions.

During the summer of 2016, Ecology initiated the first five-year review of the Hansville Landfill MTCA remedy as defined under the 2011 Amended Consent Decree. Consistent with Section XXVI of the Amended Consent Decree, a Remedial Action Status Report (RASR; SCS Engineers, 2016) was prepared and submitted to Ecology. In August 2016, Ecology prepared a draft memorandum that included an evaluation of the previous five years of groundwater data and comments to the RASR. Based on Ecology's review, the current monitoring program will continue to be implemented through the next five-year MTCA review cycle.

2.3 Surrounding Land Use

The Property is bordered to the south and west by lands owned by the Port Gamble S'Klallam Tribe. Tribal lands in the immediate vicinity of the Landfill Property consists of woodland and recreational land. The Point Casino and Hotel is located approximately 1,000 feet from the Landfill. The nearest Tribal residential land use is approximately 2,000 feet from the landfill.

Surrounding areas to the north and east of the Property are zoned by the County as light industrial use, low-density residential, and rural woodland. The nearest off-property structures include a shop and office approximately 200 feet from the demolition disposal cell.

2.4 Hydrogeology

The regional near-surface geology in the vicinity of the Landfill is dominated by glacio-fluvial and glacio-lacustrine deposits associated with the Vashon glaciation. The RI (Parametrix, 2007) identifies the following main stratigraphic units at the Site (from ground surface downward):

- **Sand –** This unit was reported in all the investigative borings from the ground surface to depths ranging from 62 to 142 feet below ground surface (bgs). The sand deposit consists primarily of poorly graded, fine- and medium-grained sand with trace amounts of silt and gravel. The material is dark yellowish brown to dark gray in color, dense to very dense, and dry to saturated. The RI references the sand unit as the upper aquifer. This unit has been interpreted as outwash associated with the Vashon Drift.
- **Transition Zone –** This zone was reported at three boring locations (MW-8, MW-9, and MW-14), and is approximately 15 feet thick. It consists of interbedded layers of sand, silty sand, and silt, and does not appear to be extensive.
- **Silt –** This unit was reported in all borings advanced through the upper aquifer. It occurred at depths ranging from approximately 66 feet bgs (at MW-9) to 163 feet bgs (at MW-14). The silt is dark gray, silty to moderately plastic, very dense, and dry. This unit has been interpreted to be the Kitsap Formation.

Groundwater in the upper aquifer near the Landfill is approximately 50 feet below the bottom extent of refuse. Groundwater flows towards the west-southwest, and discharges into the headwaters of perennial creeks, including Creek A, Creek B, and Middle Creek

(see Figure B-1). The dense silts reported for the Kitsap Formation underlying the upper aquifer restrict downward groundwater flow.

2.5 Environmental Monitoring Network

This section summarizes historical development of the Site performance and compliance monitoring network. The following are the conditional points of compliance for the Hansville Site described in the CAP:

- The Upper Aquifer at the Landfill Property boundary.
- The Upper Aquifer downgradient of the Landfill Property boundary and upgradient of the creek headwaters on Tribal property.
- Groundwater discharge to surface water at the headwaters of Creek A, Creek B, and Middle Creek on Tribal property.

2.5.1 Subsurface Gas

The landfill gas collection system and gas probes have been monitored since 1990 to assess potential landfill gas migration from the Landfill, and landfill gas concentrations within the waste.

Nine subsurface gas probes were installed outside the waste in native soils to measure for potential landfill gas migration. Six subsurface gas probes (GP-1, GP-2S, GP-2I, GP-2D, GP-3, and GP-4) were installed in 1990 at four on-Property monitoring the southern portion of the Landfill. Gas probes GP-5 and GP-6 were installed in 1994 and 1996 monitoring the northern portion of the Landfill. was installed on-Property. Gas probe GP-7 was installed in 1996 monitoring the off-Property area west of the Landfill, adjacent to groundwater monitoring well MW-9.

Per the CAP, landfill gas performance monitoring includes quarterly field measurements at the nine subsurface gas probes at seven locations, and the landfill gas collection system (21 vertical well and horizontal trench monitoring locations, the blower inlet and outlet ports). Subsurface gas compliance monitoring locations are shown on Figures A-1 and B-1.

2.5.2 Groundwater

Groundwater monitoring was initiated at the Site in 1982 with the installation of three monitoring wells (MW-1 through MW-3). Three additional monitoring wells (MW-4 through MW-6) were added to the monitoring program in 1988. Beginning in 1996, 10 monitoring wells were installed as part of a phased RI:

- Phase I included wells MW-7 through MW-12
- Phase II included wells MW-8D, MW-12I, MW-13S, MW-13D, and MW-14

Based on the RI groundwater monitoring results, the CAP includes the following six points of compliance: MW-5, MW-6, MW-7, MW-12I, MW-13D, and MW-14. See Figure B-1 for the groundwater compliance monitoring locations.

2.5.3 Surface Water

Surface water monitoring commenced in 1991 at two locations on Middle Creek (SW-1 and SW-2). Two additional locations (SW-SB and SW-3) were added in 1992 and 1994, respectively. Seven new surface water sampling locations (SW-4, SW-5, SW-6, SW-7, SW-8, SW-9, SW-10) were established in 1996 during the RI. Based on the RI surface water monitoring results, the CAP includes the following four points of compliance: SW-1, SW-4, SW-6, and SW-7. See Figure 2 for the surface water compliance monitoring locations.

2.5.4 Cleanup Criteria

The CAP established the final Site-specific cleanup levels for groundwater and surface water, summarized in the table below.

Table 1. Hansville Landfill Site Cleanup Levels

Chemical	Media	Site Cleanup Level (µg/L)	Origin of Cleanup Level
Vinyl Chloride	Groundwater	0.025	EPA Human Health, 2004
Arsenic		5	Background
Manganese		2,240	Method B Formula Value
Vinyl Chloride	Surface Water	0.025	EPA Human Health, 2004
Arsenic		5	Background

The performance standard[2] for on-Property probes is to operate the landfill gas collection system to maintain methane concentrations below five percent by volume.

3 Site Activities

Site activities included environmental monitoring of landfill gas, groundwater, and surface water. A chronology of on-Site activities performed during the fourth quarter of 2018 is provided below.

- On October 16, 2018, Aspect completed groundwater and surface water sampling in accordance with the CMP (SCS Engineers, 2011). Details of groundwater and surface water sampling are provided in Section 5.
- On October 17, 2018 Aspect conducted monthly landfill gas system tuning. Details of landfill gas monitoring are provided in Section 4.
- On November 20, 2018, Aspect conducted monthly landfill gas system tuning. Details of landfill gas monitoring are provided in Section 4.

[2] See WAC 173-304-460, from the Minimum Functional Standards for Solid Waste Handling, and one of the regulations listed in the CAP.

- On December 21, 2018, Aspect conducted compliance landfill gas monitoring in accordance with the CMP (SCS Engineers, 2011). Details of landfill gas monitoring are provided in Section 4.
- In November and December 2018, Aspect completed improvements to the condensate collection system. Details of the condensate system improvements are provided in Section 3.2.

Previously during 2018, Site activities were documented in quarterly reports (Aspect 2018a; Aspect 2018b; Aspect 2018c) and included the following:

- Monthly landfill gas system tuning
- Quarterly landfill gas compliance monitoring
- Quarterly groundwater and surface water performance and compliance monitoring
- Condensate collection system inspection and assessment (June)

3.1 Deviations from the Compliance Monitoring Plan

There were deviations from the CMP (SCS, 2011) during the fourth quarter of 2018 reporting period, but these deviations do not affect project schedule for Site cleanup. The causes of the deviations are identified below, as are solutions for avoiding these issues during future monitoring events.

- During the fourth quarter 2018, some groundwater and surface water samples were not analyzed within the 48-hour hold time prescribed by the laboratory for nitrate, nitrite, and orthophosphate. Affected results were classified as useable per the data validation process in the CMP (SCS Engineers, 2011). These data are reported and flagged as "J." The laboratory identified this as an inadvertent issue.

4 Landfill Gas Conditions

The following sections provide a discussion of landfill gas monitoring, landfill gas collection system performance, and explosive gas control. The layout of the landfill gas collection system is shown on Figure A-1.

Since active landfill gas collection started in 1991, the system has historically been operated to control landfill gas migration and to protect groundwater. Little to no methane been observed at gas compliance probes since 1992. In 1995, the maximum methane concentration was 38 percent, and the balance gas concentration was 44 percent, indicating that approximately half of the gas collected was from the atmosphere. Until approximately January 2013, landfill gas collection rates decreased steadily due to low methane concentrations and difficulty in sustaining flare operation.

Since 2013, the landfill gas collection rate has been maintained at approximately 70 standard cubic feet per minute (scfm) to improve groundwater protection. Since 2013, the

average methane concentration has been less than 5 percent, and the average balance gas concentration has been approximately 78 percent, indicating that nearly all of the gas collected was from the atmosphere.

4.1 Landfill Gas Monitoring

During the fourth quarter of 2018, the landfill gas collection system was tuned on October 16 and November 20 and compliance monitoring of the landfill gas collection system and compliance probes occurred on December 21.

Measurements were made with a GEM-5000 multigas meter. Landfill gas monitoring parameters collected for the compliance monitoring event are summarized in Tables A-1 through A-4, and listed below:

- Landfill gas composition measurements included methane (CH4), carbon dioxide (CO2), oxygen (O2), and balance gas (Balance) concentrations.
- Collection system pressure measurements included the static pressure measured before and after any valve adjustments, reported as "initial" and "adjusted," respectively. No valve adjustments were made during the December 21 compliance monitoring round.
- Collection system flow-rate measurements were obtained at selected locations. At locations with orifice plates, the differential pressure and gas temperature were measured to calculate flow.

The perimeter collection wells were operated only temporarily for monitoring and were otherwise not active during the reporting period.

4.2 Landfill Gas System Performance

During the fourth quarter of 2018, the flow at the blower inlet was approximately 72 scfm. Methane and carbon dioxide concentrations at the blower inlet were 3.3 and 13.2 percent by volume, respectively. The oxygen concentration was 4.1 percent by volume. The explosive range for methane in air is approximately 5 to 15 percent by volume, whereas the minimum methane concentration to sustain a flame is approximately 20 percent. Landfill gas measured at the blower inlet has contained less than 20 percent methane since 2012.

During the fourth quarter of 2018, methane concentrations measured at individual collection locations ranged between 0.1 and 9.8 percent by volume, similar to methane concentrations observed during the third quarter 2018. The landfill gas concentrations across the wellfield have remained relatively stable since mid-2017. Wellfield optimization will continue to focus on maximizing methane and carbon dioxide collection rates.

During condensate system improvements, static pressure and landfill gas collection rates were temporarily lower than normal due to a vacuum leak at the condensate riser. The vacuum leak was observed and addressed in late November.

4.3 Explosive Gas Control

Methane was not detected at any of the landfill gas compliance monitoring locations during the fourth quarter of 2018. Routine compliance monitoring continues to show that the Site remains in compliance with explosive gas control per WAC 173-304-460. Carbon dioxide concentrations in the compliance monitoring probes ranged from 0.1 to 1.9 percent by volume, and oxygen concentrations ranged from 20.5 to 22.1 percent by volume.

5 Groundwater and Surface Water Conditions

The following sections describe groundwater and surface water monitoring, address observed groundwater elevations and flow, water quality results, and an evaluation of statistical trends to ensure progress toward Site-specific cleanup levels.

5.1 Groundwater and Surface Water Monitoring

During the fourth quarter of 2018, groundwater and surface water was monitored and sampled by Aspect on October 16, 2018.

Measurements of field parameters were made with a calibrated YSI multiparameter probe, and a calibrated Hach turbidimeter. Samples for laboratory analysis were collected in supplied bottles and delivered using standard chain-of-custody methods. Field parameters and laboratory results for all sampling events in 2018 are organized in Tables B-2 and B-3, and listed below:

- Field parameters included dissolved oxygen, pH, oxidation reduction potential, specific conductivity, temperature, and turbidity.
- Conventional parameters included alkalinity, ammonia (as N), bicarbonate, carbonate, chloride, nitrate (as N), nitrite (as N), orthophosphate (as P), sulfate, and total organic carbon.
- Dissolved metals included arsenic and manganese.
- Detected volatile organic compounds (VOCs) included total 1,2-dichloroethene, cis-1,2-dichloroethene, diethyl ether, and vinyl chloride.

After groundwater and surface water samples were received by the laboratory for analysis of nitrate, nitrite, and orthophosphate, they were not analyzed within the prescribed 48-hour hold time. However, affected results were classified as useable per the data validation process in the CMP (SCS Engineers, 2011). These data are qualified as estimated and flagged as “J” for results above the reporting limit, or “UJ” for results not detected at the reporting limit.

5.2 Groundwater Elevations and Flow

Depth to groundwater measurements and calculated water table elevations for the fourth quarter of 2018 are presented in Table B-1, and a potentiometric surface map is provided in Figure B-1. Groundwater elevations ranged from 238.5 feet NAVD88 in MW-12I to 268.6 feet NAVD88 in MW-5. Groundwater at the Site flowed generally towards the west-southwest. Groundwater gradients ranged from 0.008 feet/feet in the upgradient areas, to 0.01 feet/feet further downgradient, with the gradient steepening and becoming more southwest oriented as it approaches the groundwater discharge area (Figure B-1). Groundwater elevation and gradient conditions were consistent with those observed during previous monitoring events.

5.3 Water Quality Results

Groundwater quality results from the fourth quarter 2018 are presented in Table B-2, including field parameters, conventional parameters, dissolved metals, and VOCs. During the fourth quarter 2018 monitoring event, field parameters were within the range of observed values during previous monitoring events. Analytical results for groundwater COCs are summarized below.

- The dissolved arsenic concentration in monitoring well MW-14 was 0.0125 mg/L and exceeded the 0.005 mg/L cleanup level. Dissolved arsenic was detected at concentrations below the cleanup level at the other groundwater points of compliance.
- Dissolved manganese concentrations were less than the 2.24 mg/L cleanup level at all groundwater points of compliance. During 2018, dissolved manganese concentrations in MW-14 decreased significantly compared with previous years.
- The vinyl chloride concentrations at monitoring wells MW-6, MW-12I, and MW-14 were 0.092 ug/L, 0.100 ug/L, and 0.034 ug/L, respectively, and exceeded the 0.025 ug/L cleanup level. Vinyl chloride was not detected at a reporting limit of 0.020 ug/L at other groundwater points of compliance.

Surface water quality results from the fourth quarter 2018 are presented in Table B-3, including field parameters, conventional parameters, dissolved metals, and VOCs. During the fourth quarter 2018 monitoring event, stream flows appeared seasonally low at the end of the dry season. Field parameters and analyte concentrations observed during the fourth quarter 2018 monitoring event were within the range of observed values during other monitoring events in 2018. During the fourth quarter of 2018, all analytical results for surface water COCs were either not detected at their respective reporting limits or were detected at concentrations below the site cleanup levels.

- Dissolved arsenic was detected at concentrations below the site cleanup level of 0.005 mg/L at all locations.
- Dissolved manganese was detected at concentrations below the site cleanup level of 2.24 mg/L at SW-4, SW-6, and SW-7 and was not detected at SW-1.

- Vinyl chloride has not been detected in surface water samples since the third quarter of 2013, and reporting limits have been less than the cleanup level of 0.025 µg/L.

5.4 Geochemical Parameters

Geochemical parameters in groundwater and surface water serve as indicators of landfill effects and can distinguish leachate impacts from gas-to-groundwater impacts. As shown in Tables B-2 and B 3, geochemical parameters collected at the Site include field parameters (dissolved oxygen, pH, Redox [reduction-oxidation potential], specific conductivity, and temperature), alkalinity/carbonate/bicarbonate, chloride, nitrate/nitrite/ammonia, sulfate, and total organic carbon.

Based on low concentrations of geochemical parameters identified as leachate indicators (such as chloride, sulfate, alkalinity, and bicarbonate) across the Site, there appears to be little if any leachate effect on groundwater and surface water quality. Historically, the downgradient monitoring wells show lower dissolved oxygen concentrations than the upgradient well (MW-5) or surface water sampling locations (SW-1, SW-4, SW-6, and SW-7). Carbon dioxide in landfill gas readily dissolves in groundwater, reducing dissolved oxygen concentrations. Optimizing landfill gas collection will reduce the gas-to-groundwater pathway that appears to be affecting groundwater geochemistry.

5.5 Statistical Evaluation

The groundwater quality data were evaluated following the description provided in the CAP (Appendix D). Time-series graphs show arsenic and vinyl chloride concentrations since 2007. Trend analysis and projected average concentrations are based on data collected since 2007, following Ecology guidance from the first five-year review[3].

5.5.1 Time-Series Graphs

Groundwater sampling results since 2007 are shown on time-series plots for dissolved arsenic (Figure C-1) and vinyl chloride (Figure C-2) at all compliance monitoring locations. Figure C-1 shows that dissolved arsenic concentrations in groundwater have been less than the cleanup level of 0.005 mg/L at MW-5 (background well), MW-6, MW-7, and MW-12I. A slow and steady increase in dissolved arsenic concentrations has been observed at MW-13D, and concentrations exceeded the cleanup level for the first time during the third quarter 2018, before decreasing below the cleanup level during the fourth quarter 2018. Dissolved arsenic concentrations at MW-14 have been decreasing over time.

Figure C-2 shows vinyl chloride concentrations in groundwater have been less than the cleanup level of 0.025 µg/L at MW-5 (background well), MW-7, and MW-13D. The concentration of vinyl chloride at MW-14 (0.024 µg/L) during the third quarter 2018 was below the cleanup level for the first time, before increasing slightly above the cleanup

[3] Ecology identified data inconsistencies between Ecology's Environmental Information Management database and the SCS Engineer's reported data set. Arsenic results for second quarter 2014 were not previously submitted to EIM. Two arsenic results (MW-6 on 4/19/2012, MW-7 on 7/5/12) had errors when originally loaded into EIM. These inconsistencies were rectified by Aspect in 2017.

level during the fourth quarter 2018. Vinyl chloride concentrations exceeded the cleanup level at MW-6 and MW-12I and concentrations continue to trend downward.

5.5.2 Statistical Trend Analysis

Based on the results of statistical analysis, the dissolved arsenic concentrations in groundwater at MW-14, and vinyl chloride concentrations in groundwater at MW-6, MW-12I, and MW-14, have statistically significant downward trends. These results show continued progress toward achieving cleanup levels.

Statistical analysis of groundwater data was performed in accordance with the CMP (SCS Engineers, 2011). The program Sanitas WQStat (ver. 9.0.34) was used to evaluate the Mann-Kendall Test and Sen's Slope. Mann-Kendall testing was performed to assess whether there were statistically significant trends in groundwater concentrations using the two-tailed test (alpha = 0.05). Mann-Kendall results are reported as an approximated normal distribution Test Value "Z" (where the number of data points was greater than 40). Sen's slope analysis was performed to identify the trend direction for statistically significant trends, and reflects the median of the slopes of all pairs of historical data.

Table C-1 provides results of statistical trend analysis, including the Mann-Kendall Test and Sen's Slope analysis. In all cases, the trends are statistically significant because the magnitude of the Mann-Kendall Test Value (Z) was greater than the Critical Value (which is based on the number of data points and alpha). In all cases, the trends are decreasing because the Sen's Slope is negative.

A statistical trend analysis was not conducted for dissolved arsenic concentrations in MW-13D due to a history of long-term oscillating concentrations dating back to the beginning of the remedial investigation in 1996. Based on the data available, it is possible that arsenic concentrations reflect natural variations, as opposed to effects from the Hansville Landfill Site. Dissolved arsenic concentrations in MW-13D will continue to be closely monitored and evaluated.

5.5.3 Trend Projections

To qualitatively evaluate the convergence of groundwater exceedances with cleanup levels, exponential attenuation curves are shown on Figure C-3. These curves are projected 10 years, through the end of 2028. Based on these long-term projections, the findings include the following:

- Within 10 years, the average vinyl chloride concentrations will meet the cleanup levels in MW-12I and MW-14.
- In more than 10 years, the average vinyl chloride concentration in MW-6 and the average dissolved arsenic in MW-14 will meet the cleanup levels.

Optimizing the landfill gas collection system may reduce the time to meet cleanup levels. This is consistent with elements of the contaminant fate and transport model presented in the RI/FS (Parametrix, 2007; Parametrix, 2009). Increasing landfill gas collection reduces the potential for landfill gas (containing carbon dioxide, methane, and VOCs) to come in contact with groundwater, which results in low dissolved oxygen.

- For vinyl chloride, this means reducing the mass transfer from vapor-phase to groundwater, and increasing the natural attenuation rates.
- For dissolved metals, this means maintaining a higher pH in groundwater, and preventing mobilization of naturally occurring arsenic and manganese.

5.5.4 Calculation of Statistical Limits

Where groundwater cleanup levels were exceeded, statistical limit concentrations were evaluated to assess the approach toward cleanup levels (CAP, Appendix D). Table C-2 shows the calculated annual statistics—including the mean[4], 95 percent upper confidence limit (UCL), and 95 percent lower confidence limit (LCL)—for sampling results from 2011 through 2018.

The statistical limits for vinyl chloride concentrations at MW-6, MW-12I, and MW-14 are all approaching the cleanup level. At MW-14, the statistical mean and UCL arsenic concentrations were decreasing at less than 0.001 ug/L per year in 2018, as shown in Figure C-3.

6 Annual Inspections

During 2018, the Kitsap Public Health District inspected the Landfill once each quarter. Appendix E provides the inspection letters and forms. The inspection dates and comments included the following:

- March 9, 2018: Compliant; condensate system to be inspected; no items noted during inspection.
- June 4, 2018: Compliant; condensate system to be inspected; mowing required.
- September 18, 2018: Compliant; new condensate system to be installed; landfill survey to be completed in next year; no issues during site visit.
- December 17, 2018: Compliant; slight pooling in the northwest corner of the cap, monitor over time.

7 Operations and Maintenance Updates

Minor updates in operations and maintenance are summarized below for groundwater sampling and condensate system improvements.

[4] The mean statistic was based on the least-squares regression method, as shown by the trend lines in Figure C-3.

7.1 Groundwater Sampling

Operations and maintenance updates for groundwater sampling include using a compressor and controller to operate new bladder pumps. Other groundwater sampling procedures remain unchanged.

On March 12 and 13, 2018, the dedicated sampling pumps were replaced, and the groundwater compliance monitoring wells were redeveloped. At each well, Aspect performed the following replacement activities:

- Removed and disposed of the electric submersible pump, control cable, tubing, and well lid
- Installed a new bladder pump, tubing, and well lid
- Redeveloped the well by pouring groundwater at approximately 0.3 gallons per minute until turbidity was reduced to below 50 nephthalometric turbidity units

The manufacturer's user's manual for the new dedicated sampling pumps can be accessed at the following website:

https://www.qedenv.com/files/mp10uhmanual.pdf

7.2 Condensate System Improvements

Operations and maintenance updates for condensate system improvements include the following activities:

- Monitor the water level in the condensate riser to ensure the new pump and float switch are operating correctly.
- Monitor the new aboveground storage tank for condensate volume.
- Notify the County for bulk condensate disposal when the tank is approximately ¾ full.

The 1,200-gallon condensate sump MH-1 had a history of quickly filling during precipitation events. In June 2018, Aspect recommended condensate system improvements after pressure-testing the condensate line leading from the flare compound to MH-1 and received approval from the County in September. In November and December 2018, Aspect completed the following actions:

- Coordinated with utility locate services, electrical subcontractor, and fencing subcontractor
- Excavated the condensate line just outside the flare compound, cut and capped the line, and backfilled the excavation
- Arranged to have the sump MH-1 pumped out and backfilled with imported clean sand
- Procured and installed a pump, float switch, and tank to extract collected condensate from the header at the flare compound and store condensate for bulk disposal by the County

- Constructed a protective cover over the condensate riser pipe and above grade hose and improved seals on the new pump and collection system

As-built drawings of the system improvements and final weather protective components will be included in the First Quarter 2019 Environmental Monitoring Report.

8 References

Aspect Consulting, LLC (Aspect), 2018a, First Quarter 2018 Environmental Monitoring Report, Hansville Landfill, Kitsap County, WA, May 31, 2018.

Aspect Consulting, LLC (Aspect), 2018b, Second Quarter 2018 Environmental Monitoring Report, Hansville Landfill, Kitsap County, WA, August 29, 2018.

Aspect Consulting, LLC (Aspect), 2018c, Third Quarter 2018 Environmental Monitoring Report, Hansville Landfill, Kitsap County, WA, November 29, 2018.

Parametrix, 2007, Hansville Landfill Remedial Investigation/Feasibility Study, Remedial Investigation Report, July 2007.

Parametrix, 2009, Hansville Landfill Remedial Investigation/Feasibility Study, Final Feasibility Study Report, June 2009.

SCS Engineers (SCS), 2011, Compliance Monitoring Plan with Sampling & Analysis Plan and Quality Assurance Plan – Remedial Action at the Hansville Landfill, September 15, 2011.

SCS Engineers (SCS), 2012, Addendum to the Hansville Landfill Compliance Monitoring Plan, January 27, 2012.

SCS Engineers (SCS), 2016, Remedial Action Status Report (RASR), May 2016

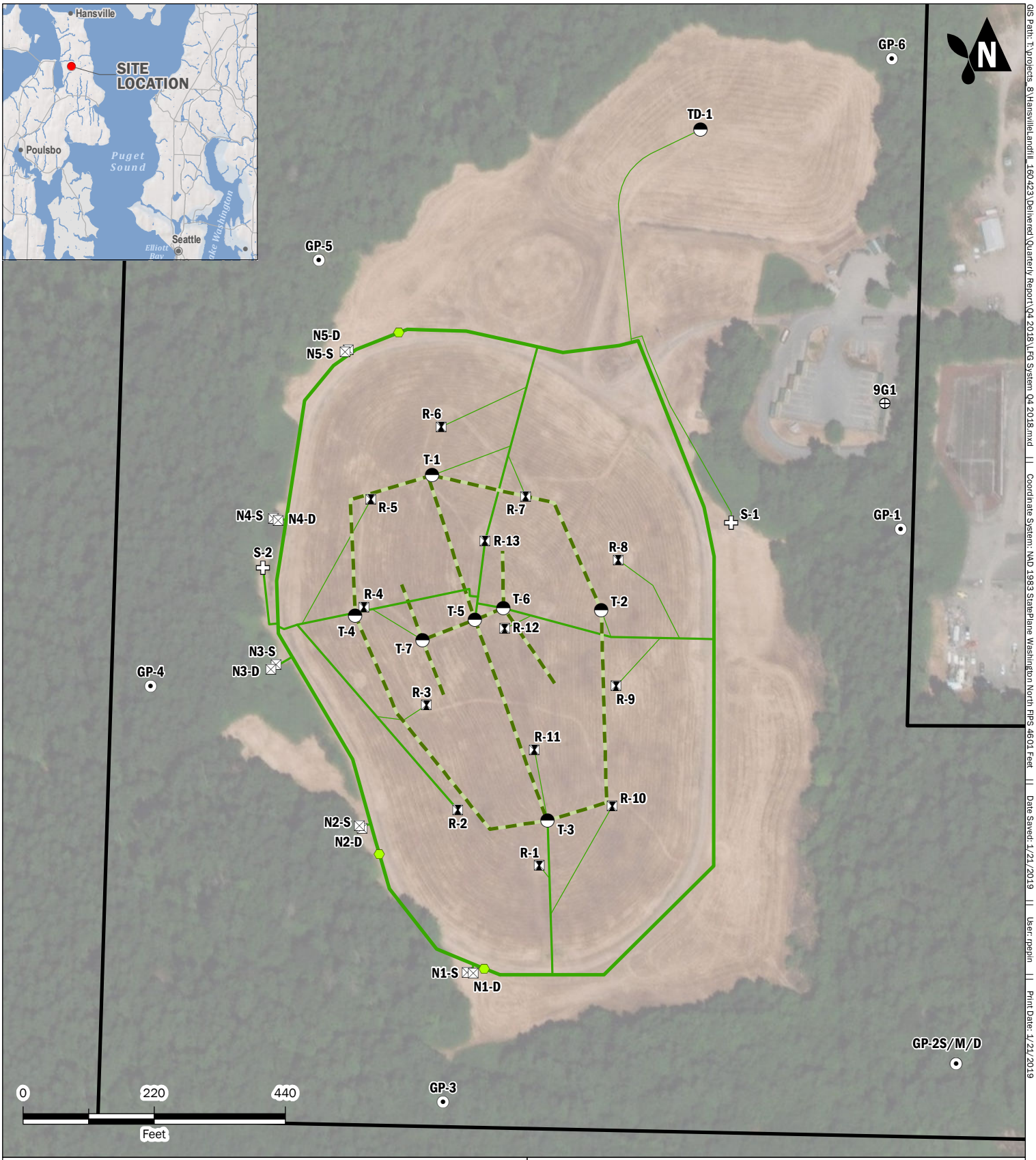
9 Limitations

Work for this project was performed for the Kitsap County Public Works Division (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

APPENDIX A

Landfill Gas Data



GIS Path: T:\projects_8\Hansville\Landfill_160423\Delivered\Quarterly Report\Q4 2018\LFG System Q4 2018.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 1/21/2019 || User: rpepin || Print Date: 1/21/2019

Exploration

- Condensate Sump
- Gas Detection Probe
- Gas Extraction Well (Native Soil Completion)
- Gas Extraction Well (in Refuse Completion)
- Trench Completion
- Well Geologic Control

Landfill Gas System

- LFG Pipe - 2"
- LFG Pipe - 4"
- LFG Pipe - 6"
- Trench
- LFG Valve
- Landfill Boundary

Landfill Gas System

Fourth Quarter 2018 Environmental Monitoring Report
Hansville Landfill
Kitsap County, Washington

Aspect Consulting	JAN-2019	BY: MLK / RAP	FIGURE NO. A-1
	PROJECT NO. 160423	REVISED BY: ---	

Table A-1. Landfill Gas Data, First Quarter, 2018

Project No. 160423, Hansville Landfill, Hansville, WA

Location	Device ID	Date/Time	Methane CH4 (% by vol)	Carbon Dioxide CO2 (% by vol)	Oxygen O2 (% by vol)	Balance Bal (% by vol)	Static Pressure (inches H2O)		Gas Temperature (degrees F)		Flow Rate (SCFM)	
							Initial	Adjusted	Initial	Adjusted	Initial	Adjusted
Blower Inlet	HANSBLIN	3/16/2018 12:35	3.2	14.7	1.5	80.6	-4.58	-4.58	52.7	52.8	74.9	75
Blower Outlet	HANSBLOT	3/16/2018 12:38	3.1	14.7	1.5	80.7	0.73	0.74	62.5	62.5	0	4.2
Extraction Well 001	HANSR001	3/16/2018 8:51	4.9	14	0	81.1	-0.95	-0.98	46.4	46.4	2.7	2.6
Extraction Well 002	HANSR002	3/16/2018 9:59	1.5	14.1	4.1	80.3	-2.7	-2.7	50.8	50.9	3.9	2.9
Extraction Well 003	HANSR003	3/16/2018 9:55	6.7	14	0	79.3	-1.48	-1.48	57.3	57.3	4.1	3.7
Extraction Well 004	HANSR004	3/16/2018 9:45	2.7	17.6	0	79.7	-2.02	-2.06	59.6	59.6	3.2	3.3
Extraction Well 005	HANSR005	3/16/2018 9:37	2.6	18.6	0	78.8	-1.33	-1.36	61.5	62	5.6	5.6
Extraction Well 006	HANSR006	3/16/2018 9:28	2.5	16.1	2.7	78.7	-1.65	-1.68	63.2	63	4	3.8
Extraction Well 007	HANSR007	3/16/2018 9:23	0.6	14	0	85.4	-0.93	-0.95	61.5	61.6	5.9	5.7
Extraction Well 008	HANSR008	3/16/2018 8:35	4.2	17.4	0	78.4	-1.28	-1.3	48.5	48.6	2.9	4.4
Extraction Well 009	HANSR009	3/16/2018 8:43	1.3	15.2	2.6	80.9	-1.82	-2.84	72.2	71.6	0.4	0.4
Extraction Well 010	HANSR010	3/16/2018 8:47	4.6	9.6	5	80.8	-1.19	-1.2	45.5	45.5	1.8	2.3
Extraction Well 011	HANSR011	3/16/2018 9:00	2.7	7.3	0	90	-1.05	-1.05	50.3	50.4	0.4	0.4
Extraction Well 012	HANSR012	3/16/2018 9:04	8.2	3.2	0	88.6	-1.43	-1.42	48.9	48.8	1.6	1
Extraction Well 013	HANSR013	3/16/2018 9:19	2.2	12.6	2.7	82.5	-2.33	-2.34	58.5	58.5	5.1	4.6
Trench Collector TD-1	HANSTD01	3/16/2018 8:20	2	19.9	0	78.1	-3.62	-3.88	46	46.1	0	0
Trench Collector TR-1	HANSTR01	3/16/2018 9:33	0.9	13.7	4.6	80.8	-0.74	-0.76	58.2	58.3	6	5.5
Trench Collector TR-2	HANSTR02	3/16/2018 8:39	4.6	15.7	0.2	79.5	-1.48	-1.47	45.9	45.9	2	2.5
Trench Collector TR-3	HANSTR03	3/16/2018 8:56	6.9	14	0	79.1	-1.5	-1.5	50.2	50.1	4.3	5.9
Trench Collector TR-4	HANSTR04	3/16/2018 9:42	1.5	17.9	0	80.6	-1.26	-1.26	52.2	52.9	5.3	5
Trench Collector TR-5	HANSTR05	3/16/2018 9:13	0	0.1	22.1	77.8	-1.33	-1.32	50.1	50.1	2.8	3.2
Trench Collector TR-6	HANSTR06	3/16/2018 9:08	5.7	15.4	0.6	78.3	-2.96	-3.03	51.1	51	0	0
Trench Collector TR-7	HANSTR07	3/16/2018 9:51	7	15.1	0.3	77.6	-1.29	-1.29	49.6	49.6	3.8	4
Native Soil Extraction Well 1 Shallow	HANSN01S	3/16/2018 10:07	0	1.5	20.1	78.4	-0.37	-0.39	54.7	54.8	3.4	3.3
Native Soil Extraction Well 1 Deep	HANSN01D	3/16/2018 10:04	0	0.1	21.6	78.3	-0.07	-0.18	51.1	51.2	3.5	3.5
Native Soil Extraction Well 2 Shallow	HANSN02S	3/16/2018 10:17	0	0.9	20.8	78.3	-0.5	-0.49	64.4	64.7	0	0
Native Soil Extraction Well 2 Deep	HANSN02D	3/16/2018 10:13	0	1.3	20.5	78.2	-0.04	-0.13	59.3	59.6	0	0
Native Soil Extraction Well 3 Shallow	HANSN03S	3/16/2018 10:28	0	0.1	21.4	78.5	-0.2	-0.25	70.7	70.9	6.8	5.9
Native Soil Extraction Well 3 Deep	HANSN03D	3/16/2018 10:24	0	0.1	21.5	78.4	-0.13	-0.25	64.9	65.8	6.3	6.4
Native Soil Extraction Well 4 Shallow	HANSN04S	3/16/2018 10:37	0	0.1	21.3	78.6	-0.13	-0.17	68.9	69	6.9	5.8
Native Soil Extraction Well 4 Deep	HANSN04D	3/16/2018 10:33	0	0.1	21.3	78.6	-0.28	-0.39	69.7	70	6.9	6.2
Native Soil Extraction Well 5 Shallow	HANSN05S	3/16/2018 10:46	0	0.1	21.3	78.6	-0.42	-0.41	63	63.1	5.9	6.7
Native Soil Extraction Well 5 Deep	HANSN05D	3/16/2018 10:42	0	0.1	21.3	78.6	-0.23	-0.28	64	64.1	6.5	6.2
Gas Probe 1	HANSGP01	3/16/2018 11:04	0	0.7	20.9	78.4	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 2 Shallow	HANSGP2S	3/16/2018 11:15	0	0.1	21.7	78.2	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 2 Middle	HANSGP2M	3/16/2018 11:20	0	0.1	21.9	78	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 2 Deep	HANSGP2D	3/16/2018 11:26	0	0.1	22	77.9	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 3	HANSGP03	3/16/2018 11:38	0	1.1	21.3	77.6	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 4	HANSGP04	3/16/2018 12:10	0	2	20	78	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 5	HANSGP05	3/16/2018 12:24	0	1.3	20.5	78.2	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 6	HANSGP06	3/16/2018 8:27	0	4.1	16.5	79.4	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 7	HANSGP07	3/16/2018 12:01	0	2.9	19	78.1	N/A	N/A	N/A	N/A	N/A	N/A

Notes

Flow rates measured using orifice plates.

N/A = indicates parameter not measured.

inches H2O = inches water column

degrees F = degrees Fahrenheit

SCFM = standard cubic feet per minute

Table A-2. Landfill Gas Data, Second Quarter, 2018

Project No. 160423, Hansville Landfill, Hansville, WA

Location	Device ID	Date/Time	Methane CH4 (% by vol)	Carbon Dioxide CO2 (% by vol)	Oxygen O2 (% by vol)	Balance Bal (% by vol)	Static Pressure (inches H2O)		Gas Temperature (degrees F)		Flow Rate (SCFM)	
							Initial	Adjusted	Initial	Adjusted	Initial	Adjusted
Blower Inlet	HANSBLIN	6/20/2018 10:23	3.6	15.3	1.4	79.7	-4.91	-4.88	72.6	72.6	69.2	70
Blower Outlet	HANSBLOT	6/20/2018 10:25	3.6	15.3	1.4	79.7	N/A	N/A	N/A	N/A	N/A	N/A
Extraction Well 001	HANSR001	6/20/2018 10:51	5.2	14	0	80.8	-0.37	-0.38	81.9	81.9	2.1	1.9
Extraction Well 002	HANSR002	6/20/2018 10:59	1.5	14.5	2.9	81.1	-2.17	-2.2	87	87.1	3.6	4.2
Extraction Well 003	HANSR003	6/20/2018 11:08	6.5	13.2	0	80.3	-1.26	-1.24	82.6	82.5	2.2	3.4
Extraction Well 004	HANSR004	6/20/2018 11:19	2.9	17.3	0	79.8	-1.46	-1.47	87.3	86.3	3.3	3
Extraction Well 005	HANSR005	6/20/2018 11:23	3.2	18.1	0	78.7	-0.79	-0.8	78	77.8	5	4.1
Extraction Well 006	HANSR006	6/20/2018 11:27	2.6	15.4	3.2	78.8	-1.04	-1.04	92.1	92.3	3.3	3.7
Extraction Well 007	HANSR007	6/20/2018 11:35	0.5	13.5	0.1	85.9	-0.24	-0.26	77.1	77.1	5.6	5.4
Extraction Well 008	HANSR008	6/20/2018 10:33	4.2	17.7	0	78.1	-0.6	-0.61	76.2	76.2	4.1	2.2
Extraction Well 009	HANSR009	6/20/2018 10:42	1.5	15.7	1.3	81.5	-1.22	-1.23	88.2	88.4	2.7	3.4
Extraction Well 010	HANSR010	6/20/2018 10:46	4.5	9.4	4.5	81.6	-0.49	-0.5	85.5	85.7	1.9	1.4
Extraction Well 011	HANSR011	6/20/2018 11:04	2.7	7.1	0	90.2	-0.49	-0.5	83.6	85.1	0.5	0.5
Extraction Well 012	HANSR012	6/20/2018 12:08	8	3.2	0	88.8	-0.69	-0.71	87.1	87.2	2	1
Extraction Well 013	HANSR013	6/20/2018 11:39	2.5	13.3	1.1	83.1	-1.56	-1.57	85.8	85.9	4.1	3.7
Trench Collector TD-1	HANSTD01	6/20/2018 10:15	1.9	21.3	0	76.8	-0.02	-0.04	81.8	82	5.9	5.8
Trench Collector TR-1	HANSTR01	6/20/2018 11:31	0.1	14	3.5	82.4	-0.53	-0.55	83.5	83.2	5.2	5.4
Trench Collector TR-2	HANSTR02	6/20/2018 10:38	5.5	16.7	0	77.8	-0.73	-0.73	79.8	79.9	2.6	1.8
Trench Collector TR-3	HANSTR03	6/20/2018 10:55	7.5	16.3	0.4	75.8	-0.69	-0.69	84.6	84.6	0.2	0
Trench Collector TR-4	HANSTR04	6/20/2018 11:15	2.3	19.1	0	78.6	-0.58	-0.61	83.5	84.1	4.6	4.8
Trench Collector TR-5	HANSTR05	6/20/2018 12:02	0	0.1	19	80.9	-0.59	-0.58	83.7	85.3	3.9	2.4
Trench Collector TR-6	HANSTR06	6/20/2018 12:12	9.5	11.6	0.2	78.7	-0.58	-0.57	94.3	93.6	2.8	2.2
Trench Collector TR-7	HANSTR07	6/20/2018 11:12	8.4	15.8	0.1	75.7	-0.69	-0.69	82.7	82.5	3.6	3.8
Native Soil Extraction Well 1 Shallow	HANSN01S	6/20/2018 12:21	0	0.1	19.8	80.1	0.06	0.06	93.7	93.8	3.2	3
Native Soil Extraction Well 1 Deep	HANSN01D	6/20/2018 12:24	0	1.2	18.5	80.3	-0.06	-0.07	87.4	87.3	2.9	3
Native Soil Extraction Well 2 Shallow	HANSN02S	6/20/2018 12:32	0	1.1	18.4	80.5	0.04	0.05	94.3	94.4	1.3	1.6
Native Soil Extraction Well 2 Deep	HANSN02D	6/20/2018 12:29	0	1.1	18.4	80.5	0.06	0.06	89.6	88.6	0	0
Native Soil Extraction Well 3 Shallow	HANSN03S	6/20/2018 12:39	0	0	19.7	80.3	0.02	0.03	92.6	92.7	6.8	6.6
Native Soil Extraction Well 3 Deep	HANSN03D	6/20/2018 12:37	0	0	19.7	80.3	0.06	0.07	91.2	91.4	6.7	6.5
Native Soil Extraction Well 4 Shallow	HANSN04S	6/20/2018 12:44	0	0	19.7	80.3	-0.02	-0.02	82.8	82.9	6.4	6.4
Native Soil Extraction Well 4 Deep	HANSN04D	6/20/2018 12:43	0	0	19.7	80.3	-0.02	-0.02	83	82.9	6.6	6.1
Native Soil Extraction Well 5 Shallow	HANSN05S	6/20/2018 12:49	0	0	19.7	80.3	0.02	0.02	89.5	89.6	5.8	6
Native Soil Extraction Well 5 Deep	HANSN05D	6/20/2018 12:47	0	0	19.7	80.3	-0.01	0	85.2	85.5	6.3	6.6
Gas Probe 1	HANSGP01	8/17/2018 13:45	0	0.4	21.8	77.8	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 2 Shallow	HANSGP2S	8/17/2018 7:12	0	0.1	21.5	78.4	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 2 Middle	HANSGP2M	8/17/2018 7:45	0	1.1	19.8	79.1	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 2 Deep	HANSGP2D	8/17/2018 7:56	0	1.1	18.5	80.4	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 3	HANSGP03	8/17/2018 8:17	0	0.9	21.3	77.8	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 4	HANSGP04	8/17/2018 14:48	0	1.5	20.3	78.2	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 5	HANSGP05	8/17/2018 8:55	0	1	21.4	77.6	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 6	HANSGP06	8/17/2018 9:10	0	2.2	20.1	77.7	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 7	HANSGP07	8/17/2018 15:01	0	2.9	18.9	78.2	N/A	N/A	N/A	N/A	N/A	N/A

Notes

Flow rates measured using orifice plates

N/A = indicates parameter not measured

inches H2O = inches water column

degrees F = degrees Fahrenheit

SCFM = standard cubic feet per minute

Table A-3. Landfill Gas Data, Third Quarter, 2018

Project No. 160423, Hansville Landfill, Hansville, WA

Location	Device ID	Date/Time	Methane CH4 (% by vol)	Carbon Dioxide CO2 (% by vol)	Oxygen O2 (% by vol)	Balance Bal (% by vol)	Static Pressure (inches H2O)		Gas Temperature (degrees F)		Flow Rate (SCFM)	
							Initial	Adjusted	Initial	Adjusted	Initial	Adjusted
Blower Inlet	HANSBLIN	9/18/2018 11:08	4.3	15.3	2.6	77.8	-4.45	-5.57	68.9	68.9	69.9	70
Blower Outlet	HANSBLOT	9/18/2018 11:09	4.2	15.3	2.5	78	N/A	N/A	N/A	N/A	N/A	N/A
Extraction Well 001	HANSR001	9/18/2018 13:16	6.9	14.1	0.5	78.5	-0.53	-0.51	71.4	70.4	3.1	2.7
Extraction Well 002	HANSR002	9/18/2018 13:24	2.1	14.7	3.8	79.4	-2.23	-2.22	79.5	79.6	3.1	4.5
Extraction Well 003	HANSR003	9/18/2018 13:32	7.1	13.8	0.1	79	-1.12	-1.08	68.5	68.7	3.4	3.7
Extraction Well 004	HANSR004	9/18/2018 13:43	3.3	17.5	0.2	79	-1.51	-1.51	70.5	70.6	3.4	3.4
Extraction Well 005	HANSR005	9/18/2018 13:49	4.2	18	0.4	77.4	-0.75	-0.75	74.6	74.6	5.4	5.3
Extraction Well 006	HANSR006	9/18/2018 13:54	3.2	17.6	2.5	76.7	-1.14	-1.12	78.6	78.2	3	3.4
Extraction Well 007	HANSR007	9/18/2018 13:58	1.1	14.6	0.3	84	-0.37	-0.33	70.3	70.3	5.9	5.3
Extraction Well 008	HANSR008	9/18/2018 13:03	5.1	18	0.4	76.5	-0.66	-0.66	67.4	67.4	2.6	3.9
Extraction Well 009	HANSR009	9/18/2018 13:10	1.9	15.7	2.1	80.3	-1.48	-1.49	86.1	88.1	0.3	0.3
Extraction Well 010	HANSR010	9/18/2018 13:13	5.8	9.8	4.7	79.7	-0.72	-0.73	70.3	70.5	2.1	2
Extraction Well 011	HANSR011	9/18/2018 13:28	3.4	7.4	0.2	89	-0.54	-0.54	71.4	71.6	0.9	1.2
Extraction Well 012	HANSR012	9/18/2018 14:07	8.6	4.1	0.1	87.2	-0.79	-0.78	70.9	70.9	1.2	1.1
Extraction Well 013	HANSR013	9/18/2018 14:00	3.4	13.7	1.5	81.4	-1.67	-1.66	69.4	69.6	4.3	3.9
Trench Collector TD-1	HANSTD01	9/18/2018 10:35	2.8	22.1	0.2	74.9	-0.18	-0.22	73.6	73.5	4.2	0
Trench Collector TR-1	HANSTR01	9/18/2018 13:52	1.3	16.6	2.3	79.8	-0.51	-0.5	73.3	73.6	4.3	4.6
Trench Collector TR-2	HANSTR02	9/18/2018 13:06	9.2	18.4	0.3	72.1	-0.77	-0.76	70	70.2	2.3	2.8
Trench Collector TR-3	HANSTR03	9/18/2018 13:19	0.1	0.1	20.7	79.1	-0.56	-0.55	68.8	69.7	3.8	2.8
Trench Collector TR-4	HANSTR04	9/18/2018 13:41	2.4	19.7	0.2	77.7	-0.53	-0.52	70.4	69.8	5.3	4.8
Trench Collector TR-5	HANSTR05	9/18/2018 14:09	0.1	0.1	21.2	78.6	-0.77	-0.69	72.3	72.9	3.2	2.8
Trench Collector TR-6	HANSTR06	9/18/2018 14:04	11.1	15.2	0.3	73.4	-0.4	-0.32	75.1	75.3	0.9	2.3
Trench Collector TR-7	HANSTR07	9/18/2018 13:36	8.9	17.5	0.3	73.3	-0.54	-0.54	69.6	69.7	3.8	3.3
Native Soil Extraction Well 1 Shallow	HANSN01S	9/18/2018 11:27	0.1	1.4	19.3	79.2	-0.39	-0.38	65	65.4	4.4	3.4
Native Soil Extraction Well 1 Deep	HANSN01D	9/18/2018 11:29	0.1	0.1	20.7	79.1	-0.05	-0.05	75.1	75.9	4.1	3.9
Native Soil Extraction Well 2 Shallow	HANSN02S	9/18/2018 12:36	0.1	1.4	20.3	78.2	0.03	0.02	81.7	81.8	0	0
Native Soil Extraction Well 2 Deep	HANSN02D	9/18/2018 12:34	0.1	1.4	20.3	78.2	0	0	72.1	72.4	0.2	0.2
Native Soil Extraction Well 3 Shallow	HANSN03S	9/18/2018 12:44	0.1	0.1	21.3	78.5	0.05	0.05	74.1	74.1	6.9	6.5
Native Soil Extraction Well 3 Deep	HANSN03D	9/18/2018 12:40	0.1	0.1	21.5	78.3	0.02	0.02	76.3	76.2	6.6	6.5
Native Soil Extraction Well 4 Shallow	HANSN04S	9/18/2018 12:48	0.1	0.1	21.3	78.5	0.05	0.05	63.3	63.1	6.3	6.5
Native Soil Extraction Well 4 Deep	HANSN04D	9/18/2018 12:46	0.1	0.1	21.2	78.6	-0.03	-0.02	66.9	66.8	7.2	6.9
Native Soil Extraction Well 5 Shallow	HANSN05S	9/18/2018 12:52	0.1	0.1	21.1	78.7	-0.04	0	67.2	67	5.8	6.7
Native Soil Extraction Well 5 Deep	HANSN05D	9/18/2018 12:50	0.1	0.1	21.2	78.6	0.02	0.03	66.7	66.3	6.7	6.7
Gas Probe 1	HANSGP01	9/18/2018 11:20	0.1	0.9	19.9	79.1	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 2 Shallow	HANSGP2S	9/18/2018 11:38	0.1	0.2	20.8	78.9	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 2 Middle	HANSGP2M	9/18/2018 11:43	0.1	1.1	19.8	79	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 2 Deep	HANSGP2D	9/18/2018 11:48	0.1	0.3	21.1	78.5	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 3	HANSGP03	9/18/2018 11:58	0.1	1.2	20.7	78	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 4	HANSGP04	9/18/2018 12:25	0.1	1.7	20.2	78	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 5	HANSGP05	9/18/2018 12:59	0.1	1.2	19.9	78.8	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 6	HANSGP06	9/18/2018 10:55	0.1	2.3	18.7	78.9	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 7	HANSGP07	9/18/2018 12:11	0.1	3	19.1	77.8	N/A	N/A	N/A	N/A	N/A	N/A

Notes

Flow rates measured using orifice plates

N/A = indicates parameter not measured

inches H2O = inches water column

degrees F = degrees Fahrenheit

SCFM = standard cubic feet per minute

Table A-4. Landfill Gas Data, Fourth Quarter, 2018

Project No. 160423, Hansville Landfill, Hansville, WA

Location	Device ID	Date	Methane CH4 (% by vol)	Carbon Dioxide CO2 (% by vol)	Oxygen O2 (% by vol)	Balance Bal (% by vol)	Static Pressure (inches H2O)		Gas Temperature (degrees F)		Flow Rate (SCFM)	
							Initial	Adjusted	Initial	Adjusted[2]	Initial	Adjusted
Blower Inlet	HANSBLIN	12/21/2018	3.3	13.2	4.1	79.3	-4.5	-4.5	48.2	48.2	72	72
Blower Outlet	HANSBLOT	12/21/2018	3.3	13.2	4.2	79.3	N/A	N/A	62.1	62.1	N/A	N/A
Extraction Well 001	HANSR001	12/21/2018	7.2	11.3	3.1	78.4	-0.83	-0.83	47.1	47.1	1.9	1.9
Extraction Well 002	HANSR002	12/21/2018	2.3	14.6	4.1	78.9	-2.65	-2.65	63.3	63.3	2.1	2.1
Extraction Well 003	HANSR003	12/21/2018	6.6	13.9	0.1	79.4	-1.36	-1.36	54.7	54.7	1.7	1.7
Extraction Well 004	HANSR004	12/21/2018	3.8	18.1	0	78.1	-2.01	-2.01	57.5	57.5	2.4	2.4
Extraction Well 005	HANSR005	12/21/2018	3.9	18.6	0.2	77.3	-1.23	-1.23	60.9	60.9	3.0	3.0
Extraction Well 006	HANSR006	12/21/2018	3.8	18.6	0	77.6	-1.51	-1.51	73.4	73.4	1.4	1.4
Extraction Well 007	HANSR007	12/21/2018	0.6	14.7	0.6	84.1	-0.85	-0.85	60.2	60.2	5.9	5.9
Extraction Well 008	HANSR008	12/21/2018	6.3	16.9	0.2	76.4	-0.83	-0.83	49.1	49.1	0.8	0.8
Extraction Well 009	HANSR009	12/21/2018	2.4	15.6	2	80.1	-1.82	-1.82	79.6	79.6	3.0	3.0
Extraction Well 010	HANSR010	12/21/2018	7	9.2	5.2	78.6	-1.02	-1.02	40.4	40.4	2.8	2.8
Extraction Well 011	HANSR011	12/21/2018	3.1	7.5	0.3	89.2	-1.01	-1.01	40.4	40.4	2.7	2.7
Extraction Well 012	HANSR012	12/21/2018	7.2	4.3	1	87.6	-1.28	-1.28	40.2	40.2	1.2	1.2
Extraction Well 013	HANSR013	12/21/2018	3.7	13.5	2.1	80	-2.13	-2.13	40.9	40.9	5.0	5.0
Trench Collector TD-1	HANSTD01	12/21/2018	3	20	0.1	76.8	-3.21	-3.21	49.8	49.8	5.3	5.3
Trench Collector TR-1	HANSTR01	12/21/2018	0.8	17.2	0.2	81.8	-1.26	-1.26	49.7	49.7	2.5	2.5
Trench Collector TR-2	HANSTR02	12/21/2018	7.9	16.7	0.1	75.5	-1.11	-1.11	48.6	48.6	2.5	2.5
Trench Collector TR-3	HANSTR03	12/21/2018	6.3	14.8	2.3	76.6	-1.04	-1.04	40.1	40.1	2.3	2.3
Trench Collector TR-4	HANSTR04	12/21/2018	2.5	17.9	0	79.6	-1	-1	45.4	45.4	3.6	3.6
Trench Collector TR-5	HANSTR05	12/21/2018	0.1	0.2	22	77.7	-1.09	-1.09	39.9	39.9	3.2	3.2
Trench Collector TR-6	HANSTR06	12/21/2018	9.8	16.6	0	73.7	-1.12	-1.12	46.4	46.4	0.9	0.9
Trench Collector TR-7	HANSTR07	12/21/2018	9.3	16.9	0.1	73.8	-1.03	-1.03	44.9	44.9	1.3	1.3
Native Soil Extraction Well 1 Shallow	HANSN01S	12/21/2018	0	1.9	20.5	77.6	-0.48	-0.48	45	45	0	0
Native Soil Extraction Well 1 Deep	HANSN01D	12/21/2018	0	0.2	22	77.8	-0.15	-0.15	44.5	44.5	0	0
Native Soil Extraction Well 2 Shallow	HANSN02S	12/21/2018	0	2	20.7	77.4	-0.07	-0.07	41.5	41.5	0	0
Native Soil Extraction Well 2 Deep	HANSN02D	12/21/2018	0	1.9	20.8	77.3	-0.11	-0.11	41.9	41.9	0	0
Native Soil Extraction Well 3 Shallow	HANSN03S	12/21/2018	0	0.1	22	77.8	-0.11	-0.11	40.4	40.4	0	0
Native Soil Extraction Well 3 Deep	HANSN03D	12/21/2018	0	0.1	22	77.8	-0.51	-0.51	40.7	40.7	0	0
Native Soil Extraction Well 4 Shallow	HANSN04S	12/21/2018	0	0.1	22	77.8	-0.15	-0.15	41	41	0	0
Native Soil Extraction Well 4 Deep	HANSN04D	12/21/2018	0	0.1	21.9	77.8	-0.03	-0.03	40.7	40.7	0	0
Native Soil Extraction Well 5 Shallow	HANSN05S	12/21/2018	0	0.2	22	77.7	-0.01	-0.01	41.8	41.8	0	0
Native Soil Extraction Well 5 Deep	HANSN05D	12/21/2018	0	0.1	22.1	77.8	-0.21	-0.21	41.4	41.4	0	0
Gas Probe 1	HANSGP01	12/21/2018	0	0.5	21.9	77.6	N/A	N/A	NA	NA	N/A	N/A
Gas Probe 2 Shallow	HANSGP2S	12/21/2018	0	0.1	22	77.8	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 2 Middle	HANSGP02M	12/21/2018	0	0.1	22	77.8	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 2 Deep	HANSGP02D	12/21/2018	0	0.2	21.1	77.8	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 3	HANSGP03	12/21/2018	0	1.6	21.2	77.2	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 4	HANSGP04	12/21/2018	0	2.7	20.2	77.1	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 5	HANSGP05	12/21/2018	0	1.9	20.9	77.2	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 6	HANSGP06	12/21/2018	0	0.2	21.7	78	N/A	N/A	N/A	N/A	N/A	N/A
Gas Probe 7	HANSGP07	12/21/2018	0	4.1	18.6	77.2	N/A	N/A	N/A	N/A	N/A	N/A

Notes

Flow rates measured using orifice plates

N/A = indicates parameter not measured

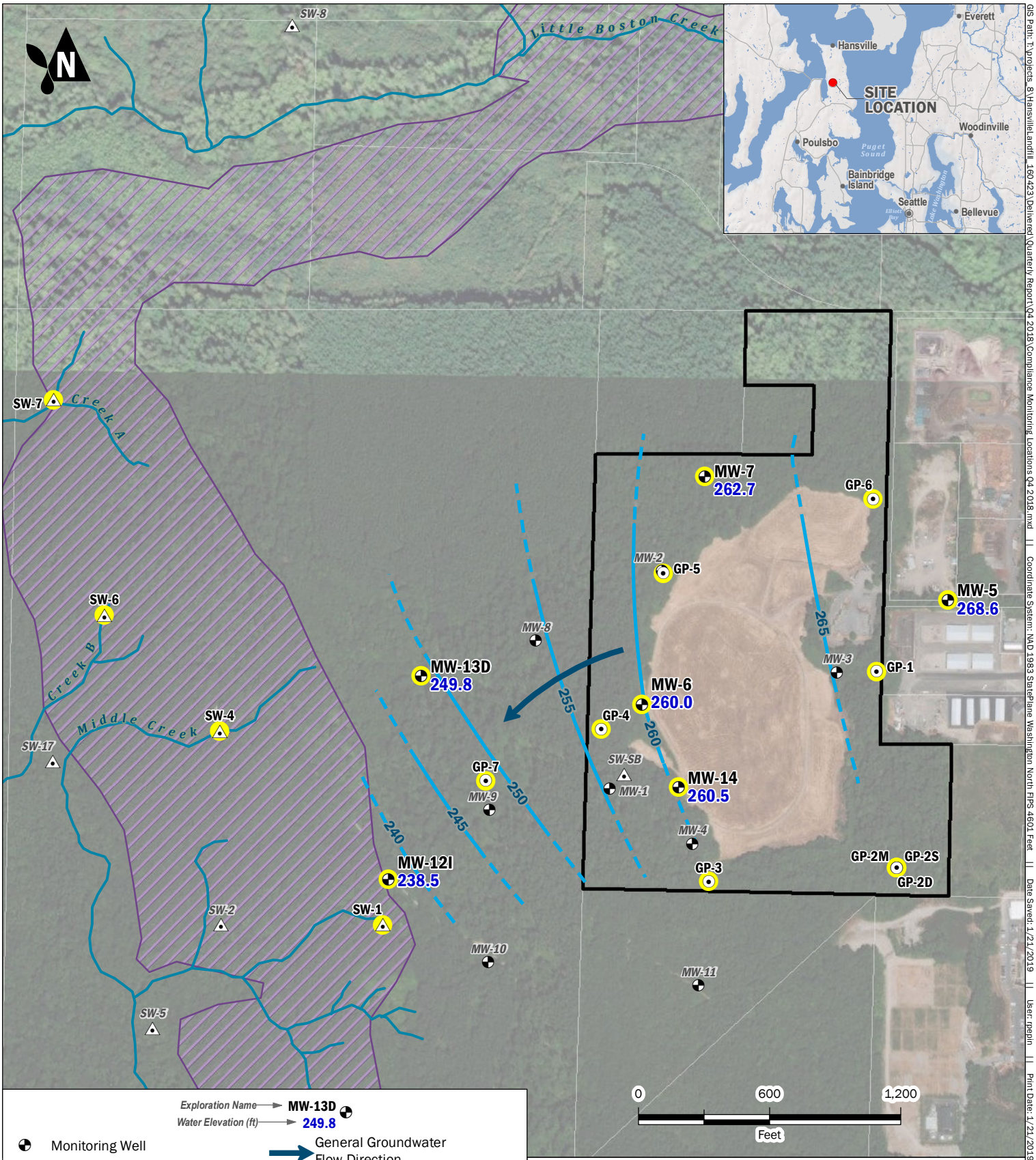
inches H2O = inches water column

degrees F = degrees Fahrenheit

SCFM = standard cubic feet per minute

APPENDIX B

Water Quality Results



Exploration Name → MW-13D
Water Elevation (ft) → 249.8

- Monitoring Well
- Gas Detection Probe
- Surface Water Station
- Compliance Monitoring Location
- Inferred Water Elevation Contour (ft, dashed where inferred) *Measured October 16th, 2018*
- General Groundwater Flow Direction
- Approximate Area of Groundwater Discharge from Upper Aquifer
- Stream
- Landfill Boundary
- Tax Parcel

Note: Vertical datum is NAVD88. Approximate area of groundwater discharge from upper aquifer delineation from Remedial Investigation Report (Parametrix, 2006).

Compliance Monitoring Locations

Fourth Quarter 2018 Environmental Monitoring Report
Hansville Landfill
Kitsap County, Washington

Aspect Consulting	JAN-2019	BY: MLK / RAP	FIGURE NO. B-1
	PROJECT NO. 160423	REVISED BY: ---	

GIS Path: T:\projects_8\Hansville\Landfill_160423\Deliverables\Quarterly Report\Q4 2018\Compliance Monitoring Locations Q4 2018.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 1/21/2019 || User: mepin || Print Date: 1/21/2019

Table B-1. Water Level Elevations

Project No. 160423, Hansville Landfill, Hansville, WA

Well	Ground Elevation (ft NAVD88)	Top of Casing Elevation (ft NAVD88)	Screen Elevation (ft NAVD88)		First Quarter 2018		Second Quarter 2018	
			Top	Bottom	Depth to Water (ft)	Water Level Elevation (ft NAVD88)	Depth to Water (ft)	Water Level Elevation (ft NAVD88)
MW-5	363.7	366.9	244	234	97.8	269.1	97.98	268.9
MW-6	332	332.7	260	245	72.3	260.4	72.15	260.6
MW-7	344.3	346.0	259	244	83.1	262.9	82.85	263.2
MW-12I	245.6	248.1	217	207	9.3	238.8	9.07	239.0
MW-13D	258.1	260.4	205	195	10.1	250.3	9.82	250.6
MW-14	338.6	341.1	262	247	79.2	261.9	79.38	261.7

Well	Ground Elevation (ft NAVD88)	Top of Casing Elevation (ft NAVD88)	Screen Elevation (ft NAVD88)		Third Quarter 2018		Fourth Quarter 2018	
			Top	Bottom	Depth to Water (ft)	Water Level Elevation (ft NAVD88)	Depth to Water (ft)	Water Level Elevation (ft NAVD88)
MW-5	363.7	366.9	244	234	97.98	268.9	98.30	268.6
MW-6	332	332.7	260	245	72.15	260.6	72.75	260.0
MW-7	344.3	346.0	259	244	82.85	263.2	83.29	262.7
MW-12I	245.6	248.1	217	207	9.07	239.0	9.65	238.5
MW-13D	258.1	260.4	205	195	9.82	250.6	10.65	249.8
MW-14	338.6	341.1	262	247	79.38	261.7	80.60	260.5

Notes

Depths to water collected on January 23 (Q1), April 18 (Q2), July 25(Q3) and October 16 (Q4) of 2018.

Elevations relative to North American Vertical Datum of 1988 (NAVD88).

Table B-2. Groundwater Quality Results

Project No. 160423, Hansville Landfill, Hansville, WA

			MW-5	MW-5	MW-5	MW-5	MW-6	MW-6	MW-6	MW-6
		Date	1/23/2018	4/18/2018	7/25/2018	10/16/2018	1/23/2018	4/18/2018	7/25/2018	10/16/2018
Parameter	**Units**	**Site Cleanup Level**								
Field Parameters										
Dissolved Oxygen	mg/L		N/A	**8.45**	**9.38**	**8.77**	N/A	**0.14**	**0.22**	**0.2**
pH	pH units		**7.41**	**7.13**	**6.91**	**6.93**	**7.34**	**7.18**	**7.22**	**7.01**
Oxidation Reduction Potential	mV		**254.9**	**89.9**	**130.6**	**75.9**	**167.5**	**117**	**74.7**	**95.2**
Specific Conductivity	uS/cm		**153**	**142.6**	**263.6**	**150.5**	**348.9**	**314**	**731**	**430.4**
Temperature	deg C		**12.4**	**9.9**	**11**	**10.6**	**14.6**	**12.5**	**13.2**	**12.7**
Turbidity	NTU		**0.26**	**1.2**	**0.93**	**4.34**	**0**	**2.85**	**2.12**	**4.69**
Conventional Parameters										
Alkalinity	mg/L		**63**	**59**	**60**	**57**	**140**	**130**	**150**	**150**
Ammonia (as N)	mg/L		0.030 U	0.030 U	0.03 U	0.03 U	0.030 U	0.030 U	0.03 U	0.03 U
Bicarbonate	mg/L		**63**	**59**	**60**	**57**	**140**	**130**	**150**	**150**
Carbonate	mg/L		5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	5 U	5 U
Chloride	mg/L		**2.6**	**2.4**	**2**	**2.1**	**13**	**10**	**14**	**17**
Nitrate (as N)	mg/L		**0.925**	0.100 U	**1.28**	**1.19 J**	**2.15**	**1.07**	**2.6 J**	**3.21 J**
Nitrite (as N)	mg/L		0.100 U	0.100 U	0.1 U	0.1 UJ	**0.374**	0.100 U	**0.352**	0.2 UJ
Orthophosphate (as P)	mg/L		0.10 U	0.10 U	0.1 U	0.1 UJ	0.10 U	0.10 U	0.1 U	0.2 UJ
Sulfate	mg/L		**7.3**	**7.9**	**9.3 J**	**8.6**	**23**	**21**	**31**	**35**
Total Organic Carbon	mg/L		1.0 U	1.0 U	1 U	1 U	**1.3**	**1.5**	**1.6**	**1.7**
Dissolved Metals										
Arsenic	mg/L	0.005	**0.00196**	**0.00197**	**0.00211**	**0.00199**	**0.00171**	**0.00179**	**0.00151**	**0.00153**
Manganese	mg/L	2.24	0.0010 U	0.0010 U	0.001 U	0.001 U	**0.46**	**0.47**	**0.43**	**0.480**
Volatile Organic Compounds (detected only)										
1,2-Dichloroethene (total)	ug/L		2.0 U	--	--	--	2.0 U	--	--	--
cis-1,2-Dichloroethene	ug/L		1.0 U	--	--	--	1.0 U	--	--	--
Vinyl Chloride	ug/L	0.025	0.020 U	0.020 U	0.02 U	0.02 U	**0.073**	**0.12**	**0.049**	**0.092**

Notes

Bold - detected
Shaded - Exceeded Site Cleanup Level
U - Not detected at or above reporting limit
J or UJ - Estimated "usable"
NA - parameter not measured

mg/L - milligrams per liter
mV - millivolts
uS - microSiemens
degrees C - degrees Celcius
NTU - Nephthalometric Turbidity Units

ug/L - micrograms per liter

Table B-2. Groundwater Quality Results

Project No. 160423, Hansville Landfill, Hansville, WA

		Date	MW-7 1/23/2018	MW-7 4/18/2018	MW-7 7/25/2018	MW-7 10/16/2018	MW-12I 1/23/2018	MW-12I 4/18/2018	MW-12I 7/25/2018	MW-12I 10/16/2018
Parameter	**Units**	**Site Cleanup Level**								
Field Parameters										
Dissolved Oxygen	mg/L		N/A	**1.39**	**1.88**	**1.53**	N/A	**0.29**	**0.20**	**0.2**
pH	pH units		**6.79**	**6.41**	**6.69**	**6.38**	**7.41**	**7.2**	**7.42**	**7.01**
Oxidation Reduction Potential	mV		**172.8**	**93.9**	**132**	**78.2**	**223**	**95.1**	**91.3**	**81.2**
Specific Conductivity	uS/cm		**292.8**	**261.7**	**459.2**	**262.5**	**164.5**	**174.5**	**310.5**	**180.5**
Temperature	deg C		**12.2**	**9.1**	**10.4**	**9.5**	**10**	**9.3**	**11.6**	**10.4**
Turbidity	NTU		**1.23**	**5.12**	**1.47**	**10.3**	**0.19**	**0.25**	**0.94**	**4.13**
Conventional Parameters										
Alkalinity	mg/L		**160**	**140**	**130**	**140**	**80**	**85**	**81**	**79**
Ammonia (as N)	mg/L		0.030 U	0.030 U	0.03 U	0.03 U	0.030 U	0.030 U	0.03 U	0.03 U
Bicarbonate	mg/L		**160**	**140**	**130**	**140**	**80**	**85**	**81**	**79**
Carbonate	mg/L		5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	5 U	5 U
Chloride	mg/L		**1.5**	**1.8**	**1.3**	**1.1**	**2.6**	**2.9**	**2.7**	**3.4**
Nitrate (as N)	mg/L		**0.489**	**0.328**	**0.461**	**0.334 J**	0.100 U	0.100 U	0.1 U	0.1 UJ
Nitrite (as N)	mg/L		0.100 U	0.100 U	0.1 U	0.1 UJ	0.100 U	0.100 U	0.1 U	0.1 UJ
Orthophosphate (as P)	mg/L		0.10 U	0.10 U	0.1 U	0.1 UJ	0.10 U	0.10 U	0.1 U	0.1 UJ
Sulfate	mg/L		**3**	**3.1**	**5 J**	**2.8**	**4.4**	**4.9**	**7 J**	**6.1**
Total Organic Carbon	mg/L		**1.5**	**2.1**	**2**	**1.9**	**2.6**	**2.7**	**2.6**	**2.8**
Dissolved Metals										
Arsenic	mg/L	0.005	**0.00109**	**0.0011**	**0.00121**	**0.00108**	**0.00225**	**0.00208**	**0.00226**	**0.00205**
Manganese	mg/L	2.24	0.0010 U	**0.0016**	0.001 U	0.001 U	**0.033**	**0.04**	**0.033**	**0.034**
Volatile Organic Compounds (detected only)										
1,2-Dichloroethene (total)	ug/L		2.0 U	--	--	--	2.0 U	--	--	--
cis-1,2-Dichloroethene	ug/L		1.0 U	--	--	--	1.0 U	--	--	--
Vinyl Chloride	ug/L	0.025	0.020 U	0.020 U	0.02 U	0.02 U	**0.049**	**0.049**	**0.047**	**0.10**

Notes

Bold - detected
Shaded - Exceeded Site Cleanup Level
U - Not detected at or above reporting limit
J or UJ - Estimated "usable"
NA - parameter not measured

mg/L - milligrams per liter
mV - millivolts
uS - microSiemens
degrees C - degrees Celcius
NTU - Nephthalometric Turbidity Units

ug/L - micrograms per liter

Table B-2. Groundwater Quality Results

Project No. 160423, Hansville Landfill, Hansville, WA

		Date	MW-13D 1/23/2018	MW-13D 4/18/2018	MW-13D 7/25/2018	MW-13D 10/16/2018	MW-14 1/23/2018	MW-14 4/18/2018	MW-14 7/25/2018	MW-14 10/16/2018
Parameter	**Units**	**Site Cleanup Level**								
Field Parameters										
Dissolved Oxygen	mg/L		N/A	**0.24**	**0.54**	**0.17**	N/A	**0.59**	**1.53**	**1.06**
pH	pH units		**7.7**	**7.59**	**7.66**	**7.4**	**7.11**	**7.04**	**7.11**	**6.94**
Oxidation Reduction Potential	mV		**261**	**108**	**60.4**	**90.4**	**159.6**	**112.4**	**105.8**	**83.9**
Specific Conductivity	uS/cm		**191.5**	**183.6**	**336.3**	**187.9**	**279.4**	**367.3**	**511**	**245.8**
Temperature	deg C		**9.6**	**10**	**11.2**	**10.7**	**14**	**11**	**12.6**	**11.4**
Turbidity	NTU		**3.74**	**8.44**	**1.67**	**4.97**	**0**	**8.78**	**5.21**	**3.98**
Conventional Parameters										
Alkalinity	mg/L		**75**	**73**	**71**	**69**	**130**	**150**	**110**	**91**
Ammonia (as N)	mg/L		0.030 U	0.030 U	0.03 U	0.03 U	0.030 U	0.041	0.03 U	0.03 U
Bicarbonate	mg/L		**75**	**73**	**71**	**69**	**130**	**150**	**110**	**91**
Carbonate	mg/L		5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	5 U	5 U
Chloride	mg/L		**5.4**	**5**	**4.8**	**5.4**	**7.2**	**14**	**11**	**8.7**
Nitrate (as N)	mg/L		0.100 U	0.100 U	0.1 U	0.1 UJ	**0.803 J**	**1.95**	**1.55**	**0.852 J**
Nitrite (as N)	mg/L		0.100 U	0.100 U	0.1 U	0.1 UJ	0.100 U	0.100 U	0.1 U	0.1 UJ
Orthophosphate (as P)	mg/L		0.1	0.10 U	0.1 U	0.1 UJ	0.10 U	0.10 U	0.1 U	0.1 UJ
Sulfate	mg/L		**16**	**15**	**17**	**18**	**12**	**21**	**14 J**	**13**
Total Organic Carbon	mg/L		**1.0 U**	**1.0 U**	**1 U**	**1 U**	**1.0 U**	**1.1**	**1.7**	**2.4**
Dissolved Metals										
Arsenic	mg/L	0.005	**0.00471**	**0.00464**	**0.00508**	**0.00479**	**0.0136**	**0.0142**	**0.0135**	**0.0125**
Manganese	mg/L	2.24	**0.022**	**0.0082**	**0.0062**	**0.0056**	**1.8**	**0.83**	**0.44**	**0.300**
Volatile Organic Compounds (detected only)										
1,2-Dichloroethene (total)	ug/L		2.0 U	--	--	--	**2.7**	--	--	--
cis-1,2-Dichloroethene	ug/L		1.0 U	--	--	--	**2.7**	--	--	--
Vinyl Chloride	ug/L	0.025	0.020 U	0.020 U	0.02 U	0.02 U	**0.058**	**0.072**	**0.024**	**0.034**

Notes

Bold - detected
Shaded - Exceeded Site Cleanup Level
U - Not detected at or above reporting limit
J or UJ - Estimated "usable"
NA - parameter not measured

mg/L - milligrams per liter
mV - millivolts
uS - microSiemens
degrees C - degrees Celcius
NTU - Nephthalometric Turbidity Units

ug/L - micrograms per liter

Table B-3. Surface Water Quality Results

Project No. 160423, Hansville Landfill, Hansville, WA

Parameter	Units	Site Cleanup Level	SW-1 1/23/2018	SW-1 4/18/2018	SW-1 7/25/2018	SW-1 10/16/2018	SW-4 1/23/2018	SW-4 4/18/2018	SW-4 7/25/2018	SW-4 10/16/2018
Field Parameters										
Dissolved Oxygen	mg/L		N/A	**10.14**	**11.70**	**10.65**	N/A	**10.34**	**8.40**	**11.03**
pH	pH units		**7.52**	**7.17**	**7.12**	**6.58**	**7.76**	**7.46**	**7.12**	**7.65**
Oxidation Reduction Potential	mV		**320.3**	**57.7**	**66.8**	**116.4**	**272.6**	**101.7**	**98.6**	**103.3**
Specific Conductivity	uS/cm		**175.2**	**176.4**	**187.9**	**174.4**	**219.3**	**263.7**	**370.5**	**356.9**
Temperature	deg C		**8.8**	**9.5**	**12.6**	**10.3**	**7.1**	**9.1**	**13.9**	**10.7**
Turbidity	NTU		NA	**6.8**	**2.03**	**0.78**	**10.6**	**2.44**	**6.77**	**4.41**
Conventional Parameters										
Alkalinity	mg/L		**68**	**69**	**82**	**64**	**91**	**110**	**160**	**150**
Ammonia (as N)	mg/L		0.030 U	0.030 U	0.03 U	0.03 U	0.030 U	0.047	0.03 U	0.03 U
Bicarbonate	mg/L		**68**	**69**	**82**	**64**	**91**	**110**	**160**	**150**
Carbonate	mg/L		5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	5 U	5 U
Chloride	mg/L		**4.2**	**4**	**4.6**	**4.7**	**8.4**	**9.6**	**15**	**15**
Nitrate (as N)	mg/L		**1.58**	**1.56**	**1.96**	**1.61 J**	**0.647**	**0.701**	**1.02**	**0.785 J**
Nitrite (as N)	mg/L		0.100 U	0.100 U	0.1 U	0.1 UJ	0.100 U	0.100 U	0.1 U	0.1 UJ
Orthophosphate (as P)	mg/L		0.10 U	0.10 U	0.1 U	0.1 UJ	0.10 U	0.10 U	0.1 U	0.1 UJ
Sulfate	mg/L		**8.9**	**8.6**	**12 J**	**11**	**9.8**	**12**	**22**	**20**
Total Organic Carbon	mg/L		**4.2**	**3.5**	**1.6**	**2.1**	**15**	**13**	**3.8**	**8**
Dissolved Metals										
Arsenic	mg/L	0.005	**0.00161**	**0.00155**	**0.00168**	**0.00161**	**0.00235**	**0.00214**	**0.00194**	**0.00216**
Manganese	mg/L	2.24	0.0010 U	**0.0014**	0.001 U	0.001 U	**0.027**	**0.044**	**0.049**	**0.042**
Volatile Organic Compounds										
1,2-Dichloroethene (total)	ug/L		2 U	--	--	--	2 U	--	--	--
cis-1,2-Dichloroethene	ug/L		1 U	--	--	--	1 U	--	--	--
Vinyl Chloride	ug/L	0.025	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U

Notes

Bold - detected

Shaded - Exceeded Site Cleanup Level

U - Not detected at or above reporting limit

J or UJ - Estimated "usable"

NA - parameter not measured

mg/L - milligrams per liter

mV - millivolts

uS - microSiemens

degrees C - degrees Celcius

NTU - Nephthalometric Turbidity Units

ug/L - micrograms per liter

Table B-3. Surface Water Quality Results

Project No. 160423, Hansville Landfill, Hansville, WA

Parameter	Units	Site Cleanup Level	SW-6 1/23/2018	SW-6 4/18/2018	SW-6 7/25/2018	SW-6 10/16/2018	SW-7 1/23/2018	SW-7 4/18/2018	SW-7 7/25/2018	SW-7 10/16/2018
Field Parameters										
Dissolved Oxygen	mg/L		N/A	**9.29**	**7.25**	**9.71**	N/A	N/A	**7.25**	**9.71**
pH	pH units		**8.11**	**7.13**	**7.55**	**7.23**	**7.92**	**7.41**	**7.55**	**7.23**
Oxidation Reduction Potential	mV		**259.6**	**90.8**	**70.9**	**76**	**271.9**	**101.4**	**70.9**	**76**
Specific Conductivity	uS/cm		**87.3**	**93.7**	**181.6**	**130.3**	**100.4**	**100.4**	**181.6**	**130.3**
Temperature	deg C		**6.5**	**9.3**	**16.7**	**11.1**	**7.1**	**9.1**	**16.7**	**11.1**
Turbidity	NTU		**15.7**	**8.09**	**20.3**	**6.64**	**4.91**	**4.6**	**10.4**	**6.13**
Conventional Parameters										
Alkalinity	mg/L		**30**	**32**	**71**	**62**	**31**	**35**	**63**	**56**
Ammonia (as N)	mg/L		0.030 U	0.047	0.11	0.053	0.030 U	0.04	0.03 U	0.03 U
Bicarbonate	mg/L		**30**	**32**	**71**	**62**	**31**	**35**	**63**	**56**
Carbonate	mg/L		5.0 U	5.0 U	5 U	5 U	5.0 U	5.0 U	5 U	5 U
Chloride	mg/L		**3.5**	**2.9**	**5.3**	**4.4**	**3.2**	**3**	**5**	**4.1**
Nitrate (as N)	mg/L		**0.537**	**0.403**	**0.149**	0.1 UJ	**1.64**	**1.31**	**0.856**	0.718 J
Nitrite (as N)	mg/L		0.100 U	0.100 U	0.1 U	0.1 UJ	0.100 U	0.100 U	0.1 U	0.1 UJ
Orthophosphate (as P)	mg/L		0.10 U	0.10 U	0.1 U	0.1 UJ	0.10 U	0.10 U	0.1 U	0.1 UJ
Sulfate	mg/L		**3.8**	**3.6**	**10 J**	**5.4**	**4.2**	**4.9**	**20**	**7.8**
Total Organic Carbon	mg/L		**23**	**23**	**15**	**12**	**14**	**11**	**5.8**	**8.5**
Dissolved Metals										
Arsenic	mg/L	0.005	**0.00237**	**0.00299**	**0.00967**	**0.00423**	**0.00106**	**0.00102**	**0.00171**	**0.00142**
Manganese	mg/L	2.24	**0.03**	**0.043**	**0.27**	**0.12**	**0.0048**	**0.0043**	**0.0038**	**0.0042**
Volatile Organic Compounds										
1,2-Dichloroethene (total)	ug/L		2 U	--	--	--	2 U	--	--	--
cis-1,2-Dichloroethene	ug/L		1 U	--	--	--	1 U	--	--	--
Vinyl Chloride	ug/L	0.025	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U

Notes

Bold - detected
Shaded - Exceeded Site Cleanup Level
U - Not detected at or above reporting limit
J or UJ - Estimated "usable"
NA - parameter not measured

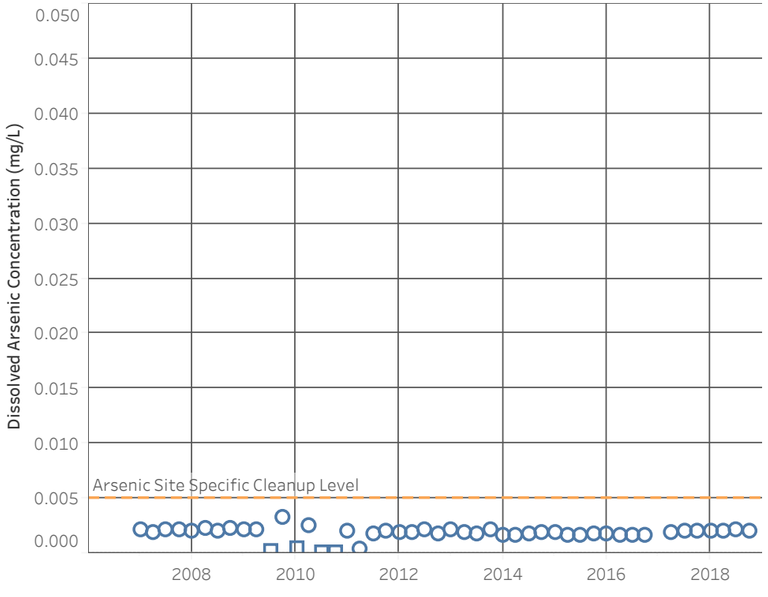
mg/L - milligrams per liter
mV - millivolts
uS - microSiemens
degrees C - degrees Celcius
NTU - Nephthalometric Turbidity Units

ug/L - micrograms per liter

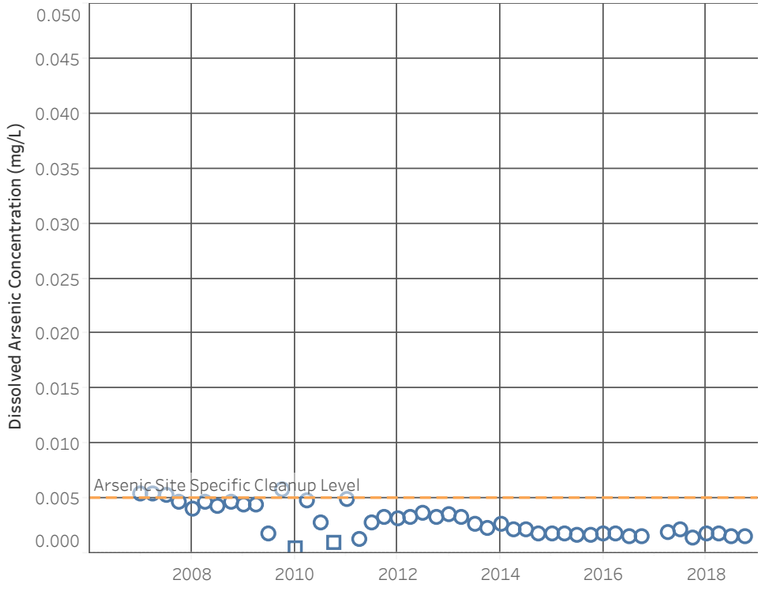
APPENDIX C

Groundwater Statistics and Time-Series Plots

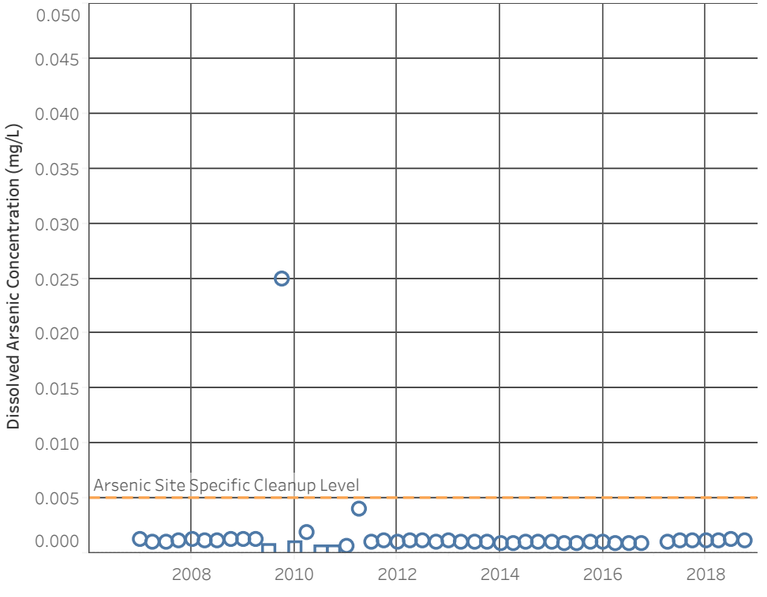
MW-5 (Background Well)



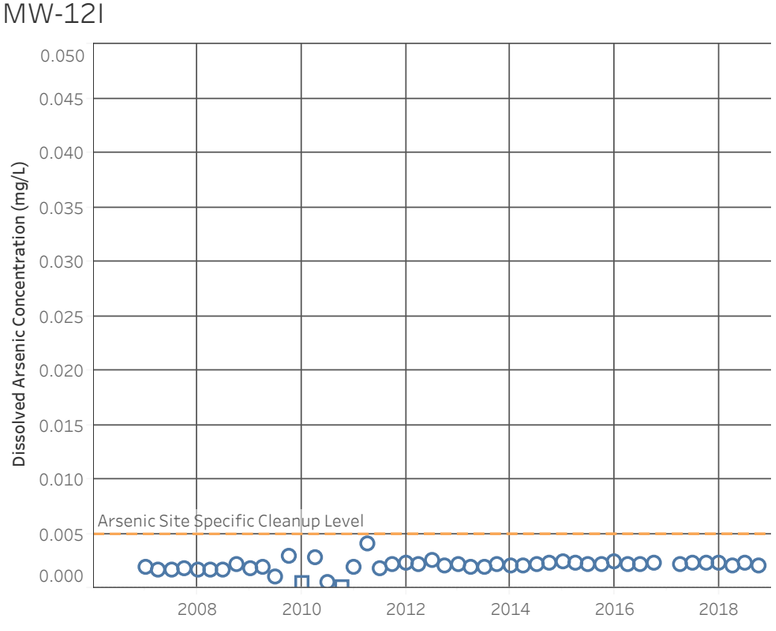
MW-6



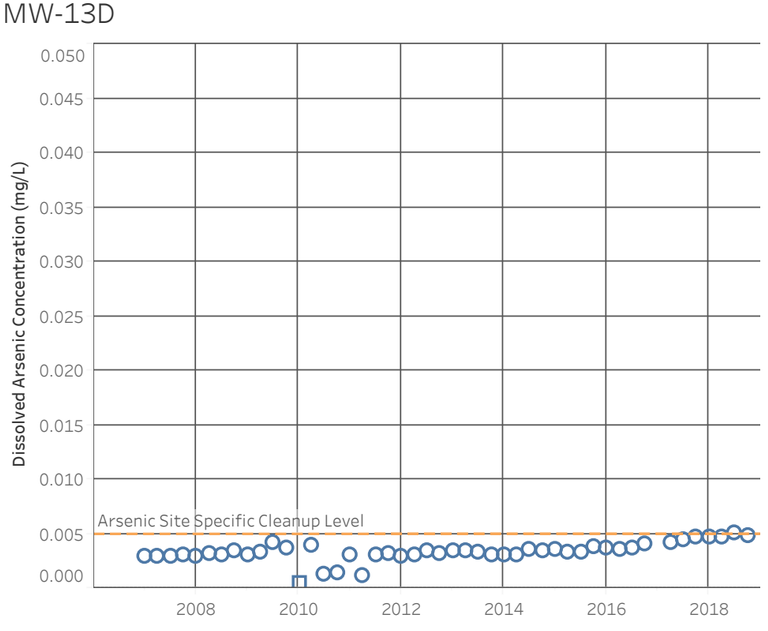
MW-7



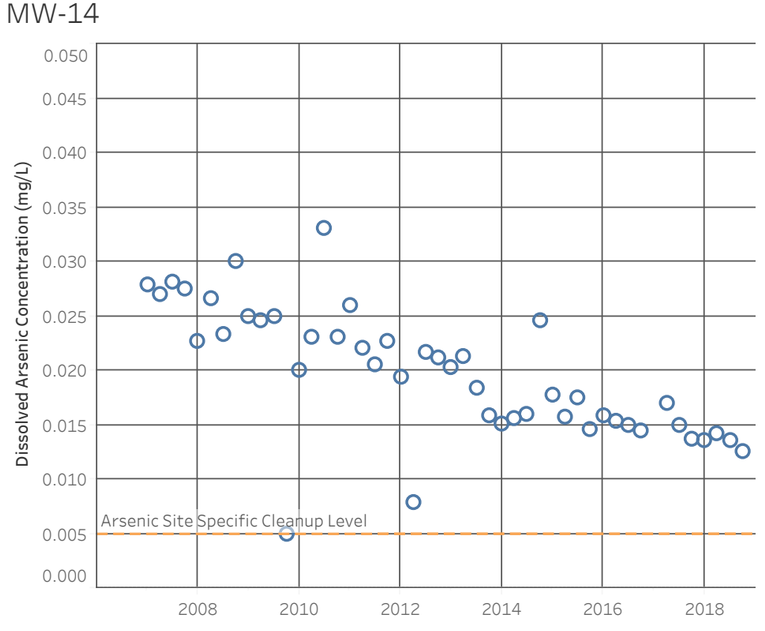
MW-12I



MW-13D



MW-14



Note: Non-detected values are shown at 1/2 the reporting limit.
Results from First Quarter 2017 were rejected. See text.

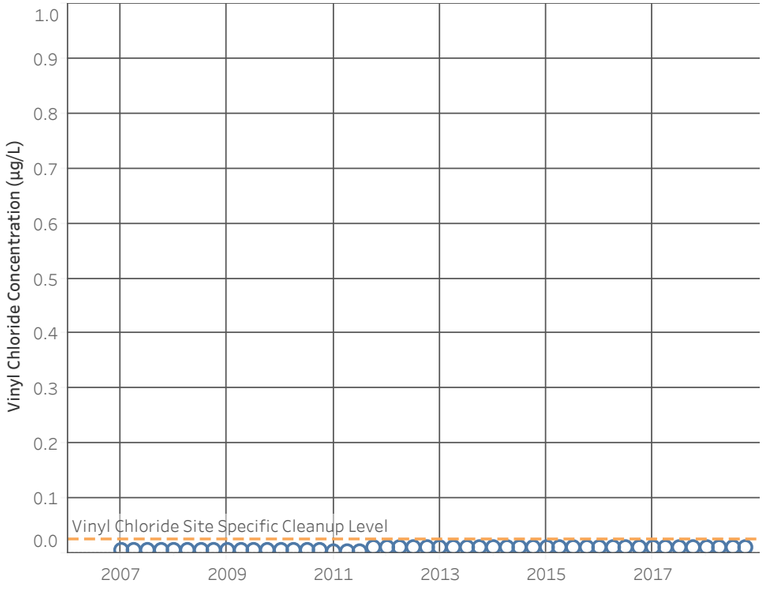
Result Flags
○ Detected □ U - Non-Detect

Aspect CONSULTING

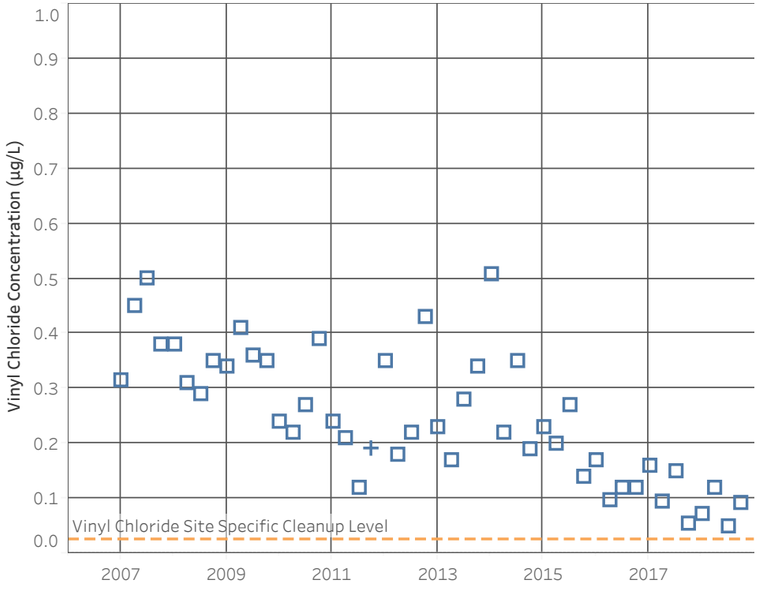
Aspect Consulting
11/27/2018
Trend Plots (As)

Figure C-1 - Dissolved Arsenic Sampling Results
2018 Annual Environmental Monitoring Report
Hansville Landfill
Kitsap County, WA

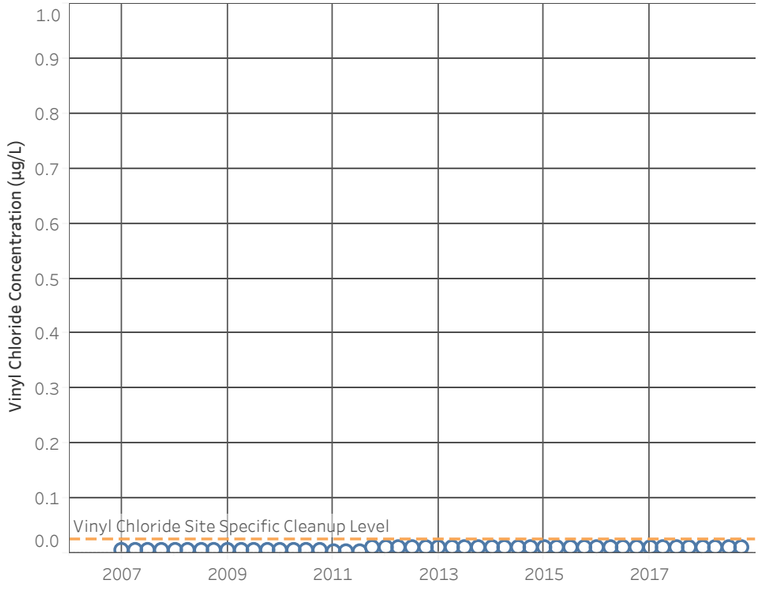
MW-5 (Background Well)



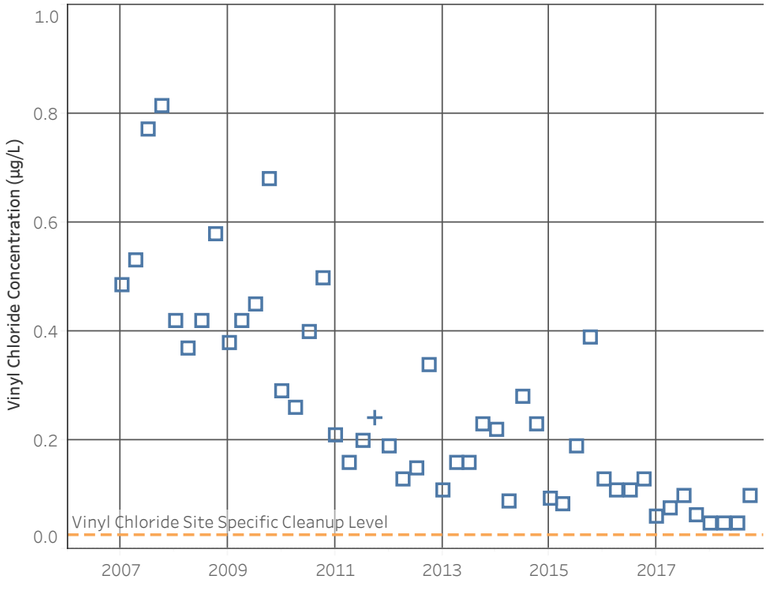
MW-6



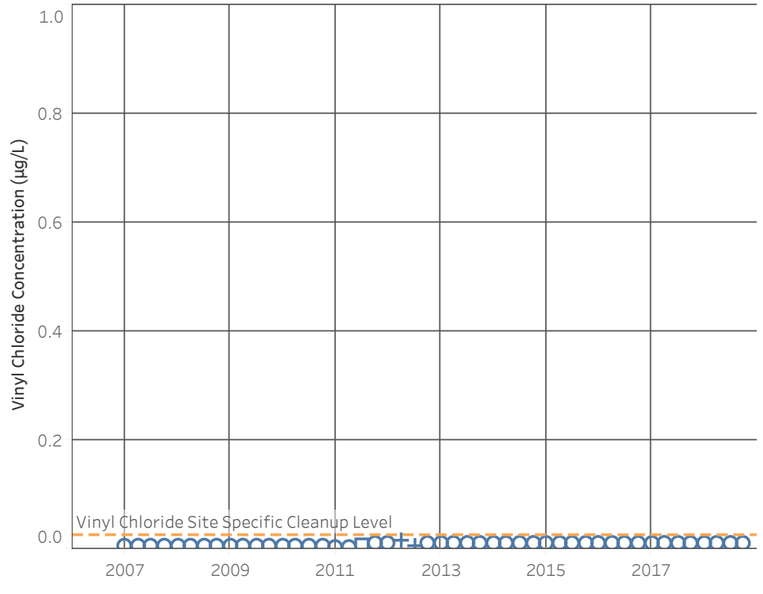
MW-7



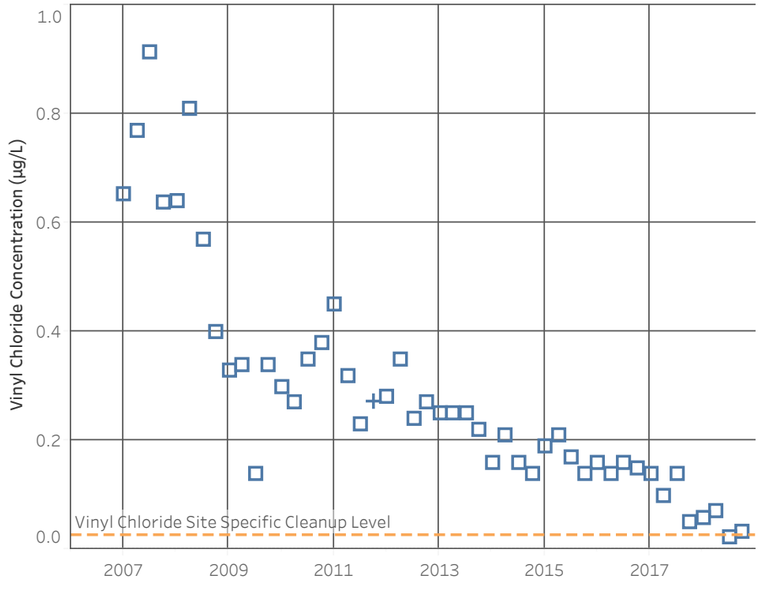
MW-12I



MW-13D



MW-14



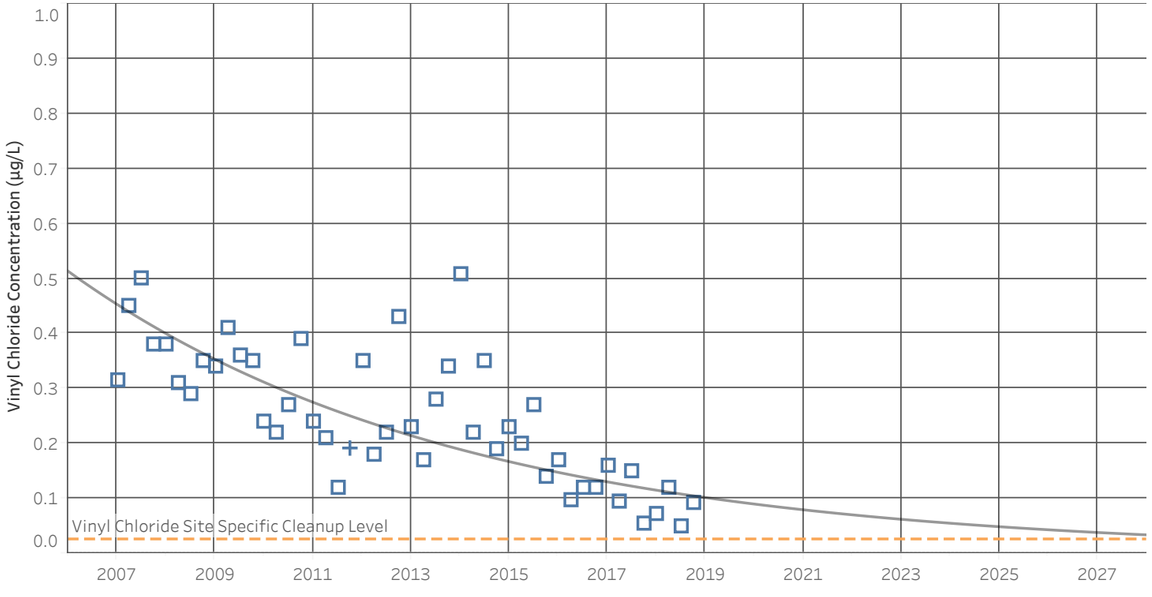
Result Flags
Detected
J - Estimate
U - Non-Detect

Note: Non-detected values are shown at 1/2 the reporting limit.

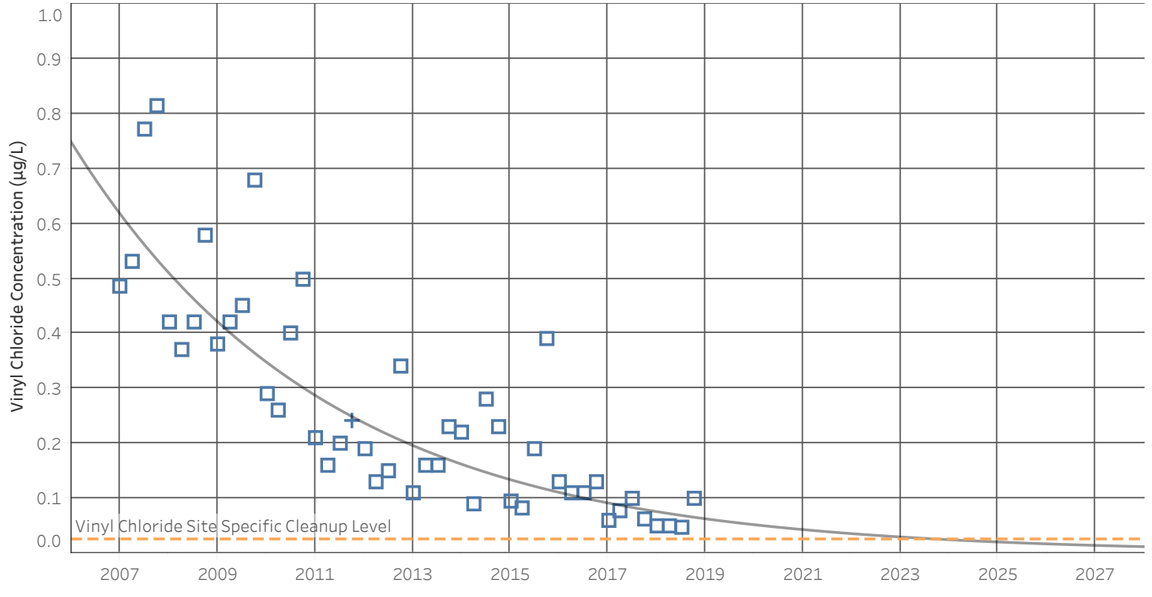
Aspect Consulting
11/27/2018
Trend Plots (VC)

Figure C-2 - Vinyl Chloride Sampling Results
2018 Annual Environmental Monitoring Report
Hansville Landfill
Kitsap County, WA

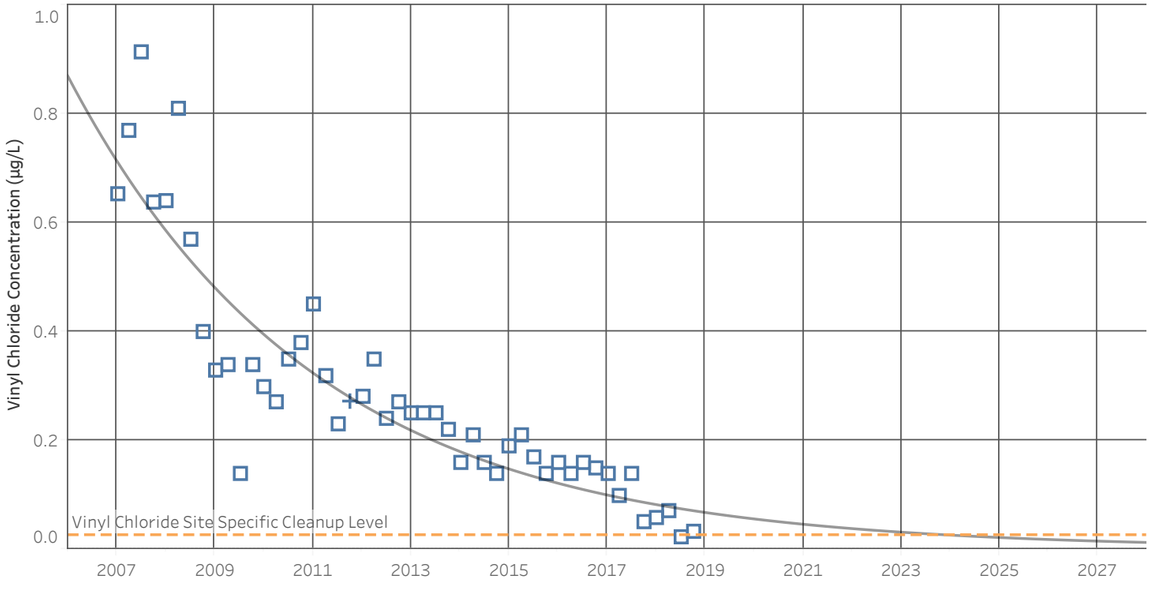
MW-6 Vinyl Chloride Trend



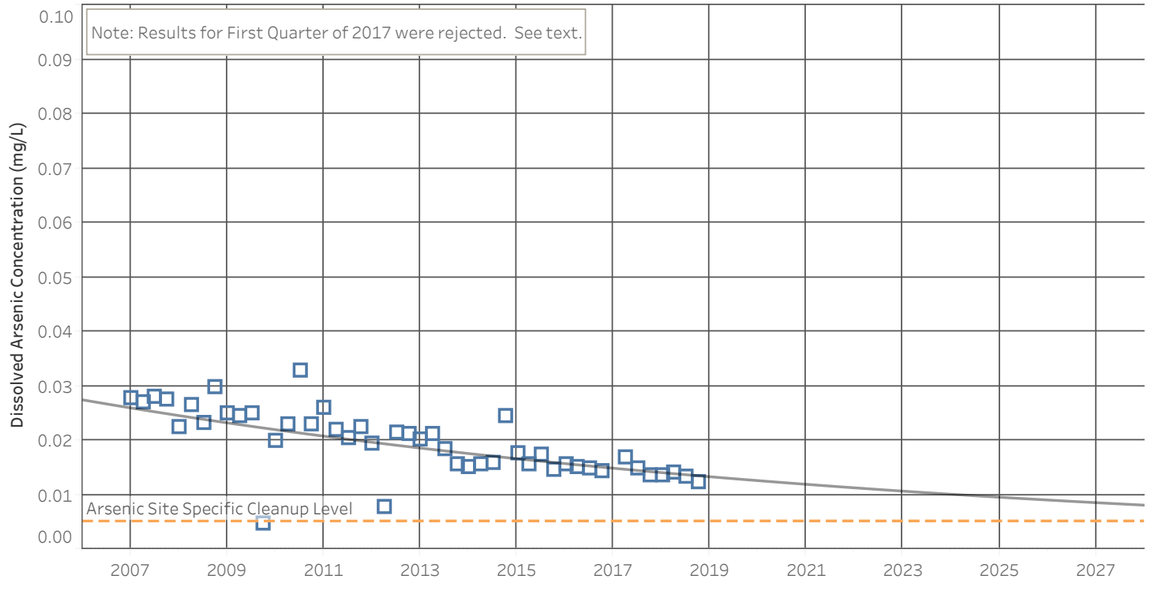
MW-12I Vinyl Chloride Trend



MW-14 Vinyl Chloride Trend



MW-14 Dissolved Arsenic Trend



Note: Non-detected values are shown at 1/2 the reporting limit.
Attenuation curves based on exponential least squares fit to the data.

Result Flags
□ Detected + J - Estimate ○ U - Non-Detect

Aspect CONSULTING

Aspect Consulting
11/27/2018
Trend Plots (VC)

Figure C-3 - 10 Year Attenuation Curves
2018 Annual Environmental Monitoring Report
Hansville Landfill
Kitsap County, WA

Table C-1. Statistical Analysis

Project 160423, Hansville Landfill, Hansville, WA

Dissolved Arsenic Statistical Results

Well	Statistical Trend[1]	Mann-Kendall Test[2]				Sen's Slope	
		Test Value, Z	Critical Value	Number of data points, n	Statistical Significance	(ug/L per day)	(ug/L per year)
MW-5	--[3]	--	--	--	--	--	--
MW-6	--	--	--	--	--	--	--
MW-7	--	--	--	--	--		--
MW-12I	--	--	--	--	--	--	--
MW-13D	--	--	--	--	--		--
MW-14	Decreasing	-6.6	-1.96	47	Yes	-3.5E-06	-0.0013

Vinyl Chloride Statistical Results

Well	Statistical Trend[1]	Mann-Kendall Test[2]				Sen's Slope	
		Test Value, Z	Critical Value	Number of data points, n	Statistical Significance	(ug/L per day)	(ug/L per year)
MW-5	--[3]	--	--	--	--		--
MW-6	Decreasing	-5.9	-1.96	48	Yes	-7.0E-05	-0.025
MW-7	--	--	--	--	--		--
MW-12I	Decreasing	-6.8	-1.96	48	Yes	-1.1E-04	-0.040
MW-13D	--	--	--	--	--		--
MW-14	Decreasing	-7.9	-1.96	48	Yes	-1.1E-04	-0.039

Notes

1 - The Statistical Trend indicates:

"Non-significant" if the magnitude of the Test Value is less than the Critical Value,

"Increasing" if the magnitude of the Test Value is greater than the Critical Value and the Sen's Slope is positive, or

"Decreasing" if the magnitude of the Test Value is greater than the Critical Value and the Sen's Slope is negative.

2 - Mann-Kendall tests were performed with alpha = 0.05 (95% confidence level).

For N>40, Mann-Kendall uses an approximation of a normal distribution, represented by Test Value Z.

For N<=40, Mann-Kendall scores are reported as Test Value S.

3 - "--" Indicates most recent groundwater concentrations were below the Site-specific cleanup level.

ug/L - micrograms per liter

Table C-2. Statistical Limit Analysis

Project 160423, Hansville Landfill, Hansville, WA

Dissolved Arsenic Statistical Concentrations (mg/L) since 2011

Well	Statistic	2011	2012	2013	2014	2015	2016	2017	2018	Site-specific Cleanup Level
MW-14	LCL	0.018	0.017	0.016	0.015	0.014	0.013	0.012	0.011	0.005
	Trend	0.020	0.019	0.018	0.017	0.016	0.015	0.015	0.014	
	UCL	0.023	0.021	0.020	0.019	0.019	0.018	0.018	0.017	

Vinyl Chloride Statistical Concentrations (ug/L) since 2011

Well	Statistic	2011	2012	2013	2014	2015	2016	2017	2018	Site-specific Cleanup Level
MW-6	LCL	0.235	0.212	0.190	0.167	0.147	0.128	0.112	0.097	0.025
	Trend	0.265	0.237	0.214	0.191	0.172	0.154	0.138	0.124	
	UCL	0.298	0.266	0.241	0.219	0.201	0.185	0.171	0.158	
MW-12I	LCL	0.235	0.197	0.164	0.134	0.109	0.088	0.071	0.057	
	Trend	0.269	0.224	0.188	0.155	0.130	0.108	0.090	0.075	
	UCL	0.308	0.255	0.214	0.181	0.155	0.133	0.114	0.098	
MW-14	LCL	0.277	0.235	0.199	0.165	0.137	0.113	0.093	0.077	
	Trend	0.306	0.258	0.219	0.184	0.156	0.132	0.111	0.094	
	UCL	0.338	0.284	0.242	0.206	0.178	0.154	0.133	0.115	

Notes

LCL is the 95% Lower Confidence Limit calculated using log-normal transformed concentrations.

Trend is the average concentration calculated using least-squares fit a line for log-normal transformed concentrations.

UCL is the 95% Upper Confidence Limit calculated using log-normal transformed concentrations.

UCL, LCL calculated based on method described in CMP (SCS Engineers, 2011), except using data collected since January 2007.

APPENDIX D

Fourth Quarter Field Forms and Laboratory Reports

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 280-115774-1

Job Description: Hansville Landfill

For:
Aspect Consulting
350 Madison Ave N
Bainbridge Island, WA 98110

Attention: Ms. Meilani Lanier-Kamaha'o

Approved for release.
Betsy A Sara
Project Manager II
11/1/2018 1:56 PM

Betsy A Sara, Project Manager II
4955 Yarrow Street, Arvada, CO, 80002
(303)736-0189
betsy.sara@testamericainc.com
11/01/2018

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is 4025.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

Table of Contents

CASE NARRATIVE

Client: Aspect Consulting

Project: Hansville Landfill

Report Number: 280-115774-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

This report may include reporting limits (RLs) less than TestAmerica's standard reporting limit. The reported sample results and associated reporting limits are being used specifically to meet the needs of this project. Note that data are not normally reported to these levels without qualification because they are inherently less reliable and potentially less defensible than required by the latest industry standards.

Sample Receiving

The samples were received on 10/18/2018; the samples arrived in good condition, properly preserved and on ice. The temperatures of the coolers at receipt were 1.0º C, 2.0º C and 2.2º C.

Holding Times

Due to an instrument issue, the Method 300.0 analysis was performed by ARI past the 48-hour holding time. The client was notified. Please refer to the ARI report at the end of this submission for more information.

All other holding times were within established control limits.

Method Blanks

All Method Blanks were within established control limits.

Laboratory Control Samples (LCS)

All Laboratory Control Samples were within established control limits.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD)

The percent recoveries and/or relative percent difference of the MS/MSD performed on a sample from another client were outside control limits for Dissolved Manganese Method 6020 because the sample concentration was greater than four times the spike amount. Because the corresponding Laboratory Control Sample and the Method Blank sample were within control limits, no corrective action was taken.

All other MS and MSD samples were within established control limits.

General Comments

The analysis for Method 8260C SIM was performed by TestAmerica Buffalo. Their address and phone number are:
TestAmerica Buffalo
10 Hazelwood Drive, Suite 106
Amherst, NY 14228
716-691-2600

The analysis for Nitrate, Nitrite, Ortho-phosphate Method 300.0, and Dissolved Arsenic Method 200.8 were performed by ARI. Their address and phone number are:
Analytical Resources, Inc.
4611 S.134th Place
Tukwila, WA 98168-3240
206-695-6200

EXECUTIVE SUMMARY - Detections

Client: Aspect Consulting Job Number: 280-115774-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-115774-1	**MW-7-101618**					
Chloride		1.1		1.0	mg/L	300.0
Sulfate		2.8		1.0	mg/L	300.0
Total Alkalinity		140		5.0	mg/L	SM 2320B
Bicarbonate Alkalinity		140		5.0	mg/L	SM 2320B
Total Organic Carbon - Average		1.9		1.0	mg/L	SM 5310B
280-115774-2	**MW-5-101618**					
Chloride		2.1		1.0	mg/L	300.0
Sulfate		8.6		1.0	mg/L	300.0
Total Alkalinity		57		5.0	mg/L	SM 2320B
Bicarbonate Alkalinity		57		5.0	mg/L	SM 2320B
280-115774-3	**SW1-101618**					
Chloride		4.7		1.0	mg/L	300.0
Sulfate		11		1.0	mg/L	300.0
Total Alkalinity		64		5.0	mg/L	SM 2320B
Bicarbonate Alkalinity		64		5.0	mg/L	SM 2320B
Total Organic Carbon - Average		2.1		1.0	mg/L	SM 5310B
280-115774-4	**MW-12I-101618**					
Vinyl chloride		0.10		0.020	ug/L	8260C SIM
Chloride		3.4		1.0	mg/L	300.0
Sulfate		6.1		1.0	mg/L	300.0
Total Alkalinity		79		5.0	mg/L	SM 2320B
Bicarbonate Alkalinity		79		5.0	mg/L	SM 2320B
Total Organic Carbon - Average		2.8		1.0	mg/L	SM 5310B
Dissolved						
Manganese		34		1.0	ug/L	6020
280-115774-5	**SW4-101618**					
Chloride		15		1.0	mg/L	300.0
Sulfate		20		1.0	mg/L	300.0
Total Alkalinity		150		5.0	mg/L	SM 2320B
Bicarbonate Alkalinity		150		5.0	mg/L	SM 2320B
Total Organic Carbon - Average		8.0		1.0	mg/L	SM 5310B
Dissolved						
Manganese		42		1.0	ug/L	6020

EXECUTIVE SUMMARY - Detections

Client: Aspect Consulting Job Number: 280-115774-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-115774-6	**MW-13D-101618**					
Chloride		5.4		1.0	mg/L	300.0
Sulfate		18		1.0	mg/L	300.0
Total Alkalinity		69		5.0	mg/L	SM 2320B
Bicarbonate Alkalinity		69		5.0	mg/L	SM 2320B
Dissolved						
Manganese		5.6		1.0	ug/L	6020
280-115774-7	**SW6-101618**					
Chloride		4.4		1.0	mg/L	300.0
Sulfate		5.4		1.0	mg/L	300.0
Ammonia as N		0.053		0.030	mg/L	350.1
Total Alkalinity		62		5.0	mg/L	SM 2320B
Bicarbonate Alkalinity		62		5.0	mg/L	SM 2320B
Total Organic Carbon - Average		12		1.0	mg/L	SM 5310B
Dissolved						
Manganese		120		1.0	ug/L	6020
280-115774-8	**SW7-101618**					
Chloride		4.1		1.0	mg/L	300.0
Sulfate		7.8		1.0	mg/L	300.0
Total Alkalinity		56		5.0	mg/L	SM 2320B
Bicarbonate Alkalinity		56		5.0	mg/L	SM 2320B
Total Organic Carbon - Average		8.5		1.0	mg/L	SM 5310B
Dissolved						
Manganese		4.2		1.0	ug/L	6020
280-115774-9	**MW-14-101618**					
Vinyl chloride		0.034		0.020	ug/L	8260C SIM
Chloride		8.7		1.0	mg/L	300.0
Sulfate		13		1.0	mg/L	300.0
Total Alkalinity		91		5.0	mg/L	SM 2320B
Bicarbonate Alkalinity		91		5.0	mg/L	SM 2320B
Total Organic Carbon - Average		2.4		1.0	mg/L	SM 5310B
Dissolved						
Manganese		300		1.0	ug/L	6020

EXECUTIVE SUMMARY - Detections

Client: Aspect Consulting Job Number: 280-115774-1

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-115774-10	**MW-6-101618**					
Vinyl chloride		0.092		0.020	ug/L	8260C SIM
Chloride		17		1.0	mg/L	300.0
Sulfate		35		1.0	mg/L	300.0
Total Alkalinity		150		5.0	mg/L	SM 2320B
Bicarbonate Alkalinity		150		5.0	mg/L	SM 2320B
Total Organic Carbon - Average		1.7		1.0	mg/L	SM 5310B
Dissolved						
Manganese		480		1.0	ug/L	6020
280-115774-11	**MW-20D-101618**					
Vinyl chloride		0.033		0.020	ug/L	8260C SIM
Chloride		9.1		1.0	mg/L	300.0
Sulfate		13		1.0	mg/L	300.0
Total Alkalinity		90		5.0	mg/L	SM 2320B
Bicarbonate Alkalinity		90		5.0	mg/L	SM 2320B
Total Organic Carbon - Average		2.4		1.0	mg/L	SM 5310B
Dissolved						
Manganese		310		1.0	ug/L	6020

METHOD SUMMARY

Client: Aspect Consulting Job Number: 280-115774-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Metals (ICP/MS)	TAL DEN	SW846 6020	
Preparation, Total Recoverable or Dissolved Metals	TAL DEN		SW846 3005A
Sample Filtration, Field			FIELD_FLTRD
Anions, Ion Chromatography	TAL DEN	MCAWW 300.0	
Nitrogen, Ammonia	TAL DEN	MCAWW 350.1	
Alkalinity	TAL DEN	SM SM 2320B	
Organic Carbon, Total (TOC)	TAL DEN	SM SM 5310B	
Volatile Organic Compounds (GC/MS)	TAL BUF	SW846 8260C SIM	
Purge and Trap	TAL BUF		SW846 5030C
General Subcontract Method	SC0056	Subcontract	

Lab References:

SC0056 = Analytical Resources, Inc

TAL BUF = TestAmerica Buffalo

TAL DEN = TestAmerica Denver

Method References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

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.

METHOD / ANALYST SUMMARY

Client: Aspect Consulting Job Number: 280-115774-1

Method	Analyst	Analyst ID
SW846 8260C SIM	Cwiklinski, Charles D	CDC
SW846 6020	Trudell, Lynn-Anne M	LMT
MCAWW 300.0	Duplin, Alysha 1	A1D
MCAWW 350.1	Pedrick, Joshua A	JAP
SM SM 2320B	Barker, Scott G	SGB
SM SM 5310B	Loux, Lauren P	LPL

SAMPLE SUMMARY

Client: Aspect Consulting

Job Number: 280-115774-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
280-115774-1	MW-7-101618	Water	10/16/2018 0945	10/18/2018 0915
280-115774-2	MW-5-101618	Water	10/16/2018 1110	10/18/2018 0915
280-115774-3	SW1-101618	Water	10/16/2018 1220	10/18/2018 0915
280-115774-4	MW-12I-101618	Water	10/16/2018 1235	10/18/2018 0915
280-115774-5	SW4-101618	Water	10/16/2018 1400	10/18/2018 0915
280-115774-6	MW-13D-101618	Water	10/16/2018 1415	10/18/2018 0915
280-115774-7	SW6-101618	Water	10/16/2018 1445	10/18/2018 0915
280-115774-8	SW7-101618	Water	10/16/2018 1540	10/18/2018 0915
280-115774-9	MW-14-101618	Water	10/16/2018 1710	10/18/2018 0915
280-115774-10	MW-6-101618	Water	10/16/2018 1825	10/18/2018 0915
280-115774-11	MW-20D-101618	Water	10/16/2018 0000	10/18/2018 0915
280-115774-12	TB1	Water	10/16/2018 0000	10/18/2018 0915

SAMPLE RESULTS

Client: Aspect Consulting Job Number: 280-115774-1

Client Sample ID: MW-7-101618

Lab Sample ID: 280-115774-1 Date Sampled: 10/16/2018 0945
Client Matrix: Water Date Received: 10/18/2018 0915

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	J7831.D
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1512			Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1512				

Analyte	Result (ug/L)	Qualifier	RL
Vinyl chloride	ND		0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
Dibromofluoromethane (Surr)	110		50 - 150
TBA-d9 (Surr)	102		50 - 150

Client: Aspect Consulting Job Number: 280-115774-1

Client Sample ID: MW-5-101618

Lab Sample ID: 280-115774-2 Date Sampled: 10/16/2018 1110
Client Matrix: Water Date Received: 10/18/2018 0915

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	J7832.D
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1537			Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1537				

Analyte	Result (ug/L)	Qualifier	RL
Vinyl chloride	ND		0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
Dibromofluoromethane (Surr)	110		50 - 150
TBA-d9 (Surr)	110		50 - 150

Client: Aspect Consulting Job Number: 280-115774-1

Client Sample ID: SW1-101618

Lab Sample ID: 280-115774-3 Date Sampled: 10/16/2018 1220
Client Matrix: Water Date Received: 10/18/2018 0915

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	J7833.D
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1601			Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1601				

Analyte	Result (ug/L)	Qualifier	RL
Vinyl chloride	ND		0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
Dibromofluoromethane (Surr)	112		50 - 150
TBA-d9 (Surr)	105		50 - 150

Client: Aspect Consulting Job Number: 280-115774-1

Client Sample ID: **MW-12I-101618**

Lab Sample ID: 280-115774-4 Date Sampled: 10/16/2018 1235
Client Matrix: Water Date Received: 10/18/2018 0915

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	J7834.D
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1625			Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1625				

Analyte	Result (ug/L)	Qualifier	RL
Vinyl chloride	0.10		0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
Dibromofluoromethane (Surr)	113		50 - 150
TBA-d9 (Surr)	111		50 - 150

Client: Aspect Consulting | Job Number: 280-115774-1

Client Sample ID: **SW4-101618**

Lab Sample ID: 280-115774-5 | Date Sampled: 10/16/2018 1400
Client Matrix: Water | Date Received: 10/18/2018 0915

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	J7835.D
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1649			Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1649				

Analyte	Result (ug/L)	Qualifier	RL
Vinyl chloride	ND		0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
Dibromofluoromethane (Surr)	112		50 - 150
TBA-d9 (Surr)	103		50 - 150

Client: Aspect Consulting | Job Number: 280-115774-1

Client Sample ID: **MW-13D-101618**

Lab Sample ID: 280-115774-6 | Date Sampled: 10/16/2018 1415
Client Matrix: Water | Date Received: 10/18/2018 0915

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	J7836.D
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1713			Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1713				

Analyte	Result (ug/L)	Qualifier	RL
Vinyl chloride	ND		0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
Dibromofluoromethane (Surr)	114		50 - 150
TBA-d9 (Surr)	115		50 - 150

Client: Aspect Consulting Job Number: 280-115774-1

Client Sample ID: SW6-101618

Lab Sample ID: 280-115774-7 Date Sampled: 10/16/2018 1445
Client Matrix: Water Date Received: 10/18/2018 0915

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	J7837.D
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1738			Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1738				

Analyte	Result (ug/L)	Qualifier	RL
Vinyl chloride	ND		0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
Dibromofluoromethane (Surr)	112		50 - 150
TBA-d9 (Surr)	102		50 - 150

Client: Aspect Consulting Job Number: 280-115774-1

Client Sample ID: SW7-101618

Lab Sample ID: 280-115774-8 Date Sampled: 10/16/2018 1540
Client Matrix: Water Date Received: 10/18/2018 0915

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	J7838.D
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1802			Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1802				

Analyte	Result (ug/L)	Qualifier	RL
Vinyl chloride	ND		0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
Dibromofluoromethane (Surr)	113		50 - 150
TBA-d9 (Surr)	102		50 - 150

Client: Aspect Consulting

Job Number: 280-115774-1

Client Sample ID: **MW-14-101618**

Lab Sample ID: 280-115774-9
Client Matrix: Water

Date Sampled: 10/16/2018 1710
Date Received: 10/18/2018 0915

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	J7839.D
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1826			Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1826				

Analyte	Result (ug/L)	Qualifier	RL
Vinyl chloride	0.034		0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
Dibromofluoromethane (Surr)	113		50 - 150
TBA-d9 (Surr)	101		50 - 150

Client: Aspect Consulting Job Number: 280-115774-1

Client Sample ID: MW-6-101618

Lab Sample ID: 280-115774-10 Date Sampled: 10/16/2018 1825
Client Matrix: Water Date Received: 10/18/2018 0915

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	J7840.D
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1850			Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1850				

Analyte	Result (ug/L)	Qualifier	RL
Vinyl chloride	0.092		0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
Dibromofluoromethane (Surr)	114		50 - 150
TBA-d9 (Surr)	104		50 - 150

Client: Aspect Consulting Job Number: 280-115774-1

Client Sample ID: MW-20D-101618

Lab Sample ID: 280-115774-11 Date Sampled: 10/16/2018 0000
Client Matrix: Water Date Received: 10/18/2018 0915

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	J7841.D
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1914			Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1914				

Analyte	Result (ug/L)	Qualifier	RL
Vinyl chloride	0.033		0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
Dibromofluoromethane (Surr)	114		50 - 150
TBA-d9 (Surr)	106		50 - 150

Client: Aspect Consulting | Job Number: 280-115774-1

Client Sample ID: **TB1**

Lab Sample ID: 280-115774-12 | Date Sampled: 10/16/2018 0000
Client Matrix: Water | Date Received: 10/18/2018 0915

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:	8260C SIM	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Prep Method:	5030C	Prep Batch:	N/A	Lab File ID:	J7842.D
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1939			Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1939				

Analyte	Result (ug/L)	Qualifier	RL
Vinyl chloride	ND		0.020

Surrogate	%Rec	Qualifier	Acceptance Limits
Dibromofluoromethane (Surr)	111		50 - 150
TBA-d9 (Surr)	101		50 - 150

Client: Aspect Consulting

Job Number: 280-115774-1

Client Sample ID: **MW-7-101618**

Lab Sample ID: 280-115774-1
Client Matrix: Water

Date Sampled: 10/16/2018 0945
Date Received: 10/18/2018 0915

6020 Metals (ICP/MS)-Dissolved

Analysis Method:	6020	Analysis Batch:	280-434473	Instrument ID:	MT_078
Prep Method:	3005A	Prep Batch:	280-434183	Lab File ID:	262SMPL.d
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0227			Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				

Analyte	Result (ug/L)	Qualifier	RL
Manganese	ND		1.0

Client: Aspect Consulting

Job Number: 280-115774-1

Client Sample ID: **MW-5-101618**

Lab Sample ID: 280-115774-2
Client Matrix: Water

Date Sampled: 10/16/2018 1110
Date Received: 10/18/2018 0915

6020 Metals (ICP/MS)-Dissolved

Analysis Method:	6020	Analysis Batch:	280-434473	Instrument ID:	MT_078
Prep Method:	3005A	Prep Batch:	280-434183	Lab File ID:	263SMPL.d
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0230			Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				

Analyte	Result (ug/L)	Qualifier	RL
Manganese	ND		1.0

Client: Aspect Consulting

Job Number: 280-115774-1

Client Sample ID: **SW1-101618**

Lab Sample ID: 280-115774-3
Client Matrix: Water

Date Sampled: 10/16/2018 1220
Date Received: 10/18/2018 0915

6020 Metals (ICP/MS)-Dissolved

Analysis Method:	6020	Analysis Batch:	280-434473	Instrument ID:	MT_078
Prep Method:	3005A	Prep Batch:	280-434183	Lab File ID:	264SMPL.d
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0234			Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				

Analyte	Result (ug/L)	Qualifier	RL
Manganese	ND		1.0

Client: Aspect Consulting

Job Number: 280-115774-1

Client Sample ID: **MW-12I-101618**

Lab Sample ID: 280-115774-4
Client Matrix: Water

Date Sampled: 10/16/2018 1235
Date Received: 10/18/2018 0915

6020 Metals (ICP/MS)-Dissolved

Analysis Method:	6020	Analysis Batch:	280-434473	Instrument ID:	MT_078
Prep Method:	3005A	Prep Batch:	280-434183	Lab File ID:	265SMPL.d
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0237			Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				

Analyte	Result (ug/L)	Qualifier	RL
Manganese	34		1.0

Client: Aspect Consulting

Job Number: 280-115774-1

Client Sample ID: **SW4-101618**

Lab Sample ID: 280-115774-5
Client Matrix: Water

Date Sampled: 10/16/2018 1400
Date Received: 10/18/2018 0915

6020 Metals (ICP/MS)-Dissolved

Analysis Method:	6020	Analysis Batch:	280-434473	Instrument ID:	MT_078
Prep Method:	3005A	Prep Batch:	280-434183	Lab File ID:	266SMPL.d
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0241			Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				

Analyte	Result (ug/L)	Qualifier	RL
Manganese	42		1.0

Client: Aspect Consulting

Job Number: 280-115774-1

Client Sample ID: **MW-13D-101618**

Lab Sample ID: 280-115774-6
Client Matrix: Water

Date Sampled: 10/16/2018 1415
Date Received: 10/18/2018 0915

6020 Metals (ICP/MS)-Dissolved

Analysis Method:	6020	Analysis Batch:	280-434473	Instrument ID:	MT_078
Prep Method:	3005A	Prep Batch:	280-434183	Lab File ID:	267SMPL.d
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0244			Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				

Analyte	Result (ug/L)	Qualifier	RL
Manganese	5.6		1.0

Client: Aspect Consulting

Job Number: 280-115774-1

Client Sample ID: **SW6-101618**

Lab Sample ID: 280-115774-7
Client Matrix: Water

Date Sampled: 10/16/2018 1445
Date Received: 10/18/2018 0915

6020 Metals (ICP/MS)-Dissolved

Analysis Method:	6020	Analysis Batch:	280-434473	Instrument ID:	MT_078
Prep Method:	3005A	Prep Batch:	280-434183	Lab File ID:	270SMPL.d
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0254			Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				

Analyte	Result (ug/L)	Qualifier	RL
Manganese	120		1.0

Client: Aspect Consulting

Job Number: 280-115774-1

Client Sample ID: **SW7-101618**

Lab Sample ID: 280-115774-8
Client Matrix: Water

Date Sampled: 10/16/2018 1540
Date Received: 10/18/2018 0915

6020 Metals (ICP/MS)-Dissolved

Analysis Method:	6020	Analysis Batch:	280-434473	Instrument ID:	MT_078
Prep Method:	3005A	Prep Batch:	280-434183	Lab File ID:	271SMPL.d
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0258			Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				

Analyte	Result (ug/L)	Qualifier	RL
Manganese	4.2		1.0

Client: Aspect Consulting

Job Number: 280-115774-1

Client Sample ID: **MW-14-101618**

Lab Sample ID: 280-115774-9
Client Matrix: Water

Date Sampled: 10/16/2018 1710
Date Received: 10/18/2018 0915

6020 Metals (ICP/MS)-Dissolved

Analysis Method:	6020	Analysis Batch:	280-434473	Instrument ID:	MT_078
Prep Method:	3005A	Prep Batch:	280-434183	Lab File ID:	272SMPL.d
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0301			Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				

Analyte	Result (ug/L)	Qualifier	RL
Manganese	300		1.0

Client: Aspect Consulting

Job Number: 280-115774-1

Client Sample ID: **MW-6-101618**

Lab Sample ID: 280-115774-10
Client Matrix: Water

Date Sampled: 10/16/2018 1825
Date Received: 10/18/2018 0915

6020 Metals (ICP/MS)-Dissolved

Analysis Method:	6020	Analysis Batch:	280-434473	Instrument ID:	MT_078
Prep Method:	3005A	Prep Batch:	280-434183	Lab File ID:	273SMPL.d
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0305			Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				

Analyte	Result (ug/L)	Qualifier	RL
Manganese	480		1.0

Client: Aspect Consulting

Job Number: 280-115774-1

Client Sample ID: **MW-20D-101618**

Lab Sample ID: 280-115774-11
Client Matrix: Water

Date Sampled: 10/16/2018 0000
Date Received: 10/18/2018 0915

6020 Metals (ICP/MS)-Dissolved

Analysis Method:	6020	Analysis Batch:	280-434473	Instrument ID:	MT_078
Prep Method:	3005A	Prep Batch:	280-434183	Lab File ID:	274SMPL.d
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0308			Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				

Analyte	Result (ug/L)	Qualifier	RL
Manganese	310		1.0

General Chemistry

Client Sample ID: MW-7-101618

Lab Sample ID: 280-115774-1 Date Sampled: 10/16/2018 0945
Client Matrix: Water Date Received: 10/18/2018 0915

Analyte	Result	Qual	Units	RL	Dil	Method
Chloride	1.1		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0106					
Sulfate	2.8		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0106					
Ammonia as N	ND		mg/L	0.030	1.0	350.1
Analysis Batch: 280-434945	Analysis Date: 10/25/2018 1109					
Total Alkalinity	140		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2258					
Bicarbonate Alkalinity	140		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2258					
Carbonate Alkalinity	ND		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2258					
Total Organic Carbon - Average	1.9		mg/L	1.0	1.0	SM 5310B
Analysis Batch: 280-434883	Analysis Date: 10/25/2018 0303					

General Chemistry

Client Sample ID: **MW-5-101618**

Lab Sample ID: 280-115774-2 Date Sampled: 10/16/2018 1110
Client Matrix: Water Date Received: 10/18/2018 0915

Analyte	Result	Qual	Units	RL	Dil	Method
Chloride	2.1		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0207					
Sulfate	8.6		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0207					
Ammonia as N	ND		mg/L	0.030	1.0	350.1
Analysis Batch: 280-434945	Analysis Date: 10/25/2018 1111					
Total Alkalinity	57		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2315					
Bicarbonate Alkalinity	57		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2315					
Carbonate Alkalinity	ND		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2315					
Total Organic Carbon - Average	ND		mg/L	1.0	1.0	SM 5310B
Analysis Batch: 280-434883	Analysis Date: 10/25/2018 0351					

General Chemistry

Client Sample ID: **SW1-101618**

Lab Sample ID: 280-115774-3 Date Sampled: 10/16/2018 1220
Client Matrix: Water Date Received: 10/18/2018 0915

Analyte	Result	Qual	Units	RL	Dil	Method
Chloride	4.7		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0223					
Sulfate	11		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0223					
Ammonia as N	ND		mg/L	0.030	1.0	350.1
Analysis Batch: 280-434945	Analysis Date: 10/25/2018 1113					
Total Alkalinity	64		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2306					
Bicarbonate Alkalinity	64		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2306					
Carbonate Alkalinity	ND		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2306					
Total Organic Carbon - Average	2.1		mg/L	1.0	1.0	SM 5310B
Analysis Batch: 280-434883	Analysis Date: 10/25/2018 0438					

General Chemistry

Client Sample ID: **MW-12I-101618**

Lab Sample ID: 280-115774-4 Date Sampled: 10/16/2018 1235
Client Matrix: Water Date Received: 10/18/2018 0915

Analyte	Result	Qual	Units	RL	Dil	Method
Chloride	3.4		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0238					
Sulfate	6.1		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0238					
Ammonia as N	ND		mg/L	0.030	1.0	350.1
Analysis Batch: 280-434945	Analysis Date: 10/25/2018 1127					
Total Alkalinity	79		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2152					
Bicarbonate Alkalinity	79		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2152					
Carbonate Alkalinity	ND		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2152					
Total Organic Carbon - Average	2.8		mg/L	1.0	1.0	SM 5310B
Analysis Batch: 280-434883	Analysis Date: 10/25/2018 0457					

General Chemistry

Client Sample ID: **SW4-101618**

Lab Sample ID: 280-115774-5 Date Sampled: 10/16/2018 1400
Client Matrix: Water Date Received: 10/18/2018 0915

Analyte	Result	Qual	Units	RL	Dil	Method
Chloride	15		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0254					
Sulfate	20		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0254					
Ammonia as N	ND		mg/L	0.030	1.0	350.1
Analysis Batch: 280-434945	Analysis Date: 10/25/2018 1129					
Total Alkalinity	150		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2211					
Bicarbonate Alkalinity	150		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2211					
Carbonate Alkalinity	ND		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2211					
Total Organic Carbon - Average	8.0		mg/L	1.0	1.0	SM 5310B
Analysis Batch: 280-434883	Analysis Date: 10/25/2018 0511					

General Chemistry

Client Sample ID: **MW-13D-101618**

Lab Sample ID: 280-115774-6 Date Sampled: 10/16/2018 1415
Client Matrix: Water Date Received: 10/18/2018 0915

Analyte	Result	Qual	Units	RL	Dil	Method
Chloride	5.4		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0309					
Sulfate	18		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0309					
Ammonia as N	ND		mg/L	0.030	1.0	350.1
Analysis Batch: 280-434945	Analysis Date: 10/25/2018 1131					
Total Alkalinity	69		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2247					
Bicarbonate Alkalinity	69		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2247					
Carbonate Alkalinity	ND		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2247					
Total Organic Carbon - Average	ND		mg/L	1.0	1.0	SM 5310B
Analysis Batch: 280-434883	Analysis Date: 10/25/2018 0528					

General Chemistry

Client Sample ID: **SW6-101618**

Lab Sample ID: 280-115774-7 Date Sampled: 10/16/2018 1445
Client Matrix: Water Date Received: 10/18/2018 0915

Analyte	Result	Qual	Units	RL	Dil	Method
Chloride	4.4		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0324					
Sulfate	5.4		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0324					
Ammonia as N	0.053		mg/L	0.030	1.0	350.1
Analysis Batch: 280-434945	Analysis Date: 10/25/2018 1133					
Total Alkalinity	62		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2230					
Bicarbonate Alkalinity	62		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2230					
Carbonate Alkalinity	ND		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2230					
Total Organic Carbon - Average	12		mg/L	1.0	1.0	SM 5310B
Analysis Batch: 280-434883	Analysis Date: 10/25/2018 0543					

General Chemistry

Client Sample ID: **SW7-101618**

Lab Sample ID: 280-115774-8 Date Sampled: 10/16/2018 1540
Client Matrix: Water Date Received: 10/18/2018 0915

Analyte	Result	Qual	Units	RL	Dil	Method
Chloride	4.1		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0411					
Sulfate	7.8		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0411					
Ammonia as N	ND		mg/L	0.030	1.0	350.1
Analysis Batch: 280-434945	Analysis Date: 10/25/2018 1135					
Total Alkalinity	56		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2219					
Bicarbonate Alkalinity	56		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2219					
Carbonate Alkalinity	ND		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2219					
Total Organic Carbon - Average	8.5		mg/L	1.0	1.0	SM 5310B
Analysis Batch: 280-434883	Analysis Date: 10/25/2018 0558					

General Chemistry

Client Sample ID: **MW-14-101618**

Lab Sample ID: 280-115774-9 Date Sampled: 10/16/2018 1710
Client Matrix: Water Date Received: 10/18/2018 0915

Analyte	Result	Qual	Units	RL	Dil	Method
Chloride	8.7		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0426					
Sulfate	13		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0426					
Ammonia as N	ND		mg/L	0.030	1.0	350.1
Analysis Batch: 280-434945	Analysis Date: 10/25/2018 1137					
Total Alkalinity	91		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2238					
Bicarbonate Alkalinity	91		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2238					
Carbonate Alkalinity	ND		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2238					
Total Organic Carbon - Average	2.4		mg/L	1.0	1.0	SM 5310B
Analysis Batch: 280-434883	Analysis Date: 10/25/2018 0617					

General Chemistry

Client Sample ID: **MW-6-101618**

Lab Sample ID: 280-115774-10 Date Sampled: 10/16/2018 1825
Client Matrix: Water Date Received: 10/18/2018 0915

Analyte	Result	Qual	Units	RL	Dil	Method
Chloride	17		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0442					
Sulfate	35		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0442					
Ammonia as N	ND		mg/L	0.030	1.0	350.1
Analysis Batch: 280-434945	Analysis Date: 10/25/2018 1139					
Total Alkalinity	150		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2342					
Bicarbonate Alkalinity	150		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2342					
Carbonate Alkalinity	ND		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2342					
Total Organic Carbon - Average	1.7		mg/L	1.0	1.0	SM 5310B
Analysis Batch: 280-434883	Analysis Date: 10/25/2018 0707					

General Chemistry

Client Sample ID: **MW-20D-101618**

Lab Sample ID: 280-115774-11 Date Sampled: 10/16/2018 0000
Client Matrix: Water Date Received: 10/18/2018 0915

Analyte	Result	Qual	Units	RL	Dil	Method
Chloride	9.1		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0457					
Sulfate	13		mg/L	1.0	1.0	300.0
Analysis Batch: 280-434900	Analysis Date: 10/26/2018 0457					
Ammonia as N	ND		mg/L	0.030	1.0	350.1
Analysis Batch: 280-434945	Analysis Date: 10/25/2018 1141					
Total Alkalinity	90		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2352					
Bicarbonate Alkalinity	90		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2352					
Carbonate Alkalinity	ND		mg/L	5.0	1.0	SM 2320B
Analysis Batch: 280-434367	Analysis Date: 10/19/2018 2352					
Total Organic Carbon - Average	2.4		mg/L	1.0	1.0	SM 5310B
Analysis Batch: 280-434883	Analysis Date: 10/25/2018 0724					

DATA REPORTING QUALIFIERS

Client: Aspect Consulting Job Number: 280-115774-1

Lab Section	Qualifier	Description
Metals		
	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.

QUALITY CONTROL RESULTS

Client: Aspect Consulting

Job Number: 280-115774-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC/MS VOA					
Analysis Batch:480-441333					
LCS 480-441333/6	Lab Control Sample	T	Water	8260C SIM	
LCSD 480-441333/7	Lab Control Sample Duplicate	T	Water	8260C SIM	
MB 480-441333/9	Method Blank	T	Water	8260C SIM	
280-115774-1	MW-7-101618	T	Water	8260C SIM	
280-115774-2	MW-5-101618	T	Water	8260C SIM	
280-115774-3	SW1-101618	T	Water	8260C SIM	
280-115774-4	MW-12I-101618	T	Water	8260C SIM	
280-115774-5	SW4-101618	T	Water	8260C SIM	
280-115774-6	MW-13D-101618	T	Water	8260C SIM	
280-115774-7	SW6-101618	T	Water	8260C SIM	
280-115774-8	SW7-101618	T	Water	8260C SIM	
280-115774-9	MW-14-101618	T	Water	8260C SIM	
280-115774-10	MW-6-101618	T	Water	8260C SIM	
280-115774-11	MW-20D-101618	T	Water	8260C SIM	
280-115774-12	TB1	T	Water	8260C SIM	

Report Basis
T = Total

Client: Aspect Consulting Job Number: 280-115774-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 280-434183					
LCS 280-434183/2-A	Lab Control Sample	R	Water	3005A	
MB 280-434183/1-A	Method Blank	R	Water	3005A	
280-115737-A-3-B MS	Matrix Spike	D	Water	3005A	
280-115737-A-3-C MSD	Matrix Spike Duplicate	D	Water	3005A	
280-115774-1	MW-7-101618	D	Water	3005A	
280-115774-2	MW-5-101618	D	Water	3005A	
280-115774-3	SW1-101618	D	Water	3005A	
280-115774-4	MW-12I-101618	D	Water	3005A	
280-115774-5	SW4-101618	D	Water	3005A	
280-115774-6	MW-13D-101618	D	Water	3005A	
280-115774-7	SW6-101618	D	Water	3005A	
280-115774-8	SW7-101618	D	Water	3005A	
280-115774-9	MW-14-101618	D	Water	3005A	
280-115774-10	MW-6-101618	D	Water	3005A	
280-115774-11	MW-20D-101618	D	Water	3005A	
Analysis Batch:280-434473					
LCS 280-434183/2-A	Lab Control Sample	R	Water	6020	280-434183
MB 280-434183/1-A	Method Blank	R	Water	6020	280-434183
280-115737-A-3-B MS	Matrix Spike	D	Water	6020	280-434183
280-115737-A-3-C MSD	Matrix Spike Duplicate	D	Water	6020	280-434183
280-115774-1	MW-7-101618	D	Water	6020	280-434183
280-115774-2	MW-5-101618	D	Water	6020	280-434183
280-115774-3	SW1-101618	D	Water	6020	280-434183
280-115774-4	MW-12I-101618	D	Water	6020	280-434183
280-115774-5	SW4-101618	D	Water	6020	280-434183
280-115774-6	MW-13D-101618	D	Water	6020	280-434183
280-115774-7	SW6-101618	D	Water	6020	280-434183
280-115774-8	SW7-101618	D	Water	6020	280-434183
280-115774-9	MW-14-101618	D	Water	6020	280-434183
280-115774-10	MW-6-101618	D	Water	6020	280-434183
280-115774-11	MW-20D-101618	D	Water	6020	280-434183

Report Basis
D = Dissolved
R = Total Recoverable

Client: Aspect Consulting Job Number: 280-115774-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:280-434367					
LCS 280-434367/30	Lab Control Sample	T	Water	SM 2320B	
MB 280-434367/31	Method Blank	T	Water	SM 2320B	
280-115774-1	MW-7-101618	T	Water	SM 2320B	
280-115774-2	MW-5-101618	T	Water	SM 2320B	
280-115774-3	SW1-101618	T	Water	SM 2320B	
280-115774-4	MW-12I-101618	T	Water	SM 2320B	
280-115774-4DU	Duplicate	T	Water	SM 2320B	
280-115774-5	SW4-101618	T	Water	SM 2320B	
280-115774-6	MW-13D-101618	T	Water	SM 2320B	
280-115774-7	SW6-101618	T	Water	SM 2320B	
280-115774-8	SW7-101618	T	Water	SM 2320B	
280-115774-9	MW-14-101618	T	Water	SM 2320B	
280-115774-10	MW-6-101618	T	Water	SM 2320B	
280-115774-11	MW-20D-101618	T	Water	SM 2320B	
Analysis Batch:280-434883					
LCS 280-434883/34	Lab Control Sample	T	Water	SM 5310B	
MB 280-434883/35	Method Blank	T	Water	SM 5310B	
280-115774-1	MW-7-101618	T	Water	SM 5310B	
280-115774-2	MW-5-101618	T	Water	SM 5310B	
280-115774-2MS	Matrix Spike	T	Water	SM 5310B	
280-115774-2MSD	Matrix Spike Duplicate	T	Water	SM 5310B	
280-115774-3	SW1-101618	T	Water	SM 5310B	
280-115774-4	MW-12I-101618	T	Water	SM 5310B	
280-115774-5	SW4-101618	T	Water	SM 5310B	
280-115774-6	MW-13D-101618	T	Water	SM 5310B	
280-115774-7	SW6-101618	T	Water	SM 5310B	
280-115774-8	SW7-101618	T	Water	SM 5310B	
280-115774-9	MW-14-101618	T	Water	SM 5310B	
280-115774-10	MW-6-101618	T	Water	SM 5310B	
280-115774-11	MW-20D-101618	T	Water	SM 5310B	

Client: Aspect Consulting Job Number: 280-115774-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:280-434900					
LCS 280-434900/4	Lab Control Sample	T	Water	300.0	
LCSD 280-434900/5	Lab Control Sample Duplicate	T	Water	300.0	
MB 280-434900/6	Method Blank	T	Water	300.0	
280-115774-1	MW-7-101618	T	Water	300.0	
280-115774-1DU	Duplicate	T	Water	300.0	
280-115774-1MS	Matrix Spike	T	Water	300.0	
280-115774-1MSD	Matrix Spike Duplicate	T	Water	300.0	
280-115774-2	MW-5-101618	T	Water	300.0	
280-115774-3	SW1-101618	T	Water	300.0	
280-115774-4	MW-12I-101618	T	Water	300.0	
280-115774-5	SW4-101618	T	Water	300.0	
280-115774-6	MW-13D-101618	T	Water	300.0	
280-115774-7	SW6-101618	T	Water	300.0	
280-115774-8	SW7-101618	T	Water	300.0	
280-115774-9	MW-14-101618	T	Water	300.0	
280-115774-10	MW-6-101618	T	Water	300.0	
280-115774-11	MW-20D-101618	T	Water	300.0	
Analysis Batch:280-434945					
LCS 280-434945/63	Lab Control Sample	T	Water	350.1	
MB 280-434945/64	Method Blank	T	Water	350.1	
280-115550-C-1 MS	Matrix Spike	T	Water	350.1	
280-115550-C-1 MSD	Matrix Spike Duplicate	T	Water	350.1	
280-115774-1	MW-7-101618	T	Water	350.1	
280-115774-2	MW-5-101618	T	Water	350.1	
280-115774-3	SW1-101618	T	Water	350.1	
280-115774-4	MW-12I-101618	T	Water	350.1	
280-115774-5	SW4-101618	T	Water	350.1	
280-115774-6	MW-13D-101618	T	Water	350.1	
280-115774-7	SW6-101618	T	Water	350.1	
280-115774-8	SW7-101618	T	Water	350.1	
280-115774-9	MW-14-101618	T	Water	350.1	
280-115774-10	MW-6-101618	T	Water	350.1	
280-115774-11	MW-20D-101618	T	Water	350.1	

Report Basis
T = Total

Surrogate Recovery Report

8260C SIM Volatile Organic Compounds (GC/MS)

Client Matrix: Water

Lab Sample ID	Client Sample ID	DBFM %Rec	TBA %Rec
280-115774-1	MW-7-101618	110	102
280-115774-2	MW-5-101618	110	110
280-115774-3	SW1-101618	112	105
280-115774-4	MW-12I-101618	113	111
280-115774-5	SW4-101618	112	103
280-115774-6	MW-13D-101618	114	115
280-115774-7	SW6-101618	112	102
280-115774-8	SW7-101618	113	102
280-115774-9	MW-14-101618	113	101
280-115774-10	MW-6-101618	114	104
280-115774-11	MW-20D-101618	114	106
280-115774-12	TB1	111	101
MB 480-441333/9		110	106
LCS 480-441333/6		101	74
LCSD 480-441333/7		102	88

Surrogate	Acceptance Limits
DBFM = Dibromofluoromethane (Surr)	50-150
TBA = TBA-d9 (Surr)	50-150

Client: Aspect Consulting Job Number: 280-115774-1

Method Blank - Batch: 480-441333 **Method: 8260C SIM**
Preparation: 5030C

Lab Sample ID:	MB 480-441333/9	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	J7826.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1200	Units:	ug/L	Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1200				
Leach Date:	N/A				

Analyte	Result	Qual	RL
Vinyl chloride	ND		0.020

Surrogate	% Rec	Acceptance Limits
Dibromofluoromethane (Surr)	110	50 - 150
TBA-d9 (Surr)	106	50 - 150

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 480-441333 **Method: 8260C SIM**
Preparation: 5030C

LCS Lab Sample ID:	LCS 480-441333/6	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	J7823.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1047	Units:	ug/L	Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1047				25 mL
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 480-441333/7	Analysis Batch:	480-441333	Instrument ID:	HP5973J
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	J7824.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	25 mL
Analysis Date:	10/24/2018 1111	Units:	ug/L	Final Weight/Volume:	25 mL
Prep Date:	10/24/2018 1111				25 mL
Leach Date:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Vinyl chloride	110	116	50 - 150	5	20		

Surrogate	LCS % Rec	LCSD % Rec	Acceptance Limits
Dibromofluoromethane (Surr)	101	102	50 - 150
TBA-d9 (Surr)	74	88	50 - 150

Client: Aspect Consulting

Job Number: 280-115774-1

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 480-441333

Method: 8260C SIM
Preparation: 5030C

LCS Lab Sample ID:	LCS 480-441333/6	Units: ug/L		LCSD Lab Sample ID:	LCSD 480-441333/7
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	10/24/2018 1047			Analysis Date:	10/24/2018 1111
Prep Date:	10/24/2018 1047			Prep Date:	10/24/2018 1111
Leach Date:	N/A			Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Vinyl chloride	0.200	0.200	0.220	0.231

Method Blank - Batch: 280-434183

Method: 6020
Preparation: 3005A
Total Recoverable

Lab Sample ID:	MB 280-434183/1-A	Analysis Batch:	280-434473	Instrument ID:	MT_078
Client Matrix:	Water	Prep Batch:	280-434183	Lab File ID:	249_BLK.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0142	Units:	ug/L	Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				
Leach Date:	N/A				

Analyte	Result	Qual	RL
Manganese	ND		1.0

Lab Control Sample - Batch: 280-434183

Method: 6020
Preparation: 3005A
Total Recoverable

Lab Sample ID:	LCS 280-434183/2-A	Analysis Batch:	280-434473	Instrument ID:	MT_078
Client Matrix:	Water	Prep Batch:	280-434183	Lab File ID:	250_LCS.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0145	Units:	ug/L	Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Manganese	40.0	41.1	103	85 - 117	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-434183

Method: 6020
Preparation: 3005A
Dissolved

MS Lab Sample ID:	280-115737-A-3-B MS	Analysis Batch:	280-434473	Instrument ID:	MT_078
Client Matrix:	Water	Prep Batch:	280-434183	Lab File ID:	255SMPL.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0203			Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				
Leach Date:	N/A				

MSD Lab Sample ID:	280-115737-A-3-C MSD	Analysis Batch:	280-434473	Instrument ID:	MT_078
Client Matrix:	Water	Prep Batch:	280-434183	Lab File ID:	256SMPL.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	50 mL
Analysis Date:	10/23/2018 0206			Final Weight/Volume:	50 mL
Prep Date:	10/21/2018 1130				
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Manganese	67	69	85 - 117	0	20	4	4

Client: Aspect Consulting

Job Number: 280-115774-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-434183

Method: 6020
Preparation: 3005A
Dissolved

MS Lab Sample ID:	280-115737-A-3-B MS	Units: ug/L	MSD Lab Sample ID:	280-115737-A-3-C MSD
Client Matrix:	Water		Client Matrix:	Water
Dilution:	1.0		Dilution:	1.0
Analysis Date:	10/23/2018 0203		Analysis Date:	10/23/2018 0206
Prep Date:	10/21/2018 1130		Prep Date:	10/21/2018 1130
Leach Date:	N/A		Leach Date:	N/A

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual		MSD Result/Qual	
Manganese	530	40.0	40.0	561	4	562	4

Method Blank - Batch: 280-434900 **Method: 300.0**
Preparation: N/A

Lab Sample ID:	MB 280-434900/6	Analysis Batch:	280-434900	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	06.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	10/25/2018 1245	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	RL
Chloride	ND		1.0
Sulfate	ND		1.0

Method Reporting Limit Check - Batch: 280-434900 **Method: 300.0**
Preparation: N/A

Lab Sample ID:	MRL 280-434900/3	Analysis Batch:	280-434900	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	03.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	10/25/2018 1158	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Chloride	2.50	ND	107	50 - 150	
Sulfate	2.50	ND	106	50 - 150	

Lab Control Sample/
Lab Control Sample Duplicate Recovery Report - Batch: 280-434900 **Method: 300.0**
Preparation: N/A

LCS Lab Sample ID:	LCS 280-434900/4	Analysis Batch:	280-434900	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	04.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	10/25/2018 1214	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				25 uL
Leach Date:	N/A				

LCSD Lab Sample ID:	LCSD 280-434900/5	Analysis Batch:	280-434900	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	05.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	10/25/2018 1229	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				25 uL
Leach Date:	N/A				

	% Rec.						
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Chloride	100	100	90 - 110	0	10		
Sulfate	102	102	90 - 110	0	10		

Client: Aspect Consulting

Job Number: 280-115774-1

Laboratory Control/
Laboratory Duplicate Data Report - Batch: 280-434900

Method: 300.0
Preparation: N/A

LCS Lab Sample ID:	LCS 280-434900/4	Units: mg/L	
Client Matrix:	Water		
Dilution:	1.0		
Analysis Date:	10/25/2018 1214		
Prep Date:	N/A		
Leach Date:	N/A		

LCSD Lab Sample ID:	LCSD 280-434900/5
Client Matrix:	Water
Dilution:	1.0
Analysis Date:	10/25/2018 1229
Prep Date:	N/A
Leach Date:	N/A

Analyte	LCS Spike Amount	LCSD Spike Amount	LCS Result/Qual	LCSD Result/Qual
Chloride	100	100	100	100
Sulfate	100	100	102	102

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-434900

Method: 300.0
Preparation: N/A

MS Lab Sample ID:	280-115774-1	Analysis Batch:	280-434900	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	29.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	10/26/2018 0136			Final Weight/Volume:	5 mL
Prep Date:	N/A				25 uL
Leach Date:	N/A				

MSD Lab Sample ID:	280-115774-1	Analysis Batch:	280-434900	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	30.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	10/26/2018 0152			Final Weight/Volume:	5 mL
Prep Date:	N/A				25 uL
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Chloride	114	115	80 - 120	1	20		
Sulfate	115	119	80 - 120	3	20		

Client: Aspect Consulting

Job Number: 280-115774-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-434900

Method: 300.0
Preparation: N/A

MS Lab Sample ID:	280-115774-1	Units: mg/L	MSD Lab Sample ID:	280-115774-1	
Client Matrix:	Water		Client Matrix:	Water	
Dilution:	1.0		Dilution:	1.0	
Analysis Date:	10/26/2018 0136		Analysis Date:	10/26/2018 0152	
Prep Date:	N/A		Prep Date:	N/A	
Leach Date:	N/A		Leach Date:	N/A	

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Chloride	1.1	25.0	25.0	29.7	29.9
Sulfate	2.8	25.0	25.0	31.6	32.5

Duplicate - Batch: 280-434900

Method: 300.0
Preparation: N/A

Lab Sample ID:	280-115774-1	Analysis Batch:	280-434900	Instrument ID:	WC_IonChrom7
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	28.0000.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	5 mL
Analysis Date:	10/26/2018 0121	Units:	mg/L	Final Weight/Volume:	5 mL
Prep Date:	N/A				25 uL
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Chloride	1.1	1.10	0.9	15	
Sulfate	2.8	2.82	0	15	

Client: Aspect Consulting Job Number: 280-115774-1

Method Blank - Batch: 280-434945

Method: 350.1
Preparation: N/A

Lab Sample ID:	MB 280-434945/64	Analysis Batch:	280-434945	Instrument ID:	WC_Alp 3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\102518.RS
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	10/25/2018 1053	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	RL
Ammonia as N	ND		0.030

Lab Control Sample - Batch: 280-434945

Method: 350.1
Preparation: N/A

Lab Sample ID:	LCS 280-434945/63	Analysis Batch:	280-434945	Instrument ID:	WC_Alp 3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\102518.RS
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	100 mL
Analysis Date:	10/25/2018 1051	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Ammonia as N	2.50	2.61	105	90 - 110	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-434945

Method: 350.1
Preparation: N/A

MS Lab Sample ID:	280-115550-C-1 MS	Analysis Batch:	280-434945	Instrument ID:	WC_Alp 3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\102518.RS
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	10/25/2018 1057			Final Weight/Volume:	10 mL
Prep Date:	N/A				
Leach Date:	N/A				

MSD Lab Sample ID:	280-115550-C-1 MSD	Analysis Batch:	280-434945	Instrument ID:	WC_Alp 3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	C:\FLOW_4\102518.RS
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	10 mL
Analysis Date:	10/25/2018 1059			Final Weight/Volume:	10 mL
Prep Date:	N/A				
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Ammonia as N	101	105	90 - 110	3	10		

Client: Aspect Consulting

Job Number: 280-115774-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-434945

Method: 350.1
Preparation: N/A

MS Lab Sample ID:	280-115550-C-1 MS	Units: mg/L	MSD Lab Sample ID:	280-115550-C-1 MSD	
Client Matrix:	Water		Client Matrix:	Water	
Dilution:	1.0		Dilution:	1.0	
Analysis Date:	10/25/2018 1057		Analysis Date:	10/25/2018 1059	
Prep Date:	N/A		Prep Date:	N/A	
Leach Date:	N/A		Leach Date:	N/A	

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Ammonia as N	ND	1.00	1.00	1.01	1.05

Client: Aspect Consulting

Job Number: 280-115774-1

Method Blank - Batch: 280-434367

Method: SM 2320B
Preparation: N/A

Lab Sample ID:	MB 280-434367/31	Analysis Batch:	280-434367	Instrument ID:	WC_AT2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	alk 101918.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	10/19/2018 2142	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	RL
Total Alkalinity	ND		5.0
Bicarbonate Alkalinity	ND		5.0
Carbonate Alkalinity	ND		5.0

Lab Control Sample - Batch: 280-434367

Method: SM 2320B
Preparation: N/A

Lab Sample ID:	LCS 280-434367/30	Analysis Batch:	280-434367	Instrument ID:	WC_AT2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	alk 101918.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	10/19/2018 2136	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Total Alkalinity	200	185	93	90 - 110	

Duplicate - Batch: 280-434367

Method: SM 2320B
Preparation: N/A

Lab Sample ID:	280-115774-4	Analysis Batch:	280-434367	Instrument ID:	WC_AT2
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	alk 101918.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	10/19/2018 2202	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Total Alkalinity	79	78.6	0	10	
Bicarbonate Alkalinity	79	78.6	0		
Carbonate Alkalinity	ND	ND	NC		

Method Blank - Batch: 280-434883

Method: SM 5310B
Preparation: N/A

Lab Sample ID:	MB 280-434883/35	Analysis Batch:	280-434883	Instrument ID:	WC_SHI3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	102418.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	10/24/2018 2306	Units:	mg/L	Final Weight/Volume:	
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Result	Qual	RL
Total Organic Carbon - Average	ND		1.0

Lab Control Sample - Batch: 280-434883

Method: SM 5310B
Preparation: N/A

Lab Sample ID:	LCS 280-434883/34	Analysis Batch:	280-434883	Instrument ID:	WC_SHI3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	102418.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	10/24/2018 2246	Units:	mg/L	Final Weight/Volume:	100 mL
Prep Date:	N/A				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Total Organic Carbon - Average	25.0	24.4	98	88 - 112	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-434883

Method: SM 5310B
Preparation: N/A

MS Lab Sample ID:	280-115774-2	Analysis Batch:	280-434883	Instrument ID:	WC_SHI3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	102418.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	10/25/2018 0406			Final Weight/Volume:	50 mL
Prep Date:	N/A				
Leach Date:	N/A				

MSD Lab Sample ID:	280-115774-2	Analysis Batch:	280-434883	Instrument ID:	WC_SHI3
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	102418.txt
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	
Analysis Date:	10/25/2018 0421			Final Weight/Volume:	50 mL
Prep Date:	N/A				
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Total Organic Carbon - Average	98	98	88 - 112	0	15		

Client: Aspect Consulting

Job Number: 280-115774-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-434883

Method: SM 5310B
Preparation: N/A

MS Lab Sample ID:	280-115774-2	Units: mg/L	MSD Lab Sample ID:	280-115774-2	
Client Matrix:	Water		Client Matrix:	Water	
Dilution:	1.0		Dilution:	1.0	
Analysis Date:	10/25/2018 0406		Analysis Date:	10/25/2018 0421	
Prep Date:	N/A		Prep Date:	N/A	
Leach Date:	N/A		Leach Date:	N/A	

Analyte	Sample Result/Qual	MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Total Organic Carbon - Average	ND	25.0	25.0	25.0	25.0

Client: Aspect Consulting Job Number: 280-115774-1

Laboratory Chronicle

Lab ID: 280-115774-1 **Client ID: MW-7-101618**

Sample Date/Time: 10/16/2018 09:45 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	280-115774-F-1		480-441333		10/24/2018 15:12	1	TAL BUF	CDC
A:8260C SIM	280-115774-F-1		480-441333		10/24/2018 15:12	1	TAL BUF	CDC
P:3005A	280-115774-B-1-A		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	280-115774-B-1-A		280-434473	280-434183	10/23/2018 02:27	1	TAL DEN	LMT
A:300.0	280-115774-A-1		280-434900		10/26/2018 01:06	1	TAL DEN	A1D
A:350.1	280-115774-C-1		280-434945		10/25/2018 11:09	1	TAL DEN	JAP
A:SM 2320B	280-115774-A-1		280-434367		10/19/2018 22:58	1	TAL DEN	SGB
A:SM 5310B	280-115774-C-1		280-434883		10/25/2018 03:03	1	TAL DEN	LPL

Lab ID: 280-115774-1 MS **Client ID: MW-7-101618**

Sample Date/Time: 10/16/2018 09:45 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:300.0	280-115774-A-1 MS		280-434900		10/26/2018 01:36	1	TAL DEN	A1D

Lab ID: 280-115774-1 MSD **Client ID: MW-7-101618**

Sample Date/Time: 10/16/2018 09:45 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:300.0	280-115774-A-1 MSD		280-434900		10/26/2018 01:52	1	TAL DEN	A1D

Lab ID: 280-115774-1 DU **Client ID: MW-7-101618**

Sample Date/Time: 10/16/2018 09:45 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:300.0	280-115774-A-1 DU		280-434900		10/26/2018 01:21	1	TAL DEN	A1D

Lab ID: 280-115774-2 **Client ID: MW-5-101618**

Sample Date/Time: 10/16/2018 11:10 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	280-115774-F-2		480-441333		10/24/2018 15:37	1	TAL BUF	CDC
A:8260C SIM	280-115774-F-2		480-441333		10/24/2018 15:37	1	TAL BUF	CDC
P:3005A	280-115774-B-2-A		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	280-115774-B-2-A		280-434473	280-434183	10/23/2018 02:30	1	TAL DEN	LMT
A:300.0	280-115774-A-2		280-434900		10/26/2018 02:07	1	TAL DEN	A1D
A:350.1	280-115774-C-2		280-434945		10/25/2018 11:11	1	TAL DEN	JAP
A:SM 2320B	280-115774-A-2		280-434367		10/19/2018 23:15	1	TAL DEN	SGB
A:SM 5310B	280-115774-C-2		280-434883		10/25/2018 03:51	1	TAL DEN	LPL

Client: Aspect Consulting Job Number: 280-115774-1

Laboratory Chronicle

Lab ID: 280-115774-2 MS **Client ID: MW-5-101618**

Sample Date/Time: 10/16/2018 11:10 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:SM 5310B	280-115774-C-2 MS		280-434883		10/25/2018 04:06	1	TAL DEN	LPL

Lab ID: 280-115774-2 MSD **Client ID: MW-5-101618**

Sample Date/Time: 10/16/2018 11:10 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:SM 5310B	280-115774-C-2 MSD		280-434883		10/25/2018 04:21	1	TAL DEN	LPL

Lab ID: 280-115774-3 **Client ID: SW1-101618**

Sample Date/Time: 10/16/2018 12:20 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	280-115774-F-3		480-441333		10/24/2018 16:01	1	TAL BUF	CDC
A:8260C SIM	280-115774-F-3		480-441333		10/24/2018 16:01	1	TAL BUF	CDC
P:3005A	280-115774-B-3-A		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	280-115774-B-3-A		280-434473	280-434183	10/23/2018 02:34	1	TAL DEN	LMT
A:300.0	280-115774-A-3		280-434900		10/26/2018 02:23	1	TAL DEN	A1D
A:350.1	280-115774-C-3		280-434945		10/25/2018 11:13	1	TAL DEN	JAP
A:SM 2320B	280-115774-A-3		280-434367		10/19/2018 23:06	1	TAL DEN	SGB
A:SM 5310B	280-115774-C-3		280-434883		10/25/2018 04:38	1	TAL DEN	LPL

Lab ID: 280-115774-4 **Client ID: MW-12I-101618**

Sample Date/Time: 10/16/2018 12:35 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	280-115774-F-4		480-441333		10/24/2018 16:25	1	TAL BUF	CDC
A:8260C SIM	280-115774-F-4		480-441333		10/24/2018 16:25	1	TAL BUF	CDC
P:3005A	280-115774-B-4-A		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	280-115774-B-4-A		280-434473	280-434183	10/23/2018 02:37	1	TAL DEN	LMT
A:300.0	280-115774-A-4		280-434900		10/26/2018 02:38	1	TAL DEN	A1D
A:350.1	280-115774-C-4		280-434945		10/25/2018 11:27	1	TAL DEN	JAP
A:SM 2320B	280-115774-A-4		280-434367		10/19/2018 21:52	1	TAL DEN	SGB
A:SM 5310B	280-115774-C-4		280-434883		10/25/2018 04:57	1	TAL DEN	LPL

Lab ID: 280-115774-4 DU **Client ID: MW-12I-101618**

Sample Date/Time: 10/16/2018 12:35 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:SM 2320B	280-115774-A-4 DU		280-434367		10/19/2018 22:02	1	TAL DEN	SGB

Client: Aspect Consulting Job Number: 280-115774-1

Laboratory Chronicle

Lab ID: 280-115774-5 **Client ID: SW4-101618**

Sample Date/Time: 10/16/2018 14:00 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	280-115774-F-5		480-441333		10/24/2018 16:49	1	TAL BUF	CDC
A:8260C SIM	280-115774-F-5		480-441333		10/24/2018 16:49	1	TAL BUF	CDC
P:3005A	280-115774-B-5-A		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	280-115774-B-5-A		280-434473	280-434183	10/23/2018 02:41	1	TAL DEN	LMT
A:300.0	280-115774-A-5		280-434900		10/26/2018 02:54	1	TAL DEN	A1D
A:350.1	280-115774-C-5		280-434945		10/25/2018 11:29	1	TAL DEN	JAP
A:SM 2320B	280-115774-A-5		280-434367		10/19/2018 22:11	1	TAL DEN	SGB
A:SM 5310B	280-115774-C-5		280-434883		10/25/2018 05:11	1	TAL DEN	LPL

Lab ID: 280-115774-6 **Client ID: MW-13D-101618**

Sample Date/Time: 10/16/2018 14:15 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	280-115774-F-6		480-441333		10/24/2018 17:13	1	TAL BUF	CDC
A:8260C SIM	280-115774-F-6		480-441333		10/24/2018 17:13	1	TAL BUF	CDC
P:3005A	280-115774-B-6-A		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	280-115774-B-6-A		280-434473	280-434183	10/23/2018 02:44	1	TAL DEN	LMT
A:300.0	280-115774-A-6		280-434900		10/26/2018 03:09	1	TAL DEN	A1D
A:350.1	280-115774-C-6		280-434945		10/25/2018 11:31	1	TAL DEN	JAP
A:SM 2320B	280-115774-A-6		280-434367		10/19/2018 22:47	1	TAL DEN	SGB
A:SM 5310B	280-115774-C-6		280-434883		10/25/2018 05:28	1	TAL DEN	LPL

Lab ID: 280-115774-7 **Client ID: SW6-101618**

Sample Date/Time: 10/16/2018 14:45 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	280-115774-F-7		480-441333		10/24/2018 17:38	1	TAL BUF	CDC
A:8260C SIM	280-115774-F-7		480-441333		10/24/2018 17:38	1	TAL BUF	CDC
P:3005A	280-115774-B-7-A		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	280-115774-B-7-A		280-434473	280-434183	10/23/2018 02:54	1	TAL DEN	LMT
A:300.0	280-115774-A-7		280-434900		10/26/2018 03:24	1	TAL DEN	A1D
A:350.1	280-115774-C-7		280-434945		10/25/2018 11:33	1	TAL DEN	JAP
A:SM 2320B	280-115774-A-7		280-434367		10/19/2018 22:30	1	TAL DEN	SGB
A:SM 5310B	280-115774-C-7		280-434883		10/25/2018 05:43	1	TAL DEN	LPL

Client: Aspect Consulting Job Number: 280-115774-1

Laboratory Chronicle

Lab ID: 280-115774-8 **Client ID: SW7-101618**

Sample Date/Time: 10/16/2018 15:40 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	280-115774-F-8		480-441333		10/24/2018 18:02	1	TAL BUF	CDC
A:8260C SIM	280-115774-F-8		480-441333		10/24/2018 18:02	1	TAL BUF	CDC
P:3005A	280-115774-B-8-A		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	280-115774-B-8-A		280-434473	280-434183	10/23/2018 02:58	1	TAL DEN	LMT
A:300.0	280-115774-A-8		280-434900		10/26/2018 04:11	1	TAL DEN	A1D
A:350.1	280-115774-C-8		280-434945		10/25/2018 11:35	1	TAL DEN	JAP
A:SM 2320B	280-115774-A-8		280-434367		10/19/2018 22:19	1	TAL DEN	SGB
A:SM 5310B	280-115774-C-8		280-434883		10/25/2018 05:58	1	TAL DEN	LPL

Lab ID: 280-115774-9 **Client ID: MW-14-101618**

Sample Date/Time: 10/16/2018 17:10 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	280-115774-F-9		480-441333		10/24/2018 18:26	1	TAL BUF	CDC
A:8260C SIM	280-115774-F-9		480-441333		10/24/2018 18:26	1	TAL BUF	CDC
P:3005A	280-115774-B-9-A		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	280-115774-B-9-A		280-434473	280-434183	10/23/2018 03:01	1	TAL DEN	LMT
A:300.0	280-115774-A-9		280-434900		10/26/2018 04:26	1	TAL DEN	A1D
A:350.1	280-115774-C-9		280-434945		10/25/2018 11:37	1	TAL DEN	JAP
A:SM 2320B	280-115774-A-9		280-434367		10/19/2018 22:38	1	TAL DEN	SGB
A:SM 5310B	280-115774-C-9		280-434883		10/25/2018 06:17	1	TAL DEN	LPL

Lab ID: 280-115774-10 **Client ID: MW-6-101618**

Sample Date/Time: 10/16/2018 18:25 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	280-115774-F-10		480-441333		10/24/2018 18:50	1	TAL BUF	CDC
A:8260C SIM	280-115774-F-10		480-441333		10/24/2018 18:50	1	TAL BUF	CDC
P:3005A	280-115774-B-10-A		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	280-115774-B-10-A		280-434473	280-434183	10/23/2018 03:05	1	TAL DEN	LMT
A:300.0	280-115774-A-10		280-434900		10/26/2018 04:42	1	TAL DEN	A1D
A:350.1	280-115774-C-10		280-434945		10/25/2018 11:39	1	TAL DEN	JAP
A:SM 2320B	280-115774-A-10		280-434367		10/19/2018 23:42	1	TAL DEN	SGB
A:SM 5310B	280-115774-C-10		280-434883		10/25/2018 07:07	1	TAL DEN	LPL

Client: Aspect Consulting Job Number: 280-115774-1

Laboratory Chronicle

Lab ID: 280-115774-11 **Client ID: MW-20D-101618**

Sample Date/Time: 10/16/2018 00:00 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	280-115774-F-11		480-441333		10/24/2018 19:14	1	TAL BUF	CDC
A:8260C SIM	280-115774-F-11		480-441333		10/24/2018 19:14	1	TAL BUF	CDC
P:3005A	280-115774-B-11-A		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	280-115774-B-11-A		280-434473	280-434183	10/23/2018 03:08	1	TAL DEN	LMT
A:300.0	280-115774-A-11		280-434900		10/26/2018 04:57	1	TAL DEN	A1D
A:350.1	280-115774-C-11		280-434945		10/25/2018 11:41	1	TAL DEN	JAP
A:SM 2320B	280-115774-A-11		280-434367		10/19/2018 23:52	1	TAL DEN	SGB
A:SM 5310B	280-115774-C-11		280-434883		10/25/2018 07:24	1	TAL DEN	LPL

Lab ID: 280-115774-12 **Client ID: TB1**

Sample Date/Time: 10/16/2018 00:00 Received Date/Time: 10/18/2018 09:15

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	280-115774-C-12		480-441333		10/24/2018 19:39	1	TAL BUF	CDC
A:8260C SIM	280-115774-C-12		480-441333		10/24/2018 19:39	1	TAL BUF	CDC

Lab ID: MB **Client ID: N/A**

Sample Date/Time: N/A Received Date/Time: N/A

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	MB 480-441333/9		480-441333		10/24/2018 12:00	1	TAL BUF	CDC
A:8260C SIM	MB 480-441333/9		480-441333		10/24/2018 12:00	1	TAL BUF	CDC
P:3005A	MB 280-434183/1-A		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	MB 280-434183/1-A		280-434473	280-434183	10/23/2018 01:42	1	TAL DEN	LMT
A:300.0	MB 280-434900/6		280-434900		10/25/2018 12:45	1	TAL DEN	A1D
A:350.1	MB 280-434945/64		280-434945		10/25/2018 10:53	1	TAL DEN	JAP
A:SM 2320B	MB 280-434367/31		280-434367		10/19/2018 21:42	1	TAL DEN	SGB
A:SM 5310B	MB 280-434883/35		280-434883		10/24/2018 23:06	1	TAL DEN	LPL

Client: Aspect Consulting Job Number: 280-115774-1

Laboratory Chronicle

Lab ID: LCS **Client ID: N/A**

Sample Date/Time: N/A Received Date/Time: N/A

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	LCS 480-441333/6		480-441333		10/24/2018 10:47	1	TAL BUF	CDC
A:8260C SIM	LCS 480-441333/6		480-441333		10/24/2018 10:47	1	TAL BUF	CDC
P:3005A	LCS 280-434183/2-A		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	LCS 280-434183/2-A		280-434473	280-434183	10/23/2018 01:45	1	TAL DEN	LMT
A:300.0	LCS 280-434900/4		280-434900		10/25/2018 12:14	1	TAL DEN	A1D
A:350.1	LCS 280-434945/63		280-434945		10/25/2018 10:51	1	TAL DEN	JAP
A:SM 2320B	LCS 280-434367/30		280-434367		10/19/2018 21:36	1	TAL DEN	SGB
A:SM 5310B	LCS 280-434883/34		280-434883		10/24/2018 22:46	1	TAL DEN	LPL

Lab ID: LCSD **Client ID: N/A**

Sample Date/Time: N/A Received Date/Time: N/A

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030C	LCSD 480-441333/7		480-441333		10/24/2018 11:11	1	TAL BUF	CDC
A:8260C SIM	LCSD 480-441333/7		480-441333		10/24/2018 11:11	1	TAL BUF	CDC
A:300.0	LCSD 280-434900/5		280-434900		10/25/2018 12:29	1	TAL DEN	A1D

Lab ID: MRL **Client ID: N/A**

Sample Date/Time: N/A Received Date/Time: N/A

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
A:300.0	MRL 280-434900/3		280-434900		10/25/2018 11:58	1	TAL DEN	A1D

Lab ID: MS **Client ID: N/A**

Sample Date/Time: 10/17/2018 11:45 Received Date/Time: 10/18/2018 14:45

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3005A	280-115737-A-3-B MS		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	280-115737-A-3-B MS		280-434473	280-434183	10/23/2018 02:03	1	TAL DEN	LMT
A:350.1	280-115550-C-1 MS		280-434945		10/25/2018 10:57	1	TAL DEN	JAP

Client: Aspect Consulting Job Number: 280-115774-1

Laboratory Chronicle

Lab ID: MSD **Client ID: N/A**

Sample Date/Time: 10/17/2018 11:45 Received Date/Time: 10/18/2018 14:45

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:3005A	280-115737-A-3-C MSD		280-434473	280-434183	10/21/2018 11:30	1	TAL DEN	DAL
A:6020	280-115737-A-3-C MSD		280-434473	280-434183	10/23/2018 02:06	1	TAL DEN	LMT
A:350.1	280-115550-C-1 MSD		280-434945		10/25/2018 10:59	1	TAL DEN	JAP

Lab References:

TAL BUF = TestAmerica Buffalo

TAL DEN = TestAmerica Denver

Analytical Resources, Incorporated
Analytical Chemists and Consultants

31 October 2018

Betsy Sara
Test America - Denver
4955 Yarrow Street
Arvada, CO 80002

RE: Hansville

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
18J0304	N/A

Amanda Volgardsen

Digitally signed by Amanda Volgardsen
DN: c=US, st=Washington, l=Tukwila, o=Analytical Resources, Inc., ou=Project Manager, cn=Amanda Volgardsen, email=amanda.volgardsen@arilabs.com
Date: 2018.10.31 11:18:41 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in it entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171 — 18J0304

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: JACKSON LUNDGREN	Lab PM: Sara, Betsy A	Carrier Tracking No(s):	COC No: 280-23414-6845.1
Client Contact: MEILANI LANIER-KAMAHAO	Phone: 206-413-5408	E-Mail: betsy.sara@testamericainc.com		Page: 1/1
Company: Aspect Consulting, LLC				Job #:
Address: 350 Madison Ave N	Due Date Requested:			
City: Bainbridge Island	TAT Requested (days):			
State, Zip: WA, 98110				
Phone:	PO #: Purchase Order not required			
Email: MKAMAHAO@ASPECTCONSULTING.COM	WO #:			
Project Name: Hansville Landfill	Project #:skip sites/events 28006013 - 2Q/3Q/4Q Sampling			
Site: Washington	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)	8260C SIM - Vinyl Chloride (TA Buffalo)	Dissolved Metals	Ammonia/TOC	Alks/Cl/SO4	Ortho-phosphate (field filtered)- direct sub to ARI	Dissolved Arsenice - direct sub to ARI	Nitrate/Nitrite (IC) - direct sub to ARI	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A	D	S	N	N	D	N		
~~SW~~ MW-7-101618	10/16/18	0945		W	Y						✓	✓	✓		
MW-5-101618		1110									✓	✓	✓		
SW-1-101618		1220									✓	✓	✓		Diss As,NO3,NO2,o-phos subbed direct to ARI
MW-12I-101618		1235									✓	✓	✓		
SW-4-101618		1400									✓	✓	✓		
MW-13D-101618		1415									✓	✓	✓		
SW-6-101618		1445									✓	✓	✓		
SW-7-101618		1540									✓	✓	✓		
MW-14-101618		1710									✓	✓	✓		
MW-6-101618		1825									✓	✓	✓		
MW-20D-101618		—			✓						✓	✓	✓		

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:	Date/Time:	Company	Received by:	Date/Time:	Company
1		10/17/18 1038	ASPECT		10/17/18 1038	ART
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:

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-7-101618	18J0304-01	Water	16-Oct-2018 09:45	17-Oct-2018 10:38
MW-5-101618	18J0304-02	Water	16-Oct-2018 11:10	17-Oct-2018 10:38
SW-1-101618	18J0304-03	Water	16-Oct-2018 12:20	17-Oct-2018 10:38
MW-12I-101618	18J0304-04	Water	16-Oct-2018 12:35	17-Oct-2018 10:38
SW-4-101618	18J0304-05	Water	16-Oct-2018 14:00	17-Oct-2018 10:38
MW-13D-101618	18J0304-06	Water	16-Oct-2018 14:15	17-Oct-2018 10:38
SW-6-101618	18J0304-07	Water	16-Oct-2018 14:45	17-Oct-2018 10:38
SW-7-101618	18J0304-08	Water	16-Oct-2018 15:40	17-Oct-2018 10:38
MW-14-101618	18J0304-09	Water	16-Oct-2018 17:10	17-Oct-2018 10:38
MW-6-101618	18J0304-10	Water	16-Oct-2018 18:25	17-Oct-2018 10:38
MW-20D-101618	18J0304-11	Water	16-Oct-2018 00:00	17-Oct-2018 10:38

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

Work Order Case Narrative

Sample receipt

Samples as listed on the preceding page were received October 17, 2018 under ARI work order 18J0304. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Dissolved Arsenic - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

A matrix spike and duplicate were prepared in conjunction with sample MW-7-101618. The matrix spike percent recovery and duplicate RPD were within QC limits.

Anions - EPA Method 300.0

Due to instrument failure the samples were analyzed outside of the 48 hour recommended holding times, and have been flagged with "H" qualifiers.

Initial and continuing calibrations were within method requirements.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

A matrix spike and duplicate were prepared in conjunction with sample MW-7-101618. The matrix spike percent recoveries and duplicate RPD were within QC limits.

WORK ORDER

18J0304

Client: Test America - Denver	**Project Manager:** Amanda Volgardsen
Project: Hansville	**Project Number:** [none]

Preservation Confirmation

Container ID	Container Type		pH	
18J0304-01 A	Miscellaneous Container	HNO3	<2	Pass
18J0304-01 B	Miscellaneous Container			
18J0304-01 C	Miscellaneous Container			
18J0304-02 A	Miscellaneous Container	HNO3	<2	Pass
18J0304-02 B	Miscellaneous Container			
18J0304-02 C	Miscellaneous Container			
18J0304-03 A	Miscellaneous Container	HNO3	<2	Pass
18J0304-03 B	Miscellaneous Container			
18J0304-03 C	Miscellaneous Container			
18J0304-04 A	Miscellaneous Container	HNO3	<2	Pass
18J0304-04 B	Miscellaneous Container			
18J0304-04 C	Miscellaneous Container			
18J0304-05 A	Miscellaneous Container	HNO3	<2	Pass
18J0304-05 B	Miscellaneous Container			
18J0304-05 C	Miscellaneous Container			
18J0304-06 A	Miscellaneous Container	HNO3	<2	Pass
18J0304-06 B	Miscellaneous Container			
18J0304-06 C	Miscellaneous Container			
18J0304-07 A	Miscellaneous Container	HNO3	<2	Pass
18J0304-07 B	Miscellaneous Container			
18J0304-07 C	Miscellaneous Container			
18J0304-08 A	Miscellaneous Container	HNO3	<2	Pass
18J0304-08 B	Miscellaneous Container			
18J0304-08 C	Miscellaneous Container			
18J0304-09 A	Miscellaneous Container	HNO3	<2	Pass
18J0304-09 B	Miscellaneous Container			
18J0304-09 C	Miscellaneous Container			
18J0304-10 A	Miscellaneous Container	HNO3	<2	Pass
18J0304-10 B	Miscellaneous Container			
18J0304-10 C	Miscellaneous Container			
18J0304-11 A	Miscellaneous Container	HNO3	<2	Pass
18J0304-11 B	Miscellaneous Container			
18J0304-11 C	Miscellaneous Container			

Reviewed By

Date

WORK ORDER

18J0304

Client: Test America - Denver	**Project Manager: Amanda Volgardsen**
Project: Hansville	**Project Number: [none]**

JBu
Preservation Confirmed By

10/17/18
Date

Reviewed By

Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Aspect Consulting Project Name: Hansville Landfill

COC No(s): _____ NA Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 18J0304 Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 2.0° 1.9°

Time: 1038

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D0052006

Cooler Accepted by: JSW Date: 10/17/18 Time: 1038

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: Trash bags			
Was sufficient ice used (if appropriate)?	NA	YES	NO
Were all bottles sealed in individual plastic bags?		YES	NO
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA		

Was Sample Split by ARI : NA YES Date/Time:_____ Equipment:_____ Split by:_____

Samples Logged by: JSW Date: 10/17/18 Time: 1059

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC
MW-20D-101618	MW-20D-101618		

Additional Notes, Discrepancies, & Resolutions: marked w/a star

By: JSW Date: 10/17/18

Small Air Bubbles – 2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
• • •	• • •	● ● ●

Small → "sm" (< 2 mm)

Peabubbles → "pb" (2 to < 4 mm)

Large → "lg" (4 to < 6 mm)

Headspace → "hs" (> 6 mm)

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

MW-7-101618

18J0304-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 10/16/2018 09:45

Instrument: ICPMS2 Analyst: MCB — Analyzed: 10/25/2018

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGJ0675 Sample Size: 25 mL
Prepared: 22-Oct-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.000200	**0.00108**	mg/L	

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

MW-7-101618

18J0304-01 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 10/16/2018 09:45
Instrument: DX2100 Analyst: KOTT — Analyzed: 10/18/2018

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGJ0563 — Sample Size: 5 mL
Prepared: 17-Oct-2018 — Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	**0.334**	mg/L	H

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.10	0.10	ND	mg/L	H, U

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

MW-5-101618

18J0304-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 10/16/2018 11:10
Instrument: ICPMS2 Analyst: MCB — Analyzed: 10/25/2018

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGJ0675 — Sample Size: 25 mL
Prepared: 22-Oct-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.000200	**0.00199**	mg/L	

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

MW-5-101618

18J0304-02 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 10/16/2018 11:10
Instrument: DX2100 Analyst: KOTT — Analyzed: 10/18/2018

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGJ0563 — Sample Size: 5 mL
Prepared: 17-Oct-2018 — Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	**1.19**	mg/L	H

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.10	0.10	ND	mg/L	H, U

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

SW-1-101618

18J0304-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 10/16/2018 12:20

Instrument: ICPMS2 Analyst: MCB — Analyzed: 10/25/2018

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGJ0675 Sample Size: 25 mL
Prepared: 22-Oct-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.000200	**0.00161**	mg/L	

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

SW-1-101618

18J0304-03 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 10/16/2018 12:20
Instrument: DX2100 Analyst: KOTT — Analyzed: 10/18/2018

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGJ0563 — Sample Size: 5 mL
Prepared: 17-Oct-2018 — Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	**1.61**	mg/L	H

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.10	0.10	ND	mg/L	H, U

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

MW-12I-101618

18J0304-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 10/16/2018 12:35
Instrument: ICPMS2 Analyst: MCB — Analyzed: 10/25/2018

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGJ0675 — Sample Size: 25 mL
Prepared: 22-Oct-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.000200	**0.00205**	mg/L	

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

MW-12I-101618

18J0304-04 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 10/16/2018 12:35
Instrument: DX2100 Analyst: KOTT — Analyzed: 10/18/2018

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGJ0563 — Sample Size: 5 mL
Prepared: 17-Oct-2018 — Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.10	0.10	ND	mg/L	H, U

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

SW-4-101618

18J0304-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 10/16/2018 14:00

Instrument: ICPMS2 Analyst: MCB — Analyzed: 10/25/2018

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGJ0675 Sample Size: 25 mL
Prepared: 22-Oct-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.000200	**0.00216**	mg/L	

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

SW-4-101618

18J0304-05 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 10/16/2018 14:00

Instrument: DX2100 Analyst: KOTT — Analyzed: 10/19/2018

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGJ0563 Sample Size: 5 mL
Prepared: 17-Oct-2018 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	**0.785**	mg/L	H

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.10	0.10	ND	mg/L	H, U

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

MW-13D-101618

18J0304-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 10/16/2018 14:15

Instrument: ICPMS2 Analyst: MCB — Analyzed: 10/25/2018

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGJ0675 Sample Size: 25 mL
Prepared: 22-Oct-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.000200	**0.00479**	mg/L	

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

MW-13D-101618

18J0304-06 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 10/16/2018 14:15
Instrument: DX2100 Analyst: KOTT — Analyzed: 10/19/2018

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGJ0563 — Sample Size: 5 mL
Prepared: 17-Oct-2018 — Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.10	0.10	ND	mg/L	H, U

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

SW-6-101618

18J0304-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 10/16/2018 14:45

Instrument: ICPMS2 Analyst: MCB — Analyzed: 10/25/2018

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGJ0675 Sample Size: 25 mL
Prepared: 22-Oct-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.000200	**0.00423**	mg/L	

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

SW-6-101618

18J0304-07 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 10/16/2018 14:45
Instrument: DX2100 Analyst: KOTT — Analyzed: 10/19/2018

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGJ0563 — Sample Size: 5 mL
Prepared: 17-Oct-2018 — Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.10	0.10	ND	mg/L	H, U

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

SW-7-101618

18J0304-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 10/16/2018 15:40

Instrument: ICPMS2 Analyst: MCB — Analyzed: 10/25/2018

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGJ0675 Sample Size: 25 mL
Prepared: 22-Oct-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.000200	**0.00142**	mg/L	

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

SW-7-101618

18J0304-08 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 10/16/2018 15:40

Instrument: DX2100 Analyst: KOTT — Analyzed: 10/19/2018

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGJ0563 Sample Size: 5 mL
Prepared: 17-Oct-2018 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	**0.718**	mg/L	H

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.10	0.10	ND	mg/L	H, U

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

MW-14-101618

18J0304-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 10/16/2018 17:10
Instrument: ICPMS2 Analyst: MCB — Analyzed: 10/26/2018

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGJ0675 — Sample Size: 25 mL
Prepared: 22-Oct-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	2	0.000400	**0.0125**	mg/L	D

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

MW-14-101618

18J0304-09 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 10/16/2018 17:10
Instrument: DX2100 Analyst: KOTT — Analyzed: 10/19/2018

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGJ0563 — Sample Size: 5 mL
Prepared: 17-Oct-2018 — Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	**0.852**	mg/L	H

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.10	0.10	ND	mg/L	H, U

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

MW-6-101618

18J0304-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 10/16/2018 18:25
Instrument: ICPMS2 Analyst: MCB — Analyzed: 10/25/2018

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGJ0675 — Sample Size: 25 mL
Prepared: 22-Oct-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.000200	**0.00153**	mg/L	

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

MW-6-101618

18J0304-10 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 10/16/2018 18:25
Instrument: DX2100 Analyst: KOTT — Analyzed: 10/19/2018

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGJ0563 — Sample Size: 5 mL
Prepared: 17-Oct-2018 — Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	2	0.200	0.200	**3.21**	mg/L	H, D

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	2	0.200	0.200	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	2	0.20	0.20	ND	mg/L	H, U

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

MW-20D-101618

18J0304-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 10/16/2018 00:00

Instrument: ICPMS2 Analyst: MCB — Analyzed: 10/25/2018

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGJ0675 Sample Size: 25 mL
Prepared: 22-Oct-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.000200	**0.0125**	mg/L	

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

MW-20D-101618

18J0304-11 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 10/16/2018 00:00
Instrument: DX2100 Analyst: KOTT — Analyzed: 10/19/2018

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGJ0563 — Sample Size: 5 mL
Prepared: 17-Oct-2018 — Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	**0.889**	mg/L	H

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Orthophosphorus	1426-54-42	1	0.10	0.10	ND	mg/L	H, U

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGJ0675 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGJ0675-BLK1)				Prepared: 22-Oct-2018 Analyzed: 25-Oct-2018 17:24							
Arsenic, Dissolved	75a	ND	0.000200	mg/L							U
LCS (BGJ0675-BS1)				Prepared: 22-Oct-2018 Analyzed: 25-Oct-2018 17:29							
Arsenic, Dissolved	75a	0.0255	0.000200	mg/L	0.0250		102	80-120			
Duplicate (BGJ0675-DUP1)		**Source: 18J0304-01**		Prepared: 22-Oct-2018 Analyzed: 25-Oct-2018 18:00							
Arsenic, Dissolved	75a	0.00112	0.000200	mg/L		0.00108			3.54	20	
Matrix Spike (BGJ0675-MS1)		**Source: 18J0304-01**		Prepared: 22-Oct-2018 Analyzed: 25-Oct-2018 18:04							
Arsenic, Dissolved	75a	0.0270	0.000200	mg/L	0.0250	0.00108	104	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

Wet Chemistry - Quality Control

Batch BGJ0563 - No Prep Wet Chem

Instrument: DX2100 Analyst: KOTT

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGJ0563-BLK1)				Prepared: 17-Oct-2018 Analyzed: 19-Oct-2018 04:11							
Nitrate-N	ND	0.100	0.100	mg/L							U
Nitrite-N	ND	0.100	0.100	mg/L							U
Orthophosphorus	ND	0.10	0.10	mg/L							U
LCS (BGJ0563-BS1)				Prepared: 17-Oct-2018 Analyzed: 19-Oct-2018 04:35							
Nitrate-N	1.48	0.100	0.100	mg/L	1.50		98.7	90-110			
Nitrite-N	1.51	0.100	0.100	mg/L	1.50		101	90-110			
Orthophosphorus	1.35	0.10	0.10	mg/L	1.50		90.1	90-110			
Duplicate (BGJ0563-DUP1)		**Source: 18J0304-01**		Prepared: 17-Oct-2018 Analyzed: 18-Oct-2018 22:09							
Nitrate-N	0.326	0.100	0.100	mg/L		0.334			2.42	20	H
Nitrite-N	ND	0.100	0.100	mg/L		ND					H, U
Orthophosphorus	ND	0.10	0.10	mg/L		ND					H, U
Matrix Spike (BGJ0563-MS1)		**Source: 18J0304-01**		Prepared: 17-Oct-2018 Analyzed: 18-Oct-2018 22:33							
Nitrate-N	2.28	0.100	0.100	mg/L	2.00	0.334	97.1	75-125			H
Nitrite-N	1.95	0.100	0.100	mg/L	2.00	ND	97.7	75-125			H
Orthophosphorus	1.77	0.10	0.10	mg/L	2.00	ND	88.3	75-125			H

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 300.0 in Water	
Nitrate-N	DoD-ELAP,WADOE,WA-DW,NELAP
Nitrite-N	DoD-ELAP,WADOE,WA-DW,NELAP
Orthophosphorus	DoD-ELAP,WADOE,WA-DW,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	02/07/2019
CALAP	California Department of Public Health CAELAP	2748	06/30/2019
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-011	05/12/2019
WADOE	WA Dept of Ecology	C558	06/30/2019
WA-DW	Ecology - Drinking Water	C558	06/30/2019

Test America - Denver	Project: Hansville	
4955 Yarrow Street	Project Number: 28006013-2Q/3Q/4Q Sampling	**Reported:**
Arvada CO, 80002	Project Manager: Betsy Sara	31-Oct-2018 11:14

Notes and Definitions

*	Flagged value is not within established control limits.
D	The reported value is from a dilution
H	Hold time violation - Hold time was exceeded.
J	Estimated concentration value detected below the reporting limit.
U	This analyte is not detected above the applicable reporting or detection limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Jackson Lundgren	Lab PM: Sara, Betsy A	Carrier Tracking No(s):	COC No: 280-23414-6845.1
Client Contact: Meilani Lanier-Kamaha'o	Phone: 206-413-5408	E-Mail: betsy.sara@testamericainc.com		Page: 1/1
Company: Aspect Consulting, LLC				Job #:
Address: 350 Madison Ave N	Due Date Requested:			
City: Bainbridge Island	TAT Requested (days):			
State, Zip: WA, 98110				
Phone:	PO #: Purchase Order not required			
Email: mlkamahao@aspectconsulting.com	WO #:			
Project Name: Hansville Landfill	Project #:skip sites/events 28006013 - 2Q/3Q/4Q Sampling			
Site: Washington	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, 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)	8260C SIM - Vinyl Chloride (TA Buffalo)	Dissolved Metals	Ammonia/TOC	Alks/Cl/SO4	Ortho-phosphate (field filtered)- direct sub to ARI	Dissolved Arsenice - direct sub to ARI	Nitrate/Nitrite (IC) - direct sub to ARI	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A	D	S	N	N	D	N		
MW-7-101618	10/16/18	0945		W	Y		✓	✓	✓	✓					
MW-5-101618		1110					✓	✓	✓	✓					
SW-1-101618		1220					✓	✓	✓	✓					Diss As,NO3,NO2,o-phos subbed direct to ARI
MW-12I-101618		1235					✓	✓	✓	✓					RUN ONCY 1 T.B.
SW-4-101618		1400					✓	✓	✓	✓					
MW-13D-101618		1415					✓	✓	✓	✓					
SW-6-101618		1445					✓	✓	✓	✓					
SW-7-101618		1540					✓	✓	✓	✓					
MW-14-101618		1710					✓	✓	✓	✓					
MW-6-101618	✓	1825					✓	✓	✓	✓					
MW-20D-101618		—		✓	✓		✓	✓	✓	✓					

280-115774 Chain of Custody

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:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	10/17/18 11:00	ASPECT		10/18/18 0945	TAHou
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: 1.5° 1.3° 0.3°C IR#9 CF+0.7

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Sara, Betsy A	Carrier Tracking No(s):	COC No: 280-458958.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: betsy.sara@testamericainc.com	State of Origin: Washington	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Washington		Job #: 280-115774-1
Address: 10 Hazelwood Drive, ,	Due Date Requested: 10/30/2018			
City: Amherst	TAT Requested (days):			
State, Zip: NY, 14228-2298				
Phone: 716-691-2600(Tel) 716-691-7991(Fax)	PO #:			
Email:	WO #:			
Project Name: Hansville Landfill	Project #: 28006013			
Site: Hansville	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 - Na2S2O3
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 - Client ID (Lab ID)	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)	8260C_SIM/5030C (MOD) Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-7-101618 (280-115774-1)	10/16/18	09:45 Pacific		Water			X	3	
MW-5-101618 (280-115774-2)	10/16/18	11:10 Pacific		Water			X	3	
SW1-101618 (280-115774-3)	10/16/18	12:20 Pacific		Water			X	3	
MW-12I-101618 (280-115774-4)	10/16/18	12:35 Pacific		Water			X	3	
SW4-101618 (280-115774-5)	10/16/18	14:00 Pacific		Water			X	3	
MW-13D-101618 (280-115774-6)	10/16/18	14:15 Pacific		Water			X	3	
SW6-101618 (280-115774-7)	10/16/18	14:45 Pacific		Water			X	3	
SW7-101618 (280-115774-8)	10/16/18	15:40 Pacific		Water			X	3	
MW-14-101618 (280-115774-9)	10/16/18	17:10 Pacific		Water			X	3	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	10-09-2018 1655	TALEN	[signature]	10/10/18 0900	MTB.
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: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: #1 3.1°

Ver: 09/20/2016

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Sara, Betsy A	Carrier Tracking No(s):	COC No: 280-458958.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: betsy.sara@testamericainc.com	State of Origin: Washington	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Washington		Job #: 280-115774-1
Address: 10 Hazelwood Drive, ,	Due Date Requested: 10/30/2018			
City: Amherst	TAT Requested (days):			
State, Zip: NY, 14228-2298				
Phone: 716-691-2600(Tel) 716-691-7991(Fax)	PO #:			
Email:	WO #:			
Project Name: Hansville Landfill	Project #: 28006013			
Site: Hansville	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 - Na2S2O3
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 - Client ID (Lab ID)	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)	8260C_SIM/5030C (MOD) Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
MW-6-101618 (280-115774-10)	10/16/18	18:25 Pacific		Water			X	3	
MW-20D-101618 (280-115774-11)	10/16/18	Pacific		Water			X	3	
TB1 (280-115774-12)	10/16/18	Pacific		Water			X	3	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		10-19-2018 1645	TAL Den		10/20/18 0900	TAL.
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: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: #1 3.1°C.

Ver: 09/20/2016

11/01/2018

Login Sample Receipt Checklist

Client: Aspect Consulting

Job Number: 280-115774-1

Login Number: 115774

List Source: TestAmerica Denver

List Number: 1

Creator: Rhoades, Joseph P

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	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 sample IDs on the containers and the COC.	True	
Samples are received within Holding Time (Excluding tests with immediate HTs)..	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Aspect Consulting

Job Number: 280-115774-1

Login Number: 115774
List Number: 2
Creator: Hulbert, Michael J

List Source: TestAmerica Buffalo
List Creation: 10/23/18 12:21 PM

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is 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	3.1 #1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time (Excluding tests with immediate HTs)..	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	False	
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	

Aspect CONSULTING

Sample number MW-7-10/618

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-7 Page: 1 of 1

Project Name: Hansville Landfill
Project Number: 160423
Date: 10/16/2018
Sampled by: NHC/JTL
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)
Starting Water Level (ft TOC): 83.29
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf
Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
0900		0.3								Start
0911			83.23	9.5	245	4.65	6.21	98.9	6.18	
0916			83.25	9.5	238.7	2.08	6.19	90.8	5.10	
0921			83.29	9.5	239.3	1.78	6.25	85.0	4.24	
0926			83.29	9.5	241.6	1.72	6.30	81.1	4.38	
0931			83.29	9.5	257.8	1.70	6.34	80.5	10.3	
0936			83.29	9.5	260.4	1.56	6.37	78.7	11.0	
0939			83.29	9.5	262.5	1.53	6.38	78.2	10.3	sample

Total Gallons Purged: 2.5
Total Casing Volumes Removed:
Ending Water Level (ft TOC):
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume mL	Bottle Type	Quantity	Filtration	Preservation	Appearance		Remarks
						Color	Turbidity & Sediment	
0945	500	amber	1	-	sulf	clr		
	1000	poly	1	-	-			
	500	poly	1	-	-			
	40	VOA	3	-	HCl			
	500	poly	2	yes	nitric			
	250	poly	1	yes	-			

METHODS

Parameters measured with (instrument model & serial number) dedicated bladder pump OR peristaltic (circle) YSI black 13E102942
Purging Equipment:
Decon Equipment: Alconox + water
Disposal of Discharged Water: on site
Observations/Comments:

Aspect CONSULTING

Sample number MW-5-101618

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-5 Page: 1 of 1

Project Name: Hansville Landfill
Project Number: 160423
Date: 10/16/2018
Starting Water Level (ft TOC): 98.30'
Sampled by: NHC/JTL
Casing Stickup (ft):
Measuring Point of Well: TOC
Total Depth (ft TOC):
Screened Interval (ft. TOC)
Casing Diameter (inches):
Filter Pack Interval (ft. TOC)

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4"= 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf
Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
1030		0.05								Start
1039		0.05	98.35	11.2	171.4	6.69	6.46	74.3	9.23	flow too low
1049		~~0.00~~ 0.2	98.30	10.9	149.0	6.42	6.45	74.2	5.88	flow OK
1054			98.30	10.9	149.6	5.98	6.61	74.6	6.20	
1059			98.30	10.8	150.2	8.42	6.75	75.2	3.99	
1102			98.30	10.6	150.4	8.86	6.87	75.6	4.92	
1105			98.30	10.6	150.5	8.77	6.93	75.9	4.34	sample

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume mL	Bottle Type	Quantity	Filtration	Preservation	Appearance		Remarks
						Color	Turbidity & Sediment	
1110	500	amber	1	-	sulf	Clr		
	1000	poly	1	-	-			
	500	poly	1	-	-			
	40	VOA	3	-	HCl			
	500	poly	2	yes	nitric			
	250	poly	1	yes	-			

METHODS

Parameters measured with (instrument model & serial number): dedicated bladder pump OR peristaltic (circle)

Purging Equipment: YSI BLACK Decon Equipment: Alconox + water

Disposal of Discharged Water: on site

Observations/Comments:

Aspect CONSULTING

Sample number SW-1-101618

GROUNDWATER SAMPLING RECORD

WELL NUMBER: SW-1 Page: 1 of 1

Project Name: Hansville Landfill
Project Number: 160423
Date: 10/16/2018
Sampled by: JTL
Starting Water Level (ft TOC): —
Casing Stickup (ft):
Measuring Point of Well: —
Total Depth (ft TOC):
Screened Interval (ft. TOC)
Casing Diameter (inches):
Filter Pack Interval (ft. TOC)

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4"= 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
1220	—	—	—	10.3	179.4	10.65	6.58	116.4	0.78	Start

Total Gallons Purged: Total Casing Volumes Removed:

Ending Water Level (ft TOC): Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume mL	Bottle Type	Quantity	Filtration	Preservation	Appearance		Remarks
						Color	Turbidity & Sediment	
1220	500	amber	1	-	sulf	CLEAR	NONE	
	1000	poly	1	-	-			
	500	poly	1	-	-			
	40	VOA	3	-	HCl			
	500	poly	2	yes	nitric			
	250	poly	1	yes	-			

METHODS

Parameters measured with (instrument model & serial number) dedicated bladder pump OR peristaltic (circle)

Purging Equipment: YSI ~~BLACK~~ Blue Decon Equipment: Alconox + water

Disposal of Discharged Water: on site

Observations/Comments:

Aspect CONSULTING

Sample number MW-12I-101618

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-12I Page: 1 of 1

Project Name: Hansville Landfill
Date: 10/16/2018
Sampled by: NHC
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Project Number: 160423
Starting Water Level (ft TOC): 9.65
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
1218		~~0.3~~ 0.5								Start
1223			9.71	10.4	178.4	0.27	7.01	81.4	4.78	
1228			9.71	10.3	180.2	0.22	7.01	81.2	4.66	
1233		9.70	~~10.~~	10.4	180.5	0.20	7.01	81.2	4.13	sample

Total Gallons Purged: 1
Total Casing Volumes Removed:
Ending Water Level (ft TOC):
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume mL	Bottle Type	Quantity	Filtration	Preservation	Appearance		Remarks
						Color	Turbidity & Sediment	
1235	500	amber	1	-	sulf	clr		
	1000	poly	1	-	-			
	500	poly	1	-	-			
	40	VOA	3	-	HCl			
	500	poly	2	yes	nitric			
	250	poly	1	yes	-			

METHODS

Parameters measured with (instrument model & serial number): dedicated bladder pump OR peristaltic (circle) YSI Black
Purging Equipment:
Decon Equipment: Alconox + water
Disposal of Discharged Water: on site
Observations/Comments:

Aspect CONSULTING

Sample number SW-4-101618

GROUNDWATER SAMPLING RECORD

WELL NUMBER: SW-4 Page: 1 of 1

Project Name: Hansville Landfill
Date: 10/16/2018
Sampled by: JTL
Measuring Point of Well: —
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Project Number: 160423
Starting Water Level (ft TOC): —
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
~~1325~~	—	—	—	10.7	356.9	11.03	7.65	103.3	4.41	~~Start~~ SAMPLE
1400										

Total Gallons Purged:
Total Casing Volumes Removed:
Ending Water Level (ft TOC):
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume mL	Bottle Type	Quantity	Filtration	Preservation	Appearance		Remarks
						Color	Turbidity & Sediment	
1400	500	amber	1	-	sulf	YELLOW	CLEAR	
	1000	poly	1	-	-			
	500	poly	1	-	-			
	40	VOA	3	-	HCl			
	500	poly	2	yes	nitric			
	250	poly	1	yes	-			

METHODS

Parameters measured with (instrument model & serial number) dedicated bladder pump OR peristaltic (circle)
Purging Equipment: YSI BLUE
Decon Equipment: Alconox + water
Disposal of Discharged Water: on site

Observations/Comments:

Aspect CONSULTING

Sample number MW-13D-101618

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-13D Page: 1 of 1

Project Name: Hansville Landfill
Date: 10/16/2018
Sampled by: MHC
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)

Project Number: 160423
Starting Water Level (ft TOC): 10.65
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
1343		0.2								Start
1348			10.9	10.7	187.9	0.51	7.28	95.0	3.91	
1353			10.83	10.7	187.9	0.35	7.36	92.9	5.96	
~~1408~~	1358		10.85	10.8	188.0	0.26	7.39	91.6	4.29	
1401			10.85	10.7	188.0	0.26	7.39	91.1	4.23	
1404			10.85	10.7	188.0	0.18	7.40	90.9	4.37	~~sample~~
1407			10.85	10.7	188.0	0.17	7.40	90.7	3.45	
1410				10.7	187.9	0.17	7.40	90.4	4.97	sample

Total Gallons Purged: ~~0~~ 1.5
Total Casing Volumes Removed:
Ending Water Level (ft TOC):
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume mL	Bottle Type	Quantity	Filtration	Preservation	Appearance		Remarks
						Color	Turbidity & Sediment	
1415	500	amber	1	-	sulf	clr		
	1000	poly	1	-	-			
	500	poly	1	-	-			
	40	VOA	3	-	HCl			
	500	poly	2	yes	nitric			
	250	poly	1	yes	-			

METHODS

Parameters measured with (instrument model & serial number) dedicated bladder pump OR peristaltic (circle) YSI Black
Purging Equipment: _____ Decon Equipment: Alconox + water
Disposal of Discharged Water: on site
Observations/Comments:

Aspect CONSULTING

Sample number SW-6-101618

GROUNDWATER SAMPLING RECORD

WELL NUMBER: SW-6 Page: 1 of 1

Project Name: Hansville Landfill
Project Number: 160423
Date: 10/16/2018
Sampled by: JTL
Measuring Point of Well: —
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)
Starting Water Level (ft TOC): —
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
1445	—	—	—	11.61	130.3	9.71	7.23	76.C	6.64	Start

Total Gallons Purged:
Total Casing Volumes Removed:
Ending Water Level (ft TOC):
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume mL	Bottle Type	Quantity	Filtration	Preservation	Appearance		Remarks
						Color	Turbidity & Sediment	
1443	500	amber	1	-	sulf	YELLOW	LOW	
	1000	poly	1	-	-			
	500	poly	1	-	-			
	40	VOA	3	-	HCl			
	500	poly	2	yes	nitric			
	250	poly	1	yes	-			

METHODS

Parameters measured with (instrument model & serial number) dedicated bladder pump OR peristaltic (circle)
Purging Equipment: YST BLUE
Decon Equipment: Alconox + water
Disposal of Discharged Water: on site
Observations/Comments: WATER VERY LOW

Aspect CONSULTING

Sample number SW-7-101618

GROUNDWATER SAMPLING RECORD

WELL NUMBER: SW-7 Page: 1 of 1

Project Name: Hansville Landfill
Date: 10/16/2018
Sampled by: JTL
Measuring Point of Well: —
Screened Interval (ft. TOC) —
Filter Pack Interval (ft. TOC) —

Project Number: 160423
Starting Water Level (ft TOC): —
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4"= 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf

Sample Intake Depth (ft TOC): —

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
1540	—	—	—	11.1	130.3	9.71	7.23	76.0	6.15	Start

Total Gallons Purged: _____ Total Casing Volumes Removed: _____

Ending Water Level (ft TOC): _____ Ending Total Depth (ft TOC): _____

SAMPLE INVENTORY

Time	Volume mL	Bottle Type	Quantity	Filtration	Preservation	Appearance		Remarks
						Color	Turbidity & Sediment	
1540	500	amber	1	-	sulf	CLEAR	LOW	
	1000	poly	1	-	-			
	500	poly	1	-	-			
	40	VOA	3	-	HCl			
	500	poly	2	yes	nitric			
	250	poly	1	yes	-			

METHODS

Parameters measured with (instrument model & serial number) dedicated bladder pump OR peristaltic (circle)

Purging Equipment: YSI BLUE Decon Equipment: Alconox + water

Disposal of Discharged Water: on site

Observations/Comments: _____

Aspect CONSULTING

Sample number MW-14-101618

GROUNDWATER SAMPLING RECORD

WELL NUMBER: 14 Page: 1 of 1

Project Name: Hansville Landfill
Project Number: 160423
Date: 10/16/2018
Sampled by: JTL NHC
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)
Starting Water Level (ft TOC): 80.60
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf
Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
1642		0.2								Start
1647			80.65	11.6	237.4	1.74	6.95	85.4	5.05	
1652			80.60	11.5	244.7	1.61	6.94	84.7	4.17	
1657			80.60	11.4	248.7	1.02	6.94	84.1	3.12	
1700	1702		80.60	11.4	245.8	1.06	6.94	83.9	3.98	Sample

Total Gallons Purged: 1
Total Casing Volumes Removed:
Ending Water Level (ft TOC):
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume mL	Bottle Type	Quantity	Filtration	Preservation	Appearance		Remarks
						Color	Turbidity & Sediment	
1710	500	amber	1	-	sulf			DUPLICATES
	1000	poly	1	-	-			
	500	poly	1	-	-			
	40	VOA	3	-	HCl			
	500	poly	2	yes	nitric			
	250	poly	1	yes	-			

METHODS

Parameters measured with (instrument model & serial number): dedicated bladder pump OR peristaltic (circle) YSI Black
Purging Equipment:
Decon Equipment: Alconox + water
Disposal of Discharged Water: on site
Observations/Comments:

Aspect CONSULTING

Sample number MW-6-101618

GROUNDWATER SAMPLING RECORD

WELL NUMBER: MW-6 Page: 1 of 1

Project Name: Hansville Landfill
Project Number: 160423
Date: 10/16/2018
Sampled by: NHL / JTL
Measuring Point of Well: TOC
Screened Interval (ft. TOC)
Filter Pack Interval (ft. TOC)
Starting Water Level (ft TOC): 72.75'
Casing Stickup (ft):
Total Depth (ft TOC):
Casing Diameter (inches):

Casing Volume _____ (ft Water) x _____ (Lpfv)(gpf) = _____ (L)(gal)
Casing volumes: 3/4"= 0.02 gpf 2" = 0.16 gpf 4" = 0.65 gpf 6" = 1.47 gpf
3/4"= 0.09 Lpf 2" = 0.62 Lpf 4" = 2.46 Lpf 6" = 5.56 Lpf
Sample Intake Depth (ft TOC):

PURGING MEASUREMENTS

Criteria:		Typical 0.1-0.5 Lpm	Stable	na	± 3%	± 10%	± 0.1	± 10 mV	± 10%	
Time	Cumul. Volume (gal or L)	Purge Rate (gpm or Lpm)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments
0602		0.2								Start
0607			72.80	12.6	432.3	0.91	7.03	96.0	6.07	
0612			72.80	12.6	436.2	0.23	7.01	95.5	5.35	
0617			72.80	12.7	429.7	0.20	7.01	95.0	6.03	
0620			72.80	12.7	430.4	0.20	7.01	95.2	4.69	Sample

Total Gallons Purged: 1.5
Total Casing Volumes Removed:
Ending Water Level (ft TOC):
Ending Total Depth (ft TOC):

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance		Remarks
1825	mL					Color	Turbidity & Sediment	
~~0625~~	500	amber	1	-	sulf	clr		
	1000	poly	1	-	-			
	500	poly	1	-	-			
	40	VOA	3	-	HCl			
	500	poly	2	yes	nitric			
	250	poly	1	yes	-			

METHODS

Parameters measured with (instrument model & serial number): ~~dedicated bladder pump~~ OR peristaltic (circle) YSI Black
Purging Equipment: _____ Decon Equipment: Alconox + water
Disposal of Discharged Water: on site
Observations/Comments: _____

APPENDIX E

Annual Inspection Forms – Kitsap Public Health District

KITSAP PUBLIC
HEALTH DISTRICT

345 6th Street, Suite 300
Bremerton, WA 98337
360-728-2235

March 12, 2018

Alexis McKinnon
Kitsap County Public Works
614 Division Street, MS-27
Port Orchard, WA 98366

RE: HANSVILLE LANDFILL INSPECTION, 2018 1st QUARTER

Dear Ms. McKinnon:

The Kitsap Public Health District (Health District) is writing to relay the results of the 1st quarter inspection of 2018 at the Hansville Landfill. Enclosed please find a copy of the inspection checklist/report for the quarterly inspection conducted on March 9, 2018, at 12:30pm.

The following items were noted or discussed:

- The Condensate pump tank (pump 1) has been filling with water in approximately 2 weeks. KCHD will investigate the reason for this abnormality and repair the problem in a timely manner.
- Exposed flex tubing has been replaced in the gas collection system.
- The next inspection is scheduled for June 2018
- A copy of the inspection form is attached.

If you have any questions or comments please feel free to contact me at (360) 728-2274.

Sincerely,

Patrick Hamel
Environmental Health Specialist
Solid and Hazardous Waste Program
360-728-2274 phone
patrick.hamel@kitsappublichealth.org

enc: Inspection Checklist

KITSAP PUBLIC
HEALTH DISTRICT

345 6th Street, Suite 300
Bremerton, WA 98337
360-337-5235

SOLID WASTE FACILITY INSPECTION FORM

Facility Name: Hansville Landfill **Operator:** K.C.D.W. **Phone #:**

Location of Facility: 7791 NE. Ecology Rd.

Inspector: Patrick Hamel **Date:** 03/09/18 **Time:**

Type of Inspection Checklist Used: **Facility Representative Present:**

Reason for Inspection	Type of Inspection	Results	Sample Taken?
X Scheduled	X Full Quarterly	X Compliant	___ Yes X No
___ Return	___ Brief	___ Non-Compliant	
___ Complaint	___ No Entry	___ Approved	
___ Permit Investigation	___ Consultation	___ Disapproved	**Attachments? (photos, etc.)**
___ Sample	___ Plan Review	___ Other	___ Yes X No
___ By Request	___ Site Review		Type?
___ Other	___ Other		

Item #	Description (see attached checklist for complete list of items)	Correction Date
	No items noted during inspection.	

Comments: Condensate Pump tank #1 has been filling with water every 2 weeks. KCDW will research the problem and correct in a timely manner.

Signatures: Alexis McKinnon 3/9/18
Facility Representative KPHD Inspector

File Name: _____

KITSAP PUBLIC
HEALTH DISTRICT

345 6th Street, Suite 300
Bremerton, WA 98337
360-728-2235

June 5, 2018

Alexis McKinnon
Kitsap County Public Works
614 Division Street, MS-27
Port Orchard, WA 98366

RE: HANSVILLE LANDFILL INSPECTION, 2018 2nd QUARTER

Dear Ms. McKinnon:

The Kitsap Public Health District (Health District) is writing to relay the results of the 2nd quarter inspection of 2018 at the Hansville Landfill. Enclosed please find a copy of the inspection checklist/report for the quarterly inspection conducted on June 4, 2018, at 12:30pm.

The following items were noted or discussed:

- The Condensate pump tank (pump 1) has been filling with water in approximately 2 weeks. KCHD will be excavating soil and investigate the reason for this abnormality on June 8, 2018 to identify and repair the problem.
- Grass is approximately 3 feet tall on the cap and needs mowing.
- The next inspection is scheduled for September 2018.
- A copy of the inspection form is attached.

If you have any questions or comments please feel free to contact me at (360) 728-2274.

Sincerely,

Patrick Hamel
Environmental Health Specialist
Solid and Hazardous Waste Program
360-728-2274 phone
patrick.hamel@kitsappublichealth.org

enc: Inspection Checklist

RECEIVED
JUN 06 2018
KITSAP COUNTY
SOLID WASTE

KITSAP PUBLIC
HEALTH DISTRICT

345 6th Street, Suite 300
Bremerton, WA 98337
360-337-5235

SOLID WASTE FACILITY INSPECTION FORM

Facility Name: Hansville Landfill **Operator:** Kitsap County Public Works **Phone #:** 360-337-5665

Location of Facility: 7791 NE Ecology Rd. Poulsbo

Inspector: Patrick Hamel **Date:** 06/04/18 **Time:** 12:30

Type of Inspection Checklist Used: **Facility Representative Present:**

Reason for Inspection	Type of Inspection	Results	Sample Taken?
✓ Scheduled	✓ Full Quarterly	✓ Compliant	___ Yes ✓ No
___ Return	___ Brief	___ Non-Compliant	
___ Complaint	___ No Entry	___ Approved	
___ Permit Investigation	___ Consultation	___ Disapproved	**Attachments? (photos, etc.)**
___ Sample	___ Plan Review	___ Other	___ Yes ✓ No
___ By Request	___ Site Review		Type?
___ Other	___ Other		

Item #	Description (see attached checklist for complete list of items)	Correction Date
	Condensate pump tank still filling up frequently. Public Works will be digging up line on 6/8/18 to investigate issue.	

Comments: - Grass tall ≈ 3ft. Will be mowing in June.

Signatures: [signature] Facility Representative [signature] 6/4/18 KPHD Inspector

File Name: _____

KITSAP PUBLIC
HEALTH DISTRICT

345 6th Street, Suite 300
Bremerton, WA 98337
360-337-5235

SOLID WASTE FACILITY INSPECTION FORM

Facility Name: Hansville Landfill **Operator:** Kitsap County Public Works **Phone #:** 360-337-5665

Location of Facility: 7791 NE. Ecology Rd. Poulsbo

Inspector: Patrick Hamel **Date:** 09-18-18 **Time:** 11:50 AM

Type of Inspection Checklist Used: **Facility Representative Present:**

Reason for Inspection	Type of Inspection	Results	Sample Taken?
✓ Scheduled	✓ Full Quarterly	✓ Compliant	___ Yes ✓ No
___ Return	___ Brief	___ Non-Compliant	
___ Complaint	___ No Entry	___ Approved	
___ Permit Investigation	___ Consultation	___ Disapproved	**Attachments? (photos, etc.)**
___ Sample	___ Plan Review	___ Other	___ Yes ✓ No
___ By Request	___ Site Review		Type?
___ Other	___ Other		

Item #	Description (see attached checklist for complete list of items)	Correction Date
	* NO ISSUES DURING SITE VISIT.	

Comments: Line to condensate tank is possibly crushed. Tank is filling frequently. A new tank will be installed next to flare & blower station.

LandFill survey to be completed in the next year.

Signatures: [signature] Facility Representative [signature] KPHD Inspector

File Name: _____

KITSAP PUBLIC
HEALTH DISTRICT

345 6th Street, Suite 300
Bremerton, WA 98337
360-728-2235

September 20, 2018

Alexis McKinnon
Kitsap County Public Works
614 Division Street, MS-27
Port Orchard, WA 98366

RE: HANSVILLE LANDFILL INSPECTION, 2018 3rd QUARTER

Dear Ms. McKinnon:

The Kitsap Public Health District (Health District) is writing to relay the results of the 3rd quarter inspection of 2018 at the Hansville Landfill. Enclosed please find a copy of the inspection checklist/report for the quarterly inspection conducted on September 18, 2018, at 12:00pm.

The following items were noted or discussed:

- The Condensate pump tank line is most likely crushed since it will not pressurize when it is tested. Surface water may be filling the line and in turn filling the sump tank prematurely. KCPW plans to install a new condensate sump tank next to the flare and blower station and decommission the old condensate sump tank.
- A survey of the landfill will be completed in the next year.
- The next inspection is scheduled for December 2018.
- A copy of the inspection form is attached.

If you have any questions or comments please feel free to contact me at (360) 728-2274.

Sincerely,

Patrick Hamel
Environmental Health Specialist
Solid and Hazardous Waste Program
360-728-2274 phone
patrick.hamel@kitsappublichealth.org

enc: Inspection Checklist

KITSAP PUBLIC
HEALTH DISTRICT

345 6th Street, Suite 300
Bremerton, WA 98337
360-337-5235

SOLID WASTE FACILITY INSPECTION FORM

Facility Name: Olalla Landfill
Operator: Kitsap County Public Works
Phone #: 360-337-5665
Location of Facility: 2850 SE Burley Olalla Rd. Port Orchard
Inspector: Patrick Hamel
Date: 12-17-18
Time: 2:50 pm
Type of Inspection Checklist Used:
Facility Representative Present:

Reason for Inspection	Type of Inspection	Results	Sample Taken?
___ Scheduled	___ Full Quarterly	✓ Compliant	___ Yes ___ No
___ Return	___ Brief	___ Non-Compliant	
___ Complaint	___ No Entry	___ Approved	
___ Permit Investigation	___ Consultation	___ Disapproved	**Attachments? (photos, etc.)**
___ Sample	___ Plan Review	___ Other	___ Yes ___ No
___ By Request	___ Site Review		Type?
___ Other	___ Other		

Item #	Description (see attached checklist for complete list of items)	Correction Date
	Slight pooling in the NW corner of the cap.	3-31-18
	-> Monitor over time.	

Comments:

Signatures:
Facility Representative
KPHD Inspector 12.17.18

File Name:

KITSAP PUBLIC
HEALTH DISTRICT

345 6th Street, Suite 300
Bremerton, WA 98337
360-728-2235

December 18, 2018

Alexis McKinnon
Kitsap County Public Works
614 Division Street, MS-27
Port Orchard, WA 98366

RE: HANSVILLE LANDFILL INSPECTION, 2018 4th QUARTER

Dear Ms. McKinnon:

The Kitsap Public Health District (Health District) is writing to relay the results of the 4th quarter inspection of 2018 at the Hansville Landfill. Enclosed please find a copy of the inspection checklist/report for the quarterly inspection conducted on December 17, 2018, at 12:30pm.

The following items were noted or discussed:

- The old condensate tank has been decommissioned and filled with gravel and left in place. KCPW installed a new above ground condensate tank next to the flare and blower station and it was operational at the time of this inspection.
- A survey of the landfill is planned for the winter of 2019.
- The landfill cover was wet due to the rain, but no pooling of water anywhere during the inspection.
- The next inspection is scheduled for March 2019.
- A copy of the inspection form is attached.

If you have any questions or comments please feel free to contact me at (360) 728-2274.

Sincerely,

Patrick Hamel
Environmental Health Specialist
Solid and Hazardous Waste Program
360-728-2274 phone
patrick.hamel@kitsappublichealth.org

enc: Inspection Checklist