

February 22, 2019

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Attn: Amy Arrington & Darshan Dhillon
Re: Groundwater and Methane Monitoring Results, 2018 Annual Report
Carnation Landfill

Dear Amy and Darshan:

This letter summarizes groundwater chemistry, groundwater flow, and landfill gas data for 2018 at the closed Carnation landfill. This report is consistent with requirements set forth in WAC 173-304. Groundwater sample collection occurred quarterly during 2018, with analytical services provided by Analytical Resources Incorporated of Tukwila, WA and Edge Analytical of Burlington, WA, both Washington State Certified Laboratories. During the quarter 1 (Q1) and quarter 3 (Q3) of 2018, only MW-2D was sampled as part of the reduced sampling regime approved by Public Health Seattle King County (PHSKC) on April 28, 2017. For every quarter, field parameters (pH, specific conductance, and temperature), VOCs, and select metals (arsenic, iron, and manganese) were monitored. In quarter 4, additional natural attenuation parameters (dissolved oxygen, oxidation reduction potential, alkalinity, ferrous iron, nitrate, and sulfate) were sampled from all wells. These 4th quarter analytes are generally consistent with those recommended in the Remedial Investigation Report (PGG, 2017) and the PHSKC variance (PHSKC, 2017).

Methane monitoring results from 2018 are also summarized in this report, with methane concentrations measured in the field using a landfill gas meter.

SUMMARY

Sampling results indicate some impact due to the landfill in downgradient monitoring wells. Five compounds exceeded their respective GWCLs during 2018 including dissolved arsenic, dissolved iron, dissolved manganese, pH, and vinyl chloride. Confidence intervals (CIs) were calculated for current well-constituent pairs which have had multiple historical exceedances, with the CIs constructed around the average, geometric mean, or median concentration of each population depending on the distribution and compared to GWCLs. In cases where background concentrations consistently exceed a GWCL (as with arsenic), non-parametric prediction limits were calculated, with downgradient concentrations compared to the prediction limit. Out of the 32 well-constituent pairs tested, 16 pairs significantly differ from GWCLs or background concentrations. MW-2D has the greatest number (five) of significantly different well-constituent combinations. Trend analyses found one statistically significant increasing trend out of 187 well-constituent combinations analyzed, and seven significant decreasing trends were detected. For well-constituent pairs that have historically exceeded GWCLs, one increasing trend was detected and four decreasing trends were detected (out of 39). However, when all trend test p-values are adjusted for the number of tests performed, no well-constituent pair had a statistically significant trend.

Groundwater flow directions and horizontal gradients remained relatively consistent throughout the year, with flow generally to the west-northwest in the shallow aquifer and north in the deep aquifer. Gradients ranged from 0.025 to 0.033 in the shallow aquifer zone and were 0.028 to 0.029 in the deep aquifer zone. Based on these gradients and existing hydraulic conductivity data, groundwater flow underneath the landfill has an expected velocity of approximately 4.4 ft/day and 1.2 ft/day for the shallow and deep aquifer zones.

Landfill gas sampling indicates that exceedances of the LEL occurred in landfill gas probe M-5 and gas vents V-3 and V-4. Methane may have exceeded the LEL at the property boundary adjacent to gas probe M-5; however, nearby gas probes M-6, M-7, M-8, and M-9 installed outside the property boundary suggest methane migration is minimal.

DEVIATIONS FROM THE SAMPLING AND ANALYSIS PLAN

All groundwater samples were collected in accordance with the Groundwater and Landfill Gas Monitoring Plan (PGG, 2016), except for MW-6S (which was dry or nearly dry all quarters), MW-5S in 2018 Q4 (which went dry during sampling and therefore Method 8260 VOCs and dissolved arsenic, iron, and manganese could not be sampled), and MW-1S in 2018 Q2 (where Method 8260 SIM-VOC analytes were not analyzed due to an issue with the septa of the bottles). MW-5S and MW-6S are completed in the shallow aquifer above the semi-confining layer at the landfill, which is effectively dry at MW-6S and seasonally dry at MW-5S.

For landfill gas monitoring all samples were collected according to the Groundwater and Landfill Gas Monitoring Plan (PGG, 2016), except for landfill gas vent V-4, which was not sampled in 2018 Q2 due to a jammed lock.

COMPOUNDS DETECTED IN GROUNDWATER

A summary of Ground Water Contaminant Level (GWCL) exceedances is presented in Table 1, while Table 2 tabulates detections of volatile organic compounds. Figures 1 through 11 present time series plots of frequently detected VOCs, field parameters, dissolved metals (arsenic, iron, manganese), nitrate, and sulfate. Concentrations of VOCs in Figures 1 through 3 are generally decreasing, or have no apparent trend. The metals, field parameters, and conventional parameter plots indicate that most constituents were within their historical ranges during 2018.

GWCL Exceedences

Constituents which exceeded their GWCLs in 2018 include vinyl chloride (VC), dissolved arsenic, dissolved iron, dissolved manganese, and pH. Exceedences are discussed below:

- **VC** at MW-2D exceeded the GWCL (0.02 ug/L) during the fourth quarter sampling event, with a concentration 0.034 ug/L. During all other quarters VC was not detected.
- **Dissolved arsenic** was detected and exceeded the GWCL (0.05 ug/L) in 10 of the 11 monitoring wells sampled (it was not detected at MW-7D). The presence of arsenic in up-gradient background wells (MW-1S and MW-1D) indicates that it is naturally elevated in the aquifer. However, highly elevated arsenic concentrations in well MW-2D (typically one to two times higher than any other well), suggests that the landfill likely affects metals concentrations. Metals are not likely derived from landfill waste, but from reducing conditions caused by the landfill that result in dissolution of metals from aquifer material. Both MW-2S and MW-3S had their historical maximum arsenic concentrations observed in 2018.
- **Dissolved iron and manganese** have been detected above their respective GWCLs (300 ug/L and 50 ug/L) consistently in down-gradient wells MW-2D and MW-6D. Additionally, cross-gradient monitoring well MW-3S consistently exceeds the manganese GWCL and frequently exceeds the iron GWCL. The elevated metals concentrations are likely due to reducing conditions imposed by the landfill at MW-2D and MW-6D, and local reducing conditions at MW-3S.

Downgradient well MW-2S also exceeded the iron and manganese GWCLs in 2018. At MW-2S metals concentrations (including arsenic) have consistently been exceeding their GWCLs since 2017 Q4. These concentration spikes are

potentially tied to recently observed root matter present in the well. It is thought that the addition of organic carbon from the root matter has caused geochemical conditions to become reducing at MW-2S, and thus mobilizing metals from the aquifer material surrounding the well. In 2019 Q1, MW-2S will be video scoped to determine if the root matter is entering through the screen or if a crack exists in the upper casing.

- Multiple wells had **pH** values outside of the GWCL pH range (6.5 - 8.5) during one or more quarters. Wells in this category had the following exceedance ranges in 2018: MW-1S (6.27 - 6.44), MW-2S (5.13 – 6.02), MW-2D (6.20 – 6.32), MW-3S (6.23), MW-5D (6.45), MW-7D (6.01- 6.12), and MW-8D (6.48). The historically low pH concentration observed at MW-2S in 2018 Q4 could potentially be associated with the observed root growth and changing redox conditions at the well and should be further monitored.

Other Detected VOCs

Detected VOCs which did not exceed their GWCLs in 2018 include acetone, chloroethane and cis-1,2-dichloroethene (cis-1,2-DCE). Several VOCs with frequent historic detections (1,1-dichloroethane, acrylonitrile, carbon disulfide, styrene, and toluene) were not detected in 2018. All detections are summarized below and in Table 2:

- **Acetone** was detected at MW-2D in 2018 Q1. Acetone does not have a GWCL and has occasionally has been detected at landfill wells. It is also a common laboratory contaminant (EPA, 1999), and therefore it is possible that the sporadic low-level detections (acetone has a reporting limit of 5 ug/L) could be associated with laboratory error.
- **Chloroethane** was detected at MW-2D in 2018 Q3 and had an annual concentration range from non-detect (less than 0.2 ug/L) to 0.43 ug/L. Chloroethane has no GWCL, but has been detected at MW-2D in numerous prior sampling events, with concentrations ranging from less than 0.2 to 3 ug/L.
- **Cis-1,2-DCE** was detected at MW-2D during 2018 Q3 and had an annual concentration range from non-detect (less than 0.2 ug/L) to 0.27 ug/L. This range is significantly below the GWCL (70 ug/L). The historical range for cis-1,2-DCE at MW-2D is less than 0.20 to 1 ug/L.

GROUNDWATER ELEVATIONS AND FLOW DIRECTIONS

Groundwater generally flows to the northwest in the shallow aquifer zone and roughly north in the deep aquifer zone. Figures 12 and 13 show groundwater flow directions in the deep and shallow aquifer, with the data presented from 2018 Q4.

Seasonal groundwater flow directions are generally consistent, though regions of the shallow aquifer (near MW-2S and MW-5S) have been observed dry during the third quarter of most years, and the region near MW-6S appears effectively dry (0.45 ft is the

maximum amount of water observed in the well, and based on water level fluctuations it appears to be stagnant endcap water). Water levels were observed to fluctuate between 3.22 to 3.59 ft in the deep aquifer zone and from 4.39 to greater than 5.3 ft in the shallow aquifer zone, as shown in Table 3. The larger relative range for annual water level fluctuations in the shallow aquifer is likely due to the presence of a low permeability unit (the semi-confining layer) underlying the shallow aquifer at MW-2S/D, MW-5S/D, MW-6S/D, and MW-8D. Recharging groundwater from precipitation to the shallow aquifer would be impeded from entering the deep aquifer by the confining layer, thereby causing the difference in seasonal head differentials. Additionally, MW-2S (which had greater than 5.3 ft of annual fluctuation) is located next to an infiltration basin where runoff from the landfill cap is diverted, likely causing higher local water levels during the winter months.

Horizontal gradients in the shallow and deep aquifer were found to be consistent throughout the year, ranging from 0.025 to over 0.033 in the shallow aquifer zone and 0.028 to 0.029 in the deep aquifer zone. Using horizontal hydraulic conductivities calculated by PGG (2011) of 37 ft/day and 11 ft/day for the shallow and deep aquifer zones, gradients of 0.030 and 0.028 (average shallow and deep gradients respectively), and an effective porosity of 0.25, groundwater velocities are calculated to be 4.4 ft/day for the shallow aquifer zone and 1.2 ft/day for the deep aquifer zone.

METHANE MONITORING RESULTS

Table 4 shows all landfill gas concentrations observed in 2018. Methane exceeded its lower explosive limit (LEL) of 5% at landfill gas probe M-5 and gas vents V-3, and V-4. M-5 is located at the landfill boundary, but as nearby gas wells outside the landfill (M-6, M-7, M-8, and M-9) did not exceed the LEL in 2018, the migration of methane to the west of the landfill appears limited.

All onsite landfill gas vents are completed beneath the landfill cap and are not adjacent to the landfill boundary. Elevated methane concentrations at V-3 and V-4 are consistent with microbial action and degradation beneath the landfill cap.

ANNUAL STATISTICAL ANALYSES

Two types of statistical tests were performed on groundwater data to assess impacts from the Carnation Landfill. Hypothesis tests were performed to compare current concentrations to GWCLs or background concentrations. These tests were performed on all current well-constituent pairs which have historically had GWCL exceedances.

Trend tests were performed on all current well-constituent pairs (with the exception of infrequently detected VOCs¹) and used to evaluate whether groundwater contaminant

¹ VOCs detected less than 25 percent of the time or in less than three consecutive sampling events were not statistically analyzed.

concentrations are increasing. A statistical summary of trend-test constituents is presented in Table 5.

Hypothesis Tests

Hypothesis tests were performed on well-constituent pairs with a GWCL exceedance within the past eight sampling events to evaluate whether their central population values are in exceedance. For this discussion, “central population value” refers to either the average, geometric mean, or median concentration of a well-constituent population, and is dependent on the population distribution (average is used for normal populations, geometric mean is for lognormal populations, and median is for nonparametric populations). Two different types of hypothesis tests were used- confidence intervals (CIs) were used to compare data sets to their GWCLs, and prediction limits (PLs) were used in cases where background concentrations exceeded GWCLs (based on recommendations from the EPA Unified Guidance for RCRA facilities (EPA, 2009)) .

The last eight analyses for each well-constituent pair were first tested for normality and log-normality using the Shapiro Wilk test. Depending on normality results, well-constituent pairs had CIs constructed around their central population value using normal, lognormal, or non-parametric approaches. For most parameters, 95 percent lower confidence intervals were calculated as recommended in the EPA Unified Guidance (EPA, 2009). For pH, 95 percent upper CIs were calculated as all pH “exceedances” at the landfill have occurred when pH is less than its lower GWCL (all other landfill parameters have exceedances when a concentration is greater than a GWCL, and therefore lower CIs are applied). CIs were constructed using the eight most recent samples, with non-detect samples assumed to have concentrations equal to half their reporting limit. Sample populations were not tested for outliers, and therefore outliers were included in the sample population. Following construction of the one-sided CIs, the lower confidence limits (or upper confidence limit for pH) were compared to GWCLs to assess if the central population value significantly exceeds the GWCL. Calculated lower confidence limits (LCLs) and upper confidence limits (UCLs) are presented in Table 6, with 16 out of 32 well-constituent pairs having a central population value exceeding a GWCL with 95 percent confidence. Of note on Table 6, the LCL for VC at MW-2D was 0.008 ug/L and therefore its most recent concentrations do not exceed the VC GWCL (0.02 ug/L) with statistical significance. In all prior annual reports, the VC LCL at MW-2D exceeded its GWCL.

Dissolved arsenic exceeded its GWCL of 0.05 ug/L at background wells MW-1S and MW-1D, and therefore PLs were used to evaluate if significant concentration differences exist between downgradient and upgradient wells (as recommended in the Unified Guidance (EPA, 2009)). A non-parametric PL was calculated based on concentrations from the previous five sampling events at background wells MW-1S and MW-1D (for a combined total of 10 background samples). From this dataset, the maximum dissolved arsenic concentration of 0.8 ug/L was set as the upper PL². Downgradient wells with arsenic exceedances were then compared to the PL. For wells MW-2D, MW-3S, and MW-6D (all

² Historical arsenic prediction limits (calculated since 2011) have ranged from 0.7 to 0.8 ug/L.

of which have elevated arsenic concentrations and are normally distributed), one sided lower confidence limits were calculated and compared to the upper PL at 95 percent confidence. For all other wells, their three most recent sample concentrations were reviewed, and if the median value exceeded the PL, then the PL was exceeded at 95 percent significance using a non-parametric PL for a future median of order three test (EPA, 2009). Non-detects were assumed to have concentrations equal to half their reporting limit. A comparison between the future medians of order three, LCLs, and PLs are presented in Table 7, with the three LCLs and the future median of order 3 at MW-2S exceeding the arsenic PL with 95 percent confidence.

Trend Tests

No pre-landfill background groundwater chemistry data exists at the Carnation Landfill, and thus intrawell tests cannot be performed to evaluate concentration trends. Mann-Kendall trend tests were performed instead to assess if statistically significant temporal trends are present within recent intrawell data (from 2016 Q1 through 2018 Q4). Mann-Kendall trend test results which had 95 percent or greater significance are listed in Table 7. Positive S values (the Mann-Kendall statistic) indicate a trend is increasing, while negative S values indicate a decreasing trend.

The p-values were then corrected for the number of comparisons because the probability of identifying at least one significant result due to chance increases as more hypotheses are tested. If one statistical test is performed at a 95 percent confidence level, there is a 5 percent chance of an exceedance by random variation alone. If more tests are performed, in this case 187, the chance is much greater.

The Bonferroni correction was used to reduce the chances of obtaining false-positive results (type I errors) when multiple pair-wise tests are performed on a single set of data. To perform a Bonferroni correction, the p-values were multiplied by the number of comparisons being made. The statistical power of the study is then calculated using the Bonferroni p-value, and a trend is considered statistically significant when the Bonferroni p-value is less than 0.05.

Using standard p-values, a statistically significant increasing trend was noted for one well-constituent pair, whereas seven statistically decreasing trends were noted. For well-constituent pairs that have historically exceeded GWCLs, one increasing trend was detected (dissolved arsenic at MW-6D) and four decreasing trends were detected (dissolved manganese at MW-8D and pH at MW-5D, MW-7D, and MW-8D). However, when Bonferroni adjusted p-values are applied, the null hypothesis was not rejected for any well-constituent pair.

LIMITATIONS

This work was performed, our findings obtained, and this document prepared, using generally accepted hydrogeologic practices used at this time and in this vicinity, for exclusive application to the Carnation Landfill, and for the exclusive use of City of Carnation, Department of Ecology, and the King County Public Health Department. This is in lieu of other warranties, express or implied.

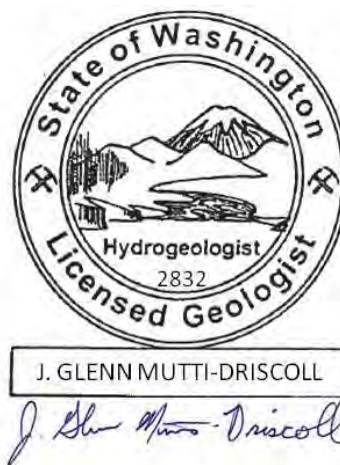
Please feel free to contact us if you have any further questions or comments.

Sincerely,

Pacific Groundwater Group



Stephen Swope
Principal Hydrogeologist



Glenn Mutti-Driscoll
Hydrogeologist

Attachments:

Table 1	Constituents Detected Above GWCLs During 2018, Carnation Landfill
Table 2	VOCs Detected in 2018, Carnation Landfill
Table 3	Quarterly Groundwater Elevations and Hydrogeologic Parameters from 2018, Carnation Landfill
Table 4	Landfill Gas Concentrations in 2018, Carnation Landfill
Table 5	Statistical Summary of Parameters Sampled and VOCs Detected in Groundwater, Carnation Landfill
Table 6	95% Confidence Intervals and Prediction Limits, Carnation Landfill 2018
Table 7	Mann-Kendall Trend Test Results 2016 Q1 through 2018 Q4, Carnation Landfill
Figure 1	Time Series Plot of Commonly Detected Volatile Organic Compounds with Concentrations Below GWCLs

Figure 2	Time Series Plot of Wells with Acrylonitrile Detections
Figure 3	Time Series Plot of Wells with Vinyl Chloride Detections
Figure 4	Dissolved Arsenic Concentration Time Series Plot
Figure 5	Dissolved Iron Concentration Time Series Plot
Figure 6	Dissolved Manganese Concentration Time Series Plot
Figure 7	pH Time Series Plot
Figure 8	Specific Conductance Time Series Plot
Figure 9	Temperature Time Series Plot
Figure 10	Nitrate Concentration Time Series Plot
Figure 11	Sulfate Concentration Time Series Plot
Figure 12	Carnation Landfill Deep Aquifer Elevations 2018Q4
Figure 13	Carnation Landfill Shallow Aquifer Elevations 2018Q4

Lab Report and Field Data Sheet Attachments (included on CD for hard copies):

Attachment 1	2018 Q1 Field Data Sheets & Laboratory Reports
Attachment 2	2018 Q2 Field Data Sheets & Laboratory Reports
Attachment 3	2018 Q3 Field Data Sheets & Laboratory Reports
Attachment 4	2018 Q4 Field Data Sheets & Laboratory Reports

REFERENCES

- PGG, 2011. Carnation Landfill Remedial Investigation Progress Report. Pacific Groundwater Group, Seattle, WA.
- PGG, 2016. Groundwater and Landfill Gas Monitoring Plan Carnation Landfill. Pacific Groundwater Group, Seattle, WA.
- PGG, 2017. Final Remedial Investigation Report Carnation Landfill. Pacific Groundwater Group, Seattle, WA. September 14, 2017.
- PHSKC, 2017. Sampling and Analysis Plan Variance Extension Request for Carnation Closed Landfill. Letter to Phil Mussina of the City of Carnation dated April 28, 2017.
- U.S. Environmental Protection Agency, 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance. EPA530-R-09-007. Office of Resource Conservation and Recovery Program Implementation and Information Division.

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Table 1. Constituents Detected Above GWCLs During 2018, Carnation Landfill

Constituent	Well	GWCL	Exceedance Concentration			
			2018 Q1	2018 Q2	2018 Q3	2018 Q4
Arsenic, Dissolved; ug/L						
	MW-1D	0.05		0.751		0.691
	MW-1S			0.225		0.313
	MW-2D		5.47	7.38	9.77	9.12
	MW-2S			3.74		1.43
	MW-3D			0.482		0.521
	MW-3S			18.2		2.85
	MW-5D			0.439		0.441
	MW-5S			0.2		
	MW-6D			1.38		1.33
	MW-8D			0.454		0.656
Iron, Dissolved; ug/L						
	MW-1D	300		340		
	MW-2D		1450	2020	2320	1900
	MW-2S			6880		1990
	MW-3S			2060		458
	MW-6D			557		604
Manganese, Dissolved; ug/L						
	MW-2D	50	2430	2650	2690	2610
	MW-2S			192		146
	MW-3S			2540		673
	MW-6D			66		80.6
pH, Field; standard units						
	MW-1S	6.5-8.5		6.44		6.27
	MW-2D		6.2	6.26	6.32	6.25
	MW-2S			6.02		5.13
	MW-3S					6.23
	MW-5D					6.45
	MW-7D			6.1		6.01
	MW-8D					6.48
						0.03
Vinyl Chloride; ug/L						
	MW-2D	0.02				0.034

J - estimated value; H - holding time exceeded

Table 2. Volatile Organic Compounds Detected In 2018 (ug/L), Carnation Landfill

Constituent/Well		GWCL	2018 Q1	2018 Q2	2018 Q3	2018 Q4
Acetone	MW-2D		6.01			
Chloroethane	MW-2D				0.43	
cis-1,2-Dichloroethene	MW-2D	70			0.27	
Vinyl Chloride SIM	MW-2D	0.02				0.034

Table 3. Quarterly Groundwater Elevations and Hydrogeologic Parameters from 2018, Carnation Landfill

	Groundwater Elevation (ft)				Annual Change in Water Table Elevation (ft)	Hydraulic Conductivity (ft/day)*
	2018 Q1	2018 Q2	2018 Q3	2018 Q4		
MW1S	112.73	111.03	108.78	108.18	4.55	2.4
MW1D	111.82	110.80	108.87	108.58	3.24	0.6
MW2S	95.91	93.89	<90.61	94.34	> 5.3	24
MW2D	89.52	88.45	85.97	86.26	3.55	13
MW3S	109.23	107.51	105.57	104.84	4.39	864
MW3D	108.86	107.79	105.85	105.64	3.22	1.6
MW5S	106.03	104.28	<101.66	103.56	> 4.37	NT
MW5D	89.91	88.79	86.32	86.62	3.59	979
MW6S	98.56	98.56	98.55	98.55	0.01	NT
MW6D	92.91	91.78	89.50	89.75	3.41	2.3
MW-7D	93.79	92.03	89.19	88.89	4.9	NT
MW-8D	89.50	88.47	86.01	86.32	3.49	NT
Shallow Aquifer Geometric Mean						37
Deep Aquifer Geometric Mean						11

*Hydraulic conductivity values from PGG (2011). NT indicates not tested. The deep aquifer geometric mean includes hydraulic conductivity data from MW-4D (90 ft/day), a well which has been decommissioned.

	2018 Q1	2018 Q2	2018 Q3	2018 Q4	Average
Shallow Aquifer Zone Gradient	0.031	0.031	0.033	0.025	0.030
Deep Aquifer Zone Gradient	0.028	0.028	0.029	0.028	0.028

Horizontal aquifer gradients are calculated perpendicular to head contours at MW-1S and MW-2S (for the shallow aquifer) and at MW-1D and MW-8D (for the deep aquifer). For 2018 Q3 (when MW-2S was dry) the assumed elevation at MW-2S was 90.61 ft.

Table 4. Landfill Gas Concentrations in 2018, Carnation Landfill

Event	Sample Date	Location ID	CH ₄ (~ (% vol)	CO ₂ (% vol)	O ₂ (% vol)	Barometric Pressure (mb)*	24-hr Barometric Trend (mb)*
2018 Q1	3/13/2018	M-1	0	3.2	15.6	1009.1	-10.2
2018 Q1	3/13/2018	M-2	0	3.5	16.5	1005.8	-6.8
2018 Q1	3/13/2018	M-3	0	3.2	14.2	1009.1	-10.2
2018 Q1	3/13/2018	M-4	0	1.6	16.6	1009.1	-10.2
2018 Q1	3/13/2018	M-5	4.8	5.6	3.3	1009.1	-10.2
2018 Q1	3/13/2018	M-6	0	3.8	9.5	1005.8	-6.8
2018 Q1	3/13/2018	M-7	0	1.8	17.2	1005.8	-6.8
2018 Q1	3/13/2018	M-8	0	3.8	14	1005.8	-6.8
2018 Q1	3/13/2018	M-9	0	4.7	13.5	1005.8	-6.8
2018 Q1	3/13/2018	V-1	0	0.1	9.9	1009.1	-10.2
2018 Q1	3/13/2018	V-2	0.3	0.2	19.7	1009.1	-10.2
2018 Q1	3/13/2018	V-3	0	0.1	19.9	1009.1	-10.2
2018 Q1	3/13/2018	V-4	0	0.1	19.8	1009.1	-10.2
2018 Q2	6/21/2018	M-1	0 J	4.5	16.1	1019.3	6.8
2018 Q2	6/21/2018	M-2	0 J	4.5	17.3	1019.3	6.8
2018 Q2	6/21/2018	M-3	0 J	4.7	16.6	1019.3	6.8
2018 Q2	6/21/2018	M-4	0 J	4.2	16.9	1019.3	6.8
2018 Q2	6/21/2018	M-5	0 J	4.7	16.3	1019.3	6.8
2018 Q2	6/21/2018	M-6	0 J	3.9	18.2	1019.3	6.8
2018 Q2	6/21/2018	M-7	0 J	3.1	19.3	1019.3	6.8
2018 Q2	6/21/2018	M-8	0 J	4.9	16.1	1019.3	6.8
2018 Q2	6/21/2018	M-9	0 J	8.1	11.8	1019.3	6.8
2018 Q2	6/21/2018	V-1	0 J	0	21	1019.3	6.8
2018 Q2	6/21/2018	V-2	0.1 J	0	20.8	1019.3	6.8
2018 Q2	6/21/2018	V-3	0.2 J	0	20.7	1019.3	6.8
2018 Q3	9/25/2018	M-1	0	4.4	15.3	1026.0	0.6
2018 Q3	9/25/2018	M-2	0	4.2	16.1	1026.0	0.6
2018 Q3	9/25/2018	M-3	0	3.4	16.7	1026.0	0.6
2018 Q3	9/25/2018	M-4	0	5	14.1	1026.0	0.6
2018 Q3	9/25/2018	M-5	0	4.1	15.2	1026.0	0.6
2018 Q3	9/25/2018	M-6	0	3.4	17	1025.9	0.6
2018 Q3	9/25/2018	M-7	0	2.8	17.9	1025.9	0.6
2018 Q3	9/25/2018	M-8	0	4.6	16	1026.2	0.7
2018 Q3	9/25/2018	M-9	0	8.7	11.5	1026.2	0.7
2018 Q3	9/25/2018	V-1	2.1	4.4	14.2	1025.3	-0.2
2018 Q3	9/25/2018	V-2	0.4	0.6	18.6	1025.3	-0.2
2018 Q3	9/25/2018	V-3	16.6	20	0	1026.0	0.6
2018 Q3	9/25/2018	V-4	14.7	19.1	2.7	1026.0	0.6
2018 Q4	12/12/2018	M-1	0	3.3	20.2	1022.7	20.3
2018 Q4	12/12/2018	M-2	0	5.4	17.5	1022.7	20.3
2018 Q4	12/12/2018	M-3	0	4.7	17	1022.7	20.3
2018 Q4	12/12/2018	M-4	0	6	11.3	1022.7	20.3
2018 Q4	12/12/2018	M-5	0	4.7	15.3	1022.7	20.3
2018 Q4	12/12/2018	M-6	0	5	13.4	1022.7	20.3
2018 Q4	12/12/2018	M-7	0	3.9	18.3	1022.7	20.3
2018 Q4	12/12/2018	M-8	0	4.4	17.8	1022.7	20.3
2018 Q4	12/12/2018	M-9	0	9.2	11.2	1022.7	20.3
2018 Q4	12/12/2018	V-1	3	7.5	7.2	1022.7	20.3
2018 Q4	12/12/2018	V-2	0.4	1.6	21.1	1022.7	20.3
2018 Q4	12/12/2018	V-3	6.1	11.8	1.7	1022.7	20.3
2018 Q4	12/12/2018	V-4	3.2	9.9	5.6	1022.7	20.3

~ Bold values are used if methane concentrations exceed the Lower Explosive Limit (LEL) of 5 percent.

*Barometric pressure data are from the Renton airport and are collected hourly. Pressures presented in the table correspond to the pressure measurement closest to sampling time. Barometric trend values are negative when it has declined over the previous 24 hours.

J: all methane concentrations are considered estimates from 2018 Q2 since readings from the landfill gas meter consistently measured 0.1% to 0.2% when purging atmospheric air. Concentrations measured in atmospheric air were subtracted from all measured methane concentrations.

Table 5. Statistical Summary of Parameters Sampled and VOCs Detected in Groundwater, Carnation Landfill

Station	Minimum	Maximum	Count	Median	25th Percentile	75th Percentile
Acrylonitrile, ug/L						
MW-1D	0.025	0.025	10	0.025	0.025	0.025
MW-1S	0.025	0.074	9	0.025	0.025	0.061
MW-2D	0.025	0.025	20	0.025	0.025	0.025
MW-2S	0.025	0.025	7	0.025	0.025	0.025
MW-3D	0.025	0.025	10	0.025	0.025	0.025
MW-3S	0.025	0.025	10	0.025	0.025	0.025
MW-5D	0.025	0.025	10	0.025	0.025	0.025
MW-5S	0.025	0.27	14	0.025	0.025	0.05675
MW-6D	0.025	0.117	10	0.025	0.025	0.05675
MW-7D	0.025	0.056	13	0.025	0.025	0.025
MW-8D	0.025	0.066	11	0.025	0.025	0.025
Arsenic, Dissolved, ug/L						
MW-1D	0.5	0.8	29	0.6	0.6	0.7
MW-1S	0.2	0.313	29	0.3	0.2	0.3
MW-2D	5.47	13.9	47	9.9	7.69	11.85
MW-2S	0.1	3.74	19	0.1	0.1	0.1
MW-3D	0.4	0.6	29	0.5	0.482	0.5
MW-3S	0.4	18.2	29	3.53	2.3	5.6
MW-5D	0.4	0.6	29	0.4	0.4	0.5
MW-5S	0.1	0.3	32	0.1	0.1	0.1
MW-6D	1.1	1.8	29	1.3	1.2	1.4
MW-7D	0.1	0.3	13	0.1	0.1	0.1
MW-8D	0.3	0.656	12	0.4	0.374	0.43975
Iron, Dissolved, ug/L						
MW-1D	25	340	29	25	25	25
MW-1S	25	110	29	25	25	25
MW-2D	840	2440	47	1520	1255	1855
MW-2S	25	6880	19	25	25	37.5
MW-3D	25	200	29	25	25	25
MW-3S	25	2060	29	239	140	458
MW-5D	25	190	29	25	25	25
MW-5S	10	106	32	25	25	25
MW-6D	310	620	29	530	480	570
MW-7D	25	110	13	25	25	25
MW-8D	25	120	12	25	25	72.225

Table5. Statistical Summary, Continued

Station	Minimum	Maximum	Count	Median	25th Percentile	75th Percentile
Manganese, Dissolved, ug/L						
MW-1D	0.5	8.9	29	1	0.5	2
MW-1S	0.5	9	29	0.5	0.5	0.5
MW-2D	1720	5560	47	2830	2585	3625
MW-2S	0.5	192	19	3	1	14.25
MW-3D	0.5	5	29	0.5	0.5	0.5
MW-3S	222	2540	29	1630	1280	1830
MW-5D	0.5	22	29	0.5	0.5	0.5
MW-5S	0.5	21	32	2	0.5	4.25
MW-6D	60	96	29	74	68	76
MW-7D	1	115	13	7	4	16
MW-8D	0.5	143	12	13.55	9.5	95.7
Nitrate, mg/L as N						
MW-1D	0.36	1.33	29	0.486	0.449	0.508
MW-1S	0.553	2.58	29	1.38	1.01	1.81
MW-2D	0.005	0.659	29	0.166	0.084	0.232
MW-2S	0.01	1.54	19	0.075	0.04135	0.588
MW-3D	0.428	0.905	29	0.704	0.523	0.834
MW-3S	0.005	1.41	29	0.027	0.01	0.098
MW-5D	0.246	0.554	29	0.384	0.325	0.494
MW-5S	1.38	5.72	20	2.61	2.1575	3.9925
MW-6D	0.005	0.012	29	0.005	0.005	0.005
MW-7D	0.151	3.24	9	1.21	0.545	1.25
MW-8D	0.81	1.33	6	1.016	0.86375	1.04
pH, standard units						
MW-1D	6.19	7.33	29	6.94	6.79	7.04
MW-1S	5.18	6.65	29	6.39	6.32	6.45
MW-2D	5.59	7.03	46	6.34	6.22	6.45
MW-2S	5.13	6.06	18	5.80	5.67	5.91
MW-3D	6.29	7.50	29	7.08	6.96	7.18
MW-3S	5.27	6.93	29	6.38	6.23	6.62
MW-5D	6.10	7.34	28	6.90	6.66	7.00
MW-5S	5.50	7.15	36	6.37	6.20	6.55
MW-6D	6.83	7.86	28	7.47	7.23	7.56
MW-7D	5.91	6.30	14	6.10	6.00	6.19
MW-8D	6.48	7.07	12	6.66	6.61	6.82

Table 5. Statistical Summary, Continued

Station	Minimum	Maximum	Count	Median	25th Percentile	75th Percentile
Specific Conductance, umhos/cm						
MW-1D	106.4	183	29	132.4	122	148.6
MW-1S	171	293	29	223	202	250.4
MW-2D	188.9	402	46	301.5	271.25	320.25
MW-2S	33	174.5	18	71.6	54.375	97.7
MW-3D	107	166.3	29	136	126	152.6
MW-3S	99	250	29	161	141.4	168
MW-5D	106	168.6	28	137.4	126.15	155.375
MW-5S	287	517	36	378	336.5	405.5
MW-6D	112	183.7	28	147.6	137.75	162.125
MW-7D	92.4	159.6	13	126	104.9	148.2
MW-8D	164.2	210	12	191.5	177.8	196.775
Sulfate, mg/L						
MW-1D	4.3	10.3	29	5.2	4.8	5.6
MW-1S	3.79	15.5	29	5	4.65	5.5
MW-2D	3.2	19.6	29	5.7	4.7	7.5
MW-2S	1	3.9	19	2.3	1	3.1
MW-3D	4.4	10	29	5.3	4.9	5.8
MW-3S	2.6	8.5	29	3.4	3	4
MW-5D	5.2	10.5	29	6.82	5.9	7.32
MW-5S	4.01	14.9	20	6.75	6.275	8.5
MW-6D	8	13.2	29	10.2	9.4	10.6
MW-7D	3.6	6.6	9	5.2	5	5.56
MW-8D	7.96	11.2	6	10.2	9.9475	10.4
Temperature, Degrees Celcius						
MW-1D	8.8	13.8	29	10.6	9.46	11.4
MW-1S	11.1	13.9	29	12.2	11.6	12.6
MW-2D	9.61	14.4	46	11.7	11.425	12.1
MW-2S	7.8	15.5	18	9.4	8.975	10.725
MW-3D	8.9	15.7	29	10.6	10	11.4
MW-3S	8.38	15.4	29	10.2	10	10.6
MW-5D	9.9	13.3	28	11.8	11.475	12.4
MW-5S	10.3	16.65	36	12	11.3	12.625
MW-6D	9.9	14.2	28	12.05	11.3825	12.5
MW-7D	9.91	12.7	13	12.1	11.6	12.3
MW-8D	9.99	13.3	12	12.2	11.475	12.725

Table 5. Statistical Summary, Continued

Station	Minimum	Maximum	Count	Median	25th Percentile	75th Percentile
Vinyl Chloride, ug/L						
MW-1D	0.005	0.01	29	0.01	0.005	0.01
MW-1S	0.005	0.01	28	0.01	0.005	0.01
MW-2D	0.005	0.44	47	0.083	0.042	0.155
MW-2S	0.005	0.01	19	0.01	0.005	0.01
MW-3D	0.005	0.01	29	0.01	0.005	0.01
MW-3S	0.005	0.01	29	0.01	0.005	0.01
MW-5D	0.005	0.01	29	0.01	0.005	0.01
MW-5S	0.005	0.037	36	0.01	0.005	0.01
MW-6D	0.005	0.01	29	0.01	0.005	0.01
MW-7D	0.005	0.076	13	0.005	0.005	0.005
MW-8D	0.005	0.005	11	0.005	0.005	0.005
Volatile Organic Compounds*, ug/L						
MW-2D Vinyl Chloride	0.005	0.44	47	0.083	0.042	0.155
MW-2D 1,1-DCA	0.1	1.1	47	0.2	0.1	0.4
MW-2D Chloroethane	0.1	3	47	0.5	0.27	1.1
MW-2D Cis-1,2-DCE	0.1	1	47	0.42	0.26	0.6
MW-6D Toluene	0.1	0.6	31	0.1	0.1	0.2
MW-5S Vinyl Chloride	0.005	0.037	36	0.01	0.005	0.01
MW-5S Styrene	0.1	5.4	37	0.1	0.1	0.1
MW-6D Carbon Disulfide	0.1	0.9	29	0.1	0.1	0.1
MW-1S Acrylonitrile	0.025	0.074	9	0.025	0.025	0.061
MW-5S Acrylonitrile	0.025	0.27	14	0.025	0.025	0.05675
MW-6D Acrylonitrile	0.025	0.117	10	0.025	0.025	0.05675
MW-8D Acrylonitrile	0.025	0.066	11	0.025	0.025	0.025

* Tabulated VOC data include only constituent-well pairs with three or more consecutive detections, or constituent-well pairs with a 25 percent or greater historical detection rate.

Table 6. 95% Confidence Intervals and Prediction Limits, Carnation Landfill 2018

Constituent	GWCL	PL	Well	LCL 95	UCL 95	Future Median of Order 3	Analytical method
Acrylonitrile SIM, ug/L	0.07		MW-1S	0.061			Non-Parametric
Acrylonitrile SIM, ug/L	0.07		MW-5S	0.025			Non-Parametric
Acrylonitrile SIM, ug/L	0.07		MW-6D	0.050			Non-Parametric
Acrylonitrile SIM, ug/L	0.07		MW-7D	0.025			Non-Parametric
Acrylonitrile SIM, ug/L	0.07		MW-8D	0.025			Non-Parametric
Vinyl Chloride SIM, ug/L	0.02		MW-2D	0.008			Normal
Vinyl Chloride SIM, ug/L	0.02		MW-7D	0.005			Non-Parametric
Iron, Dissolved, ug/L	300		MW-1D	80			Non-Parametric
Iron, Dissolved, ug/L	300		MW-2D	1508			Normal
Iron, Dissolved, ug/L	300		MW-2S	1990			Non-Parametric
Iron, Dissolved, ug/L	300		MW-3S	388			Ln-Normal
Iron, Dissolved, ug/L	300		MW-6D	517			Normal
Manganese, Dissolved, ug/L	50		MW-2D	2228			Normal
Manganese, Dissolved, ug/L	50		MW-2S	10			Ln-Normal
Manganese, Dissolved, ug/L	50		MW-3S	1407			Normal
Manganese, Dissolved, ug/L	50		MW-6D	66			Normal
pH, Field, std. units	6.5		MW-1S		6.27		Non-Parametric
pH, Field, std. units	6.5		MW-2D		6.20		Non-Parametric
pH, Field, std. units	6.5		MW-2S		5.69		Non-Parametric
pH, Field, std. units	6.5		MW-3S		6.23		Non-Parametric
pH, Field, std. units	6.5		MW-5D		7.14		Normal
pH, Field, std. units	6.5		MW-7D		6.18		Normal
pH, Field, std. units	6.5		MW-8D		6.73		Normal
Arsenic, Dissolved, ug/L	0.05	0.8	MW-2D	6.5			Normal
Arsenic, Dissolved, ug/L	0.05	0.8	MW-2S			2.4	Prediction Limit
Arsenic, Dissolved, ug/L	0.05	0.8	MW-3D			0.5	Prediction Limit
Arsenic, Dissolved, ug/L	0.05	0.8	MW-3S	2.8			Normal
Arsenic, Dissolved, ug/L	0.05	0.8	MW-5D			0.4	Prediction Limit
Arsenic, Dissolved, ug/L	0.05	0.8	MW-5S			0.1	Prediction Limit
Arsenic, Dissolved, ug/L	0.05	0.8	MW-6D	1.2			Normal
Arsenic, Dissolved, ug/L	0.05	0.8	MW-7D			0.1	Prediction Limit
Arsenic, Dissolved, ug/L	0.05	0.8	MW-8D	0.4			Normal

Bold values indicate that the 95% one-sided confidence interval of the mean/geomean/median exceeds the GWCL, or that the prediction limit for the future median is exceeded.

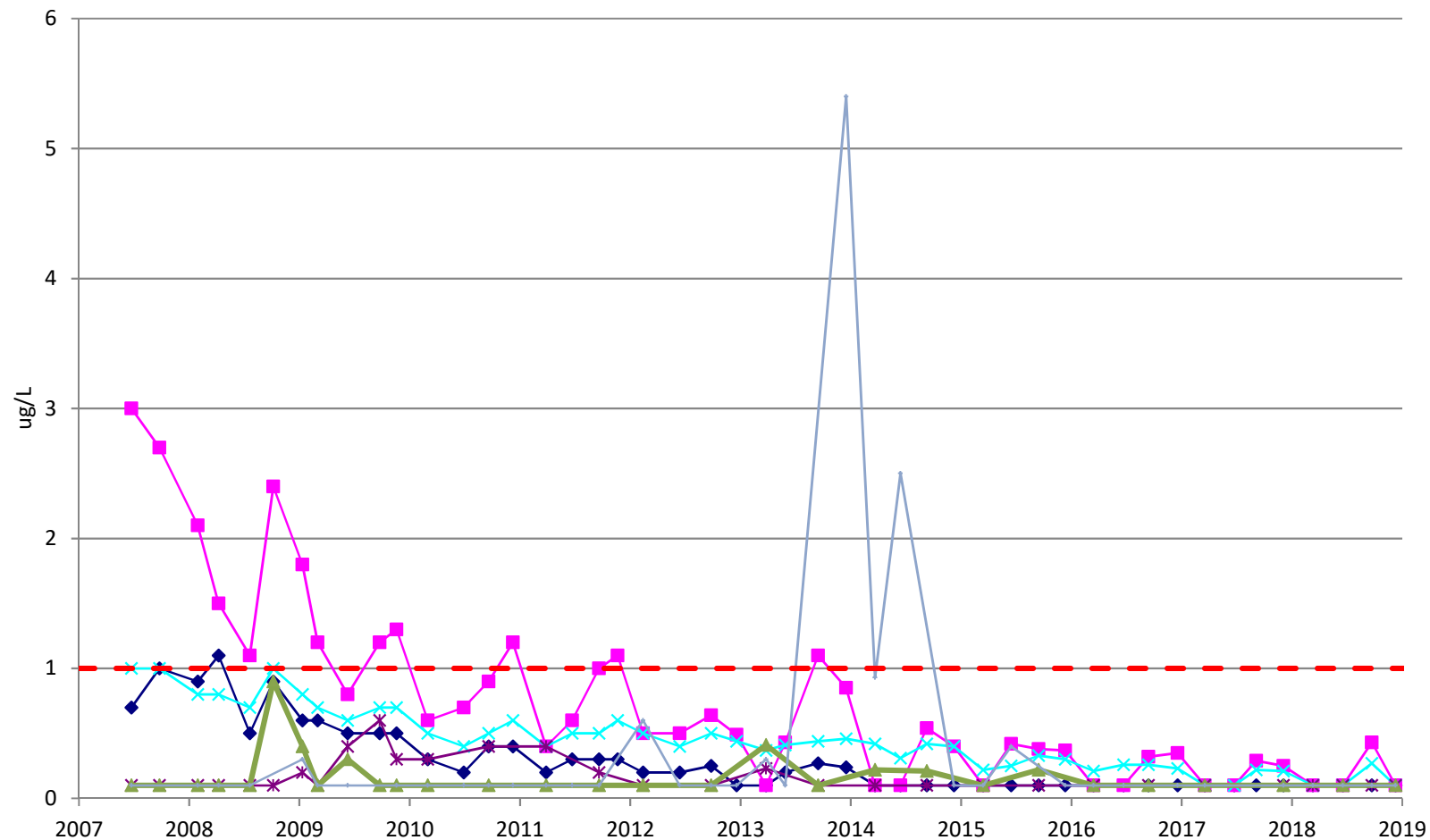
*Confidence intervals and prediction limits were calculated for well and constituent pairs which have had a GWCL exceedance in the 8 most recent sampling events, with the statistical method determined based on normality tests. Arsenic, which exceeds its GWCL at background wells MW-1D and MW-1S, was analyzed using nonparametric prediction limits to compare background concentrations to downgradient concentrations.

Table 7. Mann-Kendall Trend Test Results 2016 Q1 through 2018 Q4, Carnation Landfill

Constituent	Well	n	S	p	Bonferonni p value
Arsenic, Dissolved	MW-6D	6	10	0.048	8.976
Manganese, Dissolved	MW-8D	10	-21	0.036	6.732
Nitrate as N	MW-5S	5	-8	0.042	7.854
pH, Field	MW-3D	6	-10	0.048	8.976
pH, Field	MW-5D	6	-10	0.048	8.976
pH, Field	MW-7D	6	-10	0.048	8.976
pH, Field	MW-8D	10	-27	0.008	1.496
Temperature	MW-6D	6	-11	0.028	5.236

Negative S values indicate a statistically significant decreasing trend is occurring with a significance equal to $(1 - p)$, while a positive S value indicates there is a statistically significant increasing trend. Results are considered significant if $(1 - p)$ is greater than or equal to 0.95.

The Bonferonni method corrects p values for type I errors (false positives) by multiplying calculated p values by the number of constituent-pair tests performed. Bonferonni adjusted p-values are statistically significant if $(1 - p)$ is greater than or equal to 0.95, and are **bolded** in this table.



MW-2D 1,1-DCA
 MW-2D Cis-1,2-DCE
 MW-6D Carbon Disulfide
 MW-2D Chloroethane
 MW-6D Toluene
 MW-5S Styrene

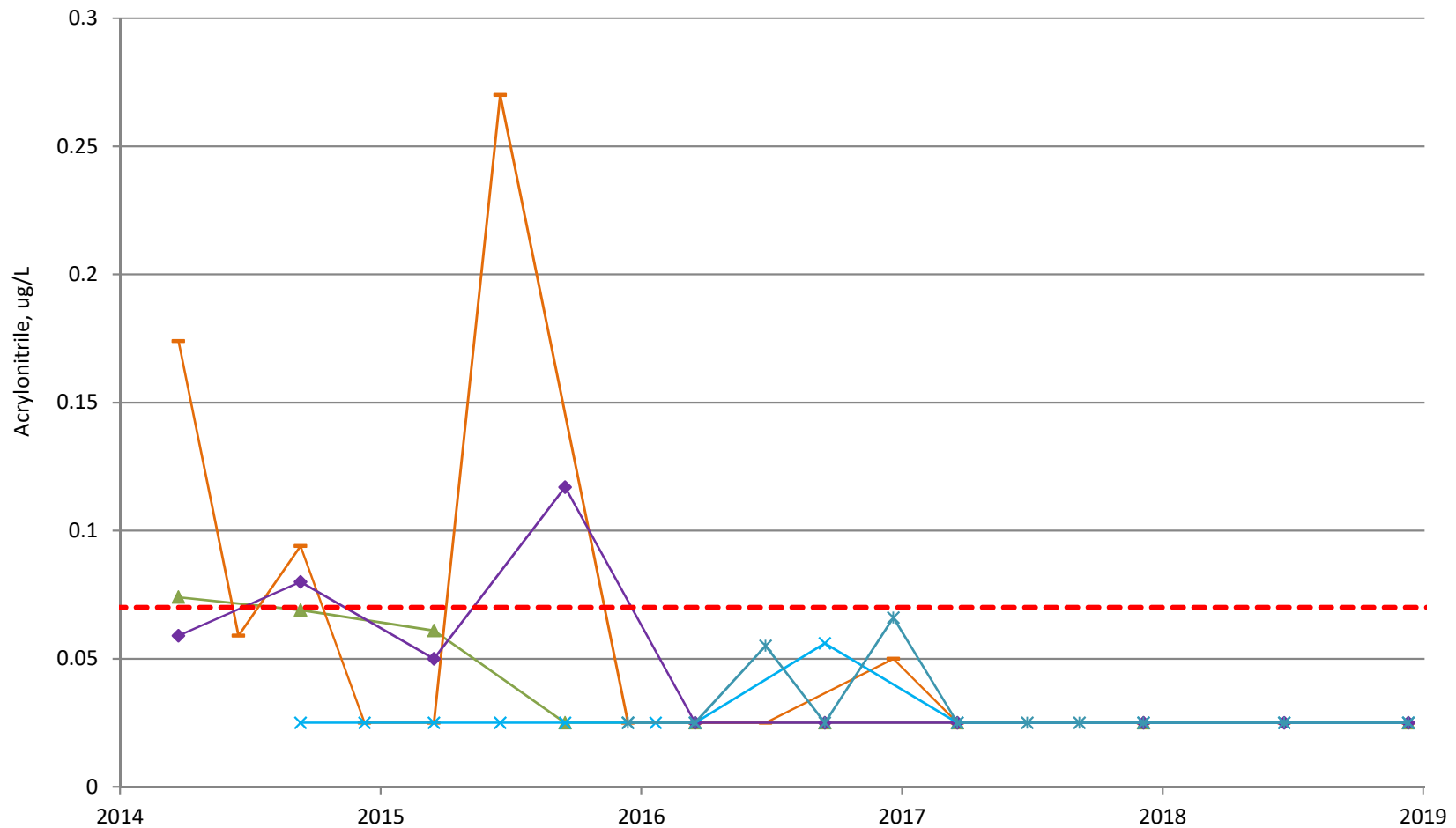
1,1-DCA GWCL

Notes:

- Plotted data include only constituent-well pairs with three or more consecutive detections, or constituent-well pairs with a 25 percent or greater historical detection rate.
- Non-detects are plotted at half of their reporting limit

Figure 1. Time Series Plot of Commonly Detected Volatile Organic Compounds with Concentrations Generally Below GWCLs

PgG

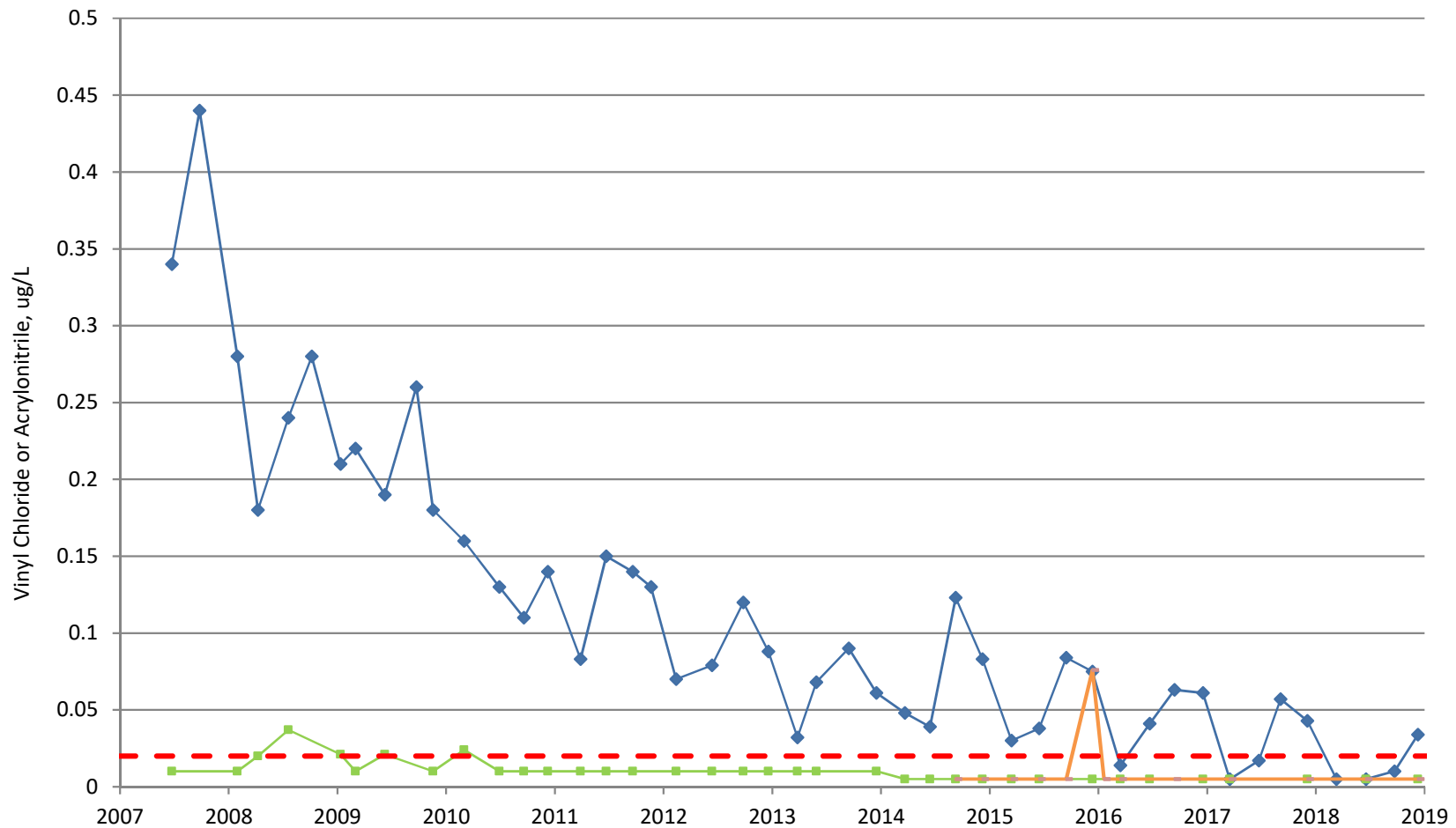


Notes:

- The reporting limit for acrylonitrile was lowered from 1 ug/L to 0.05 ug/L in 2014. Data prior to 2014 are not plotted since no detections occurred at this higher reporting limit.
- Non-detects are plotted at half of their reporting limit



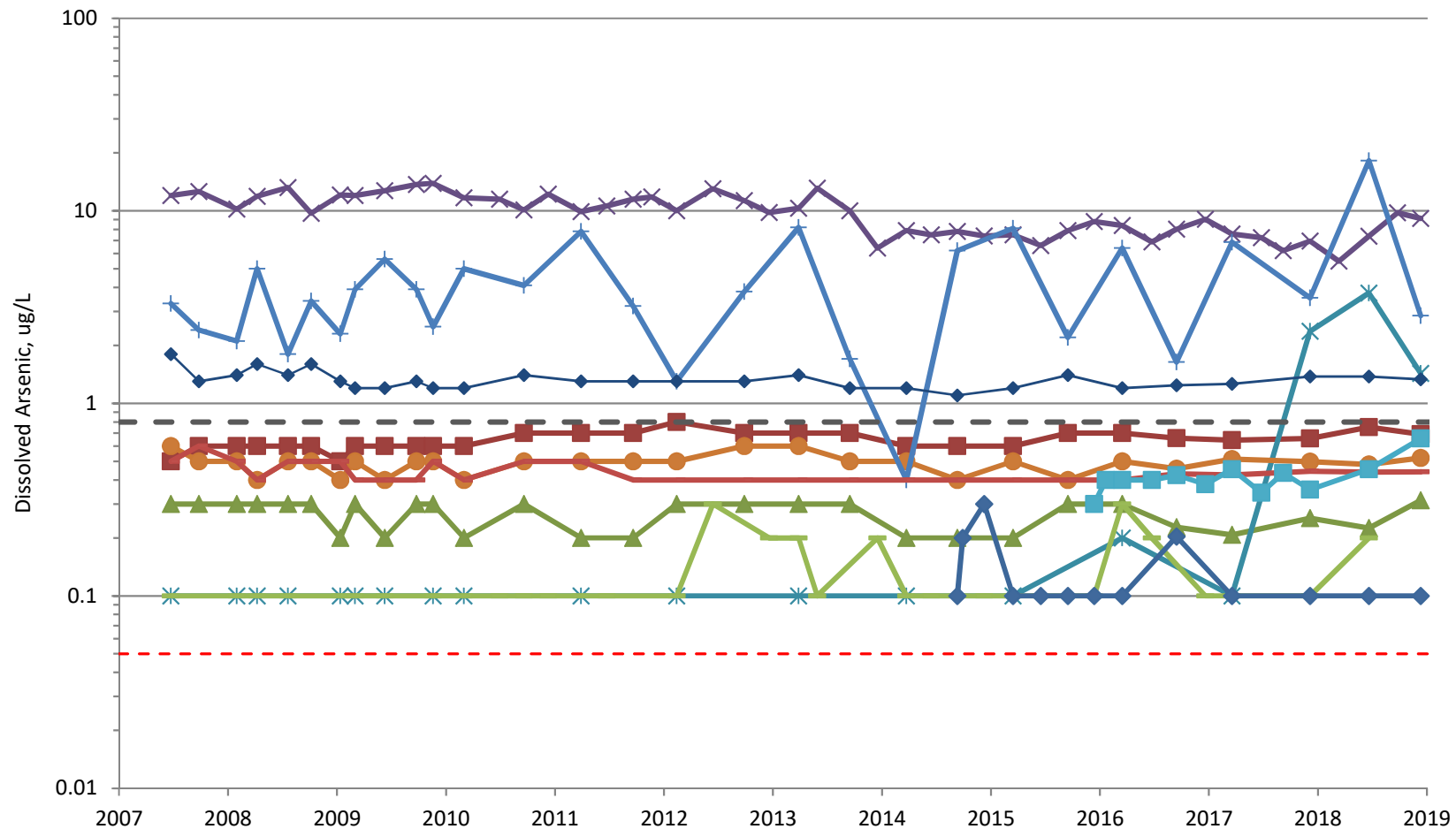
Figure 2. Time Series Plot of Wells with Acrylonitrile Detections



Notes:
 -Non-detects are plotted at half of their reporting limit

◆ MW-2D
 ■ MW-5S
 — MW-7D
 - - - Vinyl Chloride GWCL

Figure 3. Time Series Plot of Wells with Vinyl Chloride Detections

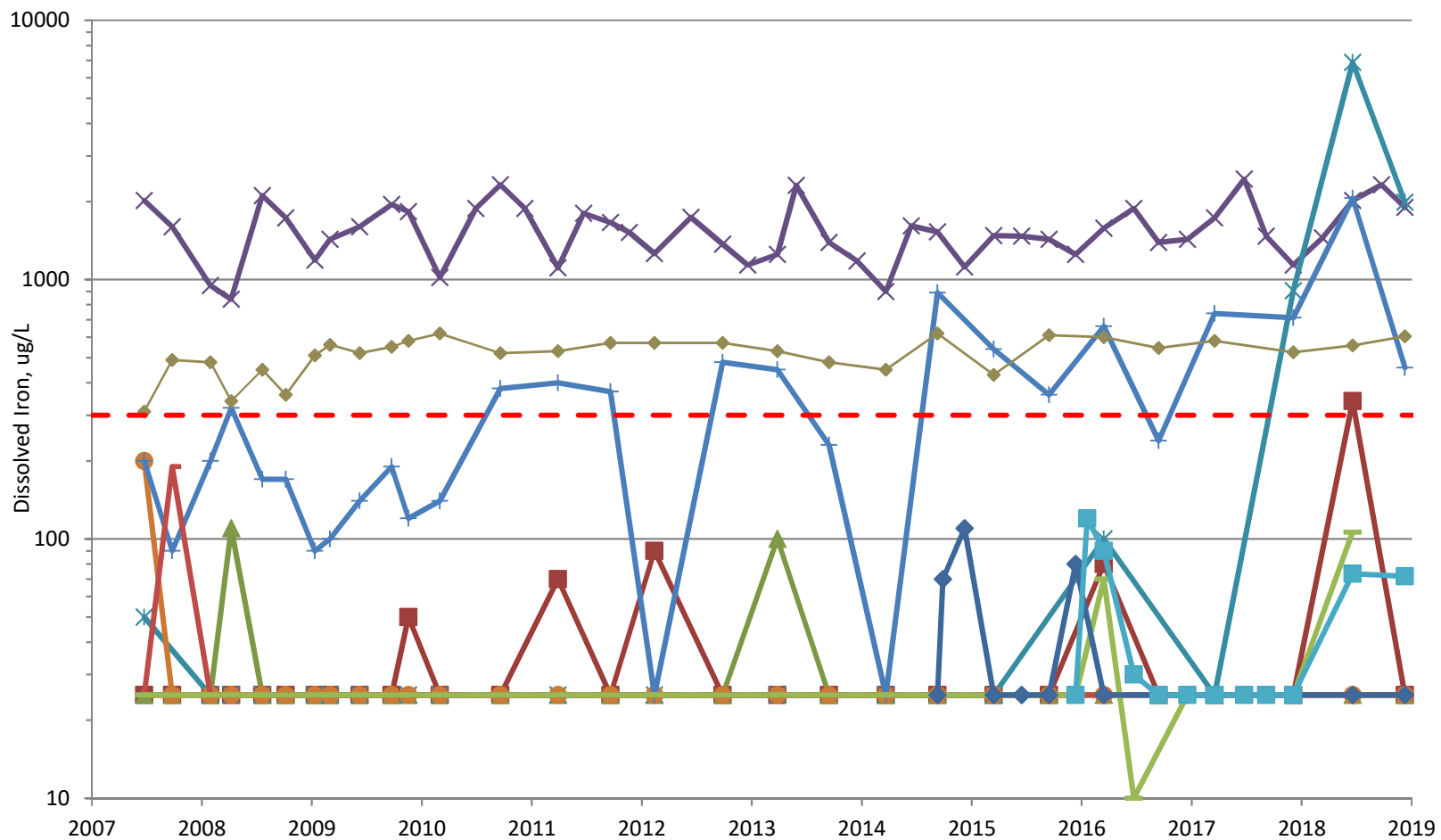


Notes:

-Non-detects are plotted at half the reporting limit



Figure 4. Dissolved Arsenic Concentration Time Series Plot

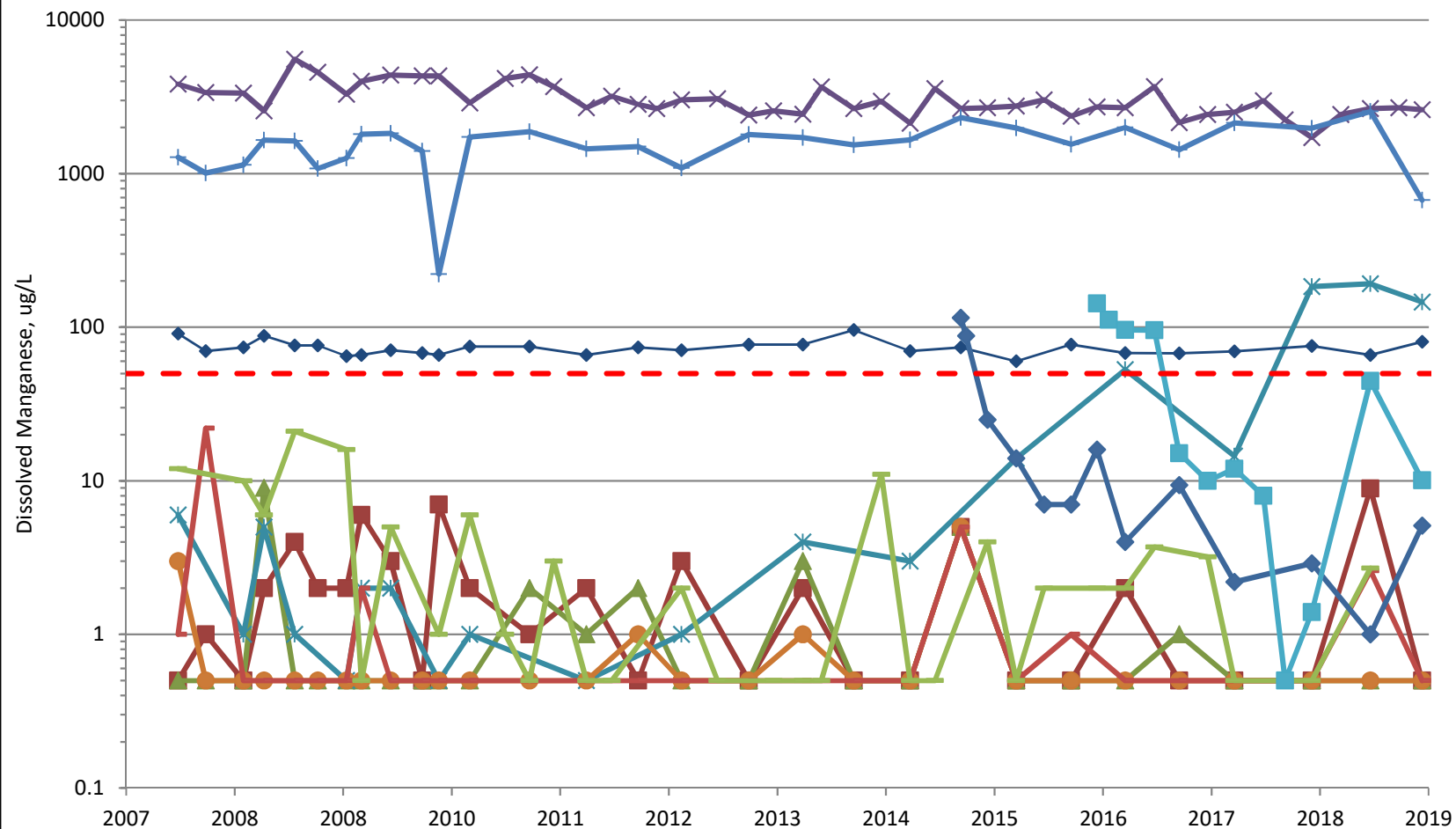


Notes:

-Non-detects are plotted at half the reporting limit



Figure 5. Dissolved Iron Concentration Time Series Plot



Notes:

-Non-detects are plotted at half the reporting limit

MW-1D MW-15 MW-2D MW-25 MW-3D MW-3S
MW-5D MW-5S MW-6D MW-7D MW-8D GWCL

Figure 6. Dissolved Manganese Concentration Time Series Plot

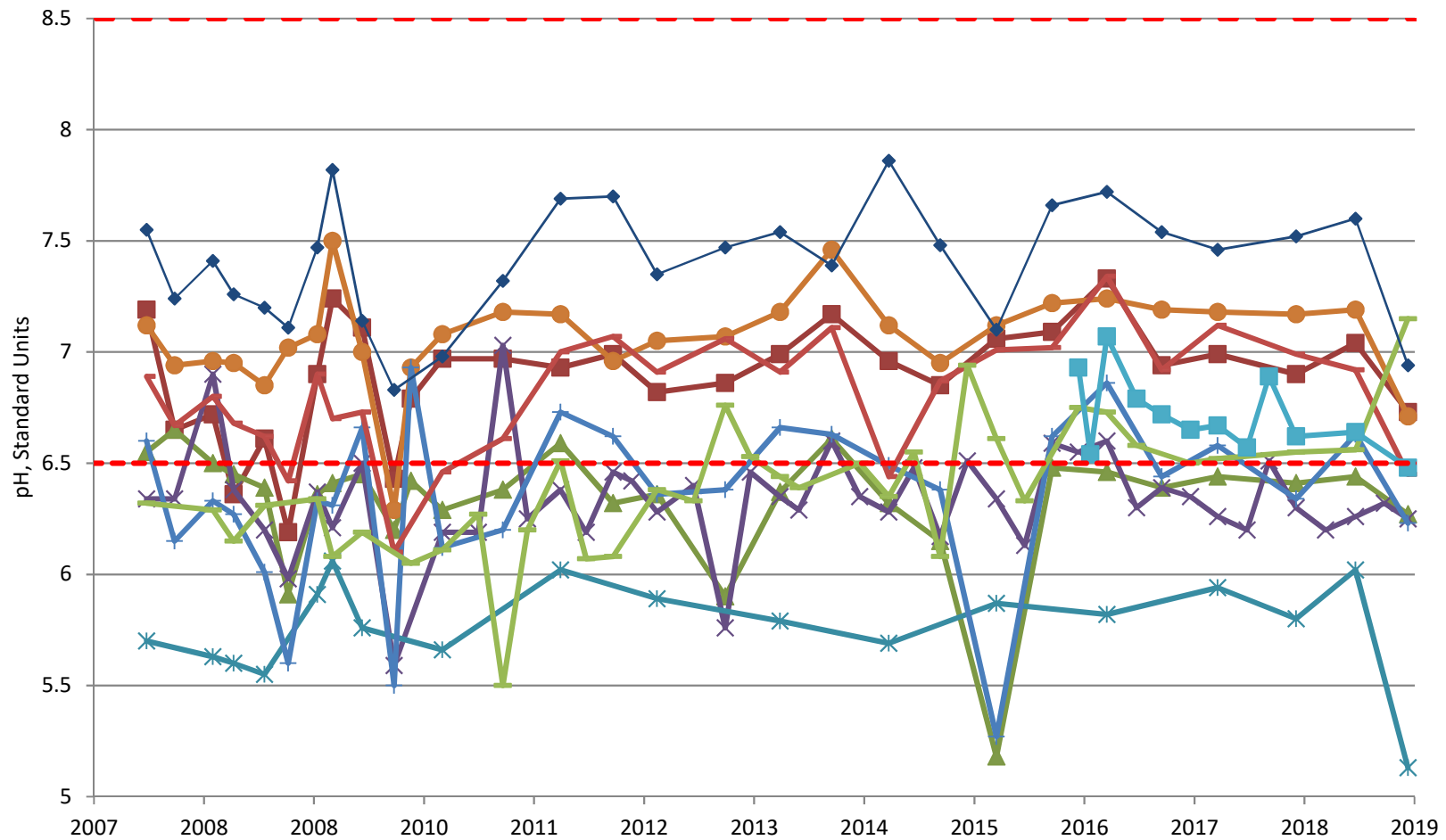
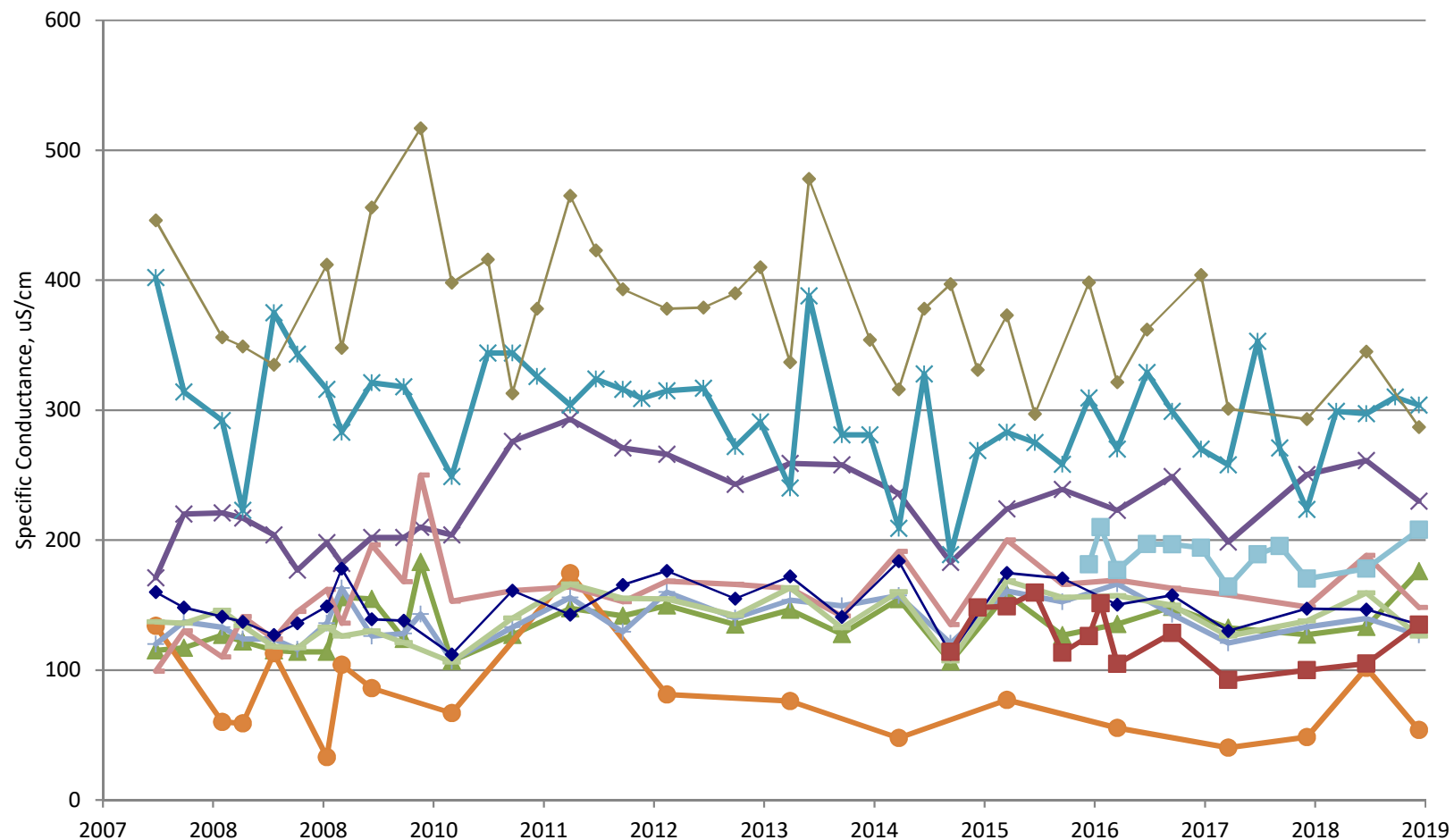


Figure 7. pH Time Series Plot



Notes:

-Specific conductance GWCL = 700 uS/cm

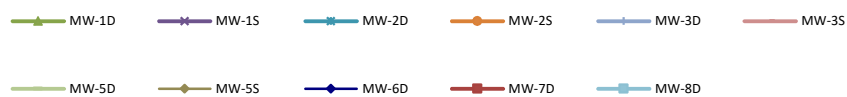
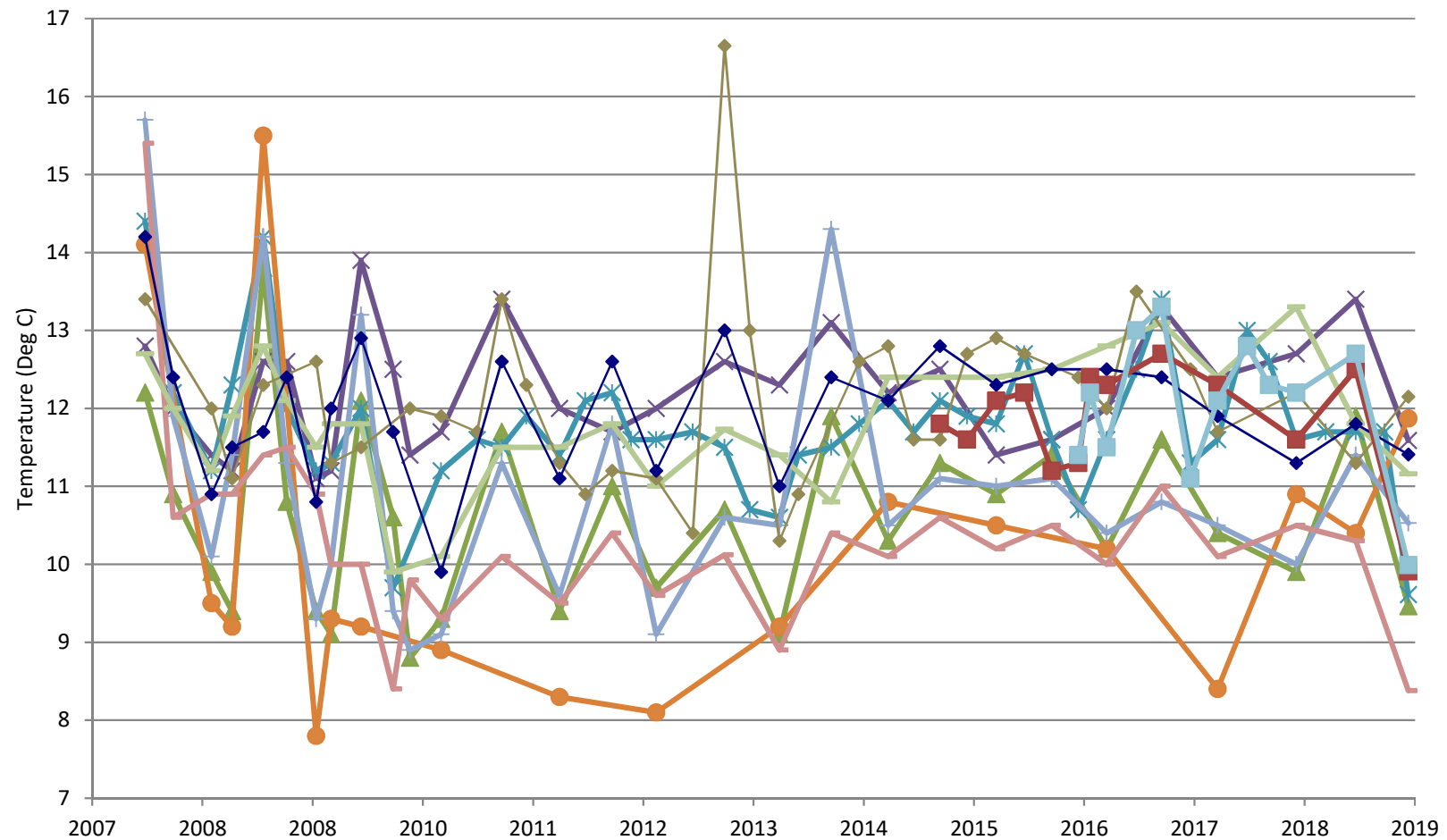


Figure 8. Specific Conductance Time Series Plot

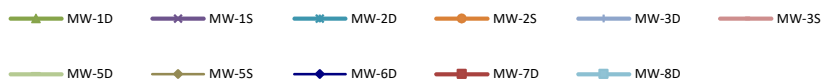
PgG

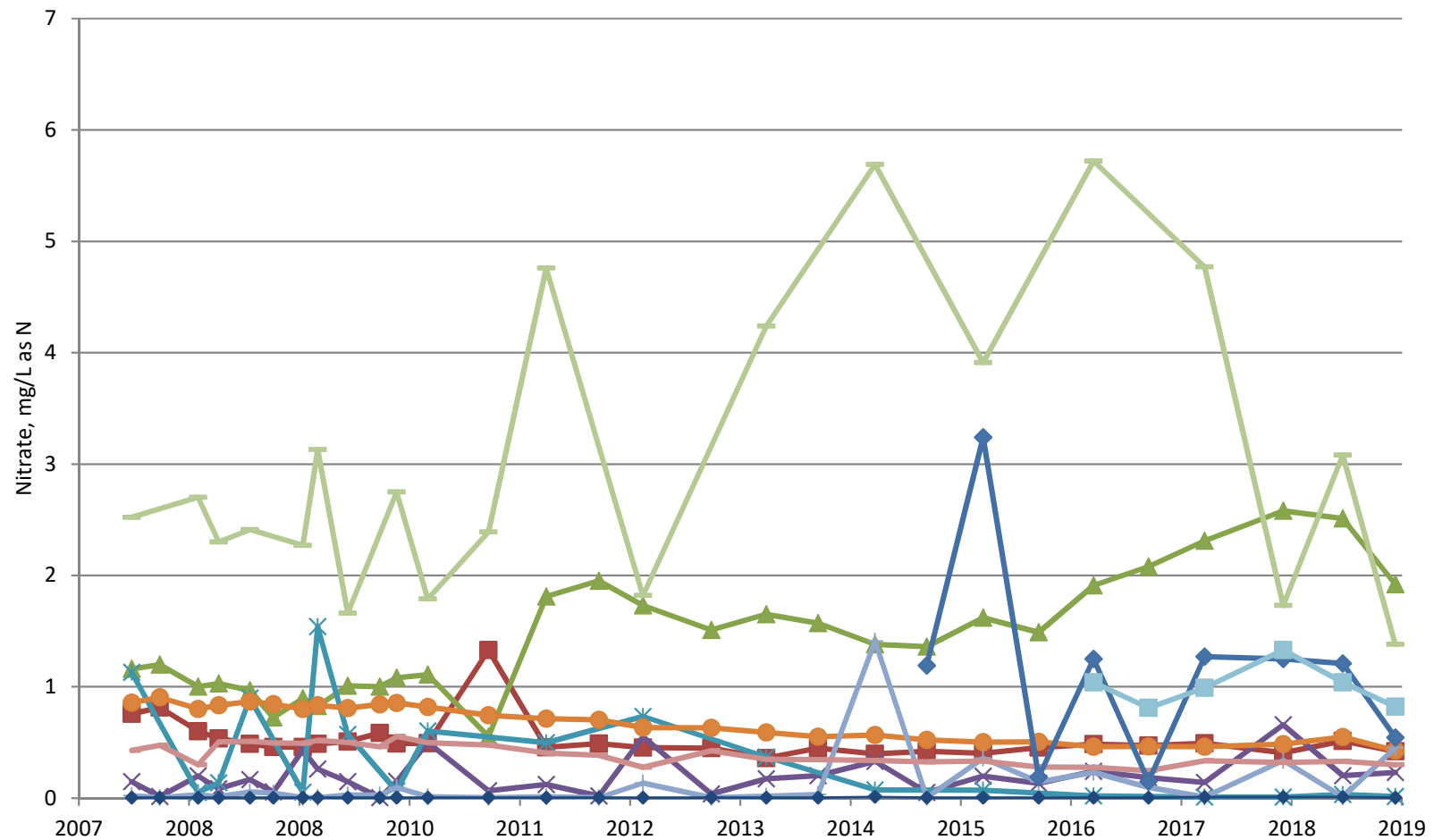


Notes:

-Temperature does not have a defined GWCL.

Figure 9. Temperature Time Series Plot





Notes:

-Nitrate GWCL = 10 mg/L as N

-Non-detects are plotted at half the reporting limit

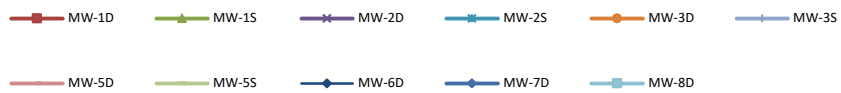
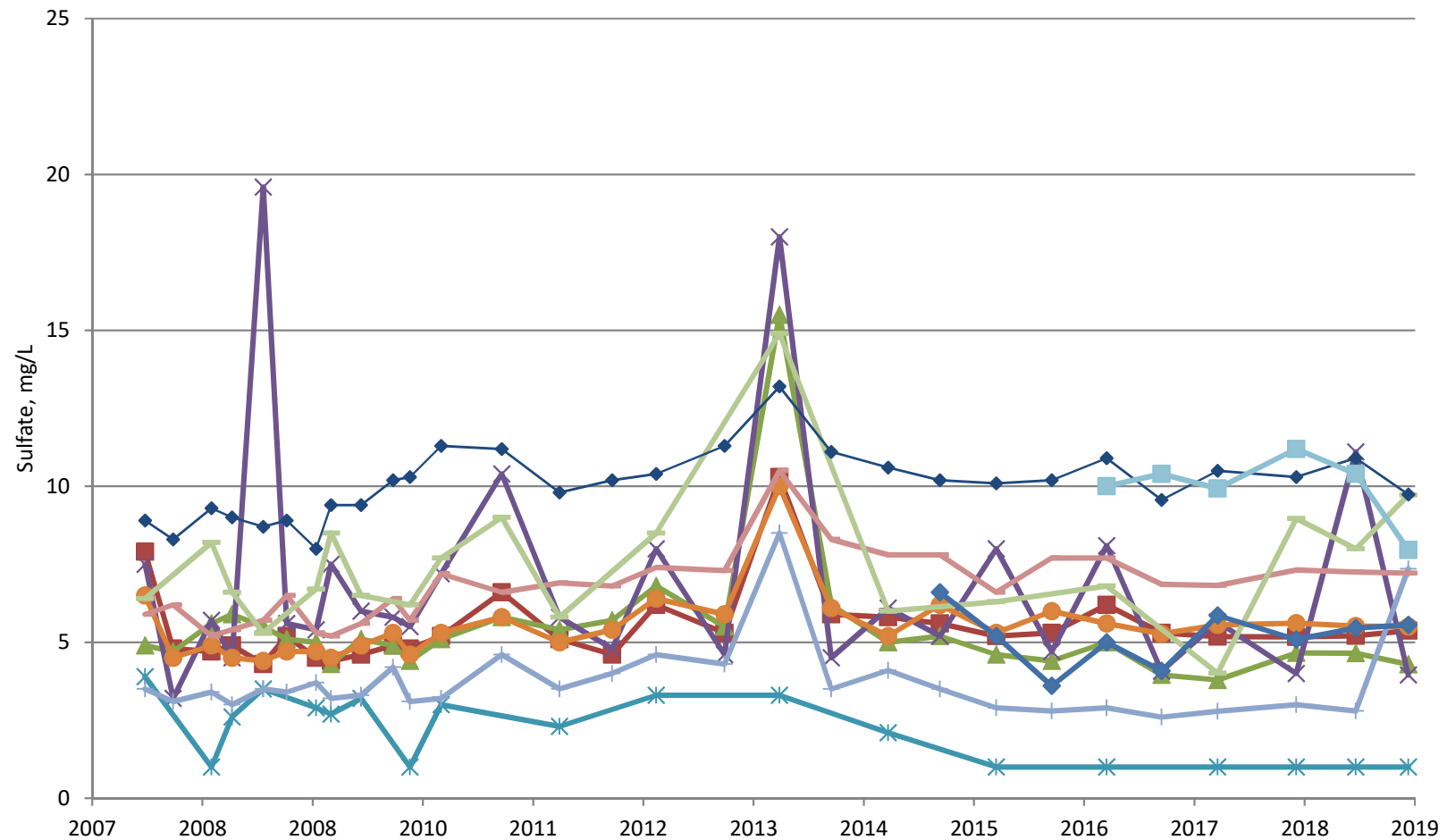


Figure 10. Nitrate Concentration Time Series Plot



Notes:

- Sulfate GWCL = 250 mg/L
- Non-detects are plotted at half the reporting limit

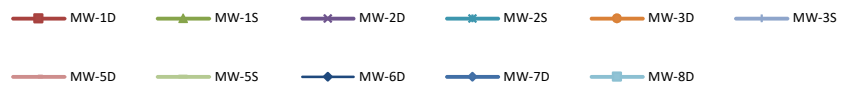


Figure 11. Sulfate Concentration Time Series Plot



K:\Steve\CarnationLandfill\GIS\Deep Aquifer_2018Q4.mxd 2/22/2019

Pictometry International Corp.

- Monitoring Wells
- Landfill Gas Monitoring Wells
- Landfill Gas Vents
- Groundwater Elevation Contour (Feet) in Deep Aquifer

- Approximate Fence Line
- Parcel Boundaries

0 Feet 100



2015 Ortho Photo from King County

Figure 12
Carnation Landfill
Deep Aquifer Elevations
2018Q4

Carnation Landfill
JS0903

PGG



K:\Steve\CarnationLandfill\GIS\Shallow_Aquifer_2018Q4.mxd 2/22/2019

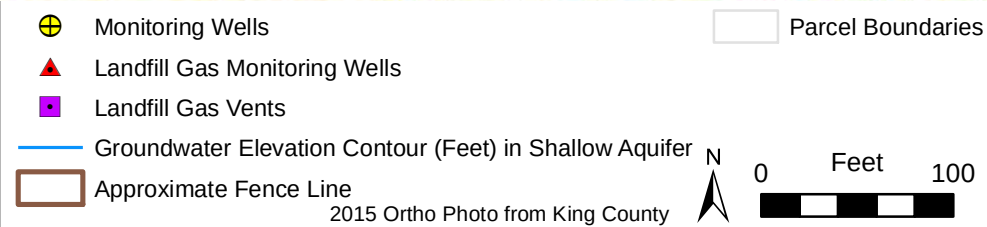


Figure 13
Carnation Landfill
Shallow Aquifer Elevations
2018Q4

Carnation Landfill
 JS0903

ATTACHMENT 1:
2018 Q1 FIELD DATA SHEETS & LABORATORY REPORTS

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW-2D

Sampling Event: 2018 Q1

Sample #: _____

Project Number: JS0903	Date: <u>3-13-18</u>
Project Name: Carnation Landfill	Location: <u>Carnation Landfill</u>
Project Address: NE 24th St & 328th Ave NE	Sampled By: <u>Joan D</u>
Client Name: City of Carnation	Purged By: _____
Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical	Date Sent to Lab: <u>3-14-18</u>
Chain-of-Custody (yes/no): <u>yes</u>	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): <u>45.45</u>	Purge Volume Measurement Method: <u>low flow</u>
Depth of Well (feet): <u>33.22</u>	Purge Date/Time: _____
Reference Point (surveyors notch, etc.): <u>Black MP on Casing</u>	Purging Equipment: <u>dedicated DC Purge pump</u>
Sampling Equipment: <u>dedicated DC Purge pump</u>	Water Level Probe Used: _____
Casing Volume Constants (CVC): 2-inch = <u>0.16</u> gpf ; 4-inch = <u>0.656</u> gpf ; 6-inch = <u>1.47</u> gpf $PV = (\pi r^2 h) (7.48 \text{ gal/ft}^3)$	
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons	

Qx600 mL/min

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)	<i>- initial water had H2S odor</i>
<u>1318</u>	<u>0.75</u>	<u>6.29</u>	<u>366</u>	<u>11.3</u>	<u>cloudy - first 0.5 gal</u>	<u>tomato soup</u>
<u>1322</u>	<u>1.25</u>	<u>6.25</u>	<u>336</u>	<u>11.5</u>	<u>sl cldy</u>	
<u>1325</u>	<u>1.75</u>	<u>6.24</u>	<u>327</u>	<u>11.6</u>	<u>" "</u>	
<u>1327</u>	<u>2.0</u>	<u>6.22</u>	<u>304</u>	<u>11.6</u>	<u>" "</u>	
<u>1328</u>	<u>2.25</u>	<u>6.21</u>	<u>384</u>	<u>11.7</u>	<u>" "</u>	
<u>1330</u>	<u>2.5</u>	<u>6.21</u>	<u>299</u>	<u>11.7</u>	<u>" "</u>	
<u>1332</u>	<u>2.75</u>	<u>6.20</u>	<u>299</u>	<u>11.7</u>	<u>" "</u>	

Well Integrity:
 when cleaning off sounder tip from MW-2S organic matter, realized after the fact
 I was using glove that was worn at MW-3S when used lock-ease.
 Therefore sounder decan ~~prince~~ may have introduced contaminants

Bottle Inventory				Day/Time Sampled: <u>3/13/18 1330</u>
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
<u>3</u>	<u>VOA</u>	<u>HCl</u>	<u>none</u>	<u>8260 VOCs</u>
<u>2</u>	<u>VOA</u>	<u>none</u>	<u>none</u>	<u>8260 SIM-VOCs</u>
<u>1</u>	<u>500 mL HDPE</u>	<u>HNO3</u>	<u>0.45 um</u>	<u>Field Filtered As, Mn, Fe</u>
<u>1</u>	<u>Small OJ</u>	<u>none</u>	<u>none</u>	<u>NO3, SO4</u>
<u>1</u>	<u>500 mL Amber</u>	<u>HCl</u>	<u>none</u>	<u>Ferrous Iron, Total</u>
<u>1</u>	<u>Small OJ</u>	<u>none</u>	<u>none</u>	<u>Alkalinity</u>

Signature: _____

Page _____ of _____

Methane Monitoring Field Form, Carnation Landfill

Sampling Event & Date: 2015 Q1, 3/13/18

Sampler: JOMD

Weather: 21st - 64.5 F

Previous 24-hr Barometric Data Downloaded?

Y

N

Time	Probe ID	Well Depth (ft bgs)	Screen Depth (ft bgs)	Depth to Water (ft bloc)	% of Screen Saturated	Purge Volume*	CH ₄ (%) total	CO ₂ (%) total	O ₂ (%) total	Static pressure (in H ₂ O)	Pump Run Time (sec)	Baro Pressure (in Hg)	Purge Data/Notes
1124	M-1	15	5-15			1.9	0	3.2	15.6	0.04	135	29.63	CO ₂ initial 0.1%, rezeroed reducer he
1117	M-2	15	5-15			1.9	0	3.5	16.5	-0.06	140	29.63	CO ₂ initial 0.1%
1131	M-3	15	5-15			1.9	0	3.2	14.2	0.07	100	29.63	
1138	M-4	8	3-8			1.1	0	4.1	16.6	0.07	140	29.63	product water in well not in reach of probe
1147	M-5	15	5-15			1.9	4.8	5.6	3.3	0.04	100	29.63	rezeroed reducer - ambient temp 60.0
1053	M-6	24	10-24			0.2	0	3.8	9.5	0.10	140	29.63	0.1% CO ₂ initial
1058	M-7	8	3-8			0.1	0	1.8	17.2	0.01	100	29.63	
1043	M-8	8	3-8			0.2	0	3.8	14.0	0.09	115	29.62	rezeroed reducer here
1036	M-9	20	10-20			0.3	0	4.7	13.5	0	140	29.62	initial CO ₂ 0.1%
1204	V-1						0	0.1	14.4	-	80	29.63	
1201	V-2						0.3	0.2	14.7	-	100	29.63	
1158	V-3						0	0.1	14.4	-	160	29.63	
1154	V-4						0	0.1	14.8	-	100	29.63	

*Purge volume is the number of strokes required for purging 1 casing volume using a 6 liter bilge pump.

bgs = below ground surface; bloc = below top of casing



Analytical Resources, Incorporated
Analytical Chemists and Consultants

27 March 2018

Glenn Mutti-Driscoll
Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle, WA 98102

RE: Carnation Landfill JS0903

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)
18C0247

Associated SDG ID(s)
N/A

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 its entirety.



Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

ARI Assigned Number: 18C0247		Turn-around Requested: Std		Page: 1 of 1										
ARI Client Company: PGG		Phone: 206-324-0141		Date: 3/13/18 Ice Present? Yes										
Client Contact: Glenn Mutti-Driscoll		No. of Coolers: 1		Cooler Temps: 1.1°C										
Client Project Name: Carnation Landfill		Analysis Requested												
Client Project #: 150903 Samplers: 16MD														
Sample ID	Date	Time	Matrix	No. Containers	VOC	Field Analyte	As, Mn, Fe							Notes/Comments
MW-2D	3/13/18	1330	W	5	X	X								
Comments/Special Instructions		Relinquished by: COE		Received by: [Signature]		Relinquished by: [Signature]		Received by: [Signature]						
		(Signature)		(Signature)		(Signature)		(Signature)						
		Printed Name: Charles Ellingson		Printed Name: Sacobyatte		Printed Name:		Printed Name:						
		Company: PGG		Company: ARI		Company:		Company:						
Date & Time: 3/14/18 1:37pm		Date & Time: 03/14/18 1337		Date & Time:		Date & Time:								

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
27-Mar-2018 11:08

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-2D	18C0247-01	Water	13-Mar-2018 13:30	14-Mar-2018 13:37
Trip Blanks	18C0247-02	Water	13-Mar-2018 13:30	14-Mar-2018 13:37



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
27-Mar-2018 11:08

Case Narrative

Volatiles - EPA Method SW8260C

The sample(s) were run within the recommended holding times.

Initial and continuing calibrations were within method requirements with the exception of all associated "Q" flagged analytes which are out of control high. All associated samples that contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/LCSD percent recoveries and RPD were within control limits with the exception of analytes flagged on the associated forms.

The analyst noted that sample 18C0247-02 was analyzed from a vial that contained a peabubble.

Dissolved Metals - EPA Method 6010C and 200.8

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.



WORK ORDER

18C0247

Client: Pacific Groundwater Group

Project Manager: Kelly Bottem

Project: Carnation Landfill JS0903

Project Number: Carnation Landfill JS0903

Report To:

Pacific Groundwater Group
Glenn Mutti-Driscoll
2377 Eastlake Ave. E. Suite 200
Seattle, WA 98102
Phone: (206) 329-0141
Fax: -

Invoice To:

Pacific Groundwater Group
Glenn Mutti-Driscoll
2377 Eastlake Ave. E. Suite 200
Seattle, WA 98102
Phone: (206) 329-0141
Fax: -

Date Due: 28-Mar-2018 18:00 (10 day TAT)

Received By: Jacob Walter

Date Received: 14-Mar-2018 13:37

Logged In By: Jacob Walter

Date Logged In: 14-Mar-2018 14:16

Samples Received at: 1.1°C

Intact, properly signed and dated custody seals attached to outside of cooler(s).....No
Custody papers properly filled out (in, signed, analyses requested, etc).....Yes
Was sufficient ice used (if appropriate).....Yes
All bottles arrived in good condition (unbroken).....Yes
Number of containers listed on COC match number received.....No
Correct bottles used for the requested analyses.....Yes
Analyses/bottles require preservation (attach preservation sheet excluding VOC).....Yes
Sample split at ARI.....No

Custody papers included with the cooler.....Yes
Was a temperature blank included in the cooler.....No
All bottles sealed in individual plastic bags.....No
All bottle labels complete and legible.....Yes
Bottle labels and tags agree with COC.....Yes
All VOC vials free of air bubbles.....No
Sufficient amount of sample sent in each bottle.....Yes

18C0247-01 MW-2D [Water] Sampled 13-Mar-2018 13:30

8260C VOA	03/28/2018	10	3/27/2018	Field Filtered
Met Diss 200.8 - As UCT	03/28/2018	10	9/9/2018	Field Filtered
Met Diss 6010C - Fe	03/28/2018	10	9/9/2018	Field Filtered
Met Diss 6010C - Mn	03/28/2018	10	9/9/2018	Field Filtered

18C0247-02 Trip Blanks [Water] Sampled 13-Mar-2018 13:30

8260C VOA	03/28/2018	10	3/27/2018	Trip Blanks

Preservation Confirmation

Container ID	Container Type	pH
18C0247-01 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	6.2 Pass
18C0247-01 B	VOA Vial, Clear, 40 mL, HCL	1 pebble
18C0247-01 C	VOA Vial, Clear, 40 mL, HCL	1 pebble
18C0247-01 D	VOA Vial, Clear, 40 mL, HCL	1 pebble
18C0247-02 A	VOA Vial, Clear, 40 mL, HCL	1 large air bubble
18C0247-02 B	VOA Vial, Clear, 40 mL, HCL	1 large air bubble

Preservation Confirmed By SSW

Date 03/14/18



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: PGC

Project Name: _____

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 18C0247

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)

Time: 1410

1.1°C

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 1005206

Cooler Accepted by: SBW

Date: 03/14/18

Time: 1440 1337

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: _____

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 3/19/18

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

Samples Logged by: SBW Date: 03/14/18 Time: 1413

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

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:
vials with air bubbles marked on preservation sheet. Trip Blanks not on COC, COC states 5 sample containers only have 4 (not including TB)

By: SBW Date: 03/14/18

Small Air Bubbles ~ 2mm 	Peabubbles 2-4 mm 	LARGE Air Bubbles > 4 mm 	Small → "sm" (< 2 mm) Peabubbles → "ph" (2 to < 4 mm) Large → "lg" (4 to < 6 mm) Headspace → "hs" (> 6 mm)



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
27-Mar-2018 11:08

MW-2D
18C0247-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 03/13/2018 13:30

Instrument: NT2

Analyzed: 15-Mar-2018 11:30

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGC0428 Sample Size: 10 mL
Prepared: 15-Mar-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	6.01	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



Pacific Groundwater Group
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Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
27-Mar-2018 11:08

MW-2D
18C0247-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 03/13/2018 13:30

Instrument: NT2

Analyzed: 15-Mar-2018 11:30

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
27-Mar-2018 11:08

MW-2D
18C0247-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 03/13/2018 13:30

Instrument: NT2

Analyzed: 15-Mar-2018 11:30

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	120	%	
Surrogate: Toluene-d8		80-120 %	92.0	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	86.0	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	103	%	



Pacific Groundwater Group
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Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
27-Mar-2018 11:08

MW-2D
18C0247-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 03/13/2018 13:30

Instrument: ICPMS2

Analyzed: 20-Mar-2018 23:16

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGC0526 Sample Size: 25 mL
Prepared: 20-Mar-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	5.47	ug/L	



Pacific Groundwater Group
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Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
27-Mar-2018 11:08

MW-2D
18C0247-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 03/13/2018 13:30

Instrument: ICP2

Analyzed: 23-Mar-2018 15:05

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGC0494 Sample Size: 25 mL
Prepared: 19-Mar-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	1.45	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	2.43	mg/L	



Pacific Groundwater Group
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Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
27-Mar-2018 11:08

Trip Blanks
18C0247-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 03/13/2018 13:30

Instrument: NT2

Analyzed: 15-Mar-2018 11:10

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGC0428 Sample Size: 10 mL
Prepared: 15-Mar-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
27-Mar-2018 11:08

Trip Blanks
18C0247-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 03/13/2018 13:30

Instrument: NT2

Analyzed: 15-Mar-2018 11:10

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Reported:
27-Mar-2018 11:08

Trip Blanks
18C0247-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 03/13/2018 13:30

Instrument: NT2

Analyzed: 15-Mar-2018 11:10

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	121	%	
Surrogate: Toluene-d8		80-120 %	94.4	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	85.0	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	107	%	



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Reported:
27-Mar-2018 11:08

Volatile Organic Compounds - Quality Control

Batch BGC0428 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0428-BLK1)		Prepared: 15-Mar-2018 Analyzed: 15-Mar-2018 10:09								
Chloromethane	ND	0.50	ug/L							U
Vinyl Chloride	ND	0.20	ug/L							U
Bromomethane	ND	1.00	ug/L							U
Chloroethane	ND	0.20	ug/L							U
Trichlorofluoromethane	ND	0.20	ug/L							U
Acrolein	ND	5.00	ug/L							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.20	ug/L							U
Acetone	ND	5.00	ug/L							U
1,1-Dichloroethene	ND	0.20	ug/L							U
Bromoethane	ND	0.20	ug/L							U
Iodomethane	ND	1.00	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.20	ug/L							U
Vinyl Acetate	ND	0.20	ug/L							U
1,1-Dichloroethane	ND	0.20	ug/L							U
2-Butanone	ND	5.00	ug/L							U
2,2-Dichloropropane	ND	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Chloroform	ND	0.20	ug/L							U
Bromochloromethane	ND	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.20	ug/L							U
1,1-Dichloropropene	ND	0.20	ug/L							U
Carbon tetrachloride	ND	0.20	ug/L							U
1,2-Dichloroethane	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Trichloroethene	ND	0.20	ug/L							U
1,2-Dichloropropane	ND	0.20	ug/L							U
Bromodichloromethane	ND	0.20	ug/L							U
Dibromomethane	ND	0.20	ug/L							U
2-Chloroethyl vinyl ether	ND	1.00	ug/L							U
4-Methyl-2-Pentanone	ND	5.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.20	ug/L							U
Toluene	ND	0.20	ug/L							U



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Reported:
27-Mar-2018 11:08

Volatile Organic Compounds - Quality Control

Batch BGC0428 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0428-BLK1)		Prepared: 15-Mar-2018 Analyzed: 15-Mar-2018 10:09								
trans-1,3-Dichloropropene	ND	0.20	ug/L							U
2-Hexanone	ND	5.00	ug/L							U
1,1,2-Trichloroethane	ND	0.20	ug/L							U
1,3-Dichloropropane	ND	0.20	ug/L							U
Tetrachloroethene	ND	0.20	ug/L							U
Dibromochloromethane	ND	0.20	ug/L							U
1,2-Dibromoethane	ND	0.20	ug/L							U
Chlorobenzene	ND	0.20	ug/L							U
Ethylbenzene	ND	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.20	ug/L							U
m,p-Xylene	ND	0.40	ug/L							U
o-Xylene	ND	0.20	ug/L							U
Xylenes, total	ND	0.60	ug/L							U
Styrene	ND	0.20	ug/L							U
Bromoform	ND	0.20	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.50	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	1.00	ug/L							U
n-Propylbenzene	ND	0.20	ug/L							U
Bromobenzene	ND	0.20	ug/L							U
Isopropyl Benzene	ND	0.20	ug/L							U
2-Chlorotoluene	ND	0.20	ug/L							U
4-Chlorotoluene	ND	0.20	ug/L							U
t-Butylbenzene	ND	0.20	ug/L							U
1,3,5-Trimethylbenzene	ND	0.20	ug/L							U
1,2,4-Trimethylbenzene	ND	0.20	ug/L							U
s-Butylbenzene	ND	0.20	ug/L							U
4-Isopropyl Toluene	ND	0.20	ug/L							U
1,3-Dichlorobenzene	ND	0.20	ug/L							U
1,4-Dichlorobenzene	ND	0.20	ug/L							U
n-Butylbenzene	ND	0.20	ug/L							U
1,2-Dichlorobenzene	ND	0.20	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.50	ug/L							U
1,2,4-Trichlorobenzene	ND	0.50	ug/L							U
Hexachloro-1,3-Butadiene	ND	0.50	ug/L							U



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Reported:
27-Mar-2018 11:08

Volatile Organic Compounds - Quality Control

Batch BGC0428 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0428-BLK1)										
Prepared: 15-Mar-2018 Analyzed: 15-Mar-2018 10:09										
Naphthalene	ND	0.50	ug/L							U
1,2,3-Trichlorobenzene	ND	0.50	ug/L							U
Dichlorodifluoromethane	ND	0.20	ug/L							U
Methyl tert-butyl Ether	ND	0.50	ug/L							U
2-Pentanone	ND	5.00	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5.65		ug/L	5.00		113	80-129			
Surrogate: Toluene-d8	4.78		ug/L	5.00		95.6	80-120			
Surrogate: 4-Bromofluorobenzene	4.36		ug/L	5.00		87.3	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.11		ug/L	5.00		102	80-120			
LCS (BGC0428-BS1)										
Prepared: 15-Mar-2018 Analyzed: 15-Mar-2018 09:08										
Chloromethane	11.0	0.50	ug/L	10.0		110	60-138			
Vinyl Chloride	12.3	0.20	ug/L	10.0		123	66-133			Q
Bromomethane	11.9	1.00	ug/L	10.0		119	72-131			
Chloroethane	13.7	0.20	ug/L	10.0		137	60-155			Q
Trichlorofluoromethane	9.85	0.20	ug/L	10.0		98.5	80-129			
Acrolein	60.4	5.00	ug/L	50.0		121	52-144			Q
1,1,2-Trichloro-1,2,2-Trifluoroethane	11.6	0.20	ug/L	10.0		116	76-129			
Acetone	55.8	5.00	ug/L	50.0		112	58-142			
1,1-Dichloroethene	11.9	0.20	ug/L	10.0		119	69-135			
Bromoethane	11.7	0.20	ug/L	10.0		117	78-128			
Iodomethane	11.5	1.00	ug/L	10.0		115	56-147			
Methylene Chloride	11.0	1.00	ug/L	10.0		110	65-135			
Acrylonitrile	9.88	1.00	ug/L	10.0		98.8	64-134			
Carbon Disulfide	11.5	0.20	ug/L	10.0		115	78-125			
trans-1,2-Dichloroethene	11.3	0.20	ug/L	10.0		113	78-128			
Vinyl Acetate	9.87	0.20	ug/L	10.0		98.7	55-138			
1,1-Dichloroethane	11.6	0.20	ug/L	10.0		116	76-124			
2-Butanone	62.1	5.00	ug/L	50.0		124	61-140			Q
2,2-Dichloropropane	11.3	0.20	ug/L	10.0		113	78-125			
cis-1,2-Dichloroethene	11.5	0.20	ug/L	10.0		115	80-121			
Chloroform	11.4	0.20	ug/L	10.0		114	80-122			
Bromochloromethane	11.1	0.20	ug/L	10.0		111	80-121			
1,1,1-Trichloroethane	11.6	0.20	ug/L	10.0		116	79-123			
1,1-Dichloropropene	11.6	0.20	ug/L	10.0		116	80-120			



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Volatile Organic Compounds - Quality Control

Batch BGC0428 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGC0428-BS1)		Prepared: 15-Mar-2018 Analyzed: 15-Mar-2018 09:08								
Carbon tetrachloride	11.4	0.20	ug/L	10.0		114	53-137			
1,2-Dichloroethane	11.0	0.20	ug/L	10.0		110	75-123			
Benzene	11.5	0.20	ug/L	10.0		115	80-120			
Trichloroethene	10.7	0.20	ug/L	10.0		107	80-120			
1,2-Dichloropropane	11.5	0.20	ug/L	10.0		115	80-120			
Bromodichloromethane	11.5	0.20	ug/L	10.0		115	80-121			
Dibromomethane	11.1	0.20	ug/L	10.0		111	80-120			
2-Chloroethyl vinyl ether	9.78	1.00	ug/L	10.0		97.8	74-127			
4-Methyl-2-Pentanone	60.2	5.00	ug/L	50.0		120	67-133			
cis-1,3-Dichloropropene	12.1	0.20	ug/L	10.0		121	80-124			Q
Toluene	10.9	0.20	ug/L	10.0		109	80-120			
trans-1,3-Dichloropropene	9.98	0.20	ug/L	10.0		99.8	71-127			
2-Hexanone	54.5	5.00	ug/L	50.0		109	69-133			
1,1,2-Trichloroethane	11.3	0.20	ug/L	10.0		113	80-121			
1,3-Dichloropropane	11.4	0.20	ug/L	10.0		114	80-120			
Tetrachloroethene	10.5	0.20	ug/L	10.0		105	80-120			
Dibromochloromethane	11.6	0.20	ug/L	10.0		116	65-135			
1,2-Dibromoethane	11.5	0.20	ug/L	10.0		115	80-121			
Chlorobenzene	10.7	0.20	ug/L	10.0		107	80-120			
Ethylbenzene	10.9	0.20	ug/L	10.0		109	80-120			
1,1,1,2-Tetrachloroethane	11.1	0.20	ug/L	10.0		111	80-120			
m,p-Xylene	23.3	0.40	ug/L	20.0		116	80-121			
o-Xylene	11.8	0.20	ug/L	10.0		118	80-121			
Xylenes, total	35.1	0.60	ug/L	30.0		117	76-127			
Styrene	10.4	0.20	ug/L	10.0		104	80-124			
Bromoform	11.3	0.20	ug/L	10.0		113	51-134			
1,1,2,2-Tetrachloroethane	11.3	0.20	ug/L	10.0		113	77-123			
1,2,3-Trichloropropane	11.1	0.50	ug/L	10.0		111	76-125			
trans-1,4-Dichloro 2-Butene	11.4	1.00	ug/L	10.0		114	55-129			
n-Propylbenzene	12.0	0.20	ug/L	10.0		120	78-130			
Bromobenzene	10.5	0.20	ug/L	10.0		105	80-120			
Isopropyl Benzene	11.2	0.20	ug/L	10.0		112	80-128			
2-Chlorotoluene	11.5	0.20	ug/L	10.0		115	78-122			
4-Chlorotoluene	11.2	0.20	ug/L	10.0		112	80-121			
t-Butylbenzene	11.6	0.20	ug/L	10.0		116	78-125			



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Reported:
27-Mar-2018 11:08

Volatile Organic Compounds - Quality Control

Batch BGC0428 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGC0428-BS1)										
					Prepared: 15-Mar-2018 Analyzed: 15-Mar-2018 09:08					
1,3,5-Trimethylbenzene	11.8	0.20	ug/L	10.0		118	80-129			
1,2,4-Trimethylbenzene	11.2	0.20	ug/L	10.0		112	80-127			
s-Butylbenzene	11.5	0.20	ug/L	10.0		115	78-129			
4-Isopropyl Toluene	11.0	0.20	ug/L	10.0		110	79-130			
1,3-Dichlorobenzene	10.9	0.20	ug/L	10.0		109	80-120			
1,4-Dichlorobenzene	9.98	0.20	ug/L	10.0		99.8	80-120			
n-Butylbenzene	11.6	0.20	ug/L	10.0		116	74-129			
1,2-Dichlorobenzene	10.5	0.20	ug/L	10.0		105	80-120			
1,2-Dibromo-3-chloropropane	10.0	0.50	ug/L	10.0		100	62-123			
1,2,4-Trichlorobenzene	10.8	0.50	ug/L	10.0		108	64-124			
Hexachloro-1,3-Butadiene	8.91	0.50	ug/L	10.0		89.1	58-123			
Naphthalene	9.74	0.50	ug/L	10.0		97.4	50-134			
1,2,3-Trichlorobenzene	10.9	0.50	ug/L	10.0		109	49-133			
Dichlorodifluoromethane	11.4	0.20	ug/L	10.0		114	48-147			
Methyl tert-butyl Ether	11.2	0.50	ug/L	10.0		112	71-132			
2-Pentanone	47.8	5.00	ug/L	50.0		95.6	69-134			
Surrogate: 1,2-Dichloroethane-d4	5.24		ug/L	5.00		105	80-129			
Surrogate: Toluene-d8	5.01		ug/L	5.00		100	80-120			
Surrogate: 4-Bromofluorobenzene	4.92		ug/L	5.00		98.3	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.91		ug/L	5.00		98.2	80-120			
LCS Dup (BGC0428-BS1)										
					Prepared: 15-Mar-2018 Analyzed: 15-Mar-2018 09:49					
Chloromethane	11.0	0.50	ug/L	10.0		110	60-138	0.07	30	
Vinyl Chloride	12.5	0.20	ug/L	10.0		125	66-133	1.53	30	Q
Bromomethane	11.8	1.00	ug/L	10.0		118	72-131	0.90	30	
Chloroethane	13.9	0.20	ug/L	10.0		139	60-155	1.63	30	Q
Trichlorofluoromethane	9.96	0.20	ug/L	10.0		99.6	80-129	1.13	30	
Acrolein	60.3	5.00	ug/L	50.0		121	52-144	0.17	30	Q
1,1,2-Trichloro-1,2,2-Trifluoroethane	12.0	0.20	ug/L	10.0		120	76-129	3.72	30	
Acetone	55.2	5.00	ug/L	50.0		110	58-142	1.01	30	
1,1-Dichloroethene	11.8	0.20	ug/L	10.0		118	69-135	0.81	30	
Bromoethane	11.9	0.20	ug/L	10.0		119	78-128	1.78	30	
Iodomethane	11.4	1.00	ug/L	10.0		114	56-147	0.13	30	
Methylene Chloride	11.0	1.00	ug/L	10.0		110	65-135	0.31	30	
Acrylonitrile	10.2	1.00	ug/L	10.0		102	64-134	3.04	30	



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
27-Mar-2018 11:08

Volatile Organic Compounds - Quality Control

Batch BGC0428 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BGC0428-BSD1)		Prepared: 15-Mar-2018 Analyzed: 15-Mar-2018 09:49								
Carbon Disulfide	11.6	0.20	ug/L	10.0		116	78-125	0.74	30	
trans-1,2-Dichloroethene	11.4	0.20	ug/L	10.0		114	78-128	1.00	30	
Vinyl Acetate	10.0	0.20	ug/L	10.0		100	55-138	1.45	30	
1,1-Dichloroethane	11.6	0.20	ug/L	10.0		116	76-124	0.14	30	
2-Butanone	61.9	5.00	ug/L	50.0		124	61-140	0.33	30	Q
2,2-Dichloropropane	11.6	0.20	ug/L	10.0		116	78-125	2.32	30	
cis-1,2-Dichloroethene	11.6	0.20	ug/L	10.0		116	80-121	1.01	30	
Chloroform	11.4	0.20	ug/L	10.0		114	80-122	0.33	30	
Bromochloromethane	11.2	0.20	ug/L	10.0		112	80-121	1.63	30	
1,1,1-Trichloroethane	11.6	0.20	ug/L	10.0		116	79-123	0.33	30	
1,1-Dichloropropene	12.0	0.20	ug/L	10.0		120	80-120	2.94	30	
Carbon tetrachloride	11.6	0.20	ug/L	10.0		116	53-137	1.96	30	
1,2-Dichloroethane	11.2	0.20	ug/L	10.0		112	75-123	2.34	30	
Benzene	11.8	0.20	ug/L	10.0		118	80-120	2.36	30	
Trichloroethene	10.9	0.20	ug/L	10.0		109	80-120	1.75	30	
1,2-Dichloropropane	11.9	0.20	ug/L	10.0		119	80-120	3.43	30	
Bromodichloromethane	11.8	0.20	ug/L	10.0		118	80-121	2.68	30	
Dibromomethane	11.3	0.20	ug/L	10.0		113	80-120	1.51	30	
2-Chloroethyl vinyl ether	9.57	1.00	ug/L	10.0		95.7	74-127	2.21	30	
4-Methyl-2-Pentanone	60.1	5.00	ug/L	50.0		120	67-133	0.20	30	
cis-1,3-Dichloropropene	12.5	0.20	ug/L	10.0		125	80-124	3.21	30	*, Q
Toluene	11.1	0.20	ug/L	10.0		111	80-120	1.71	30	
trans-1,3-Dichloropropene	10.1	0.20	ug/L	10.0		101	71-127	1.20	30	
2-Hexanone	54.4	5.00	ug/L	50.0		109	69-133	0.15	30	
1,1,2-Trichloroethane	11.6	0.20	ug/L	10.0		116	80-121	2.86	30	
1,3-Dichloropropane	11.5	0.20	ug/L	10.0		115	80-120	0.77	30	
Tetrachloroethene	10.7	0.20	ug/L	10.0		107	80-120	2.73	30	
Dibromochloromethane	11.5	0.20	ug/L	10.0		115	65-135	0.44	30	
1,2-Dibromoethane	11.8	0.20	ug/L	10.0		118	80-121	2.60	30	
Chlorobenzene	10.8	0.20	ug/L	10.0		108	80-120	1.30	30	
Ethylbenzene	11.3	0.20	ug/L	10.0		113	80-120	3.69	30	
1,1,1,2-Tetrachloroethane	11.0	0.20	ug/L	10.0		110	80-120	0.52	30	
m,p-Xylene	23.9	0.40	ug/L	20.0		120	80-121	2.71	30	
o-Xylene	11.9	0.20	ug/L	10.0		119	80-121	1.11	30	
Xylenes, total	35.9	0.60	ug/L	30.0		120	76-127	2.17	30	



Pacific Groundwater Group
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Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
27-Mar-2018 11:08

Volatile Organic Compounds - Quality Control

Batch BGC0428 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BGC0428-BSD1)		Prepared: 15-Mar-2018 Analyzed: 15-Mar-2018 09:49								
Styrene	10.6	0.20	ug/L	10.0		106	80-124	1.39	30	
Bromoform	11.7	0.20	ug/L	10.0		117	51-134	3.14	30	
1,1,2,2-Tetrachloroethane	11.4	0.20	ug/L	10.0		114	77-123	0.94	30	
1,2,3-Trichloropropane	11.2	0.50	ug/L	10.0		112	76-125	0.45	30	
trans-1,4-Dichloro 2-Butene	11.8	1.00	ug/L	10.0		118	55-129	2.84	30	
n-Propylbenzene	12.3	0.20	ug/L	10.0		123	78-130	2.61	30	
Bromobenzene	10.8	0.20	ug/L	10.0		108	80-120	2.01	30	
Isopropyl Benzene	11.7	0.20	ug/L	10.0		117	80-128	4.05	30	
2-Chlorotoluene	11.8	0.20	ug/L	10.0		118	78-122	2.31	30	
4-Chlorotoluene	11.4	0.20	ug/L	10.0		114	80-121	2.29	30	
t-Butylbenzene	11.8	0.20	ug/L	10.0		118	78-125	2.19	30	
1,3,5-Trimethylbenzene	12.2	0.20	ug/L	10.0		122	80-129	3.32	30	
1,2,4-Trimethylbenzene	11.4	0.20	ug/L	10.0		114	80-127	1.85	30	
s-Butylbenzene	11.8	0.20	ug/L	10.0		118	78-129	1.87	30	
4-Isopropyl Toluene	11.3	0.20	ug/L	10.0		113	79-130	2.75	30	
1,3-Dichlorobenzene	10.9	0.20	ug/L	10.0		109	80-120	0.07	30	
1,4-Dichlorobenzene	10.3	0.20	ug/L	10.0		103	80-120	2.79	30	
n-Butylbenzene	11.9	0.20	ug/L	10.0		119	74-129	2.14	30	
1,2-Dichlorobenzene	10.7	0.20	ug/L	10.0		107	80-120	2.09	30	
1,2-Dibromo-3-chloropropane	9.92	0.50	ug/L	10.0		99.2	62-123	1.09	30	
1,2,4-Trichlorobenzene	11.1	0.50	ug/L	10.0		111	64-124	3.06	30	
Hexachloro-1,3-Butadiene	9.77	0.50	ug/L	10.0		97.7	58-123	9.16	30	
Naphthalene	9.84	0.50	ug/L	10.0		98.4	50-134	1.06	30	
1,2,3-Trichlorobenzene	11.0	0.50	ug/L	10.0		110	49-133	1.48	30	
Dichlorodifluoromethane	11.5	0.20	ug/L	10.0		115	48-147	0.58	30	
Methyl tert-butyl Ether	11.5	0.50	ug/L	10.0		115	71-132	2.43	30	
2-Pentanone	47.6	5.00	ug/L	50.0		95.3	69-134	0.39	30	
Surrogate: 1,2-Dichloroethane-d4	5.13		ug/L	5.00		103	80-129			
Surrogate: Toluene-d8	5.08		ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	4.98		ug/L	5.00		99.7	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.14		ug/L	5.00		103	80-120			



Pacific Groundwater Group
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Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
27-Mar-2018 11:08

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGC0494 - WMN (No Prep)

Instrument: ICP2 Analyst: TCH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0494-BLK1) Prepared: 19-Mar-2018 Analyzed: 23-Mar-2018 13:01									
Iron, Dissolved	ND	0.0500	mg/L						U
Manganese, Dissolved	ND	0.0010	mg/L						U
LCS (BGC0494-BS1) Prepared: 19-Mar-2018 Analyzed: 23-Mar-2018 13:42									
Iron, Dissolved	2.07	0.0500	mg/L	2.00		103	80-120		
Manganese, Dissolved	0.497	0.0010	mg/L	0.500		99.5	80-120		



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Reported:
27-Mar-2018 11:08

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGC0526 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BGC0526-BLK2)			Prepared: 20-Mar-2018 Analyzed: 21-Mar-2018 22:22							
Arsenic, Dissolved	75a	ND	0.200	ug/L						U
LCS (BGC0526-BS2)			Prepared: 20-Mar-2018 Analyzed: 21-Mar-2018 22:44							
Arsenic, Dissolved	75a	26.5	0.200	ug/L	25.0		106 80-120			



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Project: Carnation Landfill JS0903
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Reported:
27-Mar-2018 11:08

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 6010C in Water	
Iron	WADOE,NELAP
Manganese	WADOE,NELAP
EPA 8260C in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrolein	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Iodomethane	DoD-ELAP,NELAP,CALAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,CALAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,CALAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Butanone	DoD-ELAP,NELAP,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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Reported:
27-Mar-2018 11:08

Dibromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,CALAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,CALAP,WADOE
Bromoform	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,CALAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,CALAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,CALAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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27-Mar-2018 11:08

1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	06/30/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018



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Reported:
27-Mar-2018 11:08

Notes and Definitions

Y1	Raised reporting limit due to interference
U	This analyte is not detected above the applicable reporting or detection limit.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
J	Estimated concentration value detected below the reporting limit.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
D	The reported value is from a dilution
*	Flagged value is not within established control limits.
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.



Burlington, WA	Corporate Laboratory (a)	1620 S Walnut St.	Burlington, WA 98233	800.755.9295 • 360.757.1400
Bellingham, WA	Microbiology (b)	805 Orchard Dr Ste 4	Bellingham, WA 98225	360.715.1212
Portland, OR	Microbiology/Chemistry (c)	9150 SW Pioneer Ct Ste W	Wilsonville, OR 97070	503.682.7802
Corvallis, OR	Microbiology (d)	540 SW Third Street	Corvallis, OR 97333	541.753.4946

April 5, 2018

Page 1 of 1

Glenn Mutti
Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102
RE: 18-08527 - Carnation Landfill

Dear Glenn Mutti,

Your project: Carnation Landfill, was received on Wednesday March 14, 2018.

All samples were analyzed within the accepted holding times and were appropriately preserved and analyzed according to approved analytical protocols, unless noted in the data or QC reports. The quality control data was within laboratory acceptance limits, unless specified in the data or QC reports.

If you have questions phone us at 800 755-9295.

Respectfully

A handwritten signature in blue ink that reads "Pat Miller". The signature is fluid and cursive, with a long horizontal stroke at the end.

Patrick Miller, MS
QA Officer

Enclosures: Data Report

Chain of Custody / Analysis Request (Please complete all applicable shaded sections)

18-08527
17957



Report to: Pacific Groundwater Group

Ship Address: 2377 Eastlake Ave E

Bill to: Pacific Groundwater Group
Address: 2377 Eastlake Avenue E

City: Seattle St: W/A Zip: 98102

City: Seattle St: W/A Zip: 98102

Attn: Glenn Mutti

Phone: FAX:

Phone: 206-425-329-0141 FAX: 206-329-6968

P.O. #: Attn:

Email: glenn.mutti@pwwg.com

☐ Visa ☐ M/C ☐ A/E Expires /

Project: Carnation Landfill

Card#:

Check Regulatory Program

- ☐ Safe Drinking Water Act
☐ Clean Water Act
☐ RCRA / CERCLA
☒ Other

ANALYTICAL
Main Lab (800-755-9295)

1620 South Walnut St. Burlington, WA 98233
Microbiology (888-725-1212)

805 W. Orchard Dr. Suite 4 Bellingham, WA 98225

Wilsonville Lab (503-682-7802)

9150 SW Pioneer Ct. Suite W Wilsonville, OR 97070

Corvallis Lab (541-753-4945)

540 SW 3rd St. Corvallis, OR 97333

Instructions

1. Use one line per sample Location.
2. Be specific in analysis requests.
3. (NEW) List each metal individually. (NEW)
4. Check off analyses to be performed for each sample Location.
5. Enter number of containers.

Turn Around Time Required

- ☒ Standard
☐ Half-time (50% surcharge)
☐ Quickest (100% surcharge) Phone Call Req.
☐ Emergency (Phone Call Req.)

Analyses Requested

8260 SIM
Field Blank (VOCs)
Vinyl Chloride
Acrylonitrile
EDB
1,2- DBCP

Number of Containers

Special Instructions
Conditions on Receipt



CO035215

Field ID	Location	Grab/ Comp.	Sample Matrix *	Date	Time	8260 SIM	Field Blank (VOCs)	Vinyl Chloride	Acrylonitrile	EDB	1,2- DBCP	Number of Containers	Special Instructions Conditions on Receipt
1	MW-2D	GW	3/13/18	1330		☒	☒					3	
2						☐	☐						
3						☐	☐						
4						☐	☐						
5						☐	☐						
6						☐	☐						
7						☐	☐						
8						☐	☐						
9						☐	☐						
10						☐	☐						
Sampled by: Phone: FAX: Email:												3	Total Containers

Sample Receipt Request (Must include FAX or Email)

☒

* W - water
DW - drinking water

SW - surface water
GW - Ground water

WW - waste water
S - soil
Other

Relinquished by

Date Time Received by

Date Time

Custody seals intact

Sample temp 38 C satisfactory

Yes No N/A

Samples received intact

Chain of custody & labels agree



Burlington, WA *Corporate Laboratory (a)*
1620 S Walnut St - Burlington, WA 98233 - 800.755.9295 • 360.757.1400
Bellingham, WA *Microbiology (b)*
805 Orchard Dr Ste 4 - Bellingham, WA 98225 - 360.715.1212

Portland, OR *Microbiology/Chemistry (c)*
9150 SW Pioneer Ct Ste W - Wilsonville, OR 97070 - 503.682.7802
Corvallis, OR *Microbiology/Chemistry (d)*
540 SW Third Street - Corvallis, OR 97333 - 541.753.4946
Bend, OR *Microbiology (e)*
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541.639.8425

WSDOE Lab C567

DATA REPORT

Page 1 of 1

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-08527**
Project: Carnation Landfill

Lab Number: 17957
Field ID: MW-2D
Sample Description: Carnation Landfill
Matrix: Water
Sample Date: 3/13/18
Extraction Date: 3/19/18
Extraction Method: 5030B

Report Date: 4/5/18
Date Analyzed: 3/19/18
Analyst: HY
Analytical Method: 8260SIM
Batch: SIM_180319
Approved By: pdm

Authorized by:


Patrick Miller, MS
QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	MDL	D.F.	Lab	COMMENT
	Volatile Organic Compounds								
75-01-4	VINYL CHLORIDE (SIM)	ND		ug/L	0.01	0.0059	1.00	a	
107-13-1	ACRYLONITRILE (SIM)	ND		ug/L	0.05	0.0125	1.00	a	
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	0.01	0.0069	1.00	a	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	0.04		1.00	a	

Notes:

Flags are data qualifiers. If there are data qualifiers on your report definitions can be found on an accompanying sheet.

ND - indicates the compound was not detected above the PQL or MDL.

Lab QL = Laboratory Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

Permit QL = Quantitation Limit required by permit (listed in Appendix A) or other regulatory requirement.

D.F. - Dilution Factor.

If you have any questions concerning this report contact us at the above phone number.



SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: **18-08527**

Report Date: 04/05/18

Batch	Analyte	Result	True		Method	%	Recovery	Limits*	QC		Comment
			Value	Units					Qualifier	Type	
SIM_180319	0 1,2 - DIBROMOETHANE (EDB SIM)	0.118	0.1	ug/L	8260SIM	118	80-120		LFB		SIMS ANALYSIS
	0 1,2-DIBROMO-3-CHLOROPROPANE	0.117	0.1	ug/L	8260SIM	117	80-120		LFB		SIMS ANALYSIS
	0 ACRYLONITRILE (SIM)	0.116	0.1	ug/L	8260SIM	116	80-120		LFB		SIMS ANALYSIS
	0 VINYL CHLORIDE (SIM)	0.102	0.1	ug/L	8260SIM	102	80-120		LFB		SIMS ANALYSIS

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.



SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Low-Level Lab Fortified Blank

Reference Number: **18-08527**

Report Date: 04/05/18

			True		% Recovery		QC Limits*	QC Qualifier Type	QC Comment
Batch	Analyte	Result	Value	Units	Method				
SIM_180319	0 1,2 - DIBROMOETHANE (EDB SIM)	0.015	0.01	ug/L	8260SIM	150	50-150	LLFB	
	0 1,2-DIBROMO-3-CHLOROPROPANE	0.011	0.01	ug/L	8260SIM	110	50-150	LLFB	
	0 ACRYLONITRILE (SIM)	0.043	0.05	ug/L	8260SIM	86	50-150	LLFB	
	0 VINYL CHLORIDE (SIM)	0.011	0.01	ug/L	8260SIM	110	50-150	LLFB	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.



SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: **18-08527**

Report Date: 04/05/18

			True		%	QC	QC		
Batch	Analyte	Result	Value	Units	Method	Recovery	Limits*	Qualifier Type	Comment
SIM_180319	0 1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	8260SIM		0-0	MB	TB 18-08160
	0 ACRYLONITRILE (SIM)	ND		ug/L	8260SIM		0-0	MB	TB 18-08160
	0 VINYL CHLORIDE (SIM)	ND		ug/L	8260SIM		0-0	MB	TB 18-08160
	1 1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	8260SIM		0-0	MB	TB 18-08527
	1 1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	8260SIM		0-0	MB	TB 18-08527
	1 ACRYLONITRILE (SIM)	ND		ug/L	8260SIM		0-0	MB	TB 18-08527
	1 VINYL CHLORIDE (SIM)	ND		ug/L	8260SIM		0-0	MB	TB 18-08527

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.


Reference Number: **18-08527**

Report Date: 4/5/2018

Page 1 of 1

SAMPLE DEPENDENT QUALITY CONTROL REPORT

Duplicate, Matrix Spike/Matrix Spike Duplicate and Confirmation Result Report

Batch	Sample	Analyte	Result	Spike Result	Duplicate		Spike Conc	Units	Percent Recovery		Limits*	%RPD	Limits*	QC		
					Spike Result	Spike Conc			MS	MSD				Qualifier	Type	Comments
Laboratory Fortified Matrix (MS)																
SIM_180319																
	18319	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.129	0.127	0.1	ug/L	129	127	70-130	1.6	0-20			LFM	
	18319	ACRYLONITRILE (SIM)	ND	0.119	0.115	0.1	ug/L	119	115	70-130	3.4	0-20			LFM	
	18319	VINYL CHLORIDE (SIM)	0.137	0.191	0.190	0.1	ug/L	54	53	70-130	1.9	0-20	S		LFM	
	18633	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.191	0.191	0.15	ug/L	127	127	70-130	0.0	0-20			LFM	
	18633	ACRYLONITRILE (SIM)	ND	0.188	0.178	0.15	ug/L	125	119	70-130	5.5	0-20			LFM	
	18633	VINYL CHLORIDE (SIM)	ND	0.164	0.161	0.15	ug/L	109	107	70-130	1.8	0-20			LFM	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of an analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.

FORM: QC Dependent.rpt



QUALITY CONTROL REPORT SURROGATE REPORT

Reference Number: 18-08527

Report Date: 04/05/18

Lab No	Analyte	Result	Qualifier	Units	Method	Limit
SIM_180319 17957	d8-TOLUENE (Surr)	120		%	8260SIM	Acceptance Range is 70-130%

***Notation:**

A surrogate is a pure compound added to a sample in the laboratory just before processing so that the overall efficiency of a method can be determined.

The Acceptance Limits (or Control Limits) approximate a 99% confidence interval around the mean recovery.



Qualifier Definitions

Reference Number: 18-08527

Report Date: 04/05/18

Qualifier	Definition
S	Spiking amount was lower than the 5:1 spike to background (sample amount) basis for performance criteria. The reported criteria does not apply due to increased errors in measurement of both sample and spike concentration.

Note: Some qualifier definitions found on this page may pertain to results or QC data which are not printed with this report.

ATTACHMENT 2:
2018 Q2 FIELD DATA SHEETS & LABORATORY REPORTS

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW-1D

Sampling Event: 2018 Q2

Sample #: _____

Project Number: JS0903	Date: 6/21/2018
Project Name: Carnation Landfill	Location: Carnation Landfill
Project Address: NE 24th St & 328th Ave NE	Sampled By: _____
Client Name: City of Carnation	Purged By: _____
Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical	Date Sent to Lab: _____
Chain-of-Custody (yes/no): yes	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): 30.77	Purge Volume Measurement Method: low flow
Depth of Well (feet): _____	Purge Date/Time: _____
Reference Point (surveyors notch, etc.): Black MP on Casing	Purging Equipment: dedicated DC Purge pump
Sampling Equipment: dedicated DC Purge pump	Water Level Probe Used: _____
Casing Volume Constants (CVC): 2-inch = 0.16 gpf ; 4-inch = 0.656 gpf ; 6-inch = 1.47 gpf PV=($\pi r^2 h$) (7.48 gal/ft ³)	
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons	

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)	
902	0.5	7.35	139.0	11.2	cloudy	subtle odor
907	0.75	7.00	133.8	11.2	cloudy	
912	1	6.94	133.6	11.4	slightly	0 drops
915	1.25	7.03	133.5	11.6		decreasing & needs
923	1.60	7.11	133.5	11.9		to reset through
924	1.75	7.05	133.6	11.9		
929	2	7.04	133.1	11.9		

Well Integrity:

Bottle Inventory				Day/Time Sampled: 9205, 6-21-18
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
3	VOA	HCl	none	8260 VOCs
2	VOA	none	none	8260 SIM-VOCs
1	500 mL HDPE	HNO3	0.45 um	Field Filtered As, Mn, Fe
1	Small OJ	none	none	NO3, SO4

Signature: _____

Page _____ of _____

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW-15

Sampling Event: 2018 Q2

Sample #: _____

Project Number: JS0903	Date: 6/21/2018
Project Name: Carnation Landfill	Location: Carnation Landfill
Project Address: NE 24th St & 328th Ave NE	Sampled By: _____
Client Name: City of Carnation	Purged By: _____
Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical	Date Sent to Lab: _____
Chain-of-Custody (yes/no): yes	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): 30.26 Purge Volume Measurement Method: low flow

Depth of Well (feet): _____ Purge Date/Time: _____

Reference Point (surveyors notch, etc.): Black MP on Casing Purging Equipment: dedicated DC Purge pump

Sampling Equipment: dedicated DC Purge pump Water Level Probe Used: _____

Casing Volume Constants (CVC): 2-inch = **0.16** gpf ; 4-inch = **0.656** gpf ; 6-inch = **1.47** gpf $PV = (\pi r^2 h) (7.48 \text{ gal/ft}^3)$

Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)		
9:03	1	6.67	305	12.4	Clear		
9:07	1.25	6.48	~~265~~	12.9	Clear		
9:10	1.50	6.46	263.2	13.1	Clear		
9:13	1.75	6.45	262.3	13.3	Clear		
9:15	2.0	6.44	261.3	13.4	Clear		

Well Integrity: _____

Bottle Inventory

Day/Time Sampled: 920, 6-21-18

Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
3	VOA	HCl	none	8260 VOCs
2	VOA	none	none	8260 SIM-VOCs
1	500 mL HDPE	HNO3	0.45 um	Field Filtered As, Mn, Fe
1	Small OJ	none	~~0.45 um~~ 0.45 um	NO3, SO4

Signature: _____

Page _____ of _____

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW-25

Sampling Event: 2018 Q2

Sample #: _____

Project Number: JS0903	Date: 6/21/2018
Project Name: Carnation Landfill	Location: Carnation Landfill
Project Address: NE 24th St & 328th Ave NE	Sampled By: _____
Client Name: City of Carnation	Purged By: _____
Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical	Date Sent to Lab: _____
Chain-of-Custody (yes/no): yes	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): 29.20 Purge Volume Measurement Method: low flow
 Depth of Well (feet): _____ Purge Date/Time: _____
 Reference Point (surveyors notch, etc.): Black MP on Casing Purging Equipment: dedicated DC Purge pump
 Sampling Equipment: dedicated DC Purge pump Water Level Probe Used: _____
 Casing Volume Constants (CVC): 2-inch = **0.16** gpf ; 4-inch = **0.656** gpf ; 6-inch = **1.47** gpf $PV = (\pi r^2 h) (7.48 \text{ gal/ft}^3)$
 Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)	
<u>10:48</u>	<u>1.0</u>	<u>6.33</u>	<u>103.4</u>	<u>10.4</u>	<u>clear</u>	<u>root particulate</u>
<u>10:50</u>	<u>1.50</u>	<u>6.13</u>	<u>103.1</u>	<u>10.4</u>	<u>clear</u>	<u>coming up w/ water</u>
<u>10:52</u>	<u>1.75</u>	<u>6.07</u>	<u>102.1</u>	<u>10.4</u>	<u>clear</u>	
<u>10:53</u>	<u>2.0</u>	<u>6.04</u>	<u>101.6</u>	<u>10.4</u>	<u>clear</u>	
<u>10:54</u>	<u>2.25</u>	<u>6.02</u>	<u>101.6</u>	<u>10.4</u>	<u>clear</u>	

Well Integrity: 23' to 24 feet BMP ^{sounder obstructed} pulled the pump
~6 inches of root mass above it (look picture)
20 ft bgs is screen top.

Bottle Inventory				Day/Time Sampled: <u>10:55 6/21/18</u>
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
<u>3</u>	<u>VOA</u>	<u>HCl</u>	<u>none</u>	<u>8260 VOCs</u>
<u>2</u>	<u>VOA</u>	<u>none</u>	<u>none</u>	<u>8260 SIM-VOCs</u>
<u>1</u>	<u>500 mL HDPE</u>	<u>HNO3</u>	<u>0.45 um</u>	<u>Field Filtered As, Mn, Fe</u>
<u>1</u>	<u>Small OJ</u>	<u>none</u>	<u>none</u>	<u>NO3, SO4</u>

Signature: _____

Page _____ of _____

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW-20

Sampling Event: 2018 Q2

Sample #: _____

Project Number: <u>JS0903</u>	Date: <u>6/21/2018</u>
Project Name: <u>Carnation Landfill</u>	Location: <u>Carnation Landfill</u>
Project Address: <u>NE 24th St & 328th Ave NE</u>	Sampled By: _____
Client Name: <u>City of Carnation</u>	Purged By: _____
Laboratory: <u>Analytical Resources, Inc. (ARI); Edge Analytical</u>	Date Sent to Lab: _____
Chain-of-Custody (yes/no): <u>yes</u>	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): <u>34.29</u>	Purge Volume Measurement Method: <u>low flow</u>
Depth of Well (feet): _____	Purge Date/Time: _____
Reference Point (surveyors notch, etc.): <u>Black MP on Casing</u>	Purging Equipment: <u>dedicated DC Purge pump</u>
Sampling Equipment: <u>dedicated DC Purge pump</u>	Water Level Probe Used: _____
Casing Volume Constants (CVC): 2-inch = <u>0.16</u> gpf ; 4-inch = <u>0.656</u> gpf ; 6-inch = <u>1.47</u> gpf $PV = (\pi r^2 h) (7.48 \text{ gal/ft}^3)$	
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons	

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)		
<u>1046</u>	<u>0.5</u>	<u>6.23</u>	<u>310</u>	<u>11.6</u>	<u>tan to soap color & thickness</u>		
<u>1049</u>	<u>1</u>	<u>6.25</u>	<u>310.2</u>	<u>11.5</u>	<u>sl cl'd</u>		
<u>1052</u>	<u>1.5</u>	<u>6.25</u>	<u>306.5</u>	<u>11.6</u>	<u>cl'r</u>		
<u>1056</u>	<u>2.35</u>	<u>6.26</u>	<u>298.5</u>	<u>11.6</u>			
<u>1058</u>	<u>2.75</u>	<u>6.26</u>	<u>297.3</u>	<u>11.7</u>	<u>cl'r</u>		

Well Integrity:

MW-65: 32.18' bmp

MW-20

Bottle Inventory				Day/Time Sampled: <u>1100</u>	<u>1105</u> <u>MW-220</u> , <u>6-21-18</u>
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:	
<u>6-8</u>	<u>VOA</u>	<u>HCl</u>	<u>none</u>	<u>8260 VOCs</u>	
<u>4-2</u>	<u>VOA</u>	<u>none</u>	<u>none</u>	<u>8260 SIM-VOCs</u>	
<u>2-1</u>	<u>500 mL HDPE</u>	<u>HNO3</u>	<u>0.45 um</u>	<u>Field Filtered As, Mn, Fe</u>	
<u>2-1</u>	<u>Small OJ</u>	<u>none</u>	<u>none</u>	<u>NO3, SO4</u>	

Signature: _____

Page _____ of _____

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW-35

Sampling Event: 2018 Q2

Sample #: _____

Project Number: JS0903	Date: <u>6/21/2018</u>
Project Name: Carnation Landfill	Location: <u>Carnation Landfill</u>
Project Address: NE 24th St & 328th Ave NE	Sampled By: _____
Client Name: City of Carnation	Purged By: _____
Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical	Date Sent to Lab: _____
Chain-of-Custody (yes/no): <u>yes</u>	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): <u>19.97</u>	Purge Volume Measurement Method: <u>low flow</u>
Depth of Well (feet): _____	Purge Date/Time: _____
Reference Point (surveyors notch, etc.): <u>Black MP on Casing</u>	Purging Equipment: <u>dedicated DC Purge pump</u>
Sampling Equipment: <u>dedicated DC Purge pump</u>	Water Level Probe Used: _____
Casing Volume Constants (CVC): 2-inch = 0.16 gpf ; 4-inch = 0.656 gpf ; 6-inch = 1.47 gpf $PV = (\pi r^2 h) (7.48 \text{ gal/ft}^3)$	
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons	

Q: 1.1 l/min

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)		
<u>1001</u>	<u>1</u>	<u>6.66</u>	<u>187.6</u>	<u>10.2</u>	<u>clr</u>		
<u>1005</u>	<u>2</u>	<u>6.64</u>	<u>187.8</u>	<u>10.3</u>	<u>cl</u>		
<u>1010</u>	<u>3</u>	<u>6.63</u>	<u>188.2</u>	<u>10.3</u>			

Well Integrity: Had to spray liquid graphite on lock to open it

Bottle Inventory				Day/Time Sampled: <u>1015, 6-21-18</u>
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
<u>26</u>	VOA	HCl	none	8260 VOCs
<u>2</u>	VOA	none	none	8260 SIM-VOCs
<u>42</u>	500 mL HDPE	HNO3	0.45 um	Field Filtered As, Mn, Fe
<u>10</u>	Small OJ	none	none	NO3, SO4

MS/MSD
collected for all bottles except SIM

(Edge does not run it anyway. Also they did not ship bottles so no extras from me had in office)

Signature: _____

Page _____ of _____

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW - 3D

Sampling Event: 2018 Q2

Sample #: _____

Project Number: JS0903
 Project Name: Carnation Landfill
 Project Address: NE 24th St & 328th Ave NE
 Client Name: City of Carnation
 Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical
 Chain-of-Custody (yes/no): yes
 Shipment Method: _____

Date: 6/21/2018
 Location: Carnation Landfill
 Sampled By: _____
 Purged By: _____
 Date Sent to Lab: _____
 Field CC Sample Number: _____
 Sample Split: _____

Depth to Water (feet): 19.23 Purge Volume Measurement Method: low flow
 Depth of Well (feet): _____ Purge Date/Time: _____
 Reference Point (surveyors notch, etc.): Black MP on Casing Purging Equipment: dedicated DC Purge pump
 Sampling Equipment: dedicated DC Purge pump Water Level Probe Used: _____
 Casing Volume Constants (CVC): 2-inch = 0.16 gpf ; 4-inch = 0.656 gpf ; 6-inch = 1.47 gpf $PV = (\pi r^2 h) (7.48 \text{ gal/ft}^3)$
 Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)		
<u>10:05</u>	<u>0.75</u>	<u>7.10</u>	<u>144.0</u>	<u>11.4</u>	<u>cloudy</u>		
<u>10:09</u>	<u>1.0</u>	<u>7.15</u>	<u>141.1</u>	<u>11.3</u>	<u>cloudy</u>		
<u>10:12</u>	<u>1.25</u>	<u>7.17</u>	<u>140.2</u>	<u>11.4</u>	<u>clear</u>		
<u>10:15</u>	<u>1.50</u>	<u>7.19</u>	<u>139.8</u>	<u>11.4</u>	<u>clear</u>		

Well Integrity: _____

Bottle Inventory				Day/Time Sampled: <u>10:20</u>	<u>6/21/18</u>
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:	
<u>3</u>	<u>VOA</u>	<u>HCl</u>	<u>none</u>	<u>8260 VOCs</u>	
<u>2</u>	<u>VOA</u>	<u>none</u>	<u>none</u>	<u>8260 SIM-VOCs</u>	
<u>1</u>	<u>500 mL HDPE</u>	<u>HNO3</u>	<u>0.45 um</u>	<u>Field Filtered As, Mn, Fe</u>	
<u>1</u>	<u>Small OJ</u>	<u>none</u>	<u>none</u>	<u>NO3, SO4</u>	

Signature: _____

Page _____ of _____

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW-55

Sampling Event: 2018 Q2

Sample #: _____

Project Number: JS0903	Date: 6/21/2018
Project Name: Carnation Landfill	Location: Carnation Landfill
Project Address: NE 24th St & 328th Ave NE	Sampled By: _____
Client Name: City of Carnation	Purged By: <u>JO MD</u>
Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical	Date Sent to Lab: _____
Chain-of-Custody (yes/no): yes	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): <u>22.13</u>	Purge Volume Measurement Method: <u>low flow</u>
Depth of Well (feet): <u>24.86</u>	Purge Date/Time: _____
Reference Point (surveyors notch, etc.): <u>Black MP on Casing</u>	Purging Equipment: <u>dedicated DC Purge pump</u>
Sampling Equipment: <u>dedicated DC Purge pump</u>	Water Level Probe Used: _____
Casing Volume Constants (CVC): 2-inch = <u>0.16</u> gpf ; 4-inch = <u>0.656</u> gpf ; 6-inch = <u>1.47</u> gpf PV=($\pi r^2 h$) (7.48 gal/ft ³)	
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons	

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)		
<u>833</u>	<u>0.5</u>	<u>6.89</u>	<u>312</u>	<u>11.6</u>			
<u>836</u>	<u>1</u>	<u>6.52</u>	<u>324</u>	<u>11.7</u>			
<u>838</u>	<u>1.25</u>	<u>6.54</u>	<u>352.1</u>	<u>11.9</u>			
<u>840</u>	<u>2.25</u>	<u>6.56</u>	<u>345.1</u>	<u>11.3</u>			
<u>returned @ 1300, dth 22.45 bnp</u>							

opened
up volume

Well Integrity: _____

Bottle Inventory				Day/Time Sampled: <u>1310 6-21-18</u>
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
<u>3</u>	<u>VOA</u>	<u>HCl</u>	<u>none</u>	<u>8260 VOCs</u>
<u>2</u>	<u>VOA</u>	<u>none</u>	<u>none</u>	<u>8260 SIM-VOCs</u>
<u>1</u>	<u>500 mL HDPE</u>	<u>HNO3</u>	<u>0.45 um</u>	<u>Field Filtered As, Mn, Fe</u>
<u>1</u>	<u>Small OJ</u>	<u>none</u>	<u>none</u>	<u>NO3, SO4</u>

Signature: _____

Page _____ of _____

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: WJ 5-D

Sampling Event: 2018 Q2

Sample #: _____

Project Number: JS0908	Date: 6/21/2018
Project Name: Carnation Landfill	Location: Carnation Landfill
Project Address: NE 24th St & 328th Ave NE	Sampled By: _____
Client Name: City of Carnation	Purged By: _____
Laboratory: Analytical Resources, Inc. (ARI), Edge Analytical	Date Sent to Lab: _____
Chain-of-Custody (yes/no): yes	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): <u>37.65</u>	Purge Volume Measurement Method: low flow
Depth of Well (feet): _____	Purge Date/Time: _____
Reference Point (surveyors notch, etc.): Black MP on Casing	Purging Equipment: dedicated DC Purge pump
Sampling Equipment: dedicated DC Purge pump	Water Level Probe Used: _____
Casing Volume Constants (CVC): 2-inch = 0.16 gpf ; 4-inch = 0.656 gpf ; 6-inch = 1.47 gpf PV=($\pi r^2 h$)(7.48 gal/ft ³)	
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons	

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)		
1:30	1.50	7.00	160.6	11.9	Cloudy		
1:33	1.75	6.94	160.3	11.9	Cloudy		
1:34	2.00	6.94	159.6	11.8	Clear		
1:35	2.25	6.92	159.4	11.8	Clear		
1:36	2.50	6.92	159.3	11.8	Clear		

Well Integrity:

Pump dred (unable to pump from 37), had to use back up PG
Pump

Bottle Inventory				Day/Time Sampled: <u>8:20 AM 6/21/18</u>
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
3	VOA	HCl	none	8260 VOCs
2	VOA	none	none	8260 SIM-VOCs
1	500 mL HDPE	HNO3	0.45 um	Field Filtered As, Mn, Fe
1	Small OJ	none	none	NO3, SO4

Signature: _____

Page _____ of _____

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW-6D

Sampling Event: 2018 Q2

Sample #: _____

Project Number: JS0903
Project Name: Carnation Landfill
Project Address: NE 24th St & 328th Ave NE
Client Name: City of Carnation
Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical
Chain-of-Custody (yes/no): yes
Shipment Method: _____

Date: 6/21/2018
Location: Carnation Landfill
Sampled By: _____
Purged By: _____
Date Sent to Lab: _____
Field CC Sample Number: _____
Sample Split: _____

Depth to Water (feet): 38.72 Purge Volume Measurement Method: low flow
Depth of Well (feet): _____ Purge Date/Time: _____
Reference Point (surveyors notch, etc.): Black MP on Casing Purging Equipment: dedicated DC Purge pump
Sampling Equipment: dedicated DC Purge pump Water Level Probe Used: _____
Casing Volume Constants (CVC): 2-inch = 0.16 gpf ; 4-inch = 0.656 gpf ; 6-inch = 1.47 gpf $PV = (\pi r^2 h) (7.48 \text{ gal/ft}^3)$
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)		
<u>10:35</u>	<u>.50</u>	<u>7.63</u>	<u>149.7</u>	<u>11.3</u>	<u>clear</u>		
<u>10:38</u>	<u>.75</u>	<u>7.69</u>	<u>148.3</u>	<u>11.5</u>	<u>clear</u>		
<u>10:41</u>	<u>1.0</u>	<u>7.66</u>	<u>147.6</u>	<u>11.7</u>	<u>clear</u>		
<u>10:43</u>	<u>1.25</u>	<u>7.64</u>	<u>146.8</u>	<u>11.8</u>	<u>clear</u>		
<u>11:45</u>	<u>1.50</u>	<u>7.60</u>	<u>146.6</u>	<u>11.8</u>	<u>clear</u>		

Well Integrity: _____

Bottle Inventory

Day/Time Sampled: 11:20 6/21/18

Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
<u>3</u>	<u>VOA</u>	<u>HCl</u>	<u>none</u>	<u>8260 VOCs</u>
<u>2</u>	<u>VOA</u>	<u>none</u>	<u>none</u>	<u>8260 SIM-VOCs</u>
<u>1</u>	<u>500 mL HDPE</u>	<u>HNO3</u>	<u>0.45 um</u>	<u>Field Filtered As, Mn, Fe</u>
<u>1</u>	<u>Small OJ</u>	<u>none</u>	<u>none</u>	<u>NO3, SO4</u>

Signature: _____

Page _____ of _____

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: NW-7D

Sampling Event: 2018 Q2

Sample #: _____

Project Number: <u>JS0903</u>	Date: <u>6/21/2018</u>
Project Name: <u>Carnation Landfill</u>	Location: <u>Carnation Landfill</u>
Project Address: <u>NE 24th St & 328th Ave NE</u>	Sampled By: <u>JGMB</u>
Client Name: <u>City of Carnation</u>	Purged By: _____
Laboratory: <u>Analytical Resources, Inc. (ARI); Edge Analytical</u>	Date Sent to Lab: _____
Chain-of-Custody (yes/no): <u>yes</u>	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): <u>32.05</u>	Purge Volume Measurement Method: <u>low flow</u>
Depth of Well (feet): _____	Purge Date/Time: _____
Reference Point (surveyors notch, etc.): <u>Black MP on Casing</u>	Purging Equipment: <u>dedicated DC Purge pump</u>
Sampling Equipment: <u>dedicated DC Purge pump</u>	Water Level Probe Used: _____
Casing Volume Constants (CVC): 2-inch = 0.16 gpf ; 4-inch = 0.656 gpf ; 6-inch = 1.47 gpf $PV = (\pi r^2 h) (7.48 \text{ gal/ft}^3)$	
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons	

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)	light Brownish-orange First 0.75 gal
1154	0.5	6.17	105.6	11.6	v cldy, light brown-orange	
1158	1.25	6.07	105.4	12.1	cldy	
1200	1.5	6.09	105.1	12.3	cldy-st cldy	
1202	1.75	6.10	105.1	12.4	1.1	
1203	2	6.10	104.9	12.5	1.1	

Well Integrity: - had to b/cge pump well, sheer (rainbow) on water
 Jeff w/ City is assistant today

Bottle Inventory				Day/Time Sampled: <u>1205, 6-21-18</u>
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
3	VOA	HCl	none	8260 VOCs
2	VOA	none	none	8260 SIM-VOCs
1	500 mL HDPE	HNO3	0.45 um	Field Filtered As, Mn, Fe
1	Small OJ	none	none	NO3, SO4

Signature: _____

Page _____ of _____

Well #: MW-8D

Sample #: _____

Depth to Water (feet): 41.15 Purge Volume Measurement Method: low flow
 Depth of Well (feet): _____ Purge Date/Time: _____
 Reference Point (surveyors notch, etc.): _____ Purging Equipment: dedicated dx purge v
 Sampling Equipment: _____ Water Level Probe Used: _____
 Three-Casing Volume Constant (CVC): 2-inch = **0.48** gpf ; 4-inch = **1.97** gpf ; 6-inch = **4.41** gpf $PV = (\pi r^2 h) (7.48 \text{ gal/ft}^3)$
 Purge Volume = ft of water x CVC = _____ gallons Casing diameter (ft/in): _____

[illegible]

Well Integrity:

[illegible]

Methane Monitoring Field Form, Carnation Landfill

Sampling Event & Date: 2018 Q2, 6-21-18

Sampler: JGMS

Weather: Partly Sunny

Previous 24-hr Barometric Data Downloaded? Y N

Time	Probe ID	Well Depth (ft bgs)	Screen Depth (ft bgs)	Depth to Water (ft btoc)	% of Screen Saturated	Purge Volume*	CH ₄ (%) total	CO ₂ (%) total	O ₂ (%) total	Static pressure (in H ₂ O)	Pump Run Time (sec)	Baro Pressure (in Hg)	Purge Data/Notes
1420	M-1	15	5-15	-	-	1.9	0.2	4.5	16.1	0	100	30.01	0.2% CH ₄ initial conc
1426	M-2	15	5-15	-	-	1.9	0.2	4.5	17.3	0	100	30.01	1
1441	M-3	15	5-15	-	-	1.9	0.2%	4.7	16.6	0	100	30.01	0.2% CH ₄ initial
1454	M-4	8	3-8	-	-	1.1	0.2	4.2	16.9	0	100	30.01	SAB. Wasp on nose to side. measurement could not be taken. Bring sample next time.
1500	M-5	15	5-15	-	-	1.9	0.2	4.7	16.3	0	100	30.01	SAB
1442	M-6	24	10-24	-	-	0.2	0.2	3.9	18.2	0	100	30.01	SAB
1446	M-7	8	3-8	-	-	0.1	0.2	3.1	19.3	0	100	30.01	SAB
1437	M-8	8	3-8	-	-	0.2	0.2	4.9	16.1	0	100	30.01	Same as below (SAB)
1433	M-9	20	10-20	-	-	0.3	0.2%	8.1	11.8	0	100	30.01	0.2% CH ₄ initial
1510	V-1						0.1	0	21.0	-	100		at 1445 Jett sprayed bearings and I knocked it off after with a shovel.
1513	V-2						0.2	0	20.8	-	100		SAB. Cap vent had slid all the way down. will not have been with Jett.
1508	V-3						0.3	0.0	20.7	-	100	30.01	CH ₄ initial 0.1%.
1508	V-4												Lock jammed, could not access vent. Bring lubricant next event!

*Purge volume is the number of strokes required for purging 1 casing volume using a 6 liter bilge pump.
bgs = below ground surface; btoc = below top of casing



Analytical Resources, Incorporated
Analytical Chemists and Consultants

13 July 2018

Glenn Mutti-Driscoll
Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle, WA 98102

RE: Carnation Landfill JS0903

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)
18F0351

Associated SDG ID(s)
N/A

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 its entirety.



Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 18F0357	Turn-around Requested: Std	Page: 1 of 2
ARI Client Company: PGG	Phone: 206-329-0141	Date: 6-21-18 Ice Present?
Client Contact: Glenn Muttli-Driscoll	No. of Coolers:	Cooler Temps:



Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Client Project Name: Carnation Landfill					Analysis Requested								Notes/Comments
Client Project #: 150903		Samplers: 3GMD			VOC 8260	Diss (FF) As, Mn, Fe	NO3/504						
Sample ID	Date	Time	Matrix	No. Containers									
MW-15	6-21-18	920	W	5	X	X	X						
MW-1D		925		5									
MW-35 *		1015		10									* MS/MSD collected
MW-3D		1020		5									
MW-25		1055		5									
MW-2D		1100											
MW-22D		1105											
MW-6D		1155											
MW-7D		1205											
MW-8D		1245	✓		✓	✓	✓						

Comments/Special Instructions	Relinquished by: (Signature) [Signature]	Received by: (Signature) [Signature]	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Glenn Muttli-Driscoll	Printed Name: Brandon Fisk	Printed Name:	Printed Name:
	Company: PGG	Company: ARI	Company:	Company:
	Date & Time: 6/21, 6/22/18	Date & Time: 6/21 6/22/18	Date & Time:	Date & Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

ARI Assigned Number: 18F0351		Turn-around Requested: 5/21/18		Page: 12 of 2		 Analytical Resources, Incorporated Analytical Chemists and Consultants 4611 South 134th Place, Suite 100 Tukwila, WA 98168 206-695-6200 206-695-6201 (fax) www.arilabs.com					
ARI Client Company: PGG		Phone: 206-324-0141		Date: 6-21-18				Ice Present?			
Client Contact: Glenn Mutti-Driscoll				No. of Coolers:				Cooler Temps:			
Client Project Name: Carnation Landfill				Analysis Requested						Notes/Comments	
Client Project #: J50903		Samplers: JGMD		VOC 8260		Diss (FF) As, Mn, Fe		NO3/504			
Sample ID	Date	Time	Matrix	No. Containers							
MW-55	6/21/18	1310	W	5	X	X	X				
MW-SD	6/21/18	1320	W	5	X	X	X				
Comments/Special Instructions		Relinquished by: (Signature) <i>[Signature]</i>		Received by: (Signature) <i>[Signature]</i>		Relinquished by: (Signature)		Received by: (Signature)			
		Printed Name: Glenn Mutti-Driscoll		Printed Name: Brandon Fick		Printed Name:		Printed Name:			
		Company: PGG		Company: ARI		Company:		Company:			
		Date & Time: 1621 6/22/18		Date & Time: 1621 6/22/18		Date & Time:		Date & Time:			

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1S	18F0351-01	Water	21-Jun-2018 09:20	22-Jun-2018 16:21
MW-1D	18F0351-02	Water	21-Jun-2018 09:25	22-Jun-2018 16:21
MW-3S	18F0351-03	Water	21-Jun-2018 10:15	22-Jun-2018 16:21
MW-3D	18F0351-04	Water	21-Jun-2018 10:20	22-Jun-2018 16:21
MW-2S	18F0351-05	Water	21-Jun-2018 10:55	22-Jun-2018 16:21
MW-2D	18F0351-06	Water	21-Jun-2018 11:00	22-Jun-2018 16:21
MW-22D	18F0351-07	Water	21-Jun-2018 11:05	22-Jun-2018 16:21
MW-6D	18F0351-08	Water	21-Jun-2018 11:55	22-Jun-2018 16:21
MW-7D	18F0351-09	Water	21-Jun-2018 12:05	22-Jun-2018 16:21
MW-8D	18F0351-10	Water	21-Jun-2018 12:45	22-Jun-2018 16:21
MW-5S	18F0351-11	Water	21-Jun-2018 13:10	22-Jun-2018 16:21
MW-5D	18F0351-12	Water	21-Jun-2018 13:20	22-Jun-2018 16:21
Trip Blank	18F0351-13	Water	21-Jun-2018 09:20	22-Jun-2018 16:21



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Case Narrative

Volatiles - EPA Method SW8260C

The sample(s) were run within the recommended holding times.

Initial and continuing calibrations were within method requirements with the exception of all associated "Q" flagged analytes which are out of control low in the CCAL. All associated samples that contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/LCSD percent recoveries and RPD were within control limits.

The Matrix Spike/Matrix Spike duplicate recoveries and RPD were within limits with the exception of analytes flagged on the associated forms.

Dissolved Metals

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

The Matrix Spike/Matrix Spike duplicate recoveries and RPD were within limits.



WORK ORDER

18F0351

Client: Pacific Groundwater Group

Project Manager: Kelly Bottem

Project: Carnation Landfill JS0903

Project Number: Carnation Landfill JS0903

Preservation Confirmation

Container ID	Container Type	pH
18F0351-01 A	VOA Vial, Amber, 40 mL, HCL	b
18F0351-01 B	VOA Vial, Amber, 40 mL, HCL	
18F0351-01 C	VOA Vial, Amber, 40 mL, HCL	b
18F0351-01 D	Small OJ, 500 mL	
18F0351-01 E	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2 p
18F0351-02 A	VOA Vial, Amber, 40 mL, HCL	b
18F0351-02 B	VOA Vial, Amber, 40 mL, HCL	b
18F0351-02 C	VOA Vial, Amber, 40 mL, HCL	b
18F0351-02 D	Small OJ, 500 mL	
18F0351-02 E	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2 p
18F0351-03 A	VOA Vial, Amber, 40 mL, HCL	
18F0351-03 B	VOA Vial, Amber, 40 mL, HCL	b
18F0351-03 C	VOA Vial, Amber, 40 mL, HCL	
18F0351-03 D	VOA Vial, Amber, 40 mL, HCL	
18F0351-03 E	VOA Vial, Amber, 40 mL, HCL	
18F0351-03 F	VOA Vial, Amber, 40 mL, HCL	b
18F0351-03 G	Small OJ, 500 mL	
18F0351-03 H	Small OJ, 500 mL	
18F0351-03 I	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2 p
18F0351-03 J	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2 p
18F0351-04 A	VOA Vial, Amber, 40 mL, HCL	
18F0351-04 B	VOA Vial, Amber, 40 mL, HCL	
18F0351-04 C	VOA Vial, Amber, 40 mL, HCL	b
18F0351-04 D	Small OJ, 500 mL	
18F0351-04 E	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2 p
18F0351-05 A	VOA Vial, Amber, 40 mL, HCL	
18F0351-05 B	VOA Vial, Amber, 40 mL, HCL	b
18F0351-05 C	VOA Vial, Amber, 40 mL, HCL	b
18F0351-05 D	Small OJ, 500 mL	
18F0351-05 E	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2 p
18F0351-06 A	VOA Vial, Amber, 40 mL, HCL	
18F0351-06 B	VOA Vial, Amber, 40 mL, HCL	b
18F0351-06 C	VOA Vial, Amber, 40 mL, HCL	b
18F0351-06 D	Small OJ, 500 mL	
18F0351-06 E	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2 p



WORK ORDER

18F0351

Client: Pacific Groundwater Group

Project Manager: Kelly Bottem

Project: Carnation Landfill JS0903

Project Number: Carnation Landfill JS0903

18F0351-07 A	VOA Vial, Amber, 40 mL, HCL		
18F0351-07 B	VOA Vial, Amber, 40 mL, HCL		
18F0351-07 C	VOA Vial, Amber, 40 mL, HCL	b	
18F0351-07 D	Small OJ, 500 mL		
18F0351-07 E	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	p
18F0351-08 A	VOA Vial, Amber, 40 mL, HCL	b	
18F0351-08 B	VOA Vial, Amber, 40 mL, HCL		
18F0351-08 C	VOA Vial, Amber, 40 mL, HCL	b	
18F0351-08 D	Small OJ, 500 mL		
18F0351-08 E	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	p
18F0351-09 A	VOA Vial, Amber, 40 mL, HCL	b	
18F0351-09 B	VOA Vial, Amber, 40 mL, HCL	b	
18F0351-09 C	VOA Vial, Amber, 40 mL, HCL	b	
18F0351-09 D	Small OJ, 500 mL		
18F0351-09 E	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	p
18F0351-10 A	VOA Vial, Amber, 40 mL, HCL		
18F0351-10 B	VOA Vial, Amber, 40 mL, HCL		
18F0351-10 C	VOA Vial, Amber, 40 mL, HCL		
18F0351-10 D	Small OJ, 500 mL		
18F0351-10 E	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	p
18F0351-11 A	VOA Vial, Amber, 40 mL, HCL	b	
18F0351-11 B	VOA Vial, Amber, 40 mL, HCL	b	
18F0351-11 C	VOA Vial, Amber, 40 mL, HCL	b	
18F0351-11 D	Small OJ, 500 mL		
18F0351-11 E	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	p
18F0351-12 A	VOA Vial, Amber, 40 mL, HCL		
18F0351-12 B	VOA Vial, Amber, 40 mL, HCL		
18F0351-12 C	VOA Vial, Amber, 40 mL, HCL	b	
18F0351-12 D	Small OJ, 500 mL		
18F0351-12 E	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	p
18F0351-13 A	VOA Vial, Amber, 40 mL, HCL	b	
18F0351-13 B	VOA Vial, Amber, 40 mL, HCL	b	

BF

Preservation Confirmed By

Date

6/22/18

p = pass

b = bubble



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: PGG
COC No(s): _____ NA
Assigned ARI Job No: 18F035

Project Name: Connection Landfill
Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
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 YES NO
Were custody papers properly filled out (ink, signed, etc.) YES YES NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 0.6
Time: 1730
If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 2002565
Cooler Accepted by: BF Date: 6/22/18 Time: 1621

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: _____
Was sufficient ice used (if appropriate)? NA YES YES NO
Were all bottles sealed in individual plastic bags? YES YES NO
Did all bottles arrive in good condition (unbroken)? YES YES NO
Were all bottle labels complete and legible? YES YES NO
Did the number of containers listed on COC match with the number of containers received? YES YES NO
Did all bottle labels and tags agree with custody papers? YES YES NO
Were all bottles used correct for the requested analyses? YES YES NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES YES NO
Were all VOC vials free of air bubbles? NA YES YES NO
Was sufficient amount of sample sent in each bottle? YES YES NO
Date VOC Trip Blank was made at ARI..... NA 6/19/18
Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: BF Date: 6/22/18 Time: 1750

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

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:
TB not on CoC air bubbles on pres sheet

By: BF Date: 6/22/18

Small Air Bubbles 	Peabubbles 	LARGE Air Bubbles 	Small → "sm" (< 2 mm) Peabubbles → "pb" (2 to < 4 mm) Large → "lg" (4 to < 6 mm) Headspace → "hs" (> 6 mm)



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-1S
18F0351-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 09:20

Instrument: NT3

Analyzed: 27-Jun-2018 16:45

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGF0664 Sample Size: 10 mL
Prepared: 27-Jun-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-1S
18F0351-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 09:20

Instrument: NT3

Analyzed: 27-Jun-2018 16:45

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-1S
18F0351-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 09:20

Instrument: NT3

Analyzed: 27-Jun-2018 16:45

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	96.5	%	
Surrogate: Toluene-d8		80-120 %	102	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	91.4	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	94.9	%	



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-1S
18F0351-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/21/2018 09:20

Instrument: ICPMS2

Analyzed: 03-Jul-2018 15:23

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGF0652 Sample Size: 25 mL
Prepared: 27-Jun-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.225	ug/L	



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Reported:
13-Jul-2018 14:40

MW-1S
18F0351-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/21/2018 09:20

Instrument: ICP2

Analyzed: 09-Jul-2018 16:00

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGG0092
Prepared: 05-Jul-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	ND	mg/L	U
Manganese, Dissolved	7439-96-5	1	0.0010	ND	mg/L	U



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Reported:
13-Jul-2018 14:40

MW-1S
18F0351-01 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 09:20

Instrument: [CALC]

Analyzed: 11-Jul-2018 10:29

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Jul-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	5	0.0600	2.51	mg/L	

Instrument: LACHAT2

Analyzed: 23-Jun-2018 00:14

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGF0573
Prepared: 22-Jun-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U



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Project: Carnation Landfill JS0903
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Reported:
13-Jul-2018 14:40

MW-1S
18F0351-01 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/21/2018 09:20

Instrument: LACHAT1

Analyzed: 12-Jul-2018 13:49

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0024
Prepared: 02-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	4.65	mg/L	



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-1S
18F0351-01RE1 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 09:20

Instrument: LACHAT2

Analyzed: 11-Jul-2018 10:29

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0232
Prepared: 11-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		5	0.050	0.050	2.51	mg/L	D



Pacific Groundwater Group
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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-1D
18F0351-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 09:25

Instrument: NT3

Analyzed: 27-Jun-2018 17:12

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGF0664 Sample Size: 10 mL
Prepared: 27-Jun-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-1D
18F0351-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 09:25

Instrument: NT3

Analyzed: 27-Jun-2018 17:12

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-1D
18F0351-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 09:25

Instrument: NT3

Analyzed: 27-Jun-2018 17:12

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	98.1	%	
Surrogate: Toluene-d8		80-120 %	99.0	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	99.1	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	99.7	%	



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Reported:
13-Jul-2018 14:40

MW-1D
18F0351-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/21/2018 09:25

Instrument: ICPMS2

Analyzed: 03-Jul-2018 15:28

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGF0652 Sample Size: 25 mL
Prepared: 27-Jun-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.751	ug/L	



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-1D
18F0351-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/21/2018 09:25

Instrument: ICP2

Analyzed: 09-Jul-2018 16:04

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGG0092
Prepared: 05-Jul-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	0.340	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	0.0089	mg/L	



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Reported:
13-Jul-2018 14:40

MW-1D
18F0351-02 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 09:25

Instrument: [CALC]

Analyzed: 11-Jul-2018 10:07

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Jul-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.513	mg/L	

Instrument: LACHAT2

Analyzed: 23-Jun-2018 00:15

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGF0573
Prepared: 22-Jun-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0232
Prepared: 11-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.513	mg/L	



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Reported:
13-Jul-2018 14:40

MW-1D
18F0351-02 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/21/2018 09:25

Instrument: LACHAT1

Analyzed: 12-Jul-2018 13:50

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0024
Prepared: 02-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	5.21	mg/L	



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Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-3S
18F0351-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 10:15

Instrument: NT3

Analyzed: 27-Jun-2018 17:38

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGF0664 Sample Size: 10 mL
Prepared: 27-Jun-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-3S
18F0351-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 10:15

Instrument: NT3

Analyzed: 27-Jun-2018 17:38

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-3S
18F0351-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 10:15

Instrument: NT3

Analyzed: 27-Jun-2018 17:38

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	93.3	%	
Surrogate: Toluene-d8		80-120 %	103	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	93.6	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	94.3	%	



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Reported:
13-Jul-2018 14:40

MW-3S
18F0351-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/21/2018 10:15

Instrument: ICPMS2

Analyzed: 03-Jul-2018 15:49

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGF0652 Sample Size: 25 mL
Prepared: 27-Jun-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	18.2	ug/L	



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Reported:
13-Jul-2018 14:40

MW-3S
18F0351-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/21/2018 10:15

Instrument: ICP2

Analyzed: 09-Jul-2018 15:14

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGG0092 Sample Size: 25 mL
Prepared: 05-Jul-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	2.06	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	2.54	mg/L	



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Reported:
13-Jul-2018 14:40

MW-3S
18F0351-03 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 10:15

Instrument: [CALC]

Analyzed: 11-Jul-2018 10:08

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Jul-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	U

Instrument: LACHAT2

Analyzed: 23-Jun-2018 00:16

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGF0573
Prepared: 22-Jun-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0232
Prepared: 11-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	ND	mg/L	U



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Reported:
13-Jul-2018 14:40

MW-3S
18F0351-03 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/21/2018 10:15

Instrument: LACHAT1

Analyzed: 12-Jul-2018 13:51

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0024
Prepared: 02-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	2.80	mg/L	



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Reported:
13-Jul-2018 14:40

MW-3D
18F0351-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 10:20

Instrument: NT3

Analyzed: 27-Jun-2018 18:04

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGF0664 Sample Size: 10 mL
Prepared: 27-Jun-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-3D
18F0351-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 10:20

Instrument: NT3

Analyzed: 27-Jun-2018 18:04

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project: Carnation Landfill JS0903
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Reported:
13-Jul-2018 14:40

MW-3D
18F0351-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 10:20

Instrument: NT3

Analyzed: 27-Jun-2018 18:04

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	96.4	%	
Surrogate: Toluene-d8		80-120 %	99.7	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	98.7	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	101	%	



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Reported:
13-Jul-2018 14:40

MW-3D
18F0351-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/21/2018 10:20

Instrument: ICPMS2

Analyzed: 03-Jul-2018 15:33

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGF0652 Sample Size: 25 mL
Prepared: 27-Jun-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.482	ug/L	



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-3D
18F0351-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/21/2018 10:20

Instrument: ICP2

Analyzed: 09-Jul-2018 16:08

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGG0092
Prepared: 05-Jul-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	ND	mg/L	U
Manganese, Dissolved	7439-96-5	1	0.0010	ND	mg/L	U



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Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-3D
18F0351-04 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 10:20

Instrument: [CALC]

Analyzed: 11-Jul-2018 10:12

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Jul-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.550	mg/L	

Instrument: LACHAT2

Analyzed: 11-Jul-2018 10:12

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0232
Prepared: 11-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.550	mg/L	



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Reported:
13-Jul-2018 14:40

MW-3D
18F0351-04 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/21/2018 10:20

Instrument: LACHAT1

Analyzed: 12-Jul-2018 13:55

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0024
Prepared: 02-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	5.52	mg/L	



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Reported:
13-Jul-2018 14:40

MW-3D
18F0351-04RE1 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 10:20

Instrument: LACHAT2

Analyzed: 23-Jun-2018 00:40

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGF0573 Sample Size: 10 mL
Prepared: 22-Jun-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-2S
18F0351-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 10:55

Instrument: NT3

Analyzed: 27-Jun-2018 18:30

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGF0664 Sample Size: 10 mL
Prepared: 27-Jun-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-2S
18F0351-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 10:55

Instrument: NT3

Analyzed: 27-Jun-2018 18:30

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-2S
18F0351-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 10:55

Instrument: NT3

Analyzed: 27-Jun-2018 18:30

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	93.4	%	
Surrogate: Toluene-d8		80-120 %	99.8	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	95.4	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	101	%	



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Reported:
13-Jul-2018 14:40

MW-2S
18F0351-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/21/2018 10:55

Instrument: ICPMS2

Analyzed: 03-Jul-2018 15:38

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGF0652 Sample Size: 25 mL
Prepared: 27-Jun-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	7.38	ug/L	



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MW-2S
18F0351-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/21/2018 10:55

Instrument: ICP2

Analyzed: 09-Jul-2018 16:12

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGG0092
Prepared: 05-Jul-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	2.02	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	2.65	mg/L	



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Reported:
13-Jul-2018 14:40

MW-2S
18F0351-05 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 10:55

Instrument: [CALC]

Analyzed: 11-Jul-2018 10:19

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Jul-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.0327	mg/L	

Instrument: LACHAT2

Analyzed: 23-Jun-2018 00:21

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGF0573
Prepared: 22-Jun-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0232
Prepared: 11-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.033	mg/L	



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Reported:
13-Jul-2018 14:40

MW-2S
18F0351-05 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/21/2018 10:55

Instrument: LACHAT1

Analyzed: 12-Jul-2018 13:56

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0024
Prepared: 02-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	ND	mg/L	U



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Reported:
13-Jul-2018 14:40

MW-2D
18F0351-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 11:00

Instrument: NT3

Analyzed: 27-Jun-2018 18:56

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGF0664 Sample Size: 10 mL
Prepared: 27-Jun-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-2D
18F0351-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 11:00

Instrument: NT3

Analyzed: 27-Jun-2018 18:56

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
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Reported:
13-Jul-2018 14:40

MW-2D
18F0351-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 11:00

Instrument: NT3

Analyzed: 27-Jun-2018 18:56

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	95.1	%	
Surrogate: Toluene-d8		80-120 %	105	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	98.8	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	101	%	



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-2D
18F0351-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/21/2018 11:00

Instrument: ICPMS2

Analyzed: 03-Jul-2018 16:21

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGF0652 Sample Size: 25 mL
Prepared: 27-Jun-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	3.74	ug/L	



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Reported:
13-Jul-2018 14:40

MW-2D
18F0351-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/21/2018 11:00

Instrument: ICP2

Analyzed: 09-Jul-2018 16:16

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGG0092
Prepared: 05-Jul-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	6.88	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	0.192	mg/L	



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-2D
18F0351-06 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 11:00

Instrument: [CALC]

Analyzed: 11-Jul-2018 10:20

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Jul-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.204	mg/L	

Instrument: LACHAT2

Analyzed: 23-Jun-2018 00:29

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGF0573
Prepared: 22-Jun-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0232
Prepared: 11-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.204	mg/L	



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Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-2D
18F0351-06 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/21/2018 11:00

Instrument: LACHAT1

Analyzed: 12-Jul-2018 13:57

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0024
Prepared: 02-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	11.1	mg/L	



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Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-22D
18F0351-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 11:05

Instrument: NT3

Analyzed: 28-Jun-2018 13:19

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGF0692 Sample Size: 10 mL
Prepared: 28-Jun-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-22D
18F0351-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 11:05

Instrument: NT3

Analyzed: 28-Jun-2018 13:19

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-22D
18F0351-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 11:05

Instrument: NT3

Analyzed: 28-Jun-2018 13:19

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	93.1	%	
Surrogate: Toluene-d8		80-120 %	101	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	97.0	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	101	%	



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Reported:
13-Jul-2018 14:40

MW-22D
18F0351-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/21/2018 11:05

Instrument: ICPMS2

Analyzed: 03-Jul-2018 16:26

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGF0652 Sample Size: 25 mL
Prepared: 27-Jun-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	7.38	ug/L	



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Reported:
13-Jul-2018 14:40

MW-22D
18F0351-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/21/2018 11:05

Instrument: ICP2

Analyzed: 09-Jul-2018 16:37

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGG0092 Sample Size: 25 mL
Prepared: 05-Jul-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	1.98	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	2.60	mg/L	



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Reported:
13-Jul-2018 14:40

MW-22D
18F0351-07 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 11:05

Instrument: [CALC]

Analyzed: 11-Jul-2018 10:21

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Jul-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.204	mg/L	

Instrument: LACHAT2

Analyzed: 23-Jun-2018 00:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGF0573
Prepared: 22-Jun-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0232
Prepared: 11-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.204	mg/L	



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Reported:
13-Jul-2018 14:40

MW-22D
18F0351-07 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/21/2018 11:05

Instrument: LACHAT1

Analyzed: 12-Jul-2018 13:58

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0024
Prepared: 02-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	10.9	mg/L	



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-6D
18F0351-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 11:55

Instrument: NT3

Analyzed: 28-Jun-2018 13:45

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGF0692 Sample Size: 10 mL
Prepared: 28-Jun-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-6D
18F0351-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 11:55

Instrument: NT3

Analyzed: 28-Jun-2018 13:45

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-6D
18F0351-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 11:55

Instrument: NT3

Analyzed: 28-Jun-2018 13:45

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	93.8	%	
Surrogate: Toluene-d8		80-120 %	100	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	97.1	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	101	%	



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-6D
18F0351-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/21/2018 11:55

Instrument: ICPMS2

Analyzed: 03-Jul-2018 16:31

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGF0652 Sample Size: 25 mL
Prepared: 27-Jun-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	1.38	ug/L	



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-6D
18F0351-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/21/2018 11:55

Instrument: ICP2

Analyzed: 09-Jul-2018 16:41

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGG0092
Prepared: 05-Jul-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	0.557	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	0.0660	mg/L	



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-6D
18F0351-08 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 11:55

Instrument: [CALC]

Analyzed: 11-Jul-2018 10:22

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Jul-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	U

Instrument: LACHAT2

Analyzed: 23-Jun-2018 00:31

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGF0573
Prepared: 22-Jun-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0232
Prepared: 11-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	ND	mg/L	U



Pacific Groundwater Group
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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-6D
18F0351-08 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/21/2018 11:55

Instrument: LACHAT1

Analyzed: 12-Jul-2018 14:10

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0024
Prepared: 02-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	10.9	mg/L	



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-7D
18F0351-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 12:05

Instrument: NT3

Analyzed: 28-Jun-2018 14:12

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGF0692 Sample Size: 10 mL
Prepared: 28-Jun-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-7D
18F0351-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 12:05

Instrument: NT3

Analyzed: 28-Jun-2018 14:12

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project Number: Carnation Landfill JS0903
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Reported:
13-Jul-2018 14:40

MW-7D
18F0351-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 12:05

Instrument: NT3

Analyzed: 28-Jun-2018 14:12

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	94.3	%	
Surrogate: Toluene-d8		80-120 %	101	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	98.3	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	99.3	%	



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Reported:
13-Jul-2018 14:40

MW-7D
18F0351-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/21/2018 12:05

Instrument: ICPMS2

Analyzed: 03-Jul-2018 16:36

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGF0652 Sample Size: 25 mL
Prepared: 27-Jun-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-7D
18F0351-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/21/2018 12:05

Instrument: ICP2

Analyzed: 09-Jul-2018 16:45

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGG0092
Prepared: 05-Jul-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	ND	mg/L	U
Manganese, Dissolved	7439-96-5	1	0.0010	0.0010	mg/L	



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Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-7D
18F0351-09 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 12:05

Instrument: [CALC]

Analyzed: 11-Jul-2018 10:37

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Jul-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	2	0.0300	1.21	mg/L	

Instrument: LACHAT2

Analyzed: 23-Jun-2018 00:33

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGF0573
Prepared: 22-Jun-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U



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Reported:
13-Jul-2018 14:40

MW-7D
18F0351-09 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/21/2018 12:05

Instrument: LACHAT1

Analyzed: 12-Jul-2018 14:11

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0024
Prepared: 02-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	5.46	mg/L	



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Reported:
13-Jul-2018 14:40

MW-7D
18F0351-09RE1 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 12:05

Instrument: LACHAT2

Analyzed: 11-Jul-2018 10:37

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0232 Sample Size: 10 mL
Prepared: 11-Jul-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		2	0.020	0.020	1.21	mg/L	D



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-8D
18F0351-10 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 12:45

Instrument: NT3

Analyzed: 28-Jun-2018 14:38

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGF0692 Sample Size: 10 mL
Prepared: 28-Jun-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-8D
18F0351-10 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 12:45

Instrument: NT3

Analyzed: 28-Jun-2018 14:38

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-8D
18F0351-10 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 12:45

Instrument: NT3

Analyzed: 28-Jun-2018 14:38

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	95.0	%	
Surrogate: Toluene-d8		80-120 %	103	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	96.1	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	103	%	



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Reported:
13-Jul-2018 14:40

MW-8D
18F0351-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/21/2018 12:45

Instrument: ICPMS2

Analyzed: 03-Jul-2018 16:41

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGF0652 Sample Size: 25 mL
Prepared: 27-Jun-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.454	ug/L	



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Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-8D
18F0351-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/21/2018 12:45

Instrument: ICP2

Analyzed: 09-Jul-2018 16:49

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGG0092
Prepared: 05-Jul-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	0.0735	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	0.0447	mg/L	



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Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-8D
18F0351-10 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 12:45

Instrument: [CALC]

Analyzed: 11-Jul-2018 10:38

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Jul-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	2	0.0300	1.04	mg/L	

Instrument: LACHAT2

Analyzed: 23-Jun-2018 00:34

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGF0573
Prepared: 22-Jun-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U



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Reported:
13-Jul-2018 14:40

MW-8D
18F0351-10 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/21/2018 12:45

Instrument: LACHAT1

Analyzed: 12-Jul-2018 14:12

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0024
Prepared: 02-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	10.4	mg/L	



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Reported:
13-Jul-2018 14:40

MW-8D
18F0351-10RE1 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 12:45

Instrument: LACHAT2

Analyzed: 11-Jul-2018 10:38

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0232 Sample Size: 10 mL
Prepared: 11-Jul-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		2	0.020	0.020	1.04	mg/L	D



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-5S
18F0351-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 13:10

Instrument: NT3

Analyzed: 28-Jun-2018 15:04

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGF0692 Sample Size: 10 mL
Prepared: 28-Jun-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-5S
18F0351-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 13:10

Instrument: NT3

Analyzed: 28-Jun-2018 15:04

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

MW-5S
18F0351-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 13:10

Instrument: NT3

Analyzed: 28-Jun-2018 15:04

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	93.5	%	
Surrogate: Toluene-d8		80-120 %	102	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	91.7	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	95.4	%	



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Reported:
13-Jul-2018 14:40

MW-5S
18F0351-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/21/2018 13:10

Instrument: ICPMS2

Analyzed: 03-Jul-2018 16:45

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGF0652 Sample Size: 25 mL
Prepared: 27-Jun-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.200	ug/L	



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13-Jul-2018 14:40

MW-5S
18F0351-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/21/2018 13:10

Instrument: ICP2

Analyzed: 09-Jul-2018 16:53

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGG0092 Sample Size: 25 mL
Prepared: 05-Jul-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	0.106	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	0.0027	mg/L	



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Reported:
13-Jul-2018 14:40

MW-5S
18F0351-11 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 13:10

Instrument: [CALC]

Analyzed: 11-Jul-2018 10:47

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Jul-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	5	0.0600	3.08	mg/L	

Instrument: LACHAT2

Analyzed: 23-Jun-2018 00:35

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGF0573
Prepared: 22-Jun-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U



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Reported:
13-Jul-2018 14:40

MW-5S
18F0351-11 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/21/2018 13:10

Instrument: LACHAT1

Analyzed: 12-Jul-2018 14:13

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0024
Prepared: 02-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	8.00	mg/L	



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Reported:
13-Jul-2018 14:40

MW-5S
18F0351-11RE2 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 13:10

Instrument: LACHAT2

Analyzed: 11-Jul-2018 10:47

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0232 Sample Size: 10 mL
Prepared: 11-Jul-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		5	0.050	0.050	3.08	mg/L	D



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Reported:
13-Jul-2018 14:40

MW-5D
18F0351-12 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 13:20

Instrument: NT3

Analyzed: 28-Jun-2018 15:30

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGF0692 Sample Size: 10 mL
Prepared: 28-Jun-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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13-Jul-2018 14:40

MW-5D
18F0351-12 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 13:20

Instrument: NT3

Analyzed: 28-Jun-2018 15:30

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

MW-5D
18F0351-12 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 13:20

Instrument: NT3

Analyzed: 28-Jun-2018 15:30

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	96.2	%	
Surrogate: Toluene-d8		80-120 %	102	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	92.3	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	95.6	%	



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Project: Carnation Landfill JS0903
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Reported:
13-Jul-2018 14:40

MW-5D
18F0351-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 06/21/2018 13:20

Instrument: ICPMS2

Analyzed: 03-Jul-2018 16:50

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGF0652 Sample Size: 25 mL
Prepared: 27-Jun-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.439	ug/L	



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Reported:
13-Jul-2018 14:40

MW-5D
18F0351-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 06/21/2018 13:20

Instrument: ICP2

Analyzed: 09-Jul-2018 16:57

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGG0092 Sample Size: 25 mL
Prepared: 05-Jul-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	ND	mg/L	U
Manganese, Dissolved	7439-96-5	1	0.0010	0.0026	mg/L	



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Reported:
13-Jul-2018 14:40

MW-5D
18F0351-12 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 06/21/2018 13:20

Instrument: [CALC]

Analyzed: 11-Jul-2018 10:27

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Jul-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	0.330	mg/L	

Instrument: LACHAT2

Analyzed: 23-Jun-2018 00:36

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGF0573
Prepared: 22-Jun-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0232
Prepared: 11-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.330	mg/L	



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Reported:
13-Jul-2018 14:40

MW-5D
18F0351-12 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 06/21/2018 13:20

Instrument: LACHAT1

Analyzed: 12-Jul-2018 14:15

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGG0024
Prepared: 02-Jul-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	7.25	mg/L	



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Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Trip Blank
18F0351-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 09:20

Instrument: NT3

Analyzed: 28-Jun-2018 12:53

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGF0692 Sample Size: 10 mL
Prepared: 28-Jun-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

Trip Blank
18F0351-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 09:20

Instrument: NT3

Analyzed: 28-Jun-2018 12:53

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Reported:
13-Jul-2018 14:40

Trip Blank
18F0351-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 06/21/2018 09:20

Instrument: NT3

Analyzed: 28-Jun-2018 12:53

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 1,2-Dichloroethane-d4		80-129 %	93.9	%	
Surrogate: Toluene-d8		80-120 %	103	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	94.2	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	92.0	%	



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Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0664 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGF0664-BLK1)		Prepared: 27-Jun-2018 Analyzed: 27-Jun-2018 11:32								
Chloromethane	ND	0.50	ug/L							U
Vinyl Chloride	ND	0.20	ug/L							U
Bromomethane	ND	1.00	ug/L							U
Chloroethane	ND	0.20	ug/L							U
Trichlorofluoromethane	ND	0.20	ug/L							U
Acrolein	ND	5.00	ug/L							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.20	ug/L							U
Acetone	ND	5.00	ug/L							U
1,1-Dichloroethene	ND	0.20	ug/L							U
Bromoethane	ND	0.20	ug/L							U
Iodomethane	ND	1.00	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.20	ug/L							U
Vinyl Acetate	ND	0.20	ug/L							U
1,1-Dichloroethane	ND	0.20	ug/L							U
2-Butanone	ND	5.00	ug/L							U
2,2-Dichloropropane	ND	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Chloroform	ND	0.20	ug/L							U
Bromochloromethane	ND	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.20	ug/L							U
1,1-Dichloropropene	ND	0.20	ug/L							U
Carbon tetrachloride	ND	0.20	ug/L							U
1,2-Dichloroethane	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Trichloroethene	ND	0.20	ug/L							U
1,2-Dichloropropane	ND	0.20	ug/L							U
Bromodichloromethane	ND	0.20	ug/L							U
Dibromomethane	ND	0.20	ug/L							U
2-Chloroethyl vinyl ether	ND	1.00	ug/L							U
4-Methyl-2-Pentanone	ND	5.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.20	ug/L							U
Toluene	ND	0.20	ug/L							U



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Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0664 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGF0664-BLK1)		Prepared: 27-Jun-2018 Analyzed: 27-Jun-2018 11:32								
trans-1,3-Dichloropropene	ND	0.20	ug/L							U
2-Hexanone	ND	5.00	ug/L							U
1,1,2-Trichloroethane	ND	0.20	ug/L							U
1,3-Dichloropropane	ND	0.20	ug/L							U
Tetrachloroethene	ND	0.20	ug/L							U
Dibromochloromethane	ND	0.20	ug/L							U
1,2-Dibromoethane	ND	0.20	ug/L							U
Chlorobenzene	ND	0.20	ug/L							U
Ethylbenzene	ND	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.20	ug/L							U
m,p-Xylene	ND	0.40	ug/L							U
o-Xylene	ND	0.20	ug/L							U
Xylenes, total	ND	0.60	ug/L							U
Styrene	ND	0.20	ug/L							U
Bromoform	ND	0.20	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.50	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	1.00	ug/L							U
n-Propylbenzene	ND	0.20	ug/L							U
Bromobenzene	ND	0.20	ug/L							U
Isopropyl Benzene	ND	0.20	ug/L							U
2-Chlorotoluene	ND	0.20	ug/L							U
4-Chlorotoluene	ND	0.20	ug/L							U
t-Butylbenzene	ND	0.20	ug/L							U
1,3,5-Trimethylbenzene	ND	0.20	ug/L							U
1,2,4-Trimethylbenzene	ND	0.20	ug/L							U
s-Butylbenzene	ND	0.20	ug/L							U
4-Isopropyl Toluene	ND	0.20	ug/L							U
1,3-Dichlorobenzene	ND	0.20	ug/L							U
1,4-Dichlorobenzene	ND	0.20	ug/L							U
n-Butylbenzene	ND	0.20	ug/L							U
1,2-Dichlorobenzene	ND	0.20	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.50	ug/L							U
1,2,4-Trichlorobenzene	ND	0.50	ug/L							U
Hexachloro-1,3-Butadiene	ND	0.50	ug/L							U



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Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0664 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGF0664-BLK1)										
Prepared: 27-Jun-2018 Analyzed: 27-Jun-2018 11:32										
Naphthalene	ND	0.50	ug/L							U
1,2,3-Trichlorobenzene	ND	0.50	ug/L							U
Dichlorodifluoromethane	ND	0.20	ug/L							U
Methyl tert-butyl Ether	ND	0.50	ug/L							U
2-Pentanone	ND	5.00	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	4.76		ug/L	5.00		95.2	80-129			
Surrogate: Toluene-d8	5.08		ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	4.74		ug/L	5.00		94.8	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.92		ug/L	5.00		98.5	80-120			
LCS (BGF0664-BS1)										
Prepared: 27-Jun-2018 Analyzed: 27-Jun-2018 09:22										
Chloromethane	9.59	0.50	ug/L	10.0		95.9	60-138			
Vinyl Chloride	9.95	0.20	ug/L	10.0		99.5	66-133			
Bromomethane	10.7	1.00	ug/L	10.0		107	72-131			
Chloroethane	10.3	0.20	ug/L	10.0		103	60-155			
Trichlorofluoromethane	10.3	0.20	ug/L	10.0		103	80-129			
Acrolein	45.4	5.00	ug/L	50.0		90.7	52-144			
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.7	0.20	ug/L	10.0		107	76-129			
Acetone	44.6	5.00	ug/L	50.0		89.3	58-142			
1,1-Dichloroethene	9.85	0.20	ug/L	10.0		98.5	69-135			
Bromoethane	10.5	0.20	ug/L	10.0		105	78-128			
Iodomethane	9.69	1.00	ug/L	10.0		96.9	56-147			
Methylene Chloride	10.3	1.00	ug/L	10.0		103	65-135			
Acrylonitrile	8.75	1.00	ug/L	10.0		87.5	64-134			
Carbon Disulfide	9.83	0.20	ug/L	10.0		98.3	78-125			
trans-1,2-Dichloroethene	10.1	0.20	ug/L	10.0		101	78-128			
Vinyl Acetate	8.71	0.20	ug/L	10.0		87.1	55-138			
1,1-Dichloroethane	9.91	0.20	ug/L	10.0		99.1	76-124			
2-Butanone	43.9	5.00	ug/L	50.0		87.8	61-140			
2,2-Dichloropropane	10.4	0.20	ug/L	10.0		104	78-125			
cis-1,2-Dichloroethene	10.2	0.20	ug/L	10.0		102	80-121			
Chloroform	9.66	0.20	ug/L	10.0		96.6	80-122			
Bromochloromethane	9.52	0.20	ug/L	10.0		95.2	80-121			
1,1,1-Trichloroethane	10.3	0.20	ug/L	10.0		103	79-123			
1,1-Dichloropropene	9.93	0.20	ug/L	10.0		99.3	80-120			



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0664 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGF0664-BS1)		Prepared: 27-Jun-2018 Analyzed: 27-Jun-2018 09:22								
Carbon tetrachloride	10.3	0.20	ug/L	10.0		103	53-137			
1,2-Dichloroethane	9.25	0.20	ug/L	10.0		92.5	75-123			
Benzene	10.2	0.20	ug/L	10.0		102	80-120			
Trichloroethene	10.1	0.20	ug/L	10.0		101	80-120			
1,2-Dichloropropane	9.90	0.20	ug/L	10.0		99.0	80-120			
Bromodichloromethane	9.32	0.20	ug/L	10.0		93.2	80-121			
Dibromomethane	9.40	0.20	ug/L	10.0		94.0	80-120			
2-Chloroethyl vinyl ether	10.6	1.00	ug/L	10.0		106	74-127			
4-Methyl-2-Pentanone	45.0	5.00	ug/L	50.0		89.9	67-133			
cis-1,3-Dichloropropene	9.82	0.20	ug/L	10.0		98.2	80-124			
Toluene	10.2	0.20	ug/L	10.0		102	80-120			
trans-1,3-Dichloropropene	9.74	0.20	ug/L	10.0		97.4	71-127			
2-Hexanone	41.4	5.00	ug/L	50.0		82.9	69-133			
1,1,2-Trichloroethane	9.56	0.20	ug/L	10.0		95.6	80-121			
1,3-Dichloropropane	9.11	0.20	ug/L	10.0		91.1	80-120			
Tetrachloroethene	10.1	0.20	ug/L	10.0		101	80-120			
Dibromochloromethane	9.11	0.20	ug/L	10.0		91.1	65-135			
1,2-Dibromoethane	9.75	0.20	ug/L	10.0		97.5	80-121			
Chlorobenzene	9.89	0.20	ug/L	10.0		98.9	80-120			
Ethylbenzene	10.1	0.20	ug/L	10.0		101	80-120			
1,1,1,2-Tetrachloroethane	9.36	0.20	ug/L	10.0		93.6	80-120			
m,p-Xylene	20.0	0.40	ug/L	20.0		99.9	80-121			
o-Xylene	9.74	0.20	ug/L	10.0		97.4	80-121			
Xylenes, total	29.7	0.60	ug/L	30.0		99.1	76-127			
Styrene	10.0	0.20	ug/L	10.0		100	80-124			
Bromoform	8.46	0.20	ug/L	10.0		84.6	51-134			
1,1,2,2-Tetrachloroethane	8.07	0.20	ug/L	10.0		80.7	77-123			
1,2,3-Trichloropropane	8.22	0.50	ug/L	10.0		82.2	76-125			
trans-1,4-Dichloro 2-Butene	8.02	1.00	ug/L	10.0		80.2	55-129			
n-Propylbenzene	9.58	0.20	ug/L	10.0		95.8	78-130			
Bromobenzene	9.20	0.20	ug/L	10.0		92.0	80-120			
Isopropyl Benzene	9.53	0.20	ug/L	10.0		95.3	80-128			
2-Chlorotoluene	9.17	0.20	ug/L	10.0		91.7	78-122			
4-Chlorotoluene	9.35	0.20	ug/L	10.0		93.5	80-121			
t-Butylbenzene	9.31	0.20	ug/L	10.0		93.1	78-125			



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0664 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGF0664-BS1)										
					Prepared: 27-Jun-2018 Analyzed: 27-Jun-2018 09:22					
1,3,5-Trimethylbenzene	9.49	0.20	ug/L	10.0		94.9	80-129			
1,2,4-Trimethylbenzene	9.53	0.20	ug/L	10.0		95.3	80-127			
s-Butylbenzene	9.53	0.20	ug/L	10.0		95.3	78-129			
4-Isopropyl Toluene	9.76	0.20	ug/L	10.0		97.6	79-130			
1,3-Dichlorobenzene	9.38	0.20	ug/L	10.0		93.8	80-120			
1,4-Dichlorobenzene	9.37	0.20	ug/L	10.0		93.7	80-120			
n-Butylbenzene	9.67	0.20	ug/L	10.0		96.7	74-129			
1,2-Dichlorobenzene	9.01	0.20	ug/L	10.0		90.1	80-120			
1,2-Dibromo-3-chloropropane	7.55	0.50	ug/L	10.0		75.5	62-123			Q
1,2,4-Trichlorobenzene	8.86	0.50	ug/L	10.0		88.6	64-124			
Hexachloro-1,3-Butadiene	10.2	0.50	ug/L	10.0		102	58-123			
Naphthalene	9.41	0.50	ug/L	10.0		94.1	50-134			
1,2,3-Trichlorobenzene	8.24	0.50	ug/L	10.0		82.4	49-133			
Dichlorodifluoromethane	10.4	0.20	ug/L	10.0		104	48-147			
Methyl tert-butyl Ether	9.55	0.50	ug/L	10.0		95.5	71-132			
2-Pentanone	47.7	5.00	ug/L	50.0		95.5	69-134			
Surrogate: 1,2-Dichloroethane-d4	4.54		ug/L	5.00		90.9	80-129			
Surrogate: Toluene-d8	5.13		ug/L	5.00		103	80-120			
Surrogate: 4-Bromofluorobenzene	5.10		ug/L	5.00		102	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.76		ug/L	5.00		95.2	80-120			
LCS Dup (BGF0664-BSD1)										
					Prepared: 27-Jun-2018 Analyzed: 27-Jun-2018 09:48					
Chloromethane	9.97	0.50	ug/L	10.0		99.7	60-138	3.90	30	
Vinyl Chloride	10.3	0.20	ug/L	10.0		103	66-133	3.47	30	
Bromomethane	10.8	1.00	ug/L	10.0		108	72-131	1.56	30	
Chloroethane	10.5	0.20	ug/L	10.0		105	60-155	2.50	30	
Trichlorofluoromethane	10.6	0.20	ug/L	10.0		106	80-129	2.88	30	
Acrolein	47.2	5.00	ug/L	50.0		94.3	52-144	3.87	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.3	0.20	ug/L	10.0		103	76-129	3.54	30	
Acetone	50.7	5.00	ug/L	50.0		101	58-142	12.60	30	
1,1-Dichloroethene	9.89	0.20	ug/L	10.0		98.9	69-135	0.44	30	
Bromoethane	10.4	0.20	ug/L	10.0		104	78-128	1.90	30	
Iodomethane	10.2	1.00	ug/L	10.0		102	56-147	4.93	30	
Methylene Chloride	10.4	1.00	ug/L	10.0		104	65-135	0.90	30	
Acrylonitrile	9.36	1.00	ug/L	10.0		93.6	64-134	6.79	30	



Pacific Groundwater Group
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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0664 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BGF0664-BSD1)		Prepared: 27-Jun-2018 Analyzed: 27-Jun-2018 09:48								
Carbon Disulfide	9.93	0.20	ug/L	10.0		99.3	78-125	1.07	30	
trans-1,2-Dichloroethene	10.4	0.20	ug/L	10.0		104	78-128	2.18	30	
Vinyl Acetate	9.28	0.20	ug/L	10.0		92.8	55-138	6.30	30	
1,1-Dichloroethane	9.99	0.20	ug/L	10.0		99.9	76-124	0.80	30	
2-Butanone	50.0	5.00	ug/L	50.0		100	61-140	13.10	30	
2,2-Dichloropropane	10.3	0.20	ug/L	10.0		103	78-125	0.28	30	
cis-1,2-Dichloroethene	10.3	0.20	ug/L	10.0		103	80-121	0.70	30	
Chloroform	9.93	0.20	ug/L	10.0		99.3	80-122	2.82	30	
Bromochloromethane	10.3	0.20	ug/L	10.0		103	80-121	8.06	30	
1,1,1-Trichloroethane	10.4	0.20	ug/L	10.0		104	79-123	0.68	30	
1,1-Dichloropropene	10.1	0.20	ug/L	10.0		101	80-120	1.76	30	
Carbon tetrachloride	10.2	0.20	ug/L	10.0		102	53-137	1.10	30	
1,2-Dichloroethane	9.91	0.20	ug/L	10.0		99.1	75-123	6.97	30	
Benzene	10.3	0.20	ug/L	10.0		103	80-120	0.74	30	
Trichloroethene	10.5	0.20	ug/L	10.0		105	80-120	3.22	30	
1,2-Dichloropropane	10.2	0.20	ug/L	10.0		102	80-120	2.73	30	
Bromodichloromethane	9.33	0.20	ug/L	10.0		93.3	80-121	0.10	30	
Dibromomethane	9.99	0.20	ug/L	10.0		99.9	80-120	5.99	30	
2-Chloroethyl vinyl ether	11.1	1.00	ug/L	10.0		111	74-127	4.24	30	
4-Methyl-2-Pentanone	50.1	5.00	ug/L	50.0		100	67-133	10.90	30	
cis-1,3-Dichloropropene	10.1	0.20	ug/L	10.0		101	80-124	3.08	30	
Toluene	10.4	0.20	ug/L	10.0		104	80-120	1.86	30	
trans-1,3-Dichloropropene	10.3	0.20	ug/L	10.0		103	71-127	5.84	30	
2-Hexanone	47.0	5.00	ug/L	50.0		94.0	69-133	12.60	30	
1,1,2-Trichloroethane	10.2	0.20	ug/L	10.0		102	80-121	6.98	30	
1,3-Dichloropropane	9.75	0.20	ug/L	10.0		97.5	80-120	6.88	30	
Tetrachloroethene	10.2	0.20	ug/L	10.0		102	80-120	0.55	30	
Dibromochloromethane	9.85	0.20	ug/L	10.0		98.5	65-135	7.84	30	
1,2-Dibromoethane	10.3	0.20	ug/L	10.0		103	80-121	5.21	30	
Chlorobenzene	10.1	0.20	ug/L	10.0		101	80-120	2.44	30	
Ethylbenzene	10.3	0.20	ug/L	10.0		103	80-120	1.89	30	
1,1,1,2-Tetrachloroethane	9.66	0.20	ug/L	10.0		96.6	80-120	3.13	30	
m,p-Xylene	20.1	0.40	ug/L	20.0		101	80-121	0.83	30	
o-Xylene	9.72	0.20	ug/L	10.0		97.2	80-121	0.17	30	
Xylenes, total	29.9	0.60	ug/L	30.0		99.6	76-127	0.50	30	



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Project: Carnation Landfill JS0903
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Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0664 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BGF0664-BSD1)		Prepared: 27-Jun-2018 Analyzed: 27-Jun-2018 09:48								
Styrene	10.1	0.20	ug/L	10.0		101	80-124	0.43	30	
Bromoform	10.2	0.20	ug/L	10.0		102	51-134	18.20	30	
1,1,2,2-Tetrachloroethane	9.40	0.20	ug/L	10.0		94.0	77-123	15.20	30	
1,2,3-Trichloropropane	10.0	0.50	ug/L	10.0		100	76-125	20.00	30	
trans-1,4-Dichloro 2-Butene	9.52	1.00	ug/L	10.0		95.2	55-129	17.10	30	
n-Propylbenzene	10.4	0.20	ug/L	10.0		104	78-130	8.56	30	
Bromobenzene	10.2	0.20	ug/L	10.0		102	80-120	10.20	30	
Isopropyl Benzene	10.5	0.20	ug/L	10.0		105	80-128	9.98	30	
2-Chlorotoluene	9.99	0.20	ug/L	10.0		99.9	78-122	8.57	30	
4-Chlorotoluene	10.0	0.20	ug/L	10.0		100	80-121	7.03	30	
t-Butylbenzene	10.0	0.20	ug/L	10.0		100	78-125	7.22	30	
1,3,5-Trimethylbenzene	10.0	0.20	ug/L	10.0		100	80-129	5.52	30	
1,2,4-Trimethylbenzene	9.90	0.20	ug/L	10.0		99.0	80-127	3.84	30	
s-Butylbenzene	9.90	0.20	ug/L	10.0		99.0	78-129	3.84	30	
4-Isopropyl Toluene	9.74	0.20	ug/L	10.0		97.4	79-130	0.24	30	
1,3-Dichlorobenzene	9.86	0.20	ug/L	10.0		98.6	80-120	4.98	30	
1,4-Dichlorobenzene	9.88	0.20	ug/L	10.0		98.8	80-120	5.25	30	
n-Butylbenzene	9.41	0.20	ug/L	10.0		94.1	74-129	2.72	30	
1,2-Dichlorobenzene	9.35	0.20	ug/L	10.0		93.5	80-120	3.64	30	
1,2-Dibromo-3-chloropropane	8.44	0.50	ug/L	10.0		84.4	62-123	11.10	30	Q
1,2,4-Trichlorobenzene	7.97	0.50	ug/L	10.0		79.7	64-124	10.60	30	
Hexachloro-1,3-Butadiene	8.46	0.50	ug/L	10.0		84.6	58-123	18.80	30	
Naphthalene	8.35	0.50	ug/L	10.0		83.5	50-134	11.90	30	
1,2,3-Trichlorobenzene	7.90	0.50	ug/L	10.0		79.0	49-133	4.18	30	
Dichlorodifluoromethane	10.1	0.20	ug/L	10.0		101	48-147	3.53	30	
Methyl tert-butyl Ether	10.0	0.50	ug/L	10.0		100	71-132	4.88	30	
2-Pentanone	52.9	5.00	ug/L	50.0		106	69-134	10.30	30	
Surrogate: 1,2-Dichloroethane-d4	4.70		ug/L	5.00		94.1	80-129			
Surrogate: Toluene-d8	5.10		ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	4.89		ug/L	5.00		97.7	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.70		ug/L	5.00		94.0	80-120			

Matrix Spike (BGF0664-MS2)		Source: 18F0351-03		Prepared: 27-Jun-2018 Analyzed: 27-Jun-2018 20:14						
Chloromethane	9.66	0.50	ug/L	10.0	ND	96.6	60-138			
Vinyl Chloride	10.0	0.20	ug/L	10.0	ND	100	66-133			



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Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0664 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BGF0664-MS2)		Source: 18F0351-03		Prepared: 27-Jun-2018		Analyzed: 27-Jun-2018 20:14				
Bromomethane	10.5	1.00	ug/L	10.0	ND	105	72-131			
Chloroethane	9.53	0.20	ug/L	10.0	ND	95.3	60-155			
Trichlorofluoromethane	9.51	0.20	ug/L	10.0	ND	95.1	80-129			
Acrolein	45.5	5.00	ug/L	50.0	ND	91.0	52-144			
1,1,2-Trichloro-1,2,2-Trifluoroethane	9.66	0.20	ug/L	10.0	ND	96.6	76-129			
Acetone	51.6	5.00	ug/L	50.0	ND	103	58-142			
1,1-Dichloroethene	9.53	0.20	ug/L	10.0	ND	95.3	69-135			
Bromoethane	9.93	0.20	ug/L	10.0	ND	99.3	78-128			
Iodomethane	9.89	1.00	ug/L	10.0	ND	98.9	56-147			
Methylene Chloride	10.1	1.00	ug/L	10.0	ND	101	65-135			
Acrylonitrile	9.79	1.00	ug/L	10.0	ND	97.9	64-134			
Carbon Disulfide	9.59	0.20	ug/L	10.0	ND	95.9	78-125			
trans-1,2-Dichloroethene	9.87	0.20	ug/L	10.0	ND	98.7	78-128			
Vinyl Acetate	8.73	0.20	ug/L	10.0	ND	87.3	55-138			
1,1-Dichloroethane	9.72	0.20	ug/L	10.0	ND	97.2	76-124			
2-Butanone	49.8	5.00	ug/L	50.0	ND	99.6	61-140			
2,2-Dichloropropane	8.50	0.20	ug/L	10.0	ND	85.0	78-125			
cis-1,2-Dichloroethene	10.1	0.20	ug/L	10.0	ND	101	80-121			
Chloroform	9.48	0.20	ug/L	10.0	ND	94.8	80-122			
Bromochloromethane	9.95	0.20	ug/L	10.0	ND	99.5	80-121			
1,1,1-Trichloroethane	9.97	0.20	ug/L	10.0	ND	99.7	79-123			
1,1-Dichloropropene	9.53	0.20	ug/L	10.0	ND	95.3	80-120			
Carbon tetrachloride	9.93	0.20	ug/L	10.0	ND	99.3	53-137			
1,2-Dichloroethane	9.65	0.20	ug/L	10.0	ND	96.5	75-123			
Benzene	9.85	0.20	ug/L	10.0	ND	98.5	80-120			
Trichloroethene	9.61	0.20	ug/L	10.0	ND	96.1	80-120			
1,2-Dichloropropane	9.78	0.20	ug/L	10.0	ND	97.8	80-120			
Bromodichloromethane	8.92	0.20	ug/L	10.0	ND	89.2	80-121			
Dibromomethane	9.72	0.20	ug/L	10.0	ND	97.2	80-120			
2-Chloroethyl vinyl ether	ND	1.00	ug/L	10.0	ND		74-127			*, U
4-Methyl-2-Pentanone	49.5	5.00	ug/L	50.0	ND	99.0	67-133			
cis-1,3-Dichloropropene	9.19	0.20	ug/L	10.0	ND	91.9	80-124			
Toluene	9.79	0.20	ug/L	10.0	ND	97.9	80-120			
trans-1,3-Dichloropropene	9.62	0.20	ug/L	10.0	ND	96.2	71-127			
2-Hexanone	48.6	5.00	ug/L	50.0	ND	97.1	69-133			



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Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0664 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BGF0664-MS2)		Source: 18F0351-03		Prepared: 27-Jun-2018		Analyzed: 27-Jun-2018 20:14				
1,1,2-Trichloroethane	9.79	0.20	ug/L	10.0	ND	97.9	80-121			
1,3-Dichloropropane	9.62	0.20	ug/L	10.0	ND	96.2	80-120			
Tetrachloroethene	9.75	0.20	ug/L	10.0	ND	97.5	80-120			
Dibromochloromethane	9.47	0.20	ug/L	10.0	ND	94.7	65-135			
1,2-Dibromoethane	9.98	0.20	ug/L	10.0	ND	99.8	80-121			
Chlorobenzene	9.86	0.20	ug/L	10.0	ND	98.6	80-120			
Ethylbenzene	9.71	0.20	ug/L	10.0	ND	97.1	80-120			
1,1,1,2-Tetrachloroethane	9.39	0.20	ug/L	10.0	ND	93.9	80-120			
m,p-Xylene	19.5	0.40	ug/L	20.0	ND	97.3	80-121			
o-Xylene	9.45	0.20	ug/L	10.0	ND	94.5	80-121			
Xylenes, total	28.9	0.60	ug/L	30.0	ND	96.3	76-127			
Styrene	9.63	0.20	ug/L	10.0	ND	96.3	80-124			
Bromoform	10.1	0.20	ug/L	10.0	ND	101	51-134			
1,1,2,2-Tetrachloroethane	9.70	0.20	ug/L	10.0	ND	97.0	77-123			
1,2,3-Trichloropropane	10.6	0.50	ug/L	10.0	ND	106	76-125			
trans-1,4-Dichloro 2-Butene	8.98	1.00	ug/L	10.0	ND	89.8	55-129			
n-Propylbenzene	10.1	0.20	ug/L	10.0	ND	101	78-130			
Bromobenzene	10.3	0.20	ug/L	10.0	ND	103	80-120			
Isopropyl Benzene	10.2	0.20	ug/L	10.0	ND	102	80-128			
2-Chlorotoluene	9.66	0.20	ug/L	10.0	ND	96.6	78-122			
4-Chlorotoluene	9.79	0.20	ug/L	10.0	ND	97.9	80-121			
t-Butylbenzene	9.63	0.20	ug/L	10.0	ND	96.3	78-125			
1,3,5-Trimethylbenzene	9.58	0.20	ug/L	10.0	ND	95.8	80-129			
1,2,4-Trimethylbenzene	9.47	0.20	ug/L	10.0	ND	94.7	80-127			
s-Butylbenzene	9.38	0.20	ug/L	10.0	ND	93.8	78-129			
4-Isopropyl Toluene	9.08	0.20	ug/L	10.0	ND	90.8	79-130			
1,3-Dichlorobenzene	9.22	0.20	ug/L	10.0	ND	92.2	80-120			
1,4-Dichlorobenzene	9.52	0.20	ug/L	10.0	ND	95.2	80-120			
n-Butylbenzene	8.46	0.20	ug/L	10.0	ND	84.6	74-129			
1,2-Dichlorobenzene	8.89	0.20	ug/L	10.0	ND	88.9	80-120			
1,2-Dibromo-3-chloropropane	8.26	0.50	ug/L	10.0	ND	82.6	62-123			Q
1,2,4-Trichlorobenzene	7.18	0.50	ug/L	10.0	ND	71.8	64-124			
Hexachloro-1,3-Butadiene	7.34	0.50	ug/L	10.0	ND	73.4	58-123			
Naphthalene	8.10	0.50	ug/L	10.0	ND	81.0	50-134			
1,2,3-Trichlorobenzene	7.43	0.50	ug/L	10.0	ND	74.3	49-133			



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0664 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BGF0664-MS2)		Source: 18F0351-03		Prepared: 27-Jun-2018		Analyzed: 27-Jun-2018 20:14				
Dichlorodifluoromethane	10.2	0.20	ug/L	10.0	ND	102	48-147			
Methyl tert-butyl Ether	10.2	0.50	ug/L	10.0	ND	102	71-132			
2-Pentanone	49.4	5.00	ug/L	50.0	ND	98.7	69-134			
Surrogate: 1,2-Dichloroethane-d4	4.80		ug/L	5.00	4.66	96.0	80-129			
Surrogate: Toluene-d8	5.11		ug/L	5.00	5.17	102	80-120			
Surrogate: 4-Bromofluorobenzene	4.96		ug/L	5.00	4.68	99.1	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.67		ug/L	5.00	4.72	93.4	80-120			

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

Matrix Spike Dup (BGF0664-MSD2)		Source: 18F0351-03		Prepared: 27-Jun-2018		Analyzed: 27-Jun-2018 20:40				
Chloromethane	9.86	0.50	ug/L	10.0	ND	98.6	60-138	1.96	30	
Vinyl Chloride	10.1	0.20	ug/L	10.0	ND	101	66-133	0.91	30	
Bromomethane	10.8	1.00	ug/L	10.0	ND	108	72-131	3.31	30	
Chloroethane	10.3	0.20	ug/L	10.0	ND	103	60-155	8.23	30	
Trichlorofluoromethane	9.86	0.20	ug/L	10.0	ND	98.6	80-129	3.57	30	
Acrolein	47.1	5.00	ug/L	50.0	ND	94.2	52-144	3.42	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	9.81	0.20	ug/L	10.0	ND	98.1	76-129	1.56	30	
Acetone	53.2	5.00	ug/L	50.0	ND	106	58-142	3.05	30	
1,1-Dichloroethene	9.92	0.20	ug/L	10.0	ND	99.2	69-135	4.07	30	
Bromoethane	10.0	0.20	ug/L	10.0	ND	100	78-128	0.79	30	
Iodomethane	10.1	1.00	ug/L	10.0	ND	101	56-147	2.16	30	
Methylene Chloride	10.0	1.00	ug/L	10.0	ND	100	65-135	0.38	30	
Acrylonitrile	9.74	1.00	ug/L	10.0	ND	97.4	64-134	0.53	30	
Carbon Disulfide	9.98	0.20	ug/L	10.0	ND	99.8	78-125	3.97	30	
trans-1,2-Dichloroethene	9.94	0.20	ug/L	10.0	ND	99.4	78-128	0.74	30	
Vinyl Acetate	8.68	0.20	ug/L	10.0	ND	86.8	55-138	0.67	30	
1,1-Dichloroethane	9.98	0.20	ug/L	10.0	ND	99.8	76-124	2.68	30	
2-Butanone	49.8	5.00	ug/L	50.0	ND	99.6	61-140	0.03	30	
2,2-Dichloropropane	8.64	0.20	ug/L	10.0	ND	86.4	78-125	1.64	30	
cis-1,2-Dichloroethene	10.2	0.20	ug/L	10.0	ND	102	80-121	0.51	30	
Chloroform	9.87	0.20	ug/L	10.0	ND	98.7	80-122	4.02	30	
Bromochloromethane	9.89	0.20	ug/L	10.0	ND	98.9	80-121	0.60	30	
1,1,1-Trichloroethane	10.1	0.20	ug/L	10.0	ND	101	79-123	1.00	30	
1,1-Dichloropropene	9.87	0.20	ug/L	10.0	ND	98.7	80-120	3.42	30	
Carbon tetrachloride	10.0	0.20	ug/L	10.0	ND	100	53-137	0.76	30	



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0664 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BGF0664-MSD2)		Source: 18F0351-03		Prepared: 27-Jun-2018		Analyzed: 27-Jun-2018 20:40				
1,2-Dichloroethane	9.88	0.20	ug/L	10.0	ND	98.8	75-123	2.33	30	
Benzene	10.3	0.20	ug/L	10.0	ND	103	80-120	4.15	30	
Trichloroethene	10.1	0.20	ug/L	10.0	ND	101	80-120	5.40	30	
1,2-Dichloropropane	10.0	0.20	ug/L	10.0	ND	100	80-120	2.43	30	
Bromodichloromethane	9.23	0.20	ug/L	10.0	ND	92.3	80-121	3.46	30	
Dibromomethane	9.82	0.20	ug/L	10.0	ND	98.2	80-120	1.04	30	
2-Chloroethyl vinyl ether	ND	1.00	ug/L	10.0	ND		74-127			*, U
4-Methyl-2-Pentanone	51.5	5.00	ug/L	50.0	ND	103	67-133	3.94	30	
cis-1,3-Dichloropropene	9.73	0.20	ug/L	10.0	ND	97.3	80-124	5.70	30	
Toluene	10.2	0.20	ug/L	10.0	ND	102	80-120	3.66	30	
trans-1,3-Dichloropropene	10.1	0.20	ug/L	10.0	ND	101	71-127	5.36	30	
2-Hexanone	48.3	5.00	ug/L	50.0	ND	96.6	69-133	0.59	30	
1,1,2-Trichloroethane	10.4	0.20	ug/L	10.0	ND	104	80-121	5.76	30	
1,3-Dichloropropane	9.68	0.20	ug/L	10.0	ND	96.8	80-120	0.66	30	
Tetrachloroethene	9.83	0.20	ug/L	10.0	ND	98.3	80-120	0.78	30	
Dibromochloromethane	9.45	0.20	ug/L	10.0	ND	94.5	65-135	0.26	30	
1,2-Dibromoethane	10.6	0.20	ug/L	10.0	ND	106	80-121	5.89	30	
Chlorobenzene	9.81	0.20	ug/L	10.0	ND	98.1	80-120	0.52	30	
Ethylbenzene	9.99	0.20	ug/L	10.0	ND	99.9	80-120	2.79	30	
1,1,1,2-Tetrachloroethane	9.58	0.20	ug/L	10.0	ND	95.8	80-120	2.05	30	
m,p-Xylene	19.9	0.40	ug/L	20.0	ND	99.3	80-121	2.09	30	
o-Xylene	9.72	0.20	ug/L	10.0	ND	97.2	80-121	2.82	30	
Xylenes, total	29.6	0.60	ug/L	30.0	ND	98.6	76-127	2.33	30	
Styrene	9.91	0.20	ug/L	10.0	ND	99.1	80-124	2.91	30	
Bromoform	8.87	0.20	ug/L	10.0	ND	88.7	51-134	13.30	30	
1,1,2,2-Tetrachloroethane	8.99	0.20	ug/L	10.0	ND	89.9	77-123	7.61	30	
1,2,3-Trichloropropane	9.27	0.50	ug/L	10.0	ND	92.7	76-125	13.80	30	
trans-1,4-Dichloro 2-Butene	8.40	1.00	ug/L	10.0	ND	84.0	55-129	6.68	30	
n-Propylbenzene	9.55	0.20	ug/L	10.0	ND	95.5	78-130	5.59	30	
Bromobenzene	9.45	0.20	ug/L	10.0	ND	94.5	80-120	9.08	30	
Isopropyl Benzene	9.66	0.20	ug/L	10.0	ND	96.6	80-128	5.66	30	
2-Chlorotoluene	9.17	0.20	ug/L	10.0	ND	91.7	78-122	5.23	30	
4-Chlorotoluene	9.35	0.20	ug/L	10.0	ND	93.5	80-121	4.59	30	
t-Butylbenzene	9.42	0.20	ug/L	10.0	ND	94.2	78-125	2.19	30	
1,3,5-Trimethylbenzene	9.56	0.20	ug/L	10.0	ND	95.6	80-129	0.22	30	



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Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0664 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BGF0664-MSD2)		Source: 18F0351-03		Prepared: 27-Jun-2018		Analyzed: 27-Jun-2018 20:40				
1,2,4-Trimethylbenzene	9.53	0.20	ug/L	10.0	ND	95.3	80-127	0.60	30	
s-Butylbenzene	9.57	0.20	ug/L	10.0	ND	95.7	78-129	2.00	30	
4-Isopropyl Toluene	9.56	0.20	ug/L	10.0	ND	95.6	79-130	5.16	30	
1,3-Dichlorobenzene	9.66	0.20	ug/L	10.0	ND	96.6	80-120	4.66	30	
1,4-Dichlorobenzene	9.62	0.20	ug/L	10.0	ND	96.2	80-120	1.07	30	
n-Butylbenzene	9.39	0.20	ug/L	10.0	ND	93.9	74-129	10.40	30	
1,2-Dichlorobenzene	9.63	0.20	ug/L	10.0	ND	96.3	80-120	8.03	30	
1,2-Dibromo-3-chloropropane	9.34	0.50	ug/L	10.0	ND	93.4	62-123	12.20	30	Q
1,2,4-Trichlorobenzene	10.2	0.50	ug/L	10.0	ND	102	64-124	34.40	30	*
Hexachloro-1,3-Butadiene	10.1	0.50	ug/L	10.0	ND	101	58-123	31.90	30	*
Naphthalene	11.0	0.50	ug/L	10.0	ND	110	50-134	30.20	30	*
1,2,3-Trichlorobenzene	11.1	0.50	ug/L	10.0	ND	111	49-133	39.90	30	*
Dichlorodifluoromethane	10.3	0.20	ug/L	10.0	ND	103	48-147	1.14	30	
Methyl tert-butyl Ether	10.4	0.50	ug/L	10.0	ND	104	71-132	1.98	30	
2-Pentanone	49.7	5.00	ug/L	50.0	ND	99.4	69-134	0.65	30	
Surrogate: 1,2-Dichloroethane-d4	4.60		ug/L	5.00	4.66	92.1	80-129			
Surrogate: Toluene-d8	5.10		ug/L	5.00	5.17	102	80-120			
Surrogate: 4-Bromofluorobenzene	5.16		ug/L	5.00	4.68	103	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.94		ug/L	5.00	4.72	98.9	80-120			

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



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Project: Carnation Landfill JS0903
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Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0692 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGF0692-BLK1)		Prepared: 28-Jun-2018 Analyzed: 28-Jun-2018 12:01								
Chloromethane	ND	0.50	ug/L							U
Vinyl Chloride	ND	0.20	ug/L							U
Bromomethane	ND	1.00	ug/L							U
Chloroethane	ND	0.20	ug/L							U
Trichlorofluoromethane	ND	0.20	ug/L							U
Acrolein	ND	5.00	ug/L							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.20	ug/L							U
Acetone	ND	5.00	ug/L							U
1,1-Dichloroethene	ND	0.20	ug/L							U
Bromoethane	ND	0.20	ug/L							U
Iodomethane	ND	1.00	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.20	ug/L							U
Vinyl Acetate	ND	0.20	ug/L							U
1,1-Dichloroethane	ND	0.20	ug/L							U
2-Butanone	ND	5.00	ug/L							U
2,2-Dichloropropane	ND	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Chloroform	ND	0.20	ug/L							U
Bromochloromethane	ND	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.20	ug/L							U
1,1-Dichloropropene	ND	0.20	ug/L							U
Carbon tetrachloride	ND	0.20	ug/L							U
1,2-Dichloroethane	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Trichloroethene	ND	0.20	ug/L							U
1,2-Dichloropropane	ND	0.20	ug/L							U
Bromodichloromethane	ND	0.20	ug/L							U
Dibromomethane	ND	0.20	ug/L							U
2-Chloroethyl vinyl ether	ND	1.00	ug/L							U
4-Methyl-2-Pentanone	ND	5.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.20	ug/L							U
Toluene	ND	0.20	ug/L							U



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Volatile Organic Compounds - Quality Control

Batch BGF0692 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGF0692-BLK1)		Prepared: 28-Jun-2018 Analyzed: 28-Jun-2018 12:01								
trans-1,3-Dichloropropene	ND	0.20	ug/L							U
2-Hexanone	ND	5.00	ug/L							U
1,1,2-Trichloroethane	ND	0.20	ug/L							U
1,3-Dichloropropane	ND	0.20	ug/L							U
Tetrachloroethene	ND	0.20	ug/L							U
Dibromochloromethane	ND	0.20	ug/L							U
1,2-Dibromoethane	ND	0.20	ug/L							U
Chlorobenzene	ND	0.20	ug/L							U
Ethylbenzene	ND	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.20	ug/L							U
m,p-Xylene	ND	0.40	ug/L							U
o-Xylene	ND	0.20	ug/L							U
Xylenes, total	ND	0.60	ug/L							U
Styrene	ND	0.20	ug/L							U
Bromoform	ND	0.20	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.50	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	1.00	ug/L							U
n-Propylbenzene	ND	0.20	ug/L							U
Bromobenzene	ND	0.20	ug/L							U
Isopropyl Benzene	ND	0.20	ug/L							U
2-Chlorotoluene	ND	0.20	ug/L							U
4-Chlorotoluene	ND	0.20	ug/L							U
t-Butylbenzene	ND	0.20	ug/L							U
1,3,5-Trimethylbenzene	ND	0.20	ug/L							U
1,2,4-Trimethylbenzene	ND	0.20	ug/L							U
s-Butylbenzene	ND	0.20	ug/L							U
4-Isopropyl Toluene	ND	0.20	ug/L							U
1,3-Dichlorobenzene	ND	0.20	ug/L							U
1,4-Dichlorobenzene	ND	0.20	ug/L							U
n-Butylbenzene	ND	0.20	ug/L							U
1,2-Dichlorobenzene	ND	0.20	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.50	ug/L							U
1,2,4-Trichlorobenzene	ND	0.50	ug/L							U
Hexachloro-1,3-Butadiene	ND	0.50	ug/L							U



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13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0692 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGF0692-BLK1)										
Prepared: 28-Jun-2018 Analyzed: 28-Jun-2018 12:01										
Naphthalene	ND	0.50	ug/L							U
1,2,3-Trichlorobenzene	ND	0.50	ug/L							U
Dichlorodifluoromethane	ND	0.20	ug/L							U
Methyl tert-butyl Ether	ND	0.50	ug/L							U
2-Pentanone	ND	5.00	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	4.76		ug/L	5.00		95.2	80-129			
Surrogate: Toluene-d8	5.05		ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	4.55		ug/L	5.00		91.0	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.64		ug/L	5.00		92.7	80-120			
LCS (BGF0692-BS1)										
Prepared: 28-Jun-2018 Analyzed: 28-Jun-2018 09:24										
Chloromethane	9.20	0.50	ug/L	10.0		92.0	60-138			
Vinyl Chloride	9.71	0.20	ug/L	10.0		97.1	66-133			
Bromomethane	10.3	1.00	ug/L	10.0		103	72-131			
Chloroethane	9.87	0.20	ug/L	10.0		98.7	60-155			
Trichlorofluoromethane	10.1	0.20	ug/L	10.0		101	80-129			
Acrolein	41.7	5.00	ug/L	50.0		83.4	52-144			
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.0	0.20	ug/L	10.0		100	76-129			
Acetone	42.3	5.00	ug/L	50.0		84.7	58-142			
1,1-Dichloroethene	9.33	0.20	ug/L	10.0		93.3	69-135			
Bromoethane	9.79	0.20	ug/L	10.0		97.9	78-128			
Iodomethane	9.49	1.00	ug/L	10.0		94.9	56-147			
Methylene Chloride	9.75	1.00	ug/L	10.0		97.5	65-135			
Acrylonitrile	8.08	1.00	ug/L	10.0		80.8	64-134			
Carbon Disulfide	9.49	0.20	ug/L	10.0		94.9	78-125			
trans-1,2-Dichloroethene	9.67	0.20	ug/L	10.0		96.7	78-128			
Vinyl Acetate	8.32	0.20	ug/L	10.0		83.2	55-138			
1,1-Dichloroethane	9.52	0.20	ug/L	10.0		95.2	76-124			
2-Butanone	41.6	5.00	ug/L	50.0		83.2	61-140			
2,2-Dichloropropane	10.1	0.20	ug/L	10.0		101	78-125			
cis-1,2-Dichloroethene	9.74	0.20	ug/L	10.0		97.4	80-121			
Chloroform	9.14	0.20	ug/L	10.0		91.4	80-122			
Bromochloromethane	9.50	0.20	ug/L	10.0		95.0	80-121			
1,1,1-Trichloroethane	9.92	0.20	ug/L	10.0		99.2	79-123			
1,1-Dichloropropene	9.77	0.20	ug/L	10.0		97.7	80-120			



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0692 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGF0692-BS1)		Prepared: 28-Jun-2018 Analyzed: 28-Jun-2018 09:24								
Carbon tetrachloride	9.66	0.20	ug/L	10.0		96.6	53-137			
1,2-Dichloroethane	8.86	0.20	ug/L	10.0		88.6	75-123			
Benzene	9.77	0.20	ug/L	10.0		97.7	80-120			
Trichloroethene	9.76	0.20	ug/L	10.0		97.6	80-120			
1,2-Dichloropropane	9.44	0.20	ug/L	10.0		94.4	80-120			
Bromodichloromethane	9.02	0.20	ug/L	10.0		90.2	80-121			
Dibromomethane	9.05	0.20	ug/L	10.0		90.5	80-120			
2-Chloroethyl vinyl ether	10.0	1.00	ug/L	10.0		100	74-127			
4-Methyl-2-Pentanone	42.3	5.00	ug/L	50.0		84.7	67-133			
cis-1,3-Dichloropropene	9.31	0.20	ug/L	10.0		93.1	80-124			
Toluene	9.99	0.20	ug/L	10.0		99.9	80-120			
trans-1,3-Dichloropropene	9.33	0.20	ug/L	10.0		93.3	71-127			
2-Hexanone	39.8	5.00	ug/L	50.0		79.5	69-133			Q
1,1,2-Trichloroethane	9.01	0.20	ug/L	10.0		90.1	80-121			
1,3-Dichloropropane	8.79	0.20	ug/L	10.0		87.9	80-120			
Tetrachloroethene	9.82	0.20	ug/L	10.0		98.2	80-120			
Dibromochloromethane	8.86	0.20	ug/L	10.0		88.6	65-135			
1,2-Dibromoethane	9.16	0.20	ug/L	10.0		91.6	80-121			
Chlorobenzene	9.51	0.20	ug/L	10.0		95.1	80-120			
Ethylbenzene	9.86	0.20	ug/L	10.0		98.6	80-120			
1,1,1,2-Tetrachloroethane	9.32	0.20	ug/L	10.0		93.2	80-120			
m,p-Xylene	19.3	0.40	ug/L	20.0		96.3	80-121			
o-Xylene	9.33	0.20	ug/L	10.0		93.3	80-121			
Xylenes, total	28.6	0.60	ug/L	30.0		95.3	76-127			
Styrene	9.59	0.20	ug/L	10.0		95.9	80-124			
Bromoform	8.52	0.20	ug/L	10.0		85.2	51-134			
1,1,2,2-Tetrachloroethane	7.86	0.20	ug/L	10.0		78.6	77-123			Q
1,2,3-Trichloropropane	7.88	0.50	ug/L	10.0		78.8	76-125			Q
trans-1,4-Dichloro 2-Butene	7.96	1.00	ug/L	10.0		79.6	55-129			Q
n-Propylbenzene	9.41	0.20	ug/L	10.0		94.1	78-130			
Bromobenzene	9.01	0.20	ug/L	10.0		90.1	80-120			
Isopropyl Benzene	9.43	0.20	ug/L	10.0		94.3	80-128			
2-Chlorotoluene	9.03	0.20	ug/L	10.0		90.3	78-122			
4-Chlorotoluene	9.06	0.20	ug/L	10.0		90.6	80-121			
t-Butylbenzene	9.10	0.20	ug/L	10.0		91.0	78-125			



Pacific Groundwater Group
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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0692 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGF0692-BS1)										
					Prepared: 28-Jun-2018 Analyzed: 28-Jun-2018 09:24					
1,3,5-Trimethylbenzene	9.31	0.20	ug/L	10.0		93.1	80-129			
1,2,4-Trimethylbenzene	9.26	0.20	ug/L	10.0		92.6	80-127			
s-Butylbenzene	9.43	0.20	ug/L	10.0		94.3	78-129			
4-Isopropyl Toluene	9.45	0.20	ug/L	10.0		94.5	79-130			
1,3-Dichlorobenzene	9.23	0.20	ug/L	10.0		92.3	80-120			
1,4-Dichlorobenzene	9.15	0.20	ug/L	10.0		91.5	80-120			
n-Butylbenzene	9.53	0.20	ug/L	10.0		95.3	74-129			
1,2-Dichlorobenzene	8.88	0.20	ug/L	10.0		88.8	80-120			
1,2-Dibromo-3-chloropropane	7.83	0.50	ug/L	10.0		78.3	62-123			Q
1,2,4-Trichlorobenzene	8.70	0.50	ug/L	10.0		87.0	64-124			
Hexachloro-1,3-Butadiene	9.85	0.50	ug/L	10.0		98.5	58-123			
Naphthalene	9.17	0.50	ug/L	10.0		91.7	50-134			
1,2,3-Trichlorobenzene	8.16	0.50	ug/L	10.0		81.6	49-133			
Dichlorodifluoromethane	9.93	0.20	ug/L	10.0		99.3	48-147			
Methyl tert-butyl Ether	8.89	0.50	ug/L	10.0		88.9	71-132			
2-Pentanone	44.4	5.00	ug/L	50.0		88.9	69-134			
Surrogate: 1,2-Dichloroethane-d4	4.51		ug/L	5.00		90.3	80-129			
Surrogate: Toluene-d8	5.10		ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	4.95		ug/L	5.00		99.0	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.84		ug/L	5.00		96.8	80-120			
LCS Dup (BGF0692-BSD1)										
					Prepared: 28-Jun-2018 Analyzed: 28-Jun-2018 09:50					
Chloromethane	9.48	0.50	ug/L	10.0		94.8	60-138	2.98	30	
Vinyl Chloride	9.90	0.20	ug/L	10.0		99.0	66-133	1.96	30	
Bromomethane	10.6	1.00	ug/L	10.0		106	72-131	2.91	30	
Chloroethane	10.3	0.20	ug/L	10.0		103	60-155	4.63	30	
Trichlorofluoromethane	10.3	0.20	ug/L	10.0		103	80-129	2.43	30	
Acrolein	47.3	5.00	ug/L	50.0		94.6	52-144	12.60	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.1	0.20	ug/L	10.0		101	76-129	0.85	30	
Acetone	42.3	5.00	ug/L	50.0		84.5	58-142	0.19	30	
1,1-Dichloroethene	9.31	0.20	ug/L	10.0		93.1	69-135	0.25	30	
Bromoethane	9.82	0.20	ug/L	10.0		98.2	78-128	0.24	30	
Iodomethane	9.69	1.00	ug/L	10.0		96.9	56-147	2.14	30	
Methylene Chloride	10.0	1.00	ug/L	10.0		100	65-135	2.97	30	
Acrylonitrile	9.43	1.00	ug/L	10.0		94.3	64-134	15.40	30	



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0692 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BGF0692-BSD1)		Prepared: 28-Jun-2018 Analyzed: 28-Jun-2018 09:50								
Carbon Disulfide	9.53	0.20	ug/L	10.0		95.3	78-125	0.40	30	
trans-1,2-Dichloroethene	9.92	0.20	ug/L	10.0		99.2	78-128	2.48	30	
Vinyl Acetate	9.07	0.20	ug/L	10.0		90.7	55-138	8.73	30	
1,1-Dichloroethane	9.72	0.20	ug/L	10.0		97.2	76-124	2.08	30	
2-Butanone	47.6	5.00	ug/L	50.0		95.3	61-140	13.50	30	
2,2-Dichloropropane	10.1	0.20	ug/L	10.0		101	78-125	0.22	30	
cis-1,2-Dichloroethene	9.71	0.20	ug/L	10.0		97.1	80-121	0.26	30	
Chloroform	9.54	0.20	ug/L	10.0		95.4	80-122	4.25	30	
Bromochloromethane	9.74	0.20	ug/L	10.0		97.4	80-121	2.45	30	
1,1,1-Trichloroethane	9.99	0.20	ug/L	10.0		99.9	79-123	0.71	30	
1,1-Dichloropropene	9.80	0.20	ug/L	10.0		98.0	80-120	0.27	30	
Carbon tetrachloride	10.0	0.20	ug/L	10.0		100	53-137	3.86	30	
1,2-Dichloroethane	9.40	0.20	ug/L	10.0		94.0	75-123	6.00	30	
Benzene	9.97	0.20	ug/L	10.0		99.7	80-120	2.03	30	
Trichloroethene	10.1	0.20	ug/L	10.0		101	80-120	3.21	30	
1,2-Dichloropropane	9.61	0.20	ug/L	10.0		96.1	80-120	1.79	30	
Bromodichloromethane	9.06	0.20	ug/L	10.0		90.6	80-121	0.50	30	
Dibromomethane	9.35	0.20	ug/L	10.0		93.5	80-120	3.18	30	
2-Chloroethyl vinyl ether	11.0	1.00	ug/L	10.0		110	74-127	9.23	30	
4-Methyl-2-Pentanone	47.9	5.00	ug/L	50.0		95.9	67-133	12.40	30	
cis-1,3-Dichloropropene	9.81	0.20	ug/L	10.0		98.1	80-124	5.14	30	
Toluene	9.96	0.20	ug/L	10.0		99.6	80-120	0.28	30	
trans-1,3-Dichloropropene	9.90	0.20	ug/L	10.0		99.0	71-127	5.89	30	
2-Hexanone	45.7	5.00	ug/L	50.0		91.3	69-133	13.80	30	Q
1,1,2-Trichloroethane	9.92	0.20	ug/L	10.0		99.2	80-121	9.63	30	
1,3-Dichloropropane	9.17	0.20	ug/L	10.0		91.7	80-120	4.22	30	
Tetrachloroethene	9.67	0.20	ug/L	10.0		96.7	80-120	1.58	30	
Dibromochloromethane	9.32	0.20	ug/L	10.0		93.2	65-135	5.10	30	
1,2-Dibromoethane	9.91	0.20	ug/L	10.0		99.1	80-121	7.95	30	
Chlorobenzene	9.68	0.20	ug/L	10.0		96.8	80-120	1.84	30	
Ethylbenzene	9.67	0.20	ug/L	10.0		96.7	80-120	1.96	30	
1,1,1,2-Tetrachloroethane	9.28	0.20	ug/L	10.0		92.8	80-120	0.40	30	
m,p-Xylene	19.6	0.40	ug/L	20.0		98.0	80-121	1.74	30	
o-Xylene	9.51	0.20	ug/L	10.0		95.1	80-121	1.91	30	
Xylenes, total	29.1	0.60	ug/L	30.0		97.0	76-127	1.79	30	



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Project: Carnation Landfill JS0903
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Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Volatile Organic Compounds - Quality Control

Batch BGF0692 - EPA 5030 (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BGF0692-BSD1)		Prepared: 28-Jun-2018 Analyzed: 28-Jun-2018 09:50								
Styrene	9.68	0.20	ug/L	10.0		96.8	80-124	0.83	30	
Bromoform	9.44	0.20	ug/L	10.0		94.4	51-134	10.20	30	
1,1,2,2-Tetrachloroethane	8.79	0.20	ug/L	10.0		87.9	77-123	11.20	30	Q
1,2,3-Trichloropropane	9.29	0.50	ug/L	10.0		92.9	76-125	16.50	30	Q
trans-1,4-Dichloro 2-Butene	9.10	1.00	ug/L	10.0		91.0	55-129	13.30	30	Q
n-Propylbenzene	9.61	0.20	ug/L	10.0		96.1	78-130	2.19	30	
Bromobenzene	9.59	0.20	ug/L	10.0		95.9	80-120	6.29	30	
Isopropyl Benzene	9.77	0.20	ug/L	10.0		97.7	80-128	3.54	30	
2-Chlorotoluene	9.26	0.20	ug/L	10.0		92.6	78-122	2.56	30	
4-Chlorotoluene	9.44	0.20	ug/L	10.0		94.4	80-121	4.10	30	
t-Butylbenzene	9.32	0.20	ug/L	10.0		93.2	78-125	2.41	30	
1,3,5-Trimethylbenzene	9.40	0.20	ug/L	10.0		94.0	80-129	0.93	30	
1,2,4-Trimethylbenzene	9.34	0.20	ug/L	10.0		93.4	80-127	0.93	30	
s-Butylbenzene	9.26	0.20	ug/L	10.0		92.6	78-129	1.85	30	
4-Isopropyl Toluene	9.30	0.20	ug/L	10.0		93.0	79-130	1.69	30	
1,3-Dichlorobenzene	9.19	0.20	ug/L	10.0		91.9	80-120	0.39	30	
1,4-Dichlorobenzene	9.33	0.20	ug/L	10.0		93.3	80-120	1.89	30	
n-Butylbenzene	9.02	0.20	ug/L	10.0		90.2	74-129	5.54	30	
1,2-Dichlorobenzene	8.73	0.20	ug/L	10.0		87.3	80-120	1.70	30	
1,2-Dibromo-3-chloropropane	8.02	0.50	ug/L	10.0		80.2	62-123	2.45	30	Q
1,2,4-Trichlorobenzene	7.66	0.50	ug/L	10.0		76.6	64-124	12.70	30	
Hexachloro-1,3-Butadiene	8.10	0.50	ug/L	10.0		81.0	58-123	19.50	30	
Naphthalene	7.94	0.50	ug/L	10.0		79.4	50-134	14.40	30	
1,2,3-Trichlorobenzene	7.56	0.50	ug/L	10.0		75.6	49-133	7.60	30	
Dichlorodifluoromethane	10.2	0.20	ug/L	10.0		102	48-147	2.51	30	
Methyl tert-butyl Ether	9.63	0.50	ug/L	10.0		96.3	71-132	8.02	30	
2-Pentanone	50.4	5.00	ug/L	50.0		101	69-134	12.50	30	
Surrogate: 1,2-Dichloroethane-d4	4.73		ug/L	5.00		94.5	80-129			
Surrogate: Toluene-d8	5.22		ug/L	5.00		104	80-120			
Surrogate: 4-Bromofluorobenzene	4.96		ug/L	5.00		99.1	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.62		ug/L	5.00		92.5	80-120			



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Project: Carnation Landfill JS0903
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Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGF0652 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGF0652-BLK1)			Prepared: 27-Jun-2018 Analyzed: 03-Jul-2018 15:18								
Arsenic, Dissolved	75a	ND	0.200	ug/L							U
LCS (BGF0652-BS1)			Prepared: 27-Jun-2018 Analyzed: 03-Jul-2018 16:03								
Arsenic, Dissolved	75a	26.2	0.200	ug/L	25.0		105	80-120			
Duplicate (BGF0652-DUP1)			Source: 18F0351-03		Prepared: 27-Jun-2018 Analyzed: 03-Jul-2018 15:42						
Arsenic, Dissolved	75a	17.8	0.200	ug/L		18.2			2.47	20	
Matrix Spike (BGF0652-MS1)			Source: 18F0351-03		Prepared: 27-Jun-2018 Analyzed: 03-Jul-2018 15:54						
Arsenic, Dissolved	75a	43.4	0.200	ug/L	25.0	18.2	101	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BGF0652-MSD1)			Source: 18F0351-03		Prepared: 27-Jun-2018 Analyzed: 03-Jul-2018 15:58						
Arsenic, Dissolved	75a	43.2	0.200	ug/L	25.0	18.2	100	75-125	0.40	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGG0092 - WMN (No Prep)

Instrument: ICP2 Analyst: MCB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGG0092-BLK1) Prepared: 05-Jul-2018 Analyzed: 09-Jul-2018 14:49										
Iron, Dissolved	ND	0.0500	mg/L							U
Manganese, Dissolved	ND	0.0010	mg/L							U
LCS (BGG0092-BS1) Prepared: 05-Jul-2018 Analyzed: 09-Jul-2018 15:39										
Iron, Dissolved	2.05	0.0500	mg/L	2.00		103	80-120			
Manganese, Dissolved	0.479	0.0010	mg/L	0.500		95.9	80-120			
Duplicate (BGG0092-DUP1) Source: 18F0351-03 Prepared: 05-Jul-2018 Analyzed: 09-Jul-2018 15:18										
Iron, Dissolved	2.06	0.0500	mg/L		2.06			0.18	20	
Manganese, Dissolved	2.55	0.0010	mg/L		2.54			0.26	20	
Matrix Spike (BGG0092-MS1) Source: 18F0351-03 Prepared: 05-Jul-2018 Analyzed: 09-Jul-2018 15:22										
Iron, Dissolved	4.05	0.0500	mg/L	2.00	2.06	99.6	75-125			
Manganese, Dissolved	2.98	0.0010	mg/L	0.500	2.54	86.3	75-125			

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

Matrix Spike Dup (BGG0092-MSD1) Source: 18F0351-03 Prepared: 05-Jul-2018 Analyzed: 09-Jul-2018 15:26										
Iron, Dissolved	4.09	0.0500	mg/L	2.00	2.06	102	75-125	1.01	20	
Manganese, Dissolved	2.99	0.0010	mg/L	0.500	2.54	88.7	75-125	0.39	20	

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



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
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Reported:
13-Jul-2018 14:40

Wet Chemistry - Quality Control

Batch BGF0573 - No Prep Wet Chem

Instrument: LACHAT2 Analyst: AGW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGF0573-BLK1)					Prepared: 22-Jun-2018 Analyzed: 23-Jun-2018 00:11						
Nitrite-N	ND	0.010	0.010	mg/L							U
LCS (BGF0573-BS1)					Prepared: 22-Jun-2018 Analyzed: 23-Jun-2018 00:13						
Nitrite-N	0.492	0.010	0.010	mg/L	0.500		98.4	75-125			
Duplicate (BGF0573-DUP1)					Source: 18F0351-03 Prepared: 22-Jun-2018 Analyzed: 23-Jun-2018 00:17						
Nitrite-N	ND	0.010	0.010	mg/L		ND					L, U
Matrix Spike (BGF0573-MS1)					Source: 18F0351-03 Prepared: 22-Jun-2018 Analyzed: 23-Jun-2018 00:19						
Nitrite-N	0.453	0.010	0.010	mg/L	0.500	ND	90.6	75-125			

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



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Wet Chemistry - Quality Control

Batch BGG0024 - No Prep Wet Chem

Instrument: LACHAT1 Analyst: UW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGG0024-BLK1) Prepared: 02-Jul-2018 Analyzed: 12-Jul-2018 13:07											
Sulfate	ND	2.00	2.00	mg/L							U
LCS (BGG0024-BS1) Prepared: 02-Jul-2018 Analyzed: 12-Jul-2018 13:08											
Sulfate	15.9	2.00	2.00	mg/L	15.0		106	90-110			
Duplicate (BGG0024-DUP2) Source: 18F0351-03 Prepared: 02-Jul-2018 Analyzed: 12-Jul-2018 13:53											
Sulfate	2.96	2.00	2.00	mg/L		2.80			5.57	20	
Matrix Spike (BGG0024-MS2) Source: 18F0351-03 Prepared: 02-Jul-2018 Analyzed: 12-Jul-2018 13:54											
Sulfate	20.9	2.00	2.00	mg/L	15.0	2.80	121	75-125			

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



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Wet Chemistry - Quality Control

Batch BGG0232 - No Prep Wet Chem

Instrument: LACHAT2 Analyst: UW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGG0232-BLK1)											
						Prepared: 11-Jul-2018 Analyzed: 11-Jul-2018 10:03					
Nitrate + Nitrite as N	ND	0.010	0.010	mg/L							U
LCS (BGG0232-BS1)											
						Prepared: 11-Jul-2018 Analyzed: 11-Jul-2018 10:04					
Nitrate + Nitrite as N	0.500	0.010	0.010	mg/L	0.500		100	90-110			
Duplicate (BGG0232-DUP1)											
		Source: 18F0351-03				Prepared: 11-Jul-2018 Analyzed: 11-Jul-2018 10:09					
Nitrate + Nitrite as N	ND	0.010	0.010	mg/L		ND					U



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 353.2 in Water	
Nitrate + Nitrite as N	NELAP,DoD-ELAP,WADOE
Nitrite-N	WADOE,NELAP,DoD-ELAP
EPA 375.2 in Water	
Sulfate	WADOE,NELAP
EPA 6010C in Water	
Iron	WADOE,NELAP
Manganese	WADOE,NELAP
EPA 8260C in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrolein	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Iodomethane	DoD-ELAP,NELAP,CALAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,CALAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,CALAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Butanone	DoD-ELAP,NELAP,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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13-Jul-2018 14:40

Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,CALAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,CALAP,WADOE
Bromoform	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,CALAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,CALAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,CALAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

n-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	02/07/2019
CALAP	California Department of Public Health CAELAP	2748	06/30/2018
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	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018



Pacific Groundwater Group
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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
13-Jul-2018 14:40

Notes and Definitions

- * Flagged value is not within established control limits.
- D The reported value is from a dilution
- J Estimated concentration value detected below the reporting limit.
- L Analyte concentration is ≤ 5 times the reporting limit and the replicate control limit defaults to $\pm$ RL instead of 20% RPD
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($<20\%$ RSD, $<20\%$ drift or minimum RRF)
- 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.



Burlington, WA	Corporate Laboratory (a)	1620 S Walnut St.	Burlington, WA 98233	800.755.9295 • 360.757.1400
Bellingham, WA	Microbiology (b)	805 Orchard Dr Ste 4	Bellingham, WA 98225	360.715.1212
Portland, OR	Microbiology/Chemistry (c)	9150 SW Pioneer Ct Ste W	Wilsonville, OR 97070	503.682.7802
Corvallis, OR	Microbiology (d)	540 SW Third Street	Corvallis, OR 97333	541.753.4946

September 7, 2018

Page 1 of 1

Glenn Mutti
Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102
RE: 18-22873 - Carnation Landfill

Dear Glenn Mutti,

Your project: Carnation Landfill, was received on Tuesday June 26, 2018.

All samples were analyzed within the accepted holding times and were appropriately preserved and analyzed according to approved analytical protocols, unless noted in the data or QC reports. The quality control data was within laboratory acceptance limits, unless specified in the data or QC reports.

If you have questions phone us at 800 755-9295.

Respectfully

A handwritten signature in blue ink, appearing to read "LJ Henderson", is written over a light blue circular background.

Lawrence J Henderson, PhD
Director of Laboratories, Vice President

Enclosures: Data Report



Burlington, WA *Corporate Laboratory (a)*
1620 S Walnut St - Burlington, WA 98233 - 800.755.9295 • 360.757.1400
Bellingham, WA *Microbiology (b)*
805 Orchard Dr Ste 4 - Bellingham, WA 98225 - 360.715.1212

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9150 SW Pioneer Ct Ste W - Wilsonville, OR 97070 - 503.682.7802
Corvallis, OR *Microbiology/Chemistry (d)*
540 SW Third Street - Corvallis, OR 97333 - 541.753.4946
Bend, OR *Microbiology (e)*
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541.639.8425

Page 1 of 3

Data Report

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-22873**
Project: Carnation Landfill

Report Date: 9/7/18

Date Received: 6/26/18

Approved by: nml

Authorized by:

Lawrence J Henderson, PhD
Director of Laboratories, Vice President

Sample Description: MW-1D Carnation Landfill										Sample Date: 6/21/18 9:25 am			
Lab Number: 46761 Sample Comment:										Collected By: JGMD			
CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment	

106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.01	0.0069	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627		
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	0.04		ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627		
107-13-1	ACRYLONITRILE (SIM)	ND	0.05	0.0125	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627		
75-01-4	VINYL CHLORIDE (SIM)	ND	0.01	0.0059	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627		

Sample Description: MW-3S Carnation Landfill										Sample Date: 6/21/18 10:15 am			
Lab Number: 46762 Sample Comment:										Collected By: JGMD			
CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment	

106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.01	0.0069	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627		
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	0.04		ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627		
107-13-1	ACRYLONITRILE (SIM)	ND	0.05	0.0125	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627		
75-01-4	VINYL CHLORIDE (SIM)	ND	0.01	0.0059	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627		

Sample Description: MW-3D Carnation Landfill										Sample Date: 6/21/18 10:20 am			
Lab Number: 46763 Sample Comment:										Collected By: JGMD			
CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment	

106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.01	0.0069	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627		
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	0.04		ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627		
107-13-1	ACRYLONITRILE (SIM)	ND	0.05	0.0125	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627		
75-01-4	VINYL CHLORIDE (SIM)	ND	0.01	0.0059	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627		

Sample Description: MW-2S Carnation Landfill										Sample Date: 6/21/18 10:55 am			
Lab Number: 46764 Sample Comment:										Collected By: JGMD			
CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment	

106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.01	0.0069	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627		

Notes:

ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. = Dilution Factor

If you have any questions concerning this report contact us at the above phone number.

Form: cRslt_2.rpt

Data Report

96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	0.04		ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627
107-13-1	ACRYLONITRILE (SIM)	ND	0.05	0.0125	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627
75-01-4	VINYL CHLORIDE (SIM)	ND	0.01	0.0059	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627

Sample Description: MW-2D Carnation Landfill									Sample Date: 6/21/18 11:00 am		
Lab Number: 46765 Sample Comment:									Collected By: JGMD		

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.01	0.0069	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	0.04		ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
107-13-1	ACRYLONITRILE (SIM)	ND	0.05	0.0125	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
75-01-4	VINYL CHLORIDE (SIM)	ND	0.01	0.0059	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	

Sample Description: MW-22D Carnation Landfill									Sample Date: 6/21/18 11:05 am		
Lab Number: 46766 Sample Comment:									Collected By: JGMD		

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.01	0.0069	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	0.04		ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
107-13-1	ACRYLONITRILE (SIM)	ND	0.05	0.0125	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
75-01-4	VINYL CHLORIDE (SIM)	ND	0.01	0.0059	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	

Sample Description: MW-6D Carnation Landfill									Sample Date: 6/21/18 11:55 am		
Lab Number: 46767 Sample Comment:									Collected By: JGMD		

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.01	0.0069	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	0.04		ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
107-13-1	ACRYLONITRILE (SIM)	ND	0.05	0.0125	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
75-01-4	VINYL CHLORIDE (SIM)	ND	0.01	0.0059	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	

Sample Description: MW-7D Carnation Landfill									Sample Date: 6/21/18 12:05 pm		
Lab Number: 46768 Sample Comment:									Collected By: JGMD		

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.01	0.0069	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	0.04		ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
107-13-1	ACRYLONITRILE (SIM)	ND	0.05	0.0125	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
75-01-4	VINYL CHLORIDE (SIM)	ND	0.01	0.0059	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	

Sample Description: MW-8D Carnation Landfill									Sample Date: 6/21/18 12:45 pm		
Lab Number: 46769 Sample Comment:									Collected By: JGMD		

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.01	0.0069	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	0.04		ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
107-13-1	ACRYLONITRILE (SIM)	ND	0.05	0.0125	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	

Notes:

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D.F. = Dilution Factor

Data Report

75-01-4 VINYL CHLORIDE (SIM) ND 0.01 0.0059 ug/L 1.0 8260SIM/5030B a 6/27/18 HY SIM_180627

Sample Description: MW-5S Carnation Landfill										Sample Date: 6/21/18 1:10 pm		
Lab Number: 46770 Sample Comment:										Collected By: JGMD		
CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.01	0.0069	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	0.04		ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
107-13-1	ACRYLONITRILE (SIM)	ND	0.05	0.0125	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
75-01-4	VINYL CHLORIDE (SIM)	ND	0.01	0.0059	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	

Sample Description: MW-5D Carnation Landfill										Sample Date: 6/21/18 1:20 pm		
Lab Number: 46771 Sample Comment:										Collected By: JGMD		
CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.01	0.0069	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND	0.04		ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
107-13-1	ACRYLONITRILE (SIM)	ND	0.05	0.0125	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	
75-01-4	VINYL CHLORIDE (SIM)	ND	0.01	0.0059	ug/L	1.0	8260SIM/5030B	a	6/27/18	HY	SIM_180627	

Notes:

ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.

PQL = Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

D.F. - Dilution Factor



SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: **18-22873**

Report Date: 09/07/18

			True		% Recovery		QC	QC	
Batch	Analyte	Result	Value	Units	Method	Limits*	Qualifier	Type	Comment
SIM_180627	0 1,2 - DIBROMOETHANE (EDB SIM)	0.083	0.1	ug/L	8260SIM	83	80-120	LFB	SIMS ANALYSIS
	0 1,2-DIBROMO-3-CHLOROPROPANE	0.089	0.1	ug/L	8260SIM	89	80-120	LFB	SIMS ANALYSIS
	0 ACRYLONITRILE (SIM)	0.092	0.1	ug/L	8260SIM	92	80-120	LFB	SIMS ANALYSIS
	0 VINYL CHLORIDE (SIM)	0.089	0.1	ug/L	8260SIM	89	80-120	LFB	SIMS ANALYSIS

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.



SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Low-Level Lab Fortified Blank

Reference Number: **18-22873**

Report Date: 09/07/18

Batch	Analyte	Result	True		Method	%	Recovery	Limits*	QC		Comment
			Value	Units					Qualifier	Type	
SIM_180627	0 1,2 - DIBROMOETHANE (EDB SIM)	0.018	0.02	ug/L	8260SIM	90	50-150		LLFB		
	0 1,2-DIBROMO-3-CHLOROPROPANE	0.019	0.02	ug/L	8260SIM	95	50-150		LLFB		
	0 ACRYLONITRILE (SIM)	0.061	0.05	ug/L	8260SIM	122	50-150		LLFB		
	0 VINYL CHLORIDE (SIM)	0.011	0.02	ug/L	8260SIM	55	50-150		LLFB		

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.



SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: **18-22873**

Report Date: 09/07/18

			True			%	QC	QC	
Batch	Analyte	Result	Value	Units	Method	Recovery	Limits*	Qualifier Type	Comment
SIM_180627	0 1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	8260SIM		0-0	MB	TB 18-22873
	0 1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	8260SIM		0-0	MB	TB 18-22873
	0 ACRYLONITRILE (SIM)	ND		ug/L	8260SIM		0-0	MB	TB 18-22873
	0 VINYL CHLORIDE (SIM)	ND		ug/L	8260SIM		0-0	MB	TB 18-22873

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.



Reference Number: **18-22873**

Report Date: 9/7/2018

Page 1 of 1

SAMPLE DEPENDENT QUALITY CONTROL REPORT

Duplicate, Matrix Spike/Matrix Spike Duplicate and Confirmation Result Report

Batch	Sample	Analyte	Result	Spike Result	Duplicate		Conc	Units	Percent Recovery		Limits*	%RPD	Limits*	QC		
					Spike Result	Spike Conc			MS	MSD				Qualifier	Type	Comments
Laboratory Fortified Matrix (MS)																
SIM_180627																
	46762	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.096			0.1	ug/L	96	NA	70-130	NA	0-20			LFM
	46762	1,2-DIBROMO-3-CHLOROPROPANE	ND	0.121			0.1	ug/L	121	NA	70-130	NA	0-20			LFM
	46762	ACRYLONITRILE (SIM)	ND	0.080			0.1	ug/L	80	NA	70-130	NA	0-20			LFM
	46762	VINYL CHLORIDE (SIM)	ND	0.098			0.1	ug/L	98	NA	70-130	NA	0-20			LFM

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of an analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.

FORM: QC Dependent.rpt



QUALITY CONTROL REPORT SURROGATE REPORT

Reference Number: 18-22873

Report Date: 09/07/18

Lab No	Analyte	Result	Qualifier	Units	Method	Limit
SIM_180627 46761	d8-TOLUENE (Surr)	100		%	8260SIM	Acceptance Range is 70-130%
SIM_180627 46762	d8-TOLUENE (Surr)	101		%	8260SIM	Acceptance Range is 70-130%
SIM_180627 46763	d8-TOLUENE (Surr)	99		%	8260SIM	Acceptance Range is 70-130%
SIM_180627 46764	d8-TOLUENE (Surr)	99		%	8260SIM	Acceptance Range is 70-130%
SIM_180627 46765	d8-TOLUENE (Surr)	101		%	8260SIM	Acceptance Range is 70-130%
SIM_180627 46766	d8-TOLUENE (Surr)	98		%	8260SIM	Acceptance Range is 70-130%
SIM_180627 46767	d8-TOLUENE (Surr)	99		%	8260SIM	Acceptance Range is 70-130%
SIM_180627 46768	d8-TOLUENE (Surr)	101		%	8260SIM	Acceptance Range is 70-130%
SIM_180627 46769	d8-TOLUENE (Surr)	95		%	8260SIM	Acceptance Range is 70-130%
SIM_180627 46770	d8-TOLUENE (Surr)	96		%	8260SIM	Acceptance Range is 70-130%
SIM_180627 46771	d8-TOLUENE (Surr)	99		%	8260SIM	Acceptance Range is 70-130%

*Notation:

A surrogate is a pure compound added to a sample in the laboratory just before processing so that the overall efficiency of a method can be determined.

The Acceptance Limits (or Control Limits) approximate a 99% confidence interval around the mean recovery.

Chain of Custody / Analysis Request (Please complete all applicable shaded sections)

30281



ANALYTICAL

Main Lab (800-755-9295)
1620 South Walnut St. Burlington, WA 98233
Microbiology (888-725-1212)
805 W. Orchard Dr. Suite 4 Bellingham, WA 98225
Willsonville Lab (503-682-7802)
9150 SW Pioneer Ct. Suite W Willsonville, OR 97070
Corvallis Lab (541-753-4945)
540 SW 3rd St. Corvallis, OR 97333

Report to:	Pacific Groundwater Group	Bill to:	Pacific Groundwater Group
Ship Address:	2377 Eastlake Ave E	Address:	2377 Eastlake Avenue E
City:	Seattle	City:	Seattle
State:	WA	State:	WA
Zip:	98102	Zip:	98102
Attn:	Glenn Mutti	Phone:	
Phone:	425.329-0141	FAX:	
FAX:	206-329-6968	P.O.#:	
Email:	glennmutti@pug.com	Attn:	
Project:	Carnation Landfill	Card#:	
		Expires:	
		Other:	

Analyses Requested

1. Use one line per sample location.
2. Be specific in analysis requests.
3. (NEW) List each metal individually. (NEW)
4. Check off analyses to be performed for each sample location.
5. Enter number of containers.

Field ID	Location	Turn Around Time Required		Grab/Comp.	Sample Matrix *	Date	Time	8260 SIM	Trip Field Blanks SIMS	Acrylonitrile Vinyl Chloride EDB DBCP	Number of Containers	Special Instructions Conditions on Receipt
		Standard	Half-time (50% surcharge)									
1	MW-SS										2	
2	MW-SD										3	
3												
4												
5												
6												
7												
8												
9												
10												

Sampled by: Glenn Mutti Phone: 206-329-0141 FAX: Email: glennmutti@pug.com

Sample Receipt Request (Must include FAX or Email) ☒ * W - water DW - drinking water SW - surface water GW - Ground water WW - waste water OL - oil S - soil Other

Relinquished by: Glenn Mutti Date: 6-25-18 Time: 1117 Received by: Date: Time:

Custody seals intact ☒ Sample temp 16.0 C satisfactory ☒ Samples received intact ☒ Chain of custody & labels agree ☒

Yes ☒ No ☐ N/A ☐

5 Total Containers



CO030281

Chain of Custody / Analysis Request

(Please complete all applicable shaded sections)



ANALYTICAL
Main Lab (800-765-9295)
1620 South Wapiti St. Burlington, VA 98233
Microbiology (888-725-1212)
805 W. Orchard Dr. Suite 4 Bellingham, WA 98225
Wilsonville Lab (503-682-7802)
9150 SW Pioneer Ct. Suite W Wilsonville, OR 97070
Corvallis Lab (541-753-4946)
540 SW 3rd St. Corvallis, OR 97333

Report to:	Pacific Groundwater Group	Bill to:	Pacific Groundwater Group	For Lab Use Only
Ship Address:	2377 Eastlake Ave E	Address:	2377 Eastlake Avenue E	Ref #
City:	Seattle	City:	Seattle	Check Regulatory Program
State:	WA	State:	WA	☐ Safe Drinking Water Act
Zip:	98102	Zip:	98102	☐ Clean Water Act
Alt:	Glenn Multi	Phone:		☐ RCRA / CERCLA
Phone:	206-329-0141	P.O. #:		☒ Other
FAX:	206-329-6968	Attn:		
Email:	glennmulti@pug.com	Card#:		
Project:	Corvation Landfill			

Analyses Requested

Instructions

- Use one line per sample Location.
- Be specific in analysis requests.
- (NEW) List each metal individually (NEW)
- Check off analyses to be performed for each sample Location.
- Enter number of containers.

Field ID	Location	Turn Around Time Required			Grab/ Comp.	Sample Matrix *	Date	Time	8260 SIM	Trip Field Blanks SIMS	Acrylonitrile Vinyl Chloride EDB DCEP	Number of Containers	Special Instructions Conditions on Receipt
		Standard	Half-time (50% surcharge)	Quicktest (100% surcharge)									
1	MW-15											2	
2	MW-1D											2	
3	MW-3S											2	
4	MW-3D											2	
5	MW-2S											2	
6	MW-2D											2	
7	MW-22D											2	
8	MW-6D											2	
9	MW-7D											2	
10	MW-8D											2	
Sampled by: JGMD		Phone: 206-329-0141		FAX: 329-0141		Email: glennmulti@pug.com		20 Total Containers					

Sample Receipt Request (Must include FAX or Email)

* W - water
DW - drinking water

SW - surface water
GW - Ground water

WW - waste water
OL - oil
Other

Relinquished by	Date	Time	Received by	D	Time

6-25-18 11:17

Custody seals intact	Yes	No	N/A
Sample temp. 60°C satisfactory	☒	☐	☐
Samples received intact	☒	☐	☐
Chain of custody & labels agree	☒	☐	☐

ATTACHMENT 3:
2018 Q3 FIELD DATA SHEETS & LABORATORY REPORTS

Methane Monitoring Field Form, Carnation Landfill													
Sampling Event & Date: 2018 03 09-25-18													
Sampler: TWK													
Weather: Partly Cloudy													
Previous 24-hr Barometric Data Downloaded? (Y) N													
Time	Probe ID	Well Depth (ft bgs)	Screen Depth (ft bgs)	Depth to Water (ft btoc)	% of Screen Saturated	Purge Volume*	CH ₄ (%) total	CO ₂ (%) total	O ₂ (%) total	Static pressure (in H ₂ O)	Pump Run Time (sec)	Baro Pressure (in Hg)	Purge Data/Notes
11:48	M-1	15	5-15	-	-	1.9	0.0	4.4	15.3	0.14	100	30.15	
11:53	M-2	15	5-15	-	-	1.9	0.0	4.2	16.1	0.25	100	30.15	
12:00	M-3	15	5-15	-	-	1.9	0.0	3.4	16.7	0.33	100	30.15	
12:07	M-4	8	3-8	-	-	1.1	N/A	N/A	N/A	N/A	N/A	30.15	Does almost empty canister spray inside all 3 probes
12:11	M-5	15	5-15	-	-	1.9	0.0	4.4	15.2	0.31	100	30.15	and then coming
12:19	M-6	24	10-24	-	-	0.2	0.0	3.4	17.0	0.10	100	30.17	
12:16	M-7	8	3-8	-	-	0.1	0.0	2.0	17.9	0.05	100	30.17	
12:45	M-8	8	3-8	-	-	0.2	0.0	4.6	16.0	0.15	100	30.16	
12:48	M-9	20	10-20	-	-	0.3	0.0	8.7	11.5	0.01	100	30.19	
12:30	V-1					/	2.1	4.4	14.3	0.42	100	30.15	
12:24	V-2					/	0.4	0.6	18.6	0.42	120	30.15	
12:20	V-3					/	16.6	20.0	0.0	0.38	130	30.15	
12:16	V-4					/	14.7	19.1	2.7	0.32	100	30.15	
*Purge volume is the number of strokes required for purging 1 casing volume using a 6 liter bilge pump.													
bgs = below ground surface; btoc = below top of casing						1.9	0.0	5.0	14.1	0.05		30.14	

13:59 M-4

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW-2D

Sampling Event: 2018 Q3

Sample #: _____

Project Number: JS Date: 9/25/2018
 Project Name: Carnation LP Location: _____
 Project Address: _____ Sampled By: tw
 Client Name: _____ Purged By: tw
 Laboratory: ARI / Edge Date Sent to Lab: _____
 Chain-of-Custody (yes/no): yes Field CC Sample Number: _____
 Shipment Method: courier / ship Sample Split: _____

Depth to Water (feet): 36.77 Purge Volume Measurement Method: bucket
 Depth of Well (feet): _____ Purge Date/Time: 9/25/18 14:50
 Reference Point (surveyors notch, etc.): ToC benchmark Purging Equipment: DC purge
 Sampling Equipment: DC purge Water Level Probe Used: WL ET
 Three-Casing Volume Constant (CVC): 2-inch = 0.48 gpf ; 4-inch = 1.97 gpf ; 6-inch = 4.41 gpf PV = ($\pi r^2 h$) (7.48 gal/ft³)
 Purge Volume = ft of water _____ x CVC _____ = _____ gallons Casing diameter (ft/in): _____

TIME (2400 hr)	CUMULATIVE VOLUME (gal / L)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual / NTU)	DTW	
14:59	1.0	6.75	321.8	11.8	heavy	37.09	700 ml/min
15:03	1.25	6.40	312.4	11.6	light	37.01	700 ml/min
15:07	2.0	6.33	310.3	11.6	clr	36.99	700 ml/min
15:09	2.50	6.31	310.3	11.6	clr	37.00	700 ml/min
15:14	3.25	6.34	309.9	11.6	clr	36.99	700 ml/min
15:16	3.50	6.32	310.1	11.7	clr	36.98	700 ml/min

trouble with turbidity clogging ball valve

Well Integrity: good

Bottle Inventory				Day/Time Sampled: <u>9/25/2018 15:20</u>
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
<u>1</u>	<u>500ml poly</u>	<u>HNO₃</u>	<u>0.45</u>	<u>Diss. metals As, Fe, Mn</u>
<u>3</u>	<u>40ml VOA</u>	<u>HCl</u>	<u>none</u>	<u>VOC BZ60</u>
<u>2</u>	<u>40ml VOA</u>	<u>-</u>	<u>-</u>	<u>VOC SRM</u>

Signature: [Signature]

9/28/18

MW-6S = 32.19 TOC blk mark DTW 11:07

MW-6D = 41.00 TOC blk mark DTW 11:08

MW-7D = 34.89 TOC blk mark DTW good seal in monument

MW-5D = 40.12 TOC blk mark DTW 12:44 Bees

MW-5S = 2454 + 0.29 TP with pump pulled, can hear water, TP is wet, but not measurable TOC blk mark

MW-1D = 32.70 TOC blk mark DTW 13:39

MW-1S = 32.51 TOC blk mark DTW 13:41

MW-3S = 21.91 TOC blk mark DTW 13:53

MW-3D = 21.17 TOC blk mark DTW 13:54

MW-2S = 31.59 + 0.29 TOC blk mark ^{TP}DTW 14:35 Dry pulled pump

MW-2D = 36.77 TOC blk mark DTW 14:48

MW-8D = 43.61 TOC blk mark DTW 16:01



Burlington, WA	Corporate Laboratory (a)	1620 S Walnut St.	Burlington, WA 98233	800.755.9295 • 360.757.1400
Bellingham, WA	Microbiology (b)	805 Orchard Dr Ste 4	Bellingham, WA 98225	360.715.1212
Portland, OR	Microbiology/Chemistry (c)	9150 SW Pioneer Ct Ste W	Wilsonville, OR 97070	503.682.7802
Corvallis, OR	Microbiology (d)	540 SW Third Street	Corvallis, OR 97333	541.753.4946

November 7, 2018

Page 1 of 1

Glenn Mutti
Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102
RE: 18-36444 - Carnation Landfill

Dear Glenn Mutti,

Your project: Carnation Landfill, was received on Thursday September 27, 2018.

All samples were analyzed within the accepted holding times and were appropriately preserved and analyzed according to approved analytical protocols, unless noted in the data or QC reports. The quality control data was within laboratory acceptance limits, unless specified in the data or QC reports.

If you have questions phone us at 800 755-9295.

Respectfully

A handwritten signature in blue ink, appearing to read "LJ Henderson", is written over a light blue circular background.

Lawrence J Henderson, PhD
Director of Laboratories, Vice President

Enclosures: Data Report

Page 1 of 1



20332 Empire Ave Ste F4, Bend, OR 97703

ANALYTICAL

Main Lab (800-755-9295)
1620 South Walnut St. Buntington, WA 98233
Microbiology (888-725-1212)
805 W. Orchard Dr. Suite 4 Bellingham WA 98225
Witsconville Lab (503-682-7802)
9150 SW Pioneer Ct. Suite W Wilsconville, OR 97107

Corvallis Lab (541-753-9446)
540 SW 3rd St. Corvallis, OR 97333
Bend Lab (541-639-8426)
20332 Embile Ave Ste F4, Bend, OR 97703

CO037524

- Turn Around Time Required**
- ☒ Standard
- ☐ Half-time (50% surcharge)
- ☐ Quickest (100% surcharge) Phone Call Req.
- ☐ Emergency (Phone Call Req.)

[illegible]

3 Total Containers

1000

OL - oil
Other:

☐ Yes ☐ No ☒ N/A

temp 0.1 C satisfactory

Chain of custody & labels agree



Burlington, WA *Corporate Laboratory (a)*
1620 S Walnut St - Burlington, WA 98233 - 800.755.9295 • 360.757.1400
Bellingham, WA *Microbiology (b)*
805 Orchard Dr Ste 4 - Bellingham, WA 98225 - 360.715.1212

Portland, OR *Microbiology/Chemistry (c)*
9150 SW Pioneer Ct Ste W - Wilsonville, OR 97070 - 503.682.7802
Corvallis, OR *Microbiology/Chemistry (d)*
540 SW Third Street - Corvallis, OR 97333 - 541.753.4946
Bend, OR *Microbiology (e)*
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541.639.8425

WSDOE Lab C567

DATA REPORT

Page 1 of 1

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-36444**
Project: Carnation Landfill

Lab Number: 73808
Field ID: MW-2D
Sample Description: Carnation Landfill
Matrix: Water
Sample Date: 9/25/18
Extraction Date: 10/2/18
Extraction Method: 5030B

Report Date: 11/7/18
Date Analyzed: 10/2/18
Analyst: HY
Analytical Method: 8260SIM
Batch: SIM_181002
Approved By: pdm

Authorized by:

Lawrence J Henderson, PhD
Director of Laboratories, Vice President

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
	Volatile Organic Compounds									
75-01-4	VINYL CHLORIDE (SIM)	ND		ug/L	0.02	0.02	0.0059	1.00	a	
107-13-1	ACRYLONITRILE (SIM)	ND		ug/L	0.05	0.05	0.0125	1.00	a	
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	0.02	0.02	0.0069	1.00	a	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	0.02	0.02		1.00	a	

Notes:

Flags are data qualifiers. If there are data qualifiers on your report definitions can be found on an accompanying sheet.

ND - indicates the compound was not detected above the PQL or MDL.

Lab QL = Laboratory Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

Permit QL = Quantitation Limit required by permit (listed in Appendix A) or other regulatory requirement.

D.F. - Dilution Factor.

If you have any questions concerning this report contact us at the above phone number.



SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: **18-36444**

Report Date: 11/07/18

			True		% Recovery		QC	QC		
Batch	Analyte	Result	Value	Units	Method	Recovery	Limits*	Qualifier	Type	Comment
SIM_181002	0 1,2 - DIBROMOETHANE (EDB SIM)	0.1	0.1	ug/L	8260SIM	100	80-120		LFB	SIMS ANALYSIS
	0 1,2-DIBROMO-3-CHLOROPROPANE	0.113	0.1	ug/L	8260SIM	113	80-120		LFB	SIMS ANALYSIS
	0 ACRYLONITRILE (SIM)	0.091	0.1	ug/L	8260SIM	91	80-120		LFB	SIMS ANALYSIS
	0 VINYL CHLORIDE (SIM)	0.102	0.1	ug/L	8260SIM	102	80-120		LFB	SIMS ANALYSIS

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.



SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Low-Level Lab Fortified Blank

Reference Number: **18-36444**

Report Date: 11/07/18

Batch	Analyte	Result	True		Method	%	QC	QC	Comment
			Value	Units					
SIM_181002	0 1,2 - DIBROMOETHANE (EDB SIM)	0.025	0.02	ug/L	8260SIM	125	50-150	LLFB	
	0 1,2-DIBROMO-3-CHLOROPROPANE	0.022	0.02	ug/L	8260SIM	110	50-150	LLFB	
	0 ACRYLONITRILE (SIM)	0.050	0.05	ug/L	8260SIM	100	50-150	LLFB	
	0 VINYL CHLORIDE (SIM)	0.020	0.02	ug/L	8260SIM	100	50-150	LLFB	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.



SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: **18-36444**

Report Date: 11/07/18

Batch	Analyte	Result	True		Method	%		QC		Comment
			Value	Units		Recovery	Limits*	Qualifier	Type	
SIM_181002	0 1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	8260SIM	0-0		MB		TB 18-36444
	0 1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	8260SIM	0-0		MB		TB 18-36444
	0 ACRYLONITRILE (SIM)	ND		ug/L	8260SIM	0-0		MB		TB 18-36444
	0 VINYL CHLORIDE (SIM)	ND		ug/L	8260SIM	0-0		MB		TB 18-36444

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.



SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Quality Control Sample

Reference Number: **18-36444**

Report Date: 11/07/18

Batch	Analyte	Result	True		Method	% Recovery		QC Limits*		QC Qualifier Type	Comment
			Value	Units							
SIM_181002	0 1,2 - DIBROMOETHANE (EDB SIM)	0.094	0.1	ug/L	8260SIM	94		70-130		QCS	SIMS ANALYSIS
	0 1,2-DIBROMO-3-CHLOROPROPANE	0.108	0.1	ug/L	8260SIM	108		70-130		QCS	SIMS ANALYSIS
	0 ACRYLONITRILE (SIM)	0.118	0.1	ug/L	8260SIM	118		70-130		QCS	SIMS ANALYSIS
	0 VINYL CHLORIDE (SIM)	0.097	0.1	ug/L	8260SIM	97		70-130		QCS	SIMS ANALYSIS

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.

Reference Number: **18-36444**

Report Date: 11/7/2018

Page 1 of 1

SAMPLE DEPENDENT
QUALITY CONTROL REPORT
Duplicate, Matrix Spike/Matrix Spike Duplicate and Confirmation Result Report

Batch	Sample	Analyte	Result	Duplicate			Units	Percent Recovery		Limits*	%RPD	Limits*	QC		
				Spike Result	Spike Conc	Spike		MS	MSD				Qualifier	Type	Comments
Laboratory Fortified Matrix (MS)															
SIM_181002															
	73808	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.218		0.2	ug/L	109	NA	70-130	NA	0-20		LFM	
	73808	1,2-DIBROMO-3-CHLOROPROPANE	ND	0.175		0.2	ug/L	88	NA	70-130	NA	0-20		LFM	
	73808	ACRYLONITRILE (SIM)	ND	0.199		0.2	ug/L	100	NA	70-130	NA	0-20		LFM	
	73808	VINYL CHLORIDE (SIM)	ND	0.244		0.2	ug/L	122	NA	70-130	NA	0-20		LFM	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of an analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.

FORM: QC Dependent.rpt



QUALITY CONTROL REPORT SURROGATE REPORT

Reference Number: 18-36444

Report Date: 11/07/18

Lab No	Analyte	Result	Qualifier	Units	Method	Limit
SIM_181002 73808	d8-TOLUENE (Surr)	99		%	8260SIM	Acceptance Range is 70-130%

***Notation:**

A surrogate is a pure compound added to a sample in the laboratory just before processing so that the overall efficiency of a method can be determined.

The Acceptance Limits (or Control Limits) approximate a 99% confidence interval around the mean recovery.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

09 October 2018

Glenn Mutti-Driscoll
Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle, WA 98102

RE: Carnation Landfill JS0903

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)
1810378

Associated SDG ID(s)
N/A

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 its entirety.



ARI Assigned Number: 1870378	Turn-around Requested: Std

ARJ Client Company: Pacific Groundwater Group Phone: 206 329-0141

Client Contact: Glenn Mutti-Driscoll

Client Project Name:	
Carnation Landfill	
Client Project #:	Sample:

Client Project #:	J50903	Samplers:	twk

Page: of

Date:	Ice Present? <i>Yes</i>

No. of Coolers:	1	Cooler Temps:	5.7°C



	Notes/Comments

Sample ID	Date	Time	Matrix	No. Containers	VOC	BZ	Diss. m	As	Fe							
MW-ZD	9/25/18	15:20	GW	4	X	X										
Trip blanks																
Comments/Special Instructions * Dissolved metals are 0.45 um field filtered.	Relinquished by:				Received by:				Relinquished by:				Received by:			
	(Signature)				(Signature)				(Signature)				(Signature)			
	Printed Name:				Printed Name:				Printed Name:				Printed Name:			
	Company:				Company:				Company:				Company:			
	Date & Time:				Date & Time:				Date & Time:				Date & Time:			
	9/26/18 10:25				09/26/18 1025											

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
09-Oct-2018 12:30

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-2D	18I0378-01	Water	25-Sep-2018 15:20	26-Sep-2018 10:25
Trip Blanks	18I0378-02	Water	25-Sep-2018 15:20	26-Sep-2018 10:25



Pacific Groundwater Group
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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
09-Oct-2018 12:30

Case Narrative

Volatiles - EPA Method SW8260C

The sample(s) were run within the recommended holding times.

Initial and continuing calibrations were within method requirements with the exception of all associated "Q" flagged analytes which are out of control low in the CCAL. All associated samples that contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/LCSD percent recoveries and RPD were within control limits.

Dissolved Metals - EPA Method 200.8/6010C

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.



WORK ORDER

18I0378

Client: Pacific Groundwater Group

Project Manager: Kelly Bottem

Project: Carnation Landfill JS0903

Project Number: Carnation Landfill JS0903

Report To:

Pacific Groundwater Group
Glenn Mutti-Driscoll
2377 Eastlake Ave. E. Suite 200
Seattle, WA 98102
Phone: (206) 329-0141
Fax: -

Invoice To:

Pacific Groundwater Group
Glenn Mutti-Driscoll
2377 Eastlake Ave. E. Suite 200
Seattle, WA 98102
Phone : (206) 329-0141
Fax: -

Date Due: 10-Oct-2018 18:00 (10 day TAT)

Received By: Jacob Walter

Date Received: 26-Sep-2018 10:25

Logged In By: Jacob Walter

Date Logged In: 26-Sep-2018 11:09

Samples Received at: 5.4°C

Intact, properly signed and dated custody seals attached to outside of cooler(s).....	No	Custody papers included with the cooler.....	Yes
Custody papers properly filled out (in, signed, analyses requested, etc).....	Yes	Was a temperature blank included in the cooler.....	No
Was sufficient ice used (if appropriate).....	Yes	All bottles sealed in individual plastic bags.....	No
All bottles arrived in good condition (unbroken).....	Yes	All bottle labels complete and legible.....	Yes
Number of containers listed on COC match number received.....	Yes	Bottle labels and tags agree with COC.....	Yes
Correct bottles used for the requested analyses.....	Yes	All VOC vials free of air bubbles.....	Yes
Analyses/bottles require preservation (attach preservation sheet excluding VOC).....	Yes	Sufficient amount of sample sent in each bottle.....	Yes
Sample split at ARI.....	No		

18I0378-01 MW-2D [Water] Sampled 25-Sep-2018 15:20

8260C VOA	10/10/2018	10	10/9/2018	Field Filtered
Met Diss 200.8 - As UCT	10/10/2018	10	3/24/2019	Field Filtered
Met Diss 6010C - Fe	10/10/2018	10	3/24/2019	Field Filtered
Met Diss 6010C - Mn	10/10/2018	10	3/24/2019	Field Filtered

18I0378-02 Trip Blanks [Water] Sampled 25-Sep-2018 15:20

8260C VOA	10/10/2018	10	10/9/2018

Preservation Confirmation

Container ID	Container Type	pH
18I0378-01 A	VOA Vial, Clear, 40 mL, HCL	
18I0378-01 B	VOA Vial, Clear, 40 mL, HCL	
18I0378-01 C	VOA Vial, Clear, 40 mL, HCL	
18I0378-01 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	4.2
18I0378-02 A	VOA Vial, Clear, 40 mL, HCL	
18I0378-02 B	VOA Vial, Clear, 40 mL, HCL	

Preservation Confirmed By

Date



Cooler Receipt Form

ARI Client: PGG
COC No(s): _____ NA
Assigned ARI Job No: 1870378

Project Name: Carnation Landfill
Delivered by: Fed-Ex UPS Counter Hand Delivered Other: _____
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) 5.4°
Time: 1056
If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 0005206

Cooler Accepted by: JSu Date: 09/26/18 Time: 1025

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: _____
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 09/24/18
Was Sample Split by ARI: NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JSu Date: 09/26/18 Time: 1107

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

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

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)



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
09-Oct-2018 12:30

MW-2D
1810378-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 09/25/2018 15:20

Instrument: NT7 Analyst: LH

Analyzed: 28-Sep-2018 14:34

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGI0780 Sample Size: 10 mL
Prepared: 28-Sep-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	0.43	ug/L	
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.27	ug/L	
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
09-Oct-2018 12:30

MW-2D
1810378-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 09/25/2018 15:20

Instrument: NT7 Analyst: LH

Analyzed: 28-Sep-2018 14:34

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
09-Oct-2018 12:30

MW-2D
18I0378-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 09/25/2018 15:20

Instrument: NT7 Analyst: LH

Analyzed: 28-Sep-2018 14:34

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 1,2-Dichloroethane-d4		80-129 %	99.5	%	
Surrogate: Toluene-d8		80-120 %	95.9	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	92.7	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	103	%	



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Project Manager: Glenn Mutti-Driscoll

Reported:
09-Oct-2018 12:30

MW-2D
18I0378-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 09/25/2018 15:20

Instrument: ICPMS2 Analyst: MCB

Analyzed: 04-Oct-2018 17:20

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGJ0066 Sample Size: 25 mL
Prepared: 02-Oct-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	9.77	ug/L	



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Project Manager: Glenn Mutti-Driscoll

Reported:
09-Oct-2018 12:30

MW-2D
18I0378-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 09/25/2018 15:20

Instrument: ICP2 Analyst: TCH

Analyzed: 04-Oct-2018 11:26

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BGJ0132

Prepared: 03-Oct-2018

Sample Size: 25 mL

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	2.32	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	2.69	mg/L	



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
09-Oct-2018 12:30

Trip Blanks
1810378-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 09/25/2018 15:20

Instrument: NT7 Analyst: LH

Analyzed: 28-Sep-2018 11:30

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGI0780 Sample Size: 10 mL
Prepared: 28-Sep-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
09-Oct-2018 12:30

Trip Blanks
18I0378-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 09/25/2018 15:20

Instrument: NT7 Analyst: LH

Analyzed: 28-Sep-2018 11:30

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
09-Oct-2018 12:30

Trip Blanks
18I0378-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 09/25/2018 15:20

Instrument: NT7 Analyst: LH

Analyzed: 28-Sep-2018 11:30

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 1,2-Dichloroethane-d4		80-129 %	97.4	%	
Surrogate: Toluene-d8		80-120 %	94.7	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	92.7	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	104	%	



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Reported:
09-Oct-2018 12:30

Volatile Organic Compounds - Quality Control

Batch BGI0780 - EPA 5030 (Purge and Trap)

Instrument: NT7 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGI0780-BLK1)		Prepared: 28-Sep-2018 Analyzed: 28-Sep-2018 09:44								
Chloromethane	ND	0.50	ug/L							U
Vinyl Chloride	ND	0.20	ug/L							U
Bromomethane	ND	1.00	ug/L							U
Chloroethane	ND	0.20	ug/L							U
Trichlorofluoromethane	ND	0.20	ug/L							U
Acrolein	ND	5.00	ug/L							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.20	ug/L							U
Acetone	ND	5.00	ug/L							U
1,1-Dichloroethene	ND	0.20	ug/L							U
Bromoethane	ND	0.20	ug/L							U
Iodomethane	ND	1.00	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.20	ug/L							U
Vinyl Acetate	ND	0.20	ug/L							U
1,1-Dichloroethane	ND	0.20	ug/L							U
2-Butanone	ND	5.00	ug/L							U
2,2-Dichloropropane	ND	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Chloroform	ND	0.20	ug/L							U
Bromochloromethane	ND	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.20	ug/L							U
1,1-Dichloropropene	ND	0.20	ug/L							U
Carbon tetrachloride	ND	0.20	ug/L							U
1,2-Dichloroethane	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Trichloroethene	ND	0.20	ug/L							U
1,2-Dichloropropane	ND	0.20	ug/L							U
Bromodichloromethane	ND	0.20	ug/L							U
Dibromomethane	ND	0.20	ug/L							U
2-Chloroethyl vinyl ether	ND	1.00	ug/L							U
4-Methyl-2-Pentanone	ND	5.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.20	ug/L							U
Toluene	ND	0.20	ug/L							U



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Volatile Organic Compounds - Quality Control

Batch BGI0780 - EPA 5030 (Purge and Trap)

Instrument: NT7 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGI0780-BLK1)		Prepared: 28-Sep-2018 Analyzed: 28-Sep-2018 09:44								
trans-1,3-Dichloropropene	ND	0.20	ug/L							U
2-Hexanone	ND	5.00	ug/L							U
1,1,2-Trichloroethane	ND	0.20	ug/L							U
1,3-Dichloropropane	ND	0.20	ug/L							U
Tetrachloroethene	ND	0.20	ug/L							U
Dibromochloromethane	ND	0.20	ug/L							U
1,2-Dibromoethane	ND	0.20	ug/L							U
Chlorobenzene	ND	0.20	ug/L							U
Ethylbenzene	ND	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.20	ug/L							U
m,p-Xylene	ND	0.40	ug/L							U
o-Xylene	ND	0.20	ug/L							U
Xylenes, total	ND	0.60	ug/L							U
Styrene	ND	0.20	ug/L							U
Bromoform	ND	0.20	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.50	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	1.00	ug/L							U
n-Propylbenzene	ND	0.20	ug/L							U
Bromobenzene	ND	0.20	ug/L							U
Isopropyl Benzene	ND	0.20	ug/L							U
2-Chlorotoluene	ND	0.20	ug/L							U
4-Chlorotoluene	ND	0.20	ug/L							U
t-Butylbenzene	ND	0.20	ug/L							U
1,3,5-Trimethylbenzene	ND	0.20	ug/L							U
1,2,4-Trimethylbenzene	ND	0.20	ug/L							U
s-Butylbenzene	ND	0.20	ug/L							U
4-Isopropyl Toluene	ND	0.20	ug/L							U
1,3-Dichlorobenzene	ND	0.20	ug/L							U
1,4-Dichlorobenzene	ND	0.20	ug/L							U
n-Butylbenzene	ND	0.20	ug/L							U
1,2-Dichlorobenzene	ND	0.20	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.50	ug/L							U
1,2,4-Trichlorobenzene	ND	0.50	ug/L							U
Hexachloro-1,3-Butadiene	ND	0.50	ug/L							U



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Reported:
09-Oct-2018 12:30

Volatile Organic Compounds - Quality Control

Batch BGI0780 - EPA 5030 (Purge and Trap)

Instrument: NT7 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGI0780-BLK1)										
Prepared: 28-Sep-2018 Analyzed: 28-Sep-2018 09:44										
Naphthalene	ND	0.50	ug/L							U
1,2,3-Trichlorobenzene	ND	0.50	ug/L							U
Dichlorodifluoromethane	ND	0.20	ug/L							U
Methyl tert-butyl Ether	ND	0.50	ug/L							U
2-Pentanone	ND	5.00	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	4.61		ug/L	5.00		92.2	80-129			
Surrogate: Toluene-d8	4.82		ug/L	5.00		96.5	80-120			
Surrogate: 4-Bromofluorobenzene	4.64		ug/L	5.00		92.9	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.18		ug/L	5.00		104	80-120			
LCS (BGI0780-BS1)										
Prepared: 28-Sep-2018 Analyzed: 28-Sep-2018 07:58										
Chloromethane	8.31	0.50	ug/L	10.0		83.1	60-138			
Vinyl Chloride	7.76	0.20	ug/L	10.0		77.6	66-133			Q
Bromomethane	8.31	1.00	ug/L	10.0		83.1	72-131			
Chloroethane	9.26	0.20	ug/L	10.0		92.6	60-155			
Trichlorofluoromethane	9.43	0.20	ug/L	10.0		94.3	80-129			
Acrolein	35.2	5.00	ug/L	50.0		70.4	52-144			Q
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.0	0.20	ug/L	10.0		100	76-129			
Acetone	51.0	5.00	ug/L	50.0		102	58-142			
1,1-Dichloroethene	8.37	0.20	ug/L	10.0		83.7	69-135			
Bromoethane	9.70	0.20	ug/L	10.0		97.0	78-128			
Iodomethane	10.2	1.00	ug/L	10.0		102	56-147			
Methylene Chloride	8.05	1.00	ug/L	10.0		80.5	65-135			
Acrylonitrile	8.08	1.00	ug/L	10.0		80.8	64-134			
Carbon Disulfide	9.51	0.20	ug/L	10.0		95.1	78-125			
trans-1,2-Dichloroethene	8.77	0.20	ug/L	10.0		87.7	78-128			
Vinyl Acetate	9.39	0.20	ug/L	10.0		93.9	55-138			
1,1-Dichloroethane	8.33	0.20	ug/L	10.0		83.3	76-124			
2-Butanone	50.3	5.00	ug/L	50.0		101	61-140			
2,2-Dichloropropane	11.7	0.20	ug/L	10.0		117	78-125			
cis-1,2-Dichloroethene	9.86	0.20	ug/L	10.0		98.6	80-121			
Chloroform	10.0	0.20	ug/L	10.0		100	80-122			
Bromochloromethane	10.4	0.20	ug/L	10.0		104	80-121			
1,1,1-Trichloroethane	10.4	0.20	ug/L	10.0		104	79-123			
1,1-Dichloropropene	9.42	0.20	ug/L	10.0		94.2	80-120			



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Reported:
09-Oct-2018 12:30

Volatile Organic Compounds - Quality Control

Batch BGI0780 - EPA 5030 (Purge and Trap)

Instrument: NT7 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGI0780-BS1)		Prepared: 28-Sep-2018 Analyzed: 28-Sep-2018 07:58								
Carbon tetrachloride	10.6	0.20	ug/L	10.0		106	53-137			
1,2-Dichloroethane	9.03	0.20	ug/L	10.0		90.3	75-123			
Benzene	10.2	0.20	ug/L	10.0		102	80-120			
Trichloroethene	10.3	0.20	ug/L	10.0		103	80-120			
1,2-Dichloropropane	9.03	0.20	ug/L	10.0		90.3	80-120			
Bromodichloromethane	11.1	0.20	ug/L	10.0		111	80-121			
Dibromomethane	9.89	0.20	ug/L	10.0		98.9	80-120			
2-Chloroethyl vinyl ether	9.99	1.00	ug/L	10.0		99.9	74-127			
4-Methyl-2-Pentanone	43.0	5.00	ug/L	50.0		86.1	67-133			
cis-1,3-Dichloropropene	11.1	0.20	ug/L	10.0		111	80-124			
Toluene	10.2	0.20	ug/L	10.0		102	80-120			
trans-1,3-Dichloropropene	10.1	0.20	ug/L	10.0		101	71-127			
2-Hexanone	55.3	5.00	ug/L	50.0		111	69-133			
1,1,2-Trichloroethane	9.90	0.20	ug/L	10.0		99.0	80-121			
1,3-Dichloropropane	9.82	0.20	ug/L	10.0		98.2	80-120			
Tetrachloroethene	10.7	0.20	ug/L	10.0		107	80-120			
Dibromochloromethane	9.93	0.20	ug/L	10.0		99.3	65-135			
1,2-Dibromoethane	10.4	0.20	ug/L	10.0		104	80-121			
Chlorobenzene	10.7	0.20	ug/L	10.0		107	80-120			
Ethylbenzene	10.5	0.20	ug/L	10.0		105	80-120			
1,1,1,2-Tetrachloroethane	10.8	0.20	ug/L	10.0		108	80-120			
m,p-Xylene	21.3	0.40	ug/L	20.0		107	80-121			
o-Xylene	10.3	0.20	ug/L	10.0		103	80-121			
Xylenes, total	31.6	0.60	ug/L	30.0		105	76-127			
Styrene	10.7	0.20	ug/L	10.0		107	80-124			
Bromoform	11.2	0.20	ug/L	10.0		112	51-134			
1,1,2,2-Tetrachloroethane	10.2	0.20	ug/L	10.0		102	77-123			
1,2,3-Trichloropropane	9.90	0.50	ug/L	10.0		99.0	76-125			
trans-1,4-Dichloro 2-Butene	10.2	1.00	ug/L	10.0		102	55-129			
n-Propylbenzene	10.3	0.20	ug/L	10.0		103	78-130			
Bromobenzene	10.7	0.20	ug/L	10.0		107	80-120			
Isopropyl Benzene	10.7	0.20	ug/L	10.0		107	80-128			
2-Chlorotoluene	10.4	0.20	ug/L	10.0		104	78-122			
4-Chlorotoluene	10.2	0.20	ug/L	10.0		102	80-121			
t-Butylbenzene	10.3	0.20	ug/L	10.0		103	78-125			



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Reported:
09-Oct-2018 12:30

Volatile Organic Compounds - Quality Control

Batch BGI0780 - EPA 5030 (Purge and Trap)

Instrument: NT7 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGI0780-BS1)										
					Prepared: 28-Sep-2018 Analyzed: 28-Sep-2018 07:58					
1,3,5-Trimethylbenzene	10.1	0.20	ug/L	10.0		101	80-129			
1,2,4-Trimethylbenzene	9.85	0.20	ug/L	10.0		98.5	80-127			
s-Butylbenzene	10.3	0.20	ug/L	10.0		103	78-129			
4-Isopropyl Toluene	10.1	0.20	ug/L	10.0		101	79-130			
1,3-Dichlorobenzene	10.7	0.20	ug/L	10.0		107	80-120			
1,4-Dichlorobenzene	10.7	0.20	ug/L	10.0		107	80-120			
n-Butylbenzene	10.2	0.20	ug/L	10.0		102	74-129			
1,2-Dichlorobenzene	10.6	0.20	ug/L	10.0		106	80-120			
1,2-Dibromo-3-chloropropane	8.54	0.50	ug/L	10.0		85.4	62-123			
1,2,4-Trichlorobenzene	10.6	0.50	ug/L	10.0		106	64-124			
Hexachloro-1,3-Butadiene	10.9	0.50	ug/L	10.0		109	58-123			
Naphthalene	10.1	0.50	ug/L	10.0		101	50-134			
1,2,3-Trichlorobenzene	10.5	0.50	ug/L	10.0		105	49-133			
Dichlorodifluoromethane	7.01	0.20	ug/L	10.0		70.1	48-147			Q
Methyl tert-butyl Ether	8.33	0.50	ug/L	10.0		83.3	71-132			
2-Pentanone	47.5	5.00	ug/L	50.0		94.9	69-134			
Surrogate: 1,2-Dichloroethane-d4	4.32		ug/L	5.00		86.3	80-129			
Surrogate: Toluene-d8	4.94		ug/L	5.00		98.8	80-120			
Surrogate: 4-Bromofluorobenzene	5.03		ug/L	5.00		101	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.10		ug/L	5.00		102	80-120			
LCS Dup (BGI0780-BSD1)										
					Prepared: 28-Sep-2018 Analyzed: 28-Sep-2018 08:51					
Chloromethane	8.16	0.50	ug/L	10.0		81.6	60-138	1.75	30	
Vinyl Chloride	7.62	0.20	ug/L	10.0		76.2	66-133	1.77	30	Q
Bromomethane	7.95	1.00	ug/L	10.0		79.5	72-131	4.36	30	
Chloroethane	9.40	0.20	ug/L	10.0		94.0	60-155	1.51	30	
Trichlorofluoromethane	9.37	0.20	ug/L	10.0		93.7	80-129	0.73	30	
Acrolein	34.4	5.00	ug/L	50.0		68.8	52-144	2.43	30	Q
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.1	0.20	ug/L	10.0		101	76-129	0.38	30	
Acetone	49.9	5.00	ug/L	50.0		99.7	58-142	2.34	30	
1,1-Dichloroethene	8.20	0.20	ug/L	10.0		82.0	69-135	2.06	30	
Bromoethane	9.44	0.20	ug/L	10.0		94.4	78-128	2.68	30	
Iodomethane	9.84	1.00	ug/L	10.0		98.4	56-147	3.44	30	
Methylene Chloride	7.94	1.00	ug/L	10.0		79.4	65-135	1.34	30	
Acrylonitrile	8.23	1.00	ug/L	10.0		82.3	64-134	1.79	30	



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Reported:
09-Oct-2018 12:30

Volatile Organic Compounds - Quality Control

Batch BGI0780 - EPA 5030 (Purge and Trap)

Instrument: NT7 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BGI0780-BSD1)		Prepared: 28-Sep-2018 Analyzed: 28-Sep-2018 08:51								
Carbon Disulfide	9.35	0.20	ug/L	10.0		93.5	78-125	1.65	30	
trans-1,2-Dichloroethene	8.69	0.20	ug/L	10.0		86.9	78-128	1.01	30	
Vinyl Acetate	10.1	0.20	ug/L	10.0		101	55-138	7.07	30	
1,1-Dichloroethane	8.23	0.20	ug/L	10.0		82.3	76-124	1.22	30	
2-Butanone	50.4	5.00	ug/L	50.0		101	61-140	0.06	30	
2,2-Dichloropropane	11.6	0.20	ug/L	10.0		116	78-125	0.20	30	
cis-1,2-Dichloroethene	9.91	0.20	ug/L	10.0		99.1	80-121	0.57	30	
Chloroform	9.93	0.20	ug/L	10.0		99.3	80-122	1.01	30	
Bromochloromethane	10.3	0.20	ug/L	10.0		103	80-121	1.04	30	
1,1,1-Trichloroethane	10.3	0.20	ug/L	10.0		103	79-123	1.53	30	
1,1-Dichloropropene	9.53	0.20	ug/L	10.0		95.3	80-120	1.12	30	
Carbon tetrachloride	10.6	0.20	ug/L	10.0		106	53-137	0.27	30	
1,2-Dichloroethane	9.06	0.20	ug/L	10.0		90.6	75-123	0.26	30	
Benzene	10.3	0.20	ug/L	10.0		103	80-120	1.26	30	
Trichloroethene	10.4	0.20	ug/L	10.0		104	80-120	1.36	30	
1,2-Dichloropropane	8.87	0.20	ug/L	10.0		88.7	80-120	1.79	30	
Bromodichloromethane	10.9	0.20	ug/L	10.0		109	80-121	1.27	30	
Dibromomethane	10.1	0.20	ug/L	10.0		101	80-120	1.86	30	
2-Chloroethyl vinyl ether	10.2	1.00	ug/L	10.0		102	74-127	1.84	30	
4-Methyl-2-Pentanone	43.7	5.00	ug/L	50.0		87.3	67-133	1.44	30	
cis-1,3-Dichloropropene	11.1	0.20	ug/L	10.0		111	80-124	0.57	30	
Toluene	10.3	0.20	ug/L	10.0		103	80-120	0.58	30	
trans-1,3-Dichloropropene	10.2	0.20	ug/L	10.0		102	71-127	1.25	30	
2-Hexanone	53.8	5.00	ug/L	50.0		108	69-133	2.73	30	
1,1,2-Trichloroethane	9.96	0.20	ug/L	10.0		99.6	80-121	0.58	30	
1,3-Dichloropropane	9.69	0.20	ug/L	10.0		96.9	80-120	1.33	30	
Tetrachloroethene	10.8	0.20	ug/L	10.0		108	80-120	0.92	30	
Dibromochloromethane	9.78	0.20	ug/L	10.0		97.8	65-135	1.56	30	
1,2-Dibromoethane	10.5	0.20	ug/L	10.0		105	80-121	1.00	30	
Chlorobenzene	10.5	0.20	ug/L	10.0		105	80-120	1.80	30	
Ethylbenzene	10.3	0.20	ug/L	10.0		103	80-120	1.90	30	
1,1,1,2-Tetrachloroethane	10.5	0.20	ug/L	10.0		105	80-120	2.30	30	
m,p-Xylene	20.9	0.40	ug/L	20.0		104	80-121	2.20	30	
o-Xylene	10.3	0.20	ug/L	10.0		103	80-121	0.13	30	
Xylenes, total	31.1	0.60	ug/L	30.0		104	76-127	1.52	30	



Pacific Groundwater Group
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Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
09-Oct-2018 12:30

Volatile Organic Compounds - Quality Control

Batch BGI0780 - EPA 5030 (Purge and Trap)

Instrument: NT7 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BGI0780-BSD1)		Prepared: 28-Sep-2018 Analyzed: 28-Sep-2018 08:51								
Styrene	10.6	0.20	ug/L	10.0		106	80-124	0.17	30	
Bromoform	10.6	0.20	ug/L	10.0		106	51-134	5.17	30	
1,1,2,2-Tetrachloroethane	10.1	0.20	ug/L	10.0		101	77-123	0.66	30	
1,2,3-Trichloropropane	9.82	0.50	ug/L	10.0		98.2	76-125	0.74	30	
trans-1,4-Dichloro 2-Butene	10.2	1.00	ug/L	10.0		102	55-129	0.25	30	
n-Propylbenzene	10.4	0.20	ug/L	10.0		104	78-130	0.88	30	
Bromobenzene	10.7	0.20	ug/L	10.0		107	80-120	0.27	30	
Isopropyl Benzene	10.6	0.20	ug/L	10.0		106	80-128	1.45	30	
2-Chlorotoluene	10.3	0.20	ug/L	10.0		103	78-122	0.75	30	
4-Chlorotoluene	10.2	0.20	ug/L	10.0		102	80-121	0.12	30	
t-Butylbenzene	10.3	0.20	ug/L	10.0		103	78-125	0.13	30	
1,3,5-Trimethylbenzene	10.1	0.20	ug/L	10.0		101	80-129	0.08	30	
1,2,4-Trimethylbenzene	9.86	0.20	ug/L	10.0		98.6	80-127	0.01	30	
s-Butylbenzene	10.3	0.20	ug/L	10.0		103	78-129	0.05	30	
4-Isopropyl Toluene	10.1	0.20	ug/L	10.0		101	79-130	0.06	30	
1,3-Dichlorobenzene	10.6	0.20	ug/L	10.0		106	80-120	0.90	30	
1,4-Dichlorobenzene	10.6	0.20	ug/L	10.0		106	80-120	0.20	30	
n-Butylbenzene	10.3	0.20	ug/L	10.0		103	74-129	1.17	30	
1,2-Dichlorobenzene	10.6	0.20	ug/L	10.0		106	80-120	0.13	30	
1,2-Dibromo-3-chloropropane	8.56	0.50	ug/L	10.0		85.6	62-123	0.22	30	
1,2,4-Trichlorobenzene	10.6	0.50	ug/L	10.0		106	64-124	0.11	30	
Hexachloro-1,3-Butadiene	10.9	0.50	ug/L	10.0		109	58-123	0.07	30	
Naphthalene	10.1	0.50	ug/L	10.0		101	50-134	0.14	30	
1,2,3-Trichlorobenzene	10.7	0.50	ug/L	10.0		107	49-133	1.26	30	
Dichlorodifluoromethane	6.97	0.20	ug/L	10.0		69.7	48-147	0.58	30	Q
Methyl tert-butyl Ether	8.24	0.50	ug/L	10.0		82.4	71-132	1.10	30	
2-Pentanone	48.1	5.00	ug/L	50.0		96.2	69-134	1.38	30	
Surrogate: 1,2-Dichloroethane-d4	4.42		ug/L	5.00		88.4	80-129			
Surrogate: Toluene-d8	4.85		ug/L	5.00		97.1	80-120			
Surrogate: 4-Bromofluorobenzene	4.88		ug/L	5.00		97.5	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.09		ug/L	5.00		102	80-120			



Pacific Groundwater Group
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Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
09-Oct-2018 12:30

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGJ0066 - 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 Limits	RPD	RPD Limit	Notes
Blank (BGJ0066-BLK1)			Prepared: 02-Oct-2018 Analyzed: 02-Oct-2018 19:32							
Arsenic, Dissolved	75a	ND	0.200	ug/L						U
LCS (BGJ0066-BS1)			Prepared: 02-Oct-2018 Analyzed: 02-Oct-2018 19:36							
Arsenic, Dissolved	75a	24.8	0.200	ug/L	25.0		99.4 80-120			



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Reported:
09-Oct-2018 12:30

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGJ0132 - WMN (No Prep)

Instrument: ICP2 Analyst: TCH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BGJ0132-BLK1) Prepared: 03-Oct-2018 Analyzed: 03-Oct-2018 14:04									
Iron, Dissolved	ND	0.0500	mg/L						U
Manganese, Dissolved	ND	0.0010	mg/L						U
LCS (BGJ0132-BS1) Prepared: 03-Oct-2018 Analyzed: 03-Oct-2018 14:47									
Iron, Dissolved	2.13	0.0500	mg/L	2.00		106 80-120			
Manganese, Dissolved	0.532	0.0010	mg/L	0.500		106 80-120			



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Reported:
09-Oct-2018 12:30

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 6010C in Water	
Iron	WADOE,NELAP
Manganese	WADOE,NELAP
EPA 8260C in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrolein	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Iodomethane	DoD-ELAP,NELAP,CALAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,CALAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,CALAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Butanone	DoD-ELAP,NELAP,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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Reported:
09-Oct-2018 12:30

Dibromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,CALAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,CALAP,WADOE
Bromoform	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,CALAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,CALAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,CALAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

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



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Reported:
09-Oct-2018 12:30

Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
J	Estimated concentration value detected below the reporting limit.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
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.

ATTACHMENT 4:
2018 Q4 FIELD DATA SHEETS & LABORATORY REPORTS

Methane Monitoring Field Form, Carnation Landfill													
Sampling Event & Date: 2018 Q4, 12-12-18													
Sampler: JORD													
Weather: overcast, sampling with GEN 2000													
Previous 24-hr Barometric Data Downloaded? Y N													
Time	Probe ID	Well Depth (ft bgs)	Screen Depth (ft bgs)	Depth to Water (ft bloc)	% of Screen Saturated	Purge Volume*	CH ₄ (%) total	CO ₂ (%) total	O ₂ (%) total	Static pressure (in H ₂ O)	Pump Run Time (sec)	Baro Pressure (in Hg)	Purge Data/Notes
1517	M-1	15	5-15			1.9	0	3.3	20.2	0	100	30.11	
1514	M-2	15	5-15			1.9	0	5.4	17.5	0	100	30.11	
1525	M-3	15	5-15			1.9	0	4.7	17.0	0	100	30.11	
1530	M-4	8	3-8			1.1	0	6.0	11.3	0	100	30.11	
1835	M-5	15	5-15			1.9	0.9	4.7	15.3	0	100		~1 ft water pumped in 1st trip mount, 100 min to 11 of well also uct
1508	M-6	24	10-24			0.2	0	5.0	13.4	0	100	30.11	
1507	M-7	8	3-8			0.1	0	3.9	18.3	0	100	30.11	
1458	M-8	8	3-8			0.2	0	4.4	17.8	0	100	30.11	
1452	M-9	20	10-20			0.3	0	4.2	11.2	0	100	30.11	
1552	V-1						3.0	7.5	7.2	-	100	30.11	
1548	V-2						0.4	1.6	21.1	-	100	30.11	
1545	V-3						6.1	11.8	1.7	-	100	30.11	
1541	V-4						3.2	9.9	5.6	-	100	30.11	

*Purge volume is the number of strokes required for purging 1 casing volume using a 6 liter bilge pump.
bgs = below ground surface; bloc = below top of casing

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: 15

Sampling Event: 2018 Q4

Sample #: _____

Project Number: JS0903
 Project Name: Carnation Landfill
 Project Address: NE 24th St & 328th Ave NE
 Client Name: City of Carnation
 Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical
 Chain-of-Custody (yes/no): yes
 Shipment Method: _____

Date: 12/12/2018
 Location: Carnation Landfill
 Sampled By: TH
 Purged By: _____
 Date Sent to Lab: _____
 Field CC Sample Number: _____
 Sample Split: _____

Depth to Water (feet): 33.11 ft Purge Volume Measurement Method: low flow
 Depth of Well (feet): _____ Purge Date/Time: _____
 Reference Point (surveyors notch, etc.): Black MP on Casing Purging Equipment: dedicated DC Purge pump
 Sampling Equipment: dedicated DC Purge pump Water Level Probe Used: _____
 Casing Volume Constants (CVC): 2-inch = 0.16 gpf ; 4-inch = 0.656 gpf ; 6-inch = 1.47 gpf $PV = (\pi r^2 h) (7.48 \text{ gal/ft}^3)$
 Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC ($\mu\text{mhos/cm 25 c}$)	Temp. (C)	TURBIDITY (visual)	DO	ORP
9:17	0.5	6.55	.274 / ~~1.148~~	10.63	Clear	3.77	73.9
9:19	0.75	6.50	.290 / ~~1.82~~	10.70	Clear	2.57	74.5
9:21	1.00	6.46	.238 / ~~1.74~~	11.01	Clear	2.18	76.3
9:22	1.25	6.42	.231 / ~~1.70~~	11.15	Clear	2.07	78.3
9:24	1.50	6.39	.228	11.35	Clear	2.06	80.6
9:26	1.75	6.35	.228	11.43	Clear	2.03	82.9
9:28	2.00	6.33	.228	11.50	Clear	1.99	85.9
9:30	2.25	6.30	.229	11.56	Clear	1.93	87.9
9:32	2.50	6.28	.230	11.58	Clear	1.87	89.6

Well Integrity: 9:33	2.75	6.27	.230	11.59	Clear	1.83	90.9

Bottle Inventory				Day/Time Sampled:	
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:	
3	VOA	HCl	none	8260 VOCs	
2	VOA	none	none	8260 SIM-VOCs	
1	500 mL HDPE	HNO3	0.45 um	Field Filtered As, Mn, Fe	
1	500 mL Amber	HCl	none	Ferrous Iron (Fe2+)	
1	Small OJ	none	none	NO3, SO4	
1	Small OJ	none	none	Alkalinity	

Signature: _____

Page _____ of _____

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: NW-1D

Sampling Event: 2018 Q4

Sample #: _____

Project Number: JS0903	Date: 12/12/2018
Project Name: Carnation Landfill	Location: Carnation Landfill
Project Address: NE 24th St & 328th Ave NE	Sampled By: <u>JDMD</u>
Client Name: City of Carnation	Purged By: _____
Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical	Date Sent to Lab: _____
Chain-of-Custody (yes/no): <u>yes</u>	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): 32.99 Purge Volume Measurement Method: low flow

Depth of Well (feet): _____ Purge Date/Time: _____

Reference Point (surveyors notch, etc.): Black MP on Casing Purging Equipment: dedicated DC Purge pump

Sampling Equipment: dedicated DC Purge pump Water Level Probe Used: _____

Casing Volume Constants (CVC): 2-inch = **0.16** gpf ; 4-inch = **0.656** gpf ; 6-inch = **1.47** gpf $PV = (\pi r^2 h) (7.48 \text{ gal/ft}^3)$

Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons

Q ≈ 300 ml/min

YSI meter 64440. Questioning DO/ORP calibration after sample after sampled hooked up other meter

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)	DO	ORP
918	0.5	6.72	234	7.98	clay	10.88	129.4
923	0.75	6.70	199	8.10		10.26	118.3
933	1.5	6.70	185	8.66	clr	5.43	113
938	2.0	6.72	178	9.37		5.31	116
941	2.25	6.71	176	9.44		5.12	119
945	2.5	6.71	176	9.46		5.10	121.4
958		6.73	176	9.46		5.35	126.3
1001		6.49	136	11.75		3.64	51.4

Well Integrity:

- using rental YSI DO/ORP pH/EC/T meters from field enviro
- early purge H2S smell

Bottle Inventory

Day/Time Sampled: 945, 12-12-18

Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
3	VOA	HCl	none	8260 VOCs
2	VOA	none	none	8260 SIM-VOCs
1	500 mL HDPE	HNO3	0.45 um	Field Filtered As, Mn, Fe
1	500 mL Amber	HCl	none	Ferrous Iron (Fe2+)
1	Small OJ	none	none	NO3, SO4
1	Small OJ	none	none	Alkalinity

Signature: _____

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GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: 25

Sampling Event: 2018 Q4

Sample #: _____

Project Number: JS0903	Date: <u>12/12/2018</u>
Project Name: <u>Carnation Landfill</u>	Location: <u>Carnation Landfill</u>
Project Address: <u>NE 24th St & 328th Ave NE</u>	Sampled By: <u>JH</u>
Client Name: <u>City of Carnation</u>	Purged By: _____
Laboratory: <u>Analytical Resources, Inc. (ARI); Edge Analytical</u>	Date Sent to Lab: _____
Chain-of-Custody (yes/no): <u>yes</u>	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): <u>28.75</u>	Purge Volume Measurement Method: <u>low flow</u>
Depth of Well (feet): _____	Purge Date/Time: _____
Reference Point (surveyors notch, etc.): <u>Black MP on Casing</u>	Purging Equipment: <u>dedicated DC Purge pump</u>
Sampling Equipment: <u>dedicated DC Purge pump</u>	Water Level Probe Used: _____
Casing Volume Constants (CVC): 2-inch = <u>0.16</u> gpf ; 4-inch = <u>0.656</u> gpf ; 6-inch = <u>1.47</u> gpf	
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons	

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC ($\mu\text{mhos/cm}$ 25 c)	Temp. (C)	TURBIDITY (visual)	DO	ORP
<u>11:20</u>	<u>0.5</u>	<u>5.37</u>	<u>0.066</u>	<u>11.17</u>	<u>Clear</u>	<u>1.04</u>	<u>64.5</u>
<u>11:24</u>	<u>1.0</u>	<u>5.21</u>	<u>0.058</u>	<u>11.57</u>	<u>Clear</u>	<u>0.56</u>	<u>77.4</u>
<u>11:28</u>	<u>1.5</u>	<u>5.16</u>	<u>0.055</u>	<u>11.76</u>	<u>Clear</u>	<u>0.40</u>	<u>87.1</u>
<u>11:32</u>	<u>2.0</u>	<u>5.14</u>	<u>0.054</u>	<u>11.85</u>	<u>Clear</u>	<u>0.29</u>	<u>94.0</u>
<u>11:34</u>	<u>2.25</u>	<u>5.14</u>	<u>0.054</u>	<u>11.87</u>	<u>Clear</u>	<u>0.30</u>	<u>96.2</u>
<u>11:35</u>	<u>2.50</u>	<u>5.13</u>	<u>0.054</u>	<u>11.87</u>	<u>Clear</u>	<u>0.30</u>	<u>98.3</u>
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

Well Integrity:

- black particulate (root matter) in ~5 min of purge
- water trickling into adjacent infiltration basin today

Bottle Inventory

Day/Time Sampled: 11:35am 12-12-18

Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
<u>3</u>	<u>VOA</u>	<u>HCl</u>	<u>none</u>	<u>8260 VOCs</u>
<u>2</u>	<u>VOA</u>	<u>none</u>	<u>none</u>	<u>8260 SIM-VOCs</u>
<u>1</u>	<u>500 mL HDPE</u>	<u>HNO3</u>	<u>0.45 um</u>	<u>Field Filtered As, Mn, Fe</u>
<u>1</u>	<u>500 mL Amber</u>	<u>HCl</u>	<u>none</u>	<u>Ferrous Iron (Fe2+)</u>
<u>1</u>	<u>Small OJ</u>	<u>none</u>	<u>none</u>	<u>NO3, SO4</u>
<u>1</u>	<u>Small OJ</u>	<u>none</u>	<u>none</u>	<u>Alkalinity</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Signature: _____

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Trevor
Hankinson

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW-2D

Sampling Event: 2018 Q4

Sample #: _____

Project Number: JS0903	Date: 12/12/2018
Project Name: Carnation Landfill	Location: Carnation Landfill
Project Address: NE 24th St & 328th Ave NE	Sampled By: <u>JGMD</u>
Client Name: City of Carnation	Purged By: _____
Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical	Date Sent to Lab: _____
Chain-of-Custody (yes/no): <u>yes</u>	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): 36.48 Purge Volume Measurement Method: low flow

Depth of Well (feet): _____ Purge Date/Time: 50mp

Reference Point (surveyors notch, etc.): Black MP on Casing Purging Equipment: dedicated DC Purge pump

Sampling Equipment: dedicated DC Purge pump Water Level Probe Used: YSI 6440

Casing Volume Constants (CVC): 2-inch = **0.16** gpf ; 4-inch = **0.656** gpf ; 6-inch = **1.47** gpf PV = ($\pi r^2 h$) (7.48 gal/ft³)

Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)	<u>1st 1/2 gal</u> D0	<u>total</u> ORP
1123	1	6.25	308	9.25	sl cldy	0.89	39.1
1128	2	6.26	308	9.52	11	0.83	34.8
1130	2.25	6.25	307	9.58	11	0.81	34.2
1134	2.75	6.25	304	9.61	11	0.89	33.3
1155		5.94	230	10.96		0.72	101.8

Well Integrity:

MW-65! DTW 32.19, TD = 32.4 + .29 = 0.5' water present, not enough to sample 12/12/18

Bottle Inventory				Day/Time Sampled: 1140 ; 1145 for MW-22D
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
3	VOA	HCl	none	8260 VOCs
2	VOA	none	none	8260 SIM-VOCs
1	500 mL HDPE	HNO3	0.45 um	Field Filtered As, Mn, Fe
1	500 mL Amber	HCl	none	Ferrous Iron (Fe2+)
1	Small OJ	none	none	NO3, SO4
1	Small OJ	none	none	Alkalinity

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW-35

Sampling Event: 2018 Q4

Sample #: _____

Project Number: JS0903	Date: 12/12/2018
Project Name: Carnation Landfill	Location: Carnation Landfill
Project Address: NE 24th St & 328th Ave NE	Sampled By: <u>JDMP</u>
Client Name: City of Carnation	Purged By: _____
Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical	Date Sent to Lab: _____
Chain-of-Custody (yes/no): <u>yes</u>	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): <u>22.64</u>	Purge Volume Measurement Method: <u>low flow</u>
Depth of Well (feet): _____	Purge Date/Time: _____
Reference Point (surveyors notch, etc.): <u>Black MP on Casing</u>	Purging Equipment: <u>dedicated DC Purge pump</u>
Sampling Equipment: <u>dedicated DC Purge pump</u>	Water Level Probe Used: <u>YSI model 64440</u>
Casing Volume Constants (CVC): 2-inch = 0.16 gpf ; 4-inch = 0.656 gpf ; 6-inch = 1.47 gpf	
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons	

Q = 1.4/min

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)	DO	ORP
1023	1	6.27	159	8.22	clr	2.40	-64.0
1031	3	6.25	156	8.37	clr	2.38	49.6
1035	4	6.24	152	8.38	clr	2.60	47.1
1039	5	6.23	148	8.38	clr	2.52	45.6
→ after sample measurement with other YSI							
		5.96	91	10.35	clr	1.40	49.8

Well Integrity: _____

MS/MSD volume collected

Bottle Inventory				Day/Time Sampled: <u>1035, 12-12-18</u>
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
3	VOA	HCl	none	8260 VOCs
2	VOA	none	none	8260 SIM-VOCs
1	500 mL HDPE	HNO3	0.45 um	Field Filtered As, Mn, Fe
x2 1	500 mL Amber	HCl	none	Ferrous Iron (Fe2+)
1	Small OJ	none	none	NO3, SO4
1	Small OJ	none	none	Alkalinity

Signature: _____

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GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: 3D

Sampling Event: 2018 Q4

Sample #: _____

Project Number: JS0903	Date: 12/12/2018
Project Name: Carnation Landfill	Location: Carnation Landfill
Project Address: NE 24th St & 328th Ave NE	Sampled By: TH
Client Name: City of Carnation	Purged By: _____
Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical	Date Sent to Lab: _____
Chain-of-Custody (yes/no): yes	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): 21.38	Purge Volume Measurement Method: low flow
Depth of Well (feet): _____	Purge Date/Time: _____
Reference Point (surveyors notch, etc.): Black MP on Casing	Purging Equipment: dedicated DC Purge pump
Sampling Equipment: dedicated DC Purge pump	Water Level Probe Used: _____
Casing Volume Constants (CVC): 2-inch = 0.16 gpf ; 4-inch = 0.656 gpf ; 6-inch = 1.47 gpf $PV = (\pi r^2 h) (7.48 \text{ gal/ft}^3)$	
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons	

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	mS EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)	DO	ORP
10:26	0.5	6.65	.126	9.60	cloudy	3.46	1.8
10:29	0.75	6.67	.126	9.67	cloudy	4.16	5.6
10:32	1.00	6.65	.127	9.88	cloudy	4.29	19.8
10:35	1.25	6.66	.126	10.24	clear	4.52	29.9
10:37	1.50	6.69	.126	10.71	clear	4.45	34.0
10:39	1.75	6.69	.126	10.75	clear	4.14	38.3
10:41	2.00	6.70	.126	10.66	clear	4.14	41.9
10:43	2.25	6.70	.126	10.59	clear	4.12	44.4
10:45	2.50	6.71	.127	10.53	clear	4.25	47.9

Well Integrity: _____

Bottle Inventory				Day/Time Sampled: 10:40 12/12/18
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
3	VOA	HCl	none	8260 VOCs
2	VOA	none	none	8260 SIM-VOCs
1	500 mL HDPE	HNO3	0.45 um	Field Filtered As, Mn, Fe
1	500 mL Amber	HCl	none	Ferrous Iron (Fe2+)
1	Small OJ	none	none	NO3, SO4
1	Small OJ	none	none	Alkalinity

Signature: _____

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GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: 50

Sampling Event: 2018 Q4

Sample #: _____

Project Number: JS0903	Date: 12/12/2018
Project Name: Carnation Landfill	Location: Carnation Landfill
Project Address: NE 24th St & 328th Ave NE	Sampled By: <u>TH</u>
Client Name: City of Carnation	Purged By: _____
Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical	Date Sent to Lab: _____
Chain-of-Custody (yes/no): <u>yes</u>	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): <u>31.82</u>	Purge Volume Measurement Method: <u>low flow</u>
Depth of Well (feet): _____	Purge Date/Time: _____
Reference Point (surveyors notch, etc.): <u>Black MP on Casing</u>	Purging Equipment: <u>dedicated DC Purge pump</u>
Sampling Equipment: <u>dedicated DC Purge pump</u>	Water Level Probe Used: _____
Casing Volume Constants (CVC): 2-inch = <u>0.16</u> gpf ; 4-inch = <u>0.656</u> gpf ; 6-inch = <u>1.47</u> gpf	
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons	

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	MS EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)	DO	ORP
<u>1411</u>	<u>0.75</u>	<u>6.75</u>	<u>0.129</u>	<u>10.81</u>	<u>Clear</u>	<u>1.40</u>	<u>-13.3</u>
<u>1413</u>	<u>1.25</u>	<u>6.56</u>	<u>0.126</u>	<u>11.00</u>	<u>Clear</u>	<u>1.50</u>	<u>-1.0</u>
<u>1415</u>	<u>1.75</u>	<u>6.51</u>	<u>0.126</u>	<u>11.07</u>	<u>Clear</u>	<u>1.47</u>	<u>6.3</u>
<u>1417</u>	<u>2.25</u>	<u>6.48</u>	<u>0.125</u>	<u>11.11</u>	<u>Clear</u>	<u>1.47</u>	<u>13.3</u>
<u>1418</u>	<u>2.75</u>	<u>6.47</u>	<u>0.125</u>	<u>11.13</u>	<u>Clear</u>	<u>1.49</u>	<u>17.3</u>
<u>1420</u>	<u>3.25</u>	<u>6.46</u>	<u>0.125</u>	<u>11.14</u>	<u>Clear</u>	<u>1.47</u>	<u>22.0</u>
<u>1422</u>	<u>3.75</u>	<u>6.46</u>	<u>0.126</u>	<u>11.15</u>	<u>Clear</u>	<u>1.50</u>	<u>25.8</u>
<u>1424</u>	<u>4.25</u>	<u>6.45</u>	<u>0.125</u>	<u>11.15</u>	<u>Clear</u>	<u>1.48</u>	<u>28.5</u>
<u>1425</u>	<u>4.75</u>	<u>6.45</u>	<u>0.126</u>	<u>11.15</u>	<u>Clear</u>	<u>1.52</u>	<u>30.9</u>

Well Integrity: <u>5.00</u>	<u>6.45</u>	<u>0.126</u>	<u>11.16</u>	<u>Clear</u>	<u>1.50</u>	<u>32.4</u>
<u>1427</u>						

Bottle Inventory				Day/Time Sampled: <u>1420 12-12-18</u>
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
<u>3</u>	<u>VOA</u>	<u>HCl</u>	<u>none</u>	<u>8260 VOCs</u>
<u>2</u>	<u>VOA</u>	<u>none</u>	<u>none</u>	<u>8260 SIM-VOCs</u>
<u>1</u>	<u>500 mL HDPE</u>	<u>HNO3</u>	<u>0.45 um</u>	<u>Field Filtered As, Mn, Fe</u>
<u>1</u>	<u>500 mL Amber</u>	<u>HCl</u>	<u>none</u>	<u>Ferrous Iron (Fe2+)</u>
<u>1</u>	<u>Small OJ</u>	<u>none</u>	<u>none</u>	<u>NO3, SO4</u>
<u>1</u>	<u>Small OJ</u>	<u>none</u>	<u>none</u>	<u>Alkalinity</u>

Signature: _____

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GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW-55

Sampling Event: 2018 Q4

Sample #: _____

Project Number: JS0903 Date: 12/12/2018
 Project Name: Carnation Landfill Location: Carnation Landfill
 Project Address: NE 24th St & 328th Ave NE Sampled By: _____
 Client Name: City of Carnation Purged By: _____
 Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical Date Sent to Lab: _____
 Chain-of-Custody (yes/no): yes Field CC Sample Number: _____
 Shipment Method: _____ Sample Split: _____

Depth to Water (feet): 22.82 Purge Volume Measurement Method: low flow
 Depth of Well (feet): 24.86 Purge Date/Time: _____
 Reference Point (surveyors notch, etc.): Black MP on Casing Purging Equipment: dedicated DC Purge pump
 Sampling Equipment: dedicated DC Purge pump Water Level Probe Used: used other YSI for field purging
 Casing Volume Constants (CVC): 2-inch = 0.16 gpf ; 4-inch = 0.656 gpf ; 6-inch = 1.47 gpf $PV = (\pi r^2 h) (7.48 \text{ gal/ft}^3)$
 Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)	DO	ORP
<u>845</u>	<u>0.5</u>	<u>7.40</u>	<u>284/</u>	<u>12.09</u>	<u>clr</u>	<u>5.22</u>	<u>24.4</u>
<u>848</u>	<u>0.75</u>	<u>7.15</u>	<u>287/</u>	<u>12.15</u>		<u>5.38</u>	<u>24.9</u>
	<u>-dry-</u>						

Well Integrity: pump died, had to use backup PGG sampling pump

returned to sample @ 1415

Bottle Inventory

Day/Time Sampled: 1415 12-12-18

Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
<u>2</u>	<u>VOA</u>	<u>HCl</u>	<u>none</u>	<u>8260 VOCs</u>
<u>2</u>	<u>VOA</u>	<u>none</u>	<u>none</u>	<u>8260 SIM-VOCs</u>
<u>1</u>	<u>500 mL HDPE</u>	<u>HNO3</u>	<u>0.45 um</u>	<u>Field Filtered As, Mn, Fe</u>
<u>1</u>	<u>500 mL Amber</u>	<u>HCl</u>	<u>none</u>	<u>Ferrous Iron (Fe2+)</u>
<u>1</u>	<u>Small OJ</u>	<u>none</u>	<u>none</u>	<u>NO3, SO4</u>
<u>1</u>	<u>Small OJ</u>	<u>none</u>	<u>none</u>	<u>Alkalinity</u>

went dry, unable to sample 8260 & FF metals

Signature: _____

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GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: 6D

Sampling Event: 2018 Q4

Sample #: _____

Project Number: JS0903	Date: 12/12/2018
Project Name: Carnation Landfill	Location: Carnation Landfill
Project Address: NE 24th St & 328th Ave NE	Sampled By: <u>T H</u>
Client Name: City of Carnation	Purged By: _____
Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical	Date Sent to Lab: _____
Chain-of-Custody (yes/no): <u>yes</u>	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): <u>40.75</u>	Purge Volume Measurement Method: <u>low flow</u>
Depth of Well (feet): _____	Purge Date/Time: _____
Reference Point (surveyors notch, etc.): <u>Black MP on Casing</u>	Purging Equipment: <u>dedicated DC Purge pump</u>
Sampling Equipment: <u>dedicated DC Purge pump</u>	Water Level Probe Used: _____
Casing Volume Constants (CVC): 2-inch = 0.16 gpf ; 4-inch = 0.656 gpf ; 6-inch = 1.47 gpf	
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons	

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (μ S/cm 25 c)	Temp. (C)	TURBIDITY (visual)	DO	ORP
<u>1229</u>	<u>0.75</u>	<u>6.96</u>	<u>.140</u>	<u>10.57</u>	<u>Clear</u>	<u>1.45</u>	<u>36.5</u>
<u>1232</u>	<u>1.25</u>	<u>6.97</u>	<u>.137</u>	<u>10.99</u>	<u>Clear</u>	<u>0.33</u>	<u>13.0</u>
<u>1236</u>	<u>1.75</u>	<u>6.95</u>	<u>.136</u>	<u>11.19</u>	<u>Clear</u>	<u>0.29</u>	<u>4.5</u>
<u>1238</u>	<u>2.00</u>	<u>6.95</u>	<u>.136</u>	<u>11.24</u>	<u>Clear</u>	<u>0.27</u>	<u>2.5</u>
<u>1240</u>	<u>2.25</u>	<u>6.94</u>	<u>.135</u>	<u>11.31</u>	<u>Clear</u>	<u>0.19</u>	<u>-4.8</u>
<u>1242</u>	<u>2.50</u>	<u>6.94</u>	<u>.136</u>	<u>11.34</u>	<u>Clear</u>	<u>0.17</u>	<u>-6.6</u>
<u>1244</u>	<u>2.75</u>	<u>6.93</u>	<u>.135</u>	<u>11.37</u>	<u>Clear</u>	<u>0.19</u>	<u>-10.7</u>
<u>1246</u>	<u>3.00</u>	<u>6.94</u>	<u>.135</u>	<u>11.38</u>	<u>Clear</u>	<u>0.16</u>	<u>-12.1</u>
<u>1248</u>	<u>3.25</u>	<u>6.94</u>	<u>.135</u>	<u>11.39</u>	<u>Clear</u>	<u>0.17</u>	<u>-14.9</u>
Well Integrity:							
<u>1250</u>	<u>3.50</u>	<u>6.94</u>	<u>.135</u>	<u>11.39</u>	<u>Clear</u>	<u>0.17</u>	<u>-15.4</u>
<u>1252</u>	<u>3.75</u>	<u>6.94</u>	<u>.135</u>	<u>11.41</u>	<u>Clear</u>	<u>0.18</u>	<u>-15.4</u>
<u>1300</u>							

Bottle Inventory				Day/Time Sampled:
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
3	VOA	HCl	none	8260 VOCs
2	VOA	none	none	8260 SIM-VOCs
1	500 mL HDPE	HNO3	0.45 μ m	Field Filtered As, Mn, Fe
1	500 mL Amber	HCl	none	Ferrous Iron (Fe2+)
1	Small OJ	none	none	NO3, SO4
1	Small OJ	none	none	Alkalinity

Signature: _____

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GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW-7D

Sampling Event: 2018 Q4

Sample #: _____

Project Number: JS0903	Date: 12/12/2018
Project Name: Carnation Landfill	Location: Carnation Landfill
Project Address: NE 24th St & 328th Ave NE	Sampled By: JGMB
Client Name: City of Carnation	Purged By: _____
Laboratory: Analytical Resources, Inc. (ARI); Edge Analytical	Date Sent to Lab: _____
Chain-of-Custody (yes/no): yes	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): <u>35.19</u>	Purge Volume Measurement Method: <u>low flow</u>
Depth of Well (feet): _____	Purge Date/Time: _____
Reference Point (surveyors notch, etc.): <u>Black MP on Casing</u>	Purging Equipment: <u>dedicated DC Purge pump</u>
Sampling Equipment: <u>dedicated DC Purge pump</u>	Water Level Probe Used: _____
Casing Volume Constants (CVC): 2-inch = 0.16 gpf ; 4-inch = 0.656 gpf ; 6-inch = 1.47 gpf PV=($\pi r^2 h$) (7.48 gal/ft³)	
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons	

Q ≈ 500 mL/min

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)	DO	ORP
1241	0.1	6.07	141	9.37	cldy-orange	2.18	41.2
1245	1.5	6.03	137	9.73	sl cldy	2.23	52.2
1247	1.75	6.02	136	9.79	✓	2.29	56.1
1249	2	6.02	136	9.87	✓	2.28	60.7
1251	2.25	6.01	136	9.88	✓	2.37	64.3
1253	2.5	6.01	135	9.89	clr	2.23	67.0
1255	2.75	6.01	135	9.91	✓	2.20	61.4

Well Integrity:

-initial purge water has H₂S odor

Bottle Inventory

Day/Time Sampled: 1255 12-12-18

Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
3	VOA	HCl	none	8260 VOCs
2	VOA	none	none	8260 SIM-VOCs
1	500 mL HDPE	HNO ₃	0.45 um	Field Filtered As, Mn, Fe
1	500 mL Amber	HCl	none	Ferrous Iron (Fe ²⁺)
1	Small OJ	none	none	NO ₃ , SO ₄
1	Small OJ	none	none	Alkalinity

Signature: _____

Page _____ of _____

GROUNDWATER SAMPLING FIELD DATA SHEET

Well #: MW-8D

Sample #: _____

Sampling Event: 2018 Q4

Project Number: <u>JS0903</u>	Date: <u>12/12/2018</u>
Project Name: <u>Carnation Landfill</u>	Location: <u>Carnation Landfill</u>
Project Address: <u>NE 24th St & 328th Ave NE</u>	Sampled By: <u>Tomp</u>
Client Name: <u>City of Carnation</u>	Purged By: _____
Laboratory: <u>Analytical Resources, Inc. (ARI); Edge Analytical</u>	Date Sent to Lab: _____
Chain-of-Custody (yes/no): <u>yes</u>	Field CC Sample Number: _____
Shipment Method: _____	Sample Split: _____

Depth to Water (feet): <u>113.30</u>	Purge Volume Measurement Method: <u>low flow</u>
Depth of Well (feet): _____	Purge Date/Time: _____
Reference Point (surveyors notch, etc.): <u>Black MP on Casing</u>	Purging Equipment: <u>dedicated DC Purge pump</u>
Sampling Equipment: <u>dedicated DC Purge pump</u>	Water Level Probe Used: <u>ysi 64440</u>
Casing Volume Constants (CVC): 2-inch = 0.16 gpf ; 4-inch = 0.656 gpf ; 6-inch = 1.47 gpf $PV = (\pi r^2 h) (7.48 \text{ gal/ft}^3)$	
Purge Volume = ft of water _____ x CVC _____ x Casing Volumes _____ = _____ gallons	

Q = 600 ml/min

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	pH (units)	EC (umhos/cm 25 c)	Temp. (C)	TURBIDITY (visual)	DO	ORP
1334	1.25	6.47	209	9.60	cldy	1.92	89.9
1337	1.75	6.49	210	9.80	slidy	1.90	87.9
1339	2	6.49	210	9.809	' '	1.90	87.9
1341	2.25	6.49	209	9.85	sl cldy	2.16	88.1
1343	2.5	6.48	208	9.96	' '	2.05	88.4
1345	2.75	6.48	208	9.99	' '	2.22	88.9

Well Integrity: _____

Bottle Inventory				Day/Time Sampled: <u>1350, 12-12-18</u>
Quantity:	Container:	Preservatives:	Filtered (type):	Remarks:
3	VOA	HCl	none	8260 VOCs
2	VOA	none	none	8260 SIM-VOCs
1	500 mL HDPE	HNO3	0.45 um	Field Filtered As, Mn, Fe
1	500 mL Amber	HCl	none	Ferrous Iron (Fe2+)
1	Small OJ	none	none	NO3, SO4
1	Small OJ	none	none	Alkalinity

Signature: _____

Page _____ of _____



Burlington, WA	Corporate Laboratory (a)	1620 S Walnut St.	Burlington, WA 98233	800.755.9295 • 360.757.1400
Bellingham, WA	Microbiology (b)	805 Orchard Dr Ste 4	Bellingham, WA 98225	360.715.1212
Portland, OR	Microbiology/Chemistry (c)	9150 SW Pioneer Ct Ste W	Wilsonville, OR 97070	503.682.7802
Corvallis, OR	Microbiology (d)	540 SW Third Street	Corvallis, OR 97333	541.753.4946

January 16, 2019

Page 1 of 1

Glenn Mutti
Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102
RE: 18-46479 - Carnation Landfill

Dear Glenn Mutti,

Your project: Carnation Landfill, was received on Friday December 14, 2018.

All samples were analyzed within the accepted holding times and were appropriately preserved and analyzed according to approved analytical protocols, unless noted in the data or QC reports. The quality control data was within laboratory acceptance limits, unless specified in the data or QC reports.

If you have questions phone us at 800 755-9295.

Respectfully

A handwritten signature in blue ink that reads "Pat Miller". The signature is fluid and cursive, with a long horizontal stroke at the end.

Patrick Miller, MS
QA Officer

Enclosures: Data Report

Chain of Custody / Analysis Request

(Please complete all applicable shaded sections)

30281

Report to:	Pacific Groundwater Group	Bill to:	Pacific Groundwater Group
Ship Address:	2377 Eastlake Ave E	Address:	2377 Eastlake Avenue E
City:	Seattle	City:	Seattle
Attn:	Glenn Mutti	Phone:	
Phone:	206-329-0141	FAX:	
FAX:	206-329-6968	P.O. #:	
Email:	glenn.mutti@pvg.com	Attn:	
Project:	Canastota Landfill	Card#:	
		Visa	☐
		MC	☐
		A/E	☐
		Expires	/
		Other	☒

18-46479

95061 - 95072

Check Regulatory Program

☐ Safe Drinking Water Act☐ Clean Water Act☐ RCRA / CERCLA☒ Other

ANALYTICAL

Main Lab (800-755-9295)

1620 South Walnut St. Burlington, WA 98233

Microbiology (888-725-1212)

805 W. Orchard Dr. Suite 4 Bellingham, WA 98225

Wilsonville Lab (503-662-7802)

8150 SW Pioneer Ct. Suite W Wilsonville, OR 97070

Corvallis Lab (541-753-4946)

540 SW 3rd St. Corvallis, OR 97333

Instructions

1. Use one line per sample Location.
2. Be specific in analysis requests.
3. (NEW) List each metal individually (NEW)
4. Check off analyses to be performed for each sample Location.
5. Enter number of containers.

Turn Around Time Required

☐ Standard☐ Half-time (50% surcharge)☐ Quickest (100% surcharge) Phone Call Req.☐ Emergency (Phone Call Req.)

Analyses Requested

Field ID	Location	Grab/ Comp.	Sample Matrix *	Date	Time	8260 SIM	Trip Field Blanks SIMS	Number of Containers	Special Instructions Conditions on Receipt
1	MW-1S								
2	MW-1D								
3	MW-3S *								
4	MW-3D								
5	MW-2S								
6	MW-2D								
7	MW-22D								
8	MW-6D								
9	MW-7D								
10	MW-8D								

Field ID	Location	Grab/ Comp.	Sample Matrix *	Date	Time	8260 SIM	Trip Field Blanks SIMS	Number of Containers	Special Instructions Conditions on Receipt
1	MW-1S								
2	MW-1D								
3	MW-3S *								
4	MW-3D								
5	MW-2S								
6	MW-2D								
7	MW-22D								
8	MW-6D								
9	MW-7D								
10	MW-8D								

Sampled by: JGMD

Phone: 206-329-0141

FAX: 206-329-6968

Email: glenn.mutti@pvg.com

23 Total Containers

Relinquished by

Date

Time

Received by

Date

Time

Custody seals intact

Yes No N/A

Sample Receipt Request (Must include FAX or Email)

Date

Time

Received by

Date

Time

Custody seals intact

Yes No N/A

Sample temp 5 C satisfactory

Date

Time

Received by

Date

Time

Custody seals intact

Yes No N/A

Samples received intact

Date

Time

Received by

Date

Time

Custody seals intact

Yes No N/A

Chain of custody & labels agree

Date

Time

Received by

Date

Time

Custody seals intact

Yes No N/A



CO030281

(Please complete all applicable shaded sections)



Main Lab (800-755-9295)

1620 South Walnut St. Burlington, WA 98233

Microbiology (888-725-1212)

805 W. Orchard Dr. Suite 4 Bellingham, WA 98225

Wilsonville Lab (503-682-7802)

9150 SW Pioneer Ct. Suite W Wilsonville, OR 97070

Corvallis Lab (541-753-4946)

540 SW 3rd St. Corvallis, OR 97333

20332 Empire Ave Ste F4, Bend, OR 97703

ANALYTICAL
Main Lab (800-755-9295)
1620 South Walnut St. Burlington, WA 98233
Microbiology (888-725-1212)
Orchard Dr. Suite 4 Bellingham, WA 98225
Wilsonville Lab (503-682-7802)
9150 SW Pioneer Ct. Suite W Wilsonville, OR 97070
Corvallis Lab (541-753-9946)
540 SW 3rd St. Corvallis, OR 97333
Bend Lab (541-639-8425)
20332 Emvies Ave. Suite E-3 Bend, OR 97703

Analyses Requested

- Turn Around Time Required**
- ☐ Standard
- ☐ Half-time (50% surcharge)
- ☐ Quickest (100% surcharge) Phone Call Req.
- ☐ Emergency (Phone Call Req.)

INSTRUCTIONS						Turn Around Time Required						Special Instructions Conditions on Receipt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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1 MW-SS	Carnation Landfill	G	GW	12.12.18	1415	☒																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

Yes ☐ No ☐ N/A ☒

Sample temp 5.8 C satisfactory

UPS 12/14/18 0915

Samples received intact

Chain of custody & labels agree



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Bellingham, WA Microbiology (b)
805 Orchard Dr Ste 4 - Bellingham, WA 98225 - 360.715.1212

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9150 SW Pioneer Ct Ste W - Wilsonville, OR 97070 - 503.682.7802

Corvallis, OR Microbiology/Chemistry (d)
540 SW Third Street - Corvallis, OR 97333 - 541.753.4946

Bend, OR Microbiology (e)
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541.639.8425

WSDOE Lab C567

DATA REPORT

Page 1 of 1

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-46479**
Project: Carnation Landfill

Lab Number: 95061
Field ID: MW-1S
Sample Description: Carnation Landfill
Matrix: Water
Sample Date: 12/12/18
Extraction Date: 12/18/18
Extraction Method: 5030B

Report Date: 1/16/19
Date Analyzed: 12/18/18
Analyst: HY
Analytical Method: 8260SIM
Batch: SIM_181218
Approved By: pdm

Authorized by:


Patrick Miller, MS
QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
	Volatile Organic Compounds									
75-01-4	VINYL CHLORIDE (SIM)	ND		ug/L	0.01	0.01	0.0059	1.00	a	
107-13-1	ACRYLONITRILE (SIM)	ND		ug/L	0.05	0.05	0.0125	1.00	a	
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	0.01	0.01	0.0069	1.00	a	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	0.04	0.04		1.00	a	

Notes:

Flags are data qualifiers. If there are data qualifiers on your report definitions can be found on an accompanying sheet.

ND - indicates the compound was not detected above the PQL or MDL.

Lab QL = Laboratory Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

Permit QL = Quantitation Limit required by permit (listed in Appendix A) or other regulatory requirement.

D.F. - Dilution Factor.

If you have any questions concerning this report contact us at the above phone number.

Form: c608.rpt



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Corvallis, OR Microbiology/Chemistry (d)
540 SW Third Street - Corvallis, OR 97333 - 541.753.4946

Bend, OR Microbiology (e)
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541.639.8425

WSDOE Lab C567

DATA REPORT

Page 1 of 1

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-46479**
Project: Carnation Landfill

Lab Number: 95062
Field ID: MW-1D
Sample Description: Carnation Landfill
Matrix: Water
Sample Date: 12/12/18
Extraction Date: 12/18/18
Extraction Method: 5030B

Report Date: 1/16/19
Date Analyzed: 12/18/18
Analyst: HY
Analytical Method: 8260SIM
Batch: SIM_181218
Approved By: pdm

Authorized by:


Patrick Miller, MS
QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
	Volatile Organic Compounds									
75-01-4	VINYL CHLORIDE (SIM)	ND		ug/L	0.01	0.01	0.0059	1.00	a	
107-13-1	ACRYLONITRILE (SIM)	ND		ug/L	0.05	0.05	0.0125	1.00	a	
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	0.01	0.01	0.0069	1.00	a	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	0.04	0.04		1.00	a	

Notes:

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Form: c608.rpt



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540 SW Third Street - Corvallis, OR 97333 - 541.753.4946

Bend, OR Microbiology (e)
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541.639.8425

WSDOE Lab C567

DATA REPORT

Page 1 of 1

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-46479**
Project: Carnation Landfill

Lab Number: 95063
Field ID: MW-3S*
Sample Description: Carnation Landfill
Matrix: Water
Sample Date: 12/12/18
Extraction Date: 12/18/18
Extraction Method: 5030B

Report Date: 1/16/19
Date Analyzed: 12/18/18
Analyst: HY
Analytical Method: 8260SIM
Batch: SIM_181218
Approved By: pdm

Authorized by:


Patrick Miller, MS
QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
	Volatile Organic Compounds									
75-01-4	VINYL CHLORIDE (SIM)	ND		ug/L	0.01	0.01	0.0059	1.00	a	
107-13-1	ACRYLONITRILE (SIM)	ND		ug/L	0.05	0.05	0.0125	1.00	a	
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	0.01	0.01	0.0069	1.00	a	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	0.04	0.04		1.00	a	

Notes:

Flags are data qualifiers. If there are data qualifiers on your report definitions can be found on an accompanying sheet.

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540 SW Third Street - Corvallis, OR 97333 - 541.753.4946

Bend, OR Microbiology (e)
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541.639.8425

WSDOE Lab C567

DATA REPORT

Page 1 of 1

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-46479**
Project: Carnation Landfill

Lab Number: 95064
Field ID: MW-3D
Sample Description: Carnation Landfill
Matrix: Water
Sample Date: 12/12/18
Extraction Date: 12/18/18
Extraction Method: 5030B

Report Date: 1/16/19
Date Analyzed: 12/18/18
Analyst: HY
Analytical Method: 8260SIM
Batch: SIM_181218
Approved By: pdm

Authorized by:


Patrick Miller, MS
QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
	Volatile Organic Compounds									
75-01-4	VINYL CHLORIDE (SIM)	ND		ug/L	0.01	0.01	0.0059	1.00	a	
107-13-1	ACRYLONITRILE (SIM)	ND		ug/L	0.05	0.05	0.0125	1.00	a	
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	0.01	0.01	0.0069	1.00	a	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	0.04	0.04		1.00	a	

Notes:

Flags are data qualifiers. If there are data qualifiers on your report definitions can be found on an accompanying sheet.

ND - indicates the compound was not detected above the PQL or MDL.

Lab QL = Laboratory Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

Permit QL = Quantitation Limit required by permit (listed in Appendix A) or other regulatory requirement.

D.F. - Dilution Factor.

If you have any questions concerning this report contact us at the above phone number.



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Corvallis, OR Microbiology/Chemistry (d)
540 SW Third Street - Corvallis, OR 97333 - 541.753.4946

Bend, OR Microbiology (e)
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541.639.8425

WSDOE Lab C567

DATA REPORT

Page 1 of 1

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-46479**
Project: Carnation Landfill

Lab Number: 95065
Field ID: MW-2S
Sample Description: Carnation Landfill
Matrix: Water
Sample Date: 12/12/18
Extraction Date: 12/18/18
Extraction Method: 5030B

Report Date: 1/16/19
Date Analyzed: 12/18/18
Analyst: HY
Analytical Method: 8260SIM
Batch: SIM_181218
Approved By: pdm

Authorized by:


Patrick Miller, MS
QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
	Volatile Organic Compounds									
75-01-4	VINYL CHLORIDE (SIM)	ND		ug/L	0.01	0.01	0.0059	1.00	a	
107-13-1	ACRYLONITRILE (SIM)	ND		ug/L	0.05	0.05	0.0125	1.00	a	
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	0.01	0.01	0.0069	1.00	a	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	0.04	0.04		1.00	a	

Notes:

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Bend, OR *Microbiology (e)*
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WSDOE Lab C567

DATA REPORT

Page 1 of 1

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-46479**
Project: Carnation Landfill

Lab Number: 95066
Field ID: MW-2D
Sample Description: Carnation Landfill
Matrix: Water
Sample Date: 12/12/18
Extraction Date: 12/18/18
Extraction Method: 5030B

Report Date: 1/16/19
Date Analyzed: 12/18/18
Analyst: HY
Analytical Method: 8260SIM
Batch: SIM_181218
Approved By: pdm

Authorized by:


Patrick Miller, MS
QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
	Volatile Organic Compounds									
75-01-4	VINYL CHLORIDE (SIM)	0.034		ug/L	0.01	0.01	0.0059	1.00	a	
107-13-1	ACRYLONITRILE (SIM)	ND		ug/L	0.05	0.05	0.0125	1.00	a	
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	0.01	0.01	0.0069	1.00	a	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	0.04	0.04		1.00	a	

Notes:

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Form: c608.rpt



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WSDOE Lab C567

DATA REPORT

Page 1 of 1

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-46479**
Project: Carnation Landfill

Lab Number: 95067
Field ID: MW-22D
Sample Description: Carnation Landfill
Matrix: Water
Sample Date: 12/12/18
Extraction Date: 12/18/18
Extraction Method: 5030B

Report Date: 1/16/19
Date Analyzed: 12/18/18
Analyst: HY
Analytical Method: 8260SIM
Batch: SIM_181218
Approved By: pdm

Authorized by:


Patrick Miller, MS
QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
	Volatile Organic Compounds									
75-01-4	VINYL CHLORIDE (SIM)	0.032		ug/L	0.01	0.01	0.0059	1.00	a	
107-13-1	ACRYLONITRILE (SIM)	ND		ug/L	0.05	0.05	0.0125	1.00	a	
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	0.01	0.01	0.0069	1.00	a	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	0.04	0.04		1.00	a	

Notes:

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WSDOE Lab C567

DATA REPORT

Page 1 of 1

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-46479**
Project: Carnation Landfill

Lab Number: 95068
Field ID: MW-6D
Sample Description: Carnation Landfill
Matrix: Water
Sample Date: 12/12/18
Extraction Date: 12/18/18
Extraction Method: 5030B

Report Date: 1/16/19
Date Analyzed: 12/18/18
Analyst: HY
Analytical Method: 8260SIM
Batch: SIM_181218
Approved By: pdm

Authorized by:


Patrick Miller, MS
QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
	Volatile Organic Compounds									
75-01-4	VINYL CHLORIDE (SIM)	ND		ug/L	0.01	0.01	0.0059	1.00	a	
107-13-1	ACRYLONITRILE (SIM)	ND		ug/L	0.05	0.05	0.0125	1.00	a	
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	0.01	0.01	0.0069	1.00	a	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	0.04	0.04		1.00	a	

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WSDOE Lab C567

DATA REPORT

Page 1 of 1

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-46479**
Project: Carnation Landfill

Lab Number: 95069
Field ID: MW-7D
Sample Description: Carnation Landfill
Matrix: Water
Sample Date: 12/12/18
Extraction Date: 12/18/18
Extraction Method: 5030B

Report Date: 1/16/19
Date Analyzed: 12/18/18
Analyst: HY
Analytical Method: 8260SIM
Batch: SIM_181218
Approved By: pdm

Authorized by:


Patrick Miller, MS
QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
	Volatile Organic Compounds									
75-01-4	VINYL CHLORIDE (SIM)	ND		ug/L	0.01	0.01	0.0059	1.00	a	
107-13-1	ACRYLONITRILE (SIM)	ND		ug/L	0.05	0.05	0.0125	1.00	a	
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	0.01	0.01	0.0069	1.00	a	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	0.04	0.04		1.00	a	

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WSDOE Lab C567

DATA REPORT

Page 1 of 1

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-46479**
Project: Carnation Landfill

Lab Number: 95070
Field ID: MW-8D
Sample Description: Carnation Landfill
Matrix: Water
Sample Date: 12/12/18
Extraction Date: 12/18/18
Extraction Method: 5030B

Report Date: 1/16/19
Date Analyzed: 12/18/18
Analyst: HY
Analytical Method: 8260SIM
Batch: SIM_181218
Approved By: pdm

Authorized by:


Patrick Miller, MS
QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
	Volatile Organic Compounds									
75-01-4	VINYL CHLORIDE (SIM)	ND		ug/L	0.01	0.01	0.0059	1.00	a	
107-13-1	ACRYLONITRILE (SIM)	ND		ug/L	0.05	0.05	0.0125	1.00	a	
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	0.01	0.01	0.0069	1.00	a	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	0.04	0.04		1.00	a	

Notes:

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WSDOE Lab C567

DATA REPORT

Page 1 of 1

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-46479**
Project: Carnation Landfill

Lab Number: 95071
Field ID: MW-5S
Sample Description: Carnation Landfill
Matrix: Water
Sample Date: 12/12/18
Extraction Date: 12/18/18
Extraction Method: 5030B

Report Date: 1/16/19
Date Analyzed: 12/18/18
Analyst: HY
Analytical Method: 8260SIM
Batch: SIM_181218
Approved By: pdm

Authorized by:


Patrick Miller, MS
QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
	Volatile Organic Compounds									
75-01-4	VINYL CHLORIDE (SIM)	ND		ug/L	0.01	0.01	0.0059	1.00	a	
107-13-1	ACRYLONITRILE (SIM)	ND		ug/L	0.05	0.05	0.0125	1.00	a	
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	0.01	0.01	0.0069	1.00	a	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	0.04	0.04		1.00	a	

Notes:

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WSDOE Lab C567

DATA REPORT

Page 1 of 1

Client Name: Pacific Groundwater Group
2377 Eastlake Avenue E
Seattle, WA 98102

Reference Number: **18-46479**
Project: Carnation Landfill

Lab Number: 95072
Field ID: MW-5D
Sample Description: Carnation Landfill
Matrix: Water
Sample Date: 12/12/18
Extraction Date: 12/18/18
Extraction Method: 5030B

Report Date: 1/16/19
Date Analyzed: 12/18/18
Analyst: HY
Analytical Method: 8260SIM
Batch: SIM_181218
Approved By: pdm

Authorized by:


Patrick Miller, MS
QA Officer

CAS	Compound	RESULT	Flag	UNITS	Lab QL	Permit QL	MDL	D.F.	Lab	COMMENT
	Volatile Organic Compounds									
75-01-4	VINYL CHLORIDE (SIM)	ND		ug/L	0.01	0.01	0.0059	1.00	a	
107-13-1	ACRYLONITRILE (SIM)	ND		ug/L	0.05	0.05	0.0125	1.00	a	
106-93-4	1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	0.01	0.01	0.0069	1.00	a	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	0.04	0.04		1.00	a	

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: **18-46479**

Report Date: 01/16/19

Batch	Analyte	Result	True		Method	%	Recovery	Limits*	QC		Comment
			Value	Units					Qualifier	Type	
SIM_181218	0 1,2 - DIBROMOETHANE (EDB SIM)	0.094	0.1	ug/L	8260SIM	94	80-120		LFB		SIMS ANALYSIS
	0 1,2-DIBROMO-3-CHLOROPROPANE	0.094	0.1	ug/L	8260SIM	94	80-120		LFB		SIMS ANALYSIS
	0 ACRYLONITRILE (SIM)	0.082	0.1	ug/L	8260SIM	82	80-120		LFB		SIMS ANALYSIS
	0 VINYL CHLORIDE (SIM)	0.095	0.1	ug/L	8260SIM	95	80-120		LFB		SIMS ANALYSIS

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.



SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Low-Level Lab Fortified Blank

Reference Number: **18-46479**

Report Date: 01/16/19

Batch	Analyte	Result	True		Method	%	Recovery	Limits*	QC		Comment
			Value	Units					Qualifier	Type	
SIM_181218	0 1,2 - DIBROMOETHANE (EDB SIM)	0.009	0.01	ug/L	8260SIM	90	50-150		LLFB		
	0 1,2-DIBROMO-3-CHLOROPROPANE	0.008	0.01	ug/L	8260SIM	80	50-150		LLFB		
	0 VINYL CHLORIDE (SIM)	0.010	0.01	ug/L	8260SIM	100	50-150		LLFB		

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.



SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: **18-46479**

Report Date: 01/16/19

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits*	QC Qualifier	QC Type	Comment
SIM_181218	0 1,2 - DIBROMOETHANE (EDB SIM)	ND		ug/L	8260SIM	0-0		MB		TB 18-46479
	0 1,2-DIBROMO-3-CHLOROPROPANE	ND		ug/L	8260SIM	0-0		MB		TB 18-46479
	0 ACRYLONITRILE (SIM)	ND		ug/L	8260SIM	0-0		MB		TB 18-46479
	0 VINYL CHLORIDE (SIM)	ND		ug/L	8260SIM	0-0		MB		TB 18-46479

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.


Reference Number: **18-46479**

Report Date: 1/16/2019

Page 1 of 1

SAMPLE DEPENDENT QUALITY CONTROL REPORT

Duplicate, Matrix Spike/Matrix Spike Duplicate and Confirmation Result Report

Batch	Sample	Analyte	Result	Duplicate			Units	Percent Recovery		Limits*	%RPD	Limits*	QC		
				Spike Result	Spike	Spike Conc		MS	MSD				Qualifier	Type	Comments
Laboratory Fortified Matrix (MS)															
SIM_181218															
	95063	1,2 - DIBROMOETHANE (EDB SIM)	ND	0.084	0.093	0.1	ug/L	84	93	70-130	10.2	0-20			LFM
	95063	1,2-DIBROMO-3-CHLOROPROPANE	ND	0.082	0.096	0.1	ug/L	82	96	70-130	15.7	0-20			LFM
	95063	ACRYLONITRILE (SIM)	ND	0.084	0.090	0.1	ug/L	84	90	70-130	6.9	0-20			LFM
	95063	VINYL CHLORIDE (SIM)	ND	0.091	0.106	0.1	ug/L	91	106	70-130	15.2	0-20			LFM

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of an analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.

FORM: QC Dependent.rpt



QUALITY CONTROL REPORT SURROGATE REPORT

Reference Number: 18-46479

Report Date: 01/16/19

Lab No	Analyte	Result	Qualifier	Units	Method	Limit
SIM_181218 95061	d8-TOLUENE (Surr)	91		%	8260SIM	Acceptance Range is 70-130%
SIM_181218 95062	d8-TOLUENE (Surr)	90		%	8260SIM	Acceptance Range is 70-130%
SIM_181218 95063	d8-TOLUENE (Surr)	91		%	8260SIM	Acceptance Range is 70-130%
SIM_181218 95064	d8-TOLUENE (Surr)	90		%	8260SIM	Acceptance Range is 70-130%
SIM_181218 95065	d8-TOLUENE (Surr)	90		%	8260SIM	Acceptance Range is 70-130%
SIM_181218 95066	d8-TOLUENE (Surr)	91		%	8260SIM	Acceptance Range is 70-130%
SIM_181218 95067	d8-TOLUENE (Surr)	90		%	8260SIM	Acceptance Range is 70-130%
SIM_181218 95068	d8-TOLUENE (Surr)	89		%	8260SIM	Acceptance Range is 70-130%
SIM_181218 95069	d8-TOLUENE (Surr)	89		%	8260SIM	Acceptance Range is 70-130%
SIM_181218 95070	d8-TOLUENE (Surr)	90		%	8260SIM	Acceptance Range is 70-130%
SIM_181218 95071	d8-TOLUENE (Surr)	92		%	8260SIM	Acceptance Range is 70-130%
SIM_181218 95072	d8-TOLUENE (Surr)	90		%	8260SIM	Acceptance Range is 70-130%

*Notation:

A surrogate is a pure compound added to a sample in the laboratory just before processing so that the overall efficiency of a method can be determined.

The Acceptance Limits (or Control Limits) approximate a 99% confidence interval around the mean recovery.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

10 January 2019

Glenn Mutti-Driscoll
Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle, WA 98102

RE: Carnation Landfill JS0903

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)
18L0240

Associated SDG ID(s)
N/A

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 its entirety.



Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 18L0240		Turn-around Requested: Std		Page: 1 of 2		 Analytical Resources, Incorporated Analytical Chemists and Consultants 4611 South 134th Place, Suite 100 Tukwila, WA 98168 206-695-6200 206-695-6201 (fax) www.arilabs.com								
ARI Client Company: PGG		Phone: 206-329-0141		Date: 12/12/18				Ice Present? 						
Client Contact: Glenn Mutti-Driscoll				No. of Coolers: 2				Cooler Temps: 1.31.8						
Client Project Name: Carnation Landfill														
Client Project #: JS0903		Samplers: JGMD/TH		Analysis Requested						Notes/Comments				
Sample ID	Date	Time	Matrix	No. Containers	NOC	8260	NO3, SO4	Field Filtered As, Mn, Fe	Alkalinity	Ferrous Iron (Fe2+)				
MW-1S	12-12-18	940	W	7	X	X	X	X	X					
MW-1D	↓	945	↓	7	↓	↓	↓	↓	↓	↓				
MW-3S *		1035		14										
MW-3D		1040		7										
MW-2S		1135		7										
MW-2D		1140		7										
MW-22D		1145		7										
MW-6D		1300		7										
MW-7D		1255		7										
MW-8D	↓	1350	↓	7	↓	↓	↓	↓	↓					
Comments/Special Instructions				Relinquished by: (Signature) <i>Glenn Mutti-Driscoll</i>		Received by: (Signature) <i>Stephanie Fishel</i>		Relinquished by: (Signature)		Received by: (Signature)				
				Printed Name: Glenn Mutti-Driscoll		Printed Name: Stephanie Fishel		Printed Name:		Printed Name:				
				Company: PGG		Company: ARI		Company:		Company:				
				Date & Time: 12-13-18 1054		Date & Time: 12-13-18 1052		Date & Time:		Date & Time:				

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 18L0240		Turn-around Requested: Std		Page: 2 of 2		 Analytical Resources, Incorporated Analytical Chemists and Consultants 4611 South 134th Place, Suite 100 Tukwila, WA 98168 206-695-6200 206-695-6201 (fax) www.arilabs.com							
ARI Client Company: PGG		Phone: 206-329-0141		Date: 12/12/18				Ice Present?					
Client Contact: Glenn Mutti-Driscoll				No. of Coolers: 2				Cooler Temps:					
Client Project Name: Carnation Land Fill				Analysis Requested									
Client Project #: 150903		Samplers: IGMD/TH						Notes/Comments					
Sample ID	Date	Time	Matrix	No. Containers	VOC 8260	NO ₃ , SO ₄	Field Filtered As, Mg, Fe	Alkalinity	Ferrous Iron (Fe ²⁺)				
MW-SS	12/12/18	1415	W	3		X		X	X				
MW-SD	12/12/18	1420	W	7	+	+	X	X	X				
Comments/Special Instructions		Relinquished by: (Signature) [Signature]		Received by: (Signature) Stephanie Fishel		Relinquished by: (Signature)		Received by: (Signature)					
		Printed Name: Glenn Mutti-Driscoll		Printed Name: Stephanie Fishel		Printed Name:		Printed Name:					
		Company: PGG		Company: Ani		Company:		Company:					
		Date & Time: 12-13-18 1054		Date & Time: 12-13-18 1052		Date & Time:		Date & Time:					

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1S	18L0240-01	Water	12-Dec-2018 09:40	13-Dec-2018 10:52
MW-1D	18L0240-02	Water	12-Dec-2018 09:45	13-Dec-2018 10:52
MW-3S	18L0240-03	Water	12-Dec-2018 10:35	13-Dec-2018 10:52
MW-3D	18L0240-04	Water	12-Dec-2018 10:40	13-Dec-2018 10:52
MW-2S	18L0240-05	Water	12-Dec-2018 11:35	13-Dec-2018 10:52
MW-2D	18L0240-06	Water	12-Dec-2018 11:40	13-Dec-2018 10:52
MW-22D	18L0240-07	Water	12-Dec-2018 11:45	13-Dec-2018 10:52
MW-6D	18L0240-08	Water	12-Dec-2018 13:00	13-Dec-2018 10:52
MW-7D	18L0240-09	Water	12-Dec-2018 12:55	13-Dec-2018 10:52
MW-8D	18L0240-10	Water	12-Dec-2018 13:50	13-Dec-2018 10:52
MW-5S	18L0240-11	Water	12-Dec-2018 14:15	13-Dec-2018 10:52
MW-5D	18L0240-12	Water	12-Dec-2018 14:20	13-Dec-2018 10:52
Trip Blanks	18L0240-13	Water	12-Dec-2018 09:40	13-Dec-2018 10:52



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

Work Order Case Narrative

Volatiles - EPA Method SW8260C

The sample(s) were run within the recommended holding times.

Initial and continuing calibrations were within method requirements except analytes flagged with a "Q" qualifier which were out of control low. All samples which contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/LCSD percent recoveries and RPD were within control limits except 2,2-Dichloropropane which was out of control low and is flagged within the QC section of this report.

The Matrix Spike/Matrix Spike Duplicate RPD and percent recoveries were within control limits except for analytes flagged within the QC section of this report which were out of control low.

Dissolved Metals - EPA Method 200.8/6010C

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

The Duplicate RPD and Matrix Spike percent recoveries were within control limits.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times except for Ferrous Iron where the holding time was exceeded upon sample receipt.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

The Duplicate RPD were within control limits.

The Matrix Spike/ Matrix Spike Duplicate RPD and percent recoveries were within control limits except for Sulfate which percent recoveries were out of control low and are flagged within the QC section of this report.

Data for the nitrite analysis was lost during the power outage. The client was notified that no data will be reported for nitrate and nitrite.



WORK ORDER

18L0240

Client: Pacific Groundwater Group

Project Manager: Kelly Bottem

Project: Carnation Landfill JS0903

Project Number: Carnation Landfill JS0903

Report To:

Pacific Groundwater Group
Glenn Mutti-Driscoll
2377 Eastlake Ave. E. Suite 200
Seattle, WA 98102
Phone: (206) 329-0141
Fax: -

Invoice To:

Pacific Groundwater Group
Glenn Mutti-Driscoll
2377 Eastlake Ave. E. Suite 200
Seattle, WA 98102
Phone : (206) 329-0141
Fax: -

Date Due: 28-Dec-2018 18:00 (10 day TAT)

Received By: Stephanie Fishel

Date Received: 13-Dec-2018 10:52

Logged In By: Jacob Walter

Date Logged In: 13-Dec-2018 11:55

Samples Received at: 1.3°C

Intact, properly signed and dated custody seals attached to outside of cooler(s).....No
Custody papers properly filled out (in, signed, analyses requested, etc).....Yes
Was sufficient ice used (if appropriate).....Yes
All bottles arrived in good condition (unbroken).....Yes
Number of containers listed on COC match number received.....Yes
Correct bottles used for the requested analyses.....Yes
Analyses/bottles require preservation (attach preservation sheet excluding VOC).....Yes
Sample split at ARI.....No

Custody papers included with the cooler..... Yes
Was a temperature blank included in the cooler..... No
All bottles sealed in individual plastic bags..... No
All bottle labels complete and legible..... Yes
Bottle labels and tags agree with COC..... Yes
All VOC vials free of air bubbles..... No
Sufficient amount of sample sent in each bottle..... Yes



WORK ORDER

18L0240

Client: Pacific Groundwater Group

Project Manager: Kelly Bottem

Project: Carnation Landfill JS0903

Project Number: Carnation Landfill JS0903

Analysis	Due	TAT	Expires	Comments
18L0240-01 MW-1S [Water] Sampled 12-Dec-2018 09:40				
Nitrite-N, EPA 353.2	12/28/2018	10	12/14/2018	
Met Diss 200.8 - As UCT	12/28/2018	10	6/10/2019	
Iron, Ferrous SM 3500-Fe B-97	12/28/2018	10	12/13/2018	
Alkalinity, Total SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Hydroxide SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Carbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Bicarbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Met Diss 6010C - Mn	12/28/2018	10	6/10/2019	
8260C VOA	12/28/2018	10	12/26/2018	
Met Diss 6010C - Fe	12/28/2018	10	6/10/2019	
Nitrate + Nitrite-N, EPA 353.2	12/28/2018	10	1/9/2019	
Nitrate-N Calc EPA 353.2	12/28/2018	10	12/14/2018	
Sulfate, EPA 375.2	12/28/2018	10	1/9/2019	
18L0240-02 MW-1D [Water] Sampled 12-Dec-2018 09:45				
Met Diss 200.8 - As UCT	12/28/2018	10	6/10/2019	
Met Diss 6010C - Fe	12/28/2018	10	6/10/2019	
Met Diss 6010C - Mn	12/28/2018	10	6/10/2019	
Nitrate + Nitrite-N, EPA 353.2	12/28/2018	10	1/9/2019	
Nitrate-N Calc EPA 353.2	12/28/2018	10	12/14/2018	
Iron, Ferrous SM 3500-Fe B-97	12/28/2018	10	12/13/2018	
Alkalinity, Hydroxide SM 2320 B-97	12/28/2018	10	12/26/2018	
Sulfate, EPA 375.2	12/28/2018	10	1/9/2019	
Alkalinity, Carbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Bicarbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Total SM 2320 B-97	12/28/2018	10	12/26/2018	
8260C VOA	12/28/2018	10	12/26/2018	
Nitrite-N, EPA 353.2	12/28/2018	10	12/14/2018	
18L0240-03 MW-3S [Water] Sampled 12-Dec-2018 10:35				
Nitrite-N, EPA 353.2	12/28/2018	10	12/14/2018	MS/MSD
Alkalinity, Hydroxide SM 2320 B-97	12/28/2018	10	12/26/2018	MS/MSD
Nitrate-N Calc EPA 353.2	12/28/2018	10	12/14/2018	MS/MSD
Nitrate + Nitrite-N, EPA 353.2	12/28/2018	10	1/9/2019	MS/MSD
Met Diss 6010C - Mn	12/28/2018	10	6/10/2019	MS/MSD
Met Diss 6010C - Fe	12/28/2018	10	6/10/2019	MS/MSD
Met Diss 200.8 - As UCT	12/28/2018	10	6/10/2019	MS/MSD
Iron, Ferrous SM 3500-Fe B-97	12/28/2018	10	12/13/2018	MS/MSD
Alkalinity, Total SM 2320 B-97	12/28/2018	10	12/26/2018	MS/MSD
Alkalinity, Carbonate SM 2320 B-97	12/28/2018	10	12/26/2018	MS/MSD
8260C VOA	12/28/2018	10	12/26/2018	MS/MSD



WORK ORDER

18L0240

Client: Pacific Groundwater Group

Project Manager: Kelly Bottem

Project: Carnation Landfill JS0903

Project Number: Carnation Landfill JS0903

Analysis	Due	TAT	Expires	Comments
Sulfate, EPA 375.2	12/28/2018	10	1/9/2019	MS/MSD
Alkalinity, Bicarbonate SM 2320 B-97	12/28/2018	10	12/26/2018	MS/MSD
18L0240-04 MW-3D [Water] Sampled 12-Dec-2018 10:40				
8260C VOA	12/28/2018	10	12/26/2018	
Met Diss 200.8 - As UCT	12/28/2018	10	6/10/2019	
Iron, Ferrous SM 3500-Fe B-97	12/28/2018	10	12/13/2018	
Alkalinity, Total SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Hydroxide SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Carbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Bicarbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Sulfate, EPA 375.2	12/28/2018	10	1/9/2019	
Nitrite-N, EPA 353.2	12/28/2018	10	12/14/2018	
Met Diss 6010C - Mn	12/28/2018	10	6/10/2019	
Met Diss 6010C - Fe	12/28/2018	10	6/10/2019	
Nitrate + Nitrite-N, EPA 353.2	12/28/2018	10	1/9/2019	
Nitrate-N Calc EPA 353.2	12/28/2018	10	12/14/2018	
18L0240-05 MW-2S [Water] Sampled 12-Dec-2018 11:35				
Nitrate + Nitrite-N, EPA 353.2	12/28/2018	10	1/9/2019	
Alkalinity, Total SM 2320 B-97	12/28/2018	10	12/26/2018	
Iron, Ferrous SM 3500-Fe B-97	12/28/2018	10	12/13/2018	
Nitrate-N Calc EPA 353.2	12/28/2018	10	12/14/2018	
Met Diss 6010C - Mn	12/28/2018	10	6/10/2019	
Alkalinity, Hydroxide SM 2320 B-97	12/28/2018	10	12/26/2018	
8260C VOA	12/28/2018	10	12/26/2018	
Alkalinity, Bicarbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Carbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Sulfate, EPA 375.2	12/28/2018	10	1/9/2019	
Met Diss 6010C - Fe	12/28/2018	10	6/10/2019	
Met Diss 200.8 - As UCT	12/28/2018	10	6/10/2019	
Nitrite-N, EPA 353.2	12/28/2018	10	12/14/2018	
18L0240-06 MW-2D [Water] Sampled 12-Dec-2018 11:40				
Sulfate, EPA 375.2	12/28/2018	10	1/9/2019	
Nitrate-N Calc EPA 353.2	12/28/2018	10	12/14/2018	
Iron, Ferrous SM 3500-Fe B-97	12/28/2018	10	12/13/2018	
Alkalinity, Total SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Hydroxide SM 2320 B-97	12/28/2018	10	12/26/2018	
Nitrate + Nitrite-N, EPA 353.2	12/28/2018	10	1/9/2019	
Met Diss 6010C - Fe	12/28/2018	10	6/10/2019	
Alkalinity, Carbonate SM 2320 B-97	12/28/2018	10	12/26/2018	



WORK ORDER

18L0240

Client: Pacific Groundwater Group

Project Manager: Kelly Bottem

Project: Carnation Landfill JS0903

Project Number: Carnation Landfill JS0903

Analysis	Due	TAT	Expires	Comments
Alkalinity, Bicarbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
8260C VOA	12/28/2018	10	12/26/2018	
Met Diss 6010C - Mn	12/28/2018	10	6/10/2019	
Met Diss 200.8 - As UCT	12/28/2018	10	6/10/2019	
Nitrite-N, EPA 353.2	12/28/2018	10	12/14/2018	

18L0240-07 MW-22D [Water] Sampled 12-Dec-2018 11:45

Alkalinity, Bicarbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Sulfate, EPA 375.2	12/28/2018	10	1/9/2019	
Nitrite-N, EPA 353.2	12/28/2018	10	12/14/2018	
Nitrate-N Calc EPA 353.2	12/28/2018	10	12/14/2018	
Nitrate + Nitrite-N, EPA 353.2	12/28/2018	10	1/9/2019	
Met Diss 6010C - Fe	12/28/2018	10	6/10/2019	
Iron, Ferrous SM 3500-Fe B-97	12/28/2018	10	12/13/2018	
Alkalinity, Total SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Carbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Met Diss 200.8 - As UCT	12/28/2018	10	6/10/2019	
Met Diss 6010C - Mn	12/28/2018	10	6/10/2019	
8260C VOA	12/28/2018	10	12/26/2018	
Alkalinity, Hydroxide SM 2320 B-97	12/28/2018	10	12/26/2018	

18L0240-08 MW-6D [Water] Sampled 12-Dec-2018 13:00

Nitrate-N Calc EPA 353.2	12/28/2018	10	12/14/2018	
Alkalinity, Carbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Bicarbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
8260C VOA	12/28/2018	10	12/26/2018	
Met Diss 200.8 - As UCT	12/28/2018	10	6/10/2019	
Met Diss 6010C - Fe	12/28/2018	10	6/10/2019	
Nitrate + Nitrite-N, EPA 353.2	12/28/2018	10	1/9/2019	
Iron, Ferrous SM 3500-Fe B-97	12/28/2018	10	12/13/2018	
Nitrite-N, EPA 353.2	12/28/2018	10	12/14/2018	
Sulfate, EPA 375.2	12/28/2018	10	1/9/2019	
Alkalinity, Total SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Hydroxide SM 2320 B-97	12/28/2018	10	12/26/2018	
Met Diss 6010C - Mn	12/28/2018	10	6/10/2019	

18L0240-09 MW-7D [Water] Sampled 12-Dec-2018 12:55

Alkalinity, Hydroxide SM 2320 B-97	12/28/2018	10	12/26/2018	
Nitrite-N, EPA 353.2	12/28/2018	10	12/14/2018	
8260C VOA	12/28/2018	10	12/26/2018	
Met Diss 6010C - Mn	12/28/2018	10	6/10/2019	
Met Diss 6010C - Fe	12/28/2018	10	6/10/2019	



WORK ORDER

18L0240

Client: Pacific Groundwater Group

Project Manager: Kelly Bottem

Project: Carnation Landfill JS0903

Project Number: Carnation Landfill JS0903

Analysis	Due	TAT	Expires	Comments
Met Diss 200.8 - As UCT	12/28/2018	10	6/10/2019	
Sulfate, EPA 375.2	12/28/2018	10	1/9/2019	
Alkalinity, Total SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Bicarbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Carbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Nitrate-N Calc EPA 353.2	12/28/2018	10	12/14/2018	
Nitrate + Nitrite-N, EPA 353.2	12/28/2018	10	1/9/2019	
Iron, Ferrous SM 3500-Fe B-97	12/28/2018	10	12/13/2018	

18L0240-10 MW-8D [Water] Sampled 12-Dec-2018 13:50

Met Diss 6010C - Fe	12/28/2018	10	6/10/2019	
Alkalinity, Bicarbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Nitrate + Nitrite-N, EPA 353.2	12/28/2018	10	1/9/2019	
Nitrate-N Calc EPA 353.2	12/28/2018	10	12/14/2018	
Nitrite-N, EPA 353.2	12/28/2018	10	12/14/2018	
Sulfate, EPA 375.2	12/28/2018	10	1/9/2019	
Iron, Ferrous SM 3500-Fe B-97	12/28/2018	10	12/13/2018	
Alkalinity, Total SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Carbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Hydroxide SM 2320 B-97	12/28/2018	10	12/26/2018	
Met Diss 6010C - Mn	12/28/2018	10	6/10/2019	
8260C VOA	12/28/2018	10	12/26/2018	
Met Diss 200.8 - As UCT	12/28/2018	10	6/10/2019	

18L0240-11 MW-5S [Water] Sampled 12-Dec-2018 14:15

Sulfate, EPA 375.2	12/28/2018	10	1/9/2019	
Nitrate + Nitrite-N, EPA 353.2	12/28/2018	10	1/9/2019	
Alkalinity, Total SM 2320 B-97	12/28/2018	10	12/26/2018	
Nitrate-N Calc EPA 353.2	12/28/2018	10	12/14/2018	
Alkalinity, Hydroxide SM 2320 B-97	12/28/2018	10	12/26/2018	
Iron, Ferrous SM 3500-Fe B-97	12/28/2018	10	12/13/2018	
Alkalinity, Bicarbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Carbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Nitrite-N, EPA 353.2	12/28/2018	10	12/14/2018	

18L0240-12 MW-5D [Water] Sampled 12-Dec-2018 14:20

8260C VOA	12/28/2018	10	12/26/2018	
Alkalinity, Bicarbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Alkalinity, Carbonate SM 2320 B-97	12/28/2018	10	12/26/2018	
Met Diss 6010C - Fe	12/28/2018	10	6/10/2019	
Met Diss 6010C - Mn	12/28/2018	10	6/10/2019	
Nitrate + Nitrite-N, EPA 353.2	12/28/2018	10	1/9/2019	

Reviewed By

Date



WORK ORDER

18L0240

Client: Pacific Groundwater Group

Project Manager: Kelly Bottem

Project: Carnation Landfill JS0903

Project Number: Carnation Landfill JS0903

Analysis	Due	TAT	Expires	Comments
Nitrate-N Calc EPA 353.2	12/28/2018	10	12/14/2018	
Nitrite-N, EPA 353.2	12/28/2018	10	12/14/2018	
Sulfate, EPA 375.2	12/28/2018	10	1/9/2019	
Alkalinity, Hydroxide SM 2320 B-97	12/28/2018	10	12/26/2018	
Iron, Ferrous SM 3500-Fe B-97	12/28/2018	10	12/13/2018	
Alkalinity, Total SM 2320 B-97	12/28/2018	10	12/26/2018	
Met Diss 200.8 - As UCT	12/28/2018	10	6/10/2019	

18L0240-13 Trip Blanks [Water] Sampled 12-Dec-2018 09:40

8260C VOA	12/28/2018	10	12/26/2018

Analysis groups included in this work order

Nitrate-N Calc EPA 353.2

Nitrite-N, EPA 353.2

Nitrate + Nitrite-N, EPA 353.2



WORK ORDER

18L0240

Client: Pacific Groundwater Group

Project Manager: Kelly Bottem

Project: Carnation Landfill JS0903

Project Number: Carnation Landfill JS0903

Preservation Confirmation

Container ID	Container Type	pH	
18L0240-01 A	Glass NM, Amber, 500 mL, HCl		
18L0240-01 B	Small OJ, 500 mL		
18L0240-01 C	Small OJ, 500 mL		
18L0240-01 D	HDPE NM, 500 mL, 1:1 HNO ₃ (FF)	LT	Pass
18L0240-01 E	VOA Vial, Clear, 40 mL, HCL		
18L0240-01 F	VOA Vial, Clear, 40 mL, HCL		
18L0240-01 G	VOA Vial, Clear, 40 mL, HCL		
18L0240-02 A	Glass NM, Amber, 500 mL, HCl		
18L0240-02 B	Small OJ, 500 mL		
18L0240-02 C	Small OJ, 500 mL		
18L0240-02 D	HDPE NM, 500 mL, 1:1 HNO ₃ (FF)	LT	Pass
18L0240-02 E	VOA Vial, Clear, 40 mL, HCL		
18L0240-02 F	VOA Vial, Clear, 40 mL, HCL		
18L0240-02 G	VOA Vial, Clear, 40 mL, HCL		
18L0240-03 A	Glass NM, Amber, 500 mL, HCl		
18L0240-03 B	Glass NM, Amber, 500 mL, HCl		
18L0240-03 C	Small OJ, 500 mL		
18L0240-03 D	Small OJ, 500 mL		
18L0240-03 E	Small OJ, 500 mL		
18L0240-03 F	Small OJ, 500 mL		
18L0240-03 G	HDPE NM, 500 mL, 1:1 HNO ₃ (FF)	LT	Pass
18L0240-03 H	HDPE NM, 500 mL, 1:1 HNO ₃ (FF)	LT	Pass
18L0240-03 I	VOA Vial, Clear, 40 mL, HCL		
18L0240-03 J	VOA Vial, Clear, 40 mL, HCL		
18L0240-03 K	VOA Vial, Clear, 40 mL, HCL		
18L0240-03 L	VOA Vial, Clear, 40 mL, HCL		
18L0240-03 M	VOA Vial, Clear, 40 mL, HCL		
18L0240-03 N	VOA Vial, Clear, 40 mL, HCL		
18L0240-04 A	Glass NM, Amber, 500 mL, HCl		
18L0240-04 B	Small OJ, 500 mL		
18L0240-04 C	Small OJ, 500 mL		
18L0240-04 D	HDPE NM, 500 mL, 1:1 HNO ₃ (FF)	LT	Pass
18L0240-04 E	VOA Vial, Clear, 40 mL, HCL		
18L0240-04 F	VOA Vial, Clear, 40 mL, HCL		
18L0240-04 G	VOA Vial, Clear, 40 mL, HCL		



WORK ORDER

18L0240

Client: Pacific Groundwater Group

Project Manager: Kelly Bottem

Project: Carnation Landfill JS0903

Project Number: Carnation Landfill JS0903

18L0240-05 A	Glass NM, Amber, 500 mL, HCl		
18L0240-05 B	Small OJ, 500 mL		
18L0240-05 C	Small OJ, 500 mL		
18L0240-05 D	HDPE NM, 500 mL, 1:1 HNO ₃ (FF)	✓	Pass
18L0240-05 E	VOA Vial, Clear, 40 mL, HCL		
18L0240-05 F	VOA Vial, Clear, 40 mL, HCL		
18L0240-05 G	VOA Vial, Clear, 40 mL, HCL		
18L0240-06 A	Glass NM, Amber, 500 mL, HCl		
18L0240-06 B	Small OJ, 500 mL		
18L0240-06 C	Small OJ, 500 mL		
18L0240-06 D	HDPE NM, 500 mL, 1:1 HNO ₃ (FF)	✓	Pass
18L0240-06 E	VOA Vial, Clear, 40 mL, HCL		
18L0240-06 F	VOA Vial, Clear, 40 mL, HCL		
18L0240-06 G	VOA Vial, Clear, 40 mL, HCL		
18L0240-07 A	Glass NM, Amber, 500 mL, HCl		
18L0240-07 B	Small OJ, 500 mL		
18L0240-07 C	Small OJ, 500 mL		
18L0240-07 D	HDPE NM, 500 mL, 1:1 HNO ₃ (FF)	✓	Pass
18L0240-07 E	VOA Vial, Clear, 40 mL, HCL		
18L0240-07 F	VOA Vial, Clear, 40 mL, HCL		
18L0240-07 G	VOA Vial, Clear, 40 mL, HCL		
18L0240-08 A	Glass NM, Amber, 500 mL, HCl		
18L0240-08 B	Small OJ, 500 mL		
18L0240-08 C	Small OJ, 500 mL		
18L0240-08 D	HDPE NM, 500 mL, 1:1 HNO ₃ (FF)	✓	Pass
18L0240-08 E	VOA Vial, Clear, 40 mL, HCL	B-556	
18L0240-08 F	VOA Vial, Clear, 40 mL, HCL		
18L0240-08 G	VOA Vial, Clear, 40 mL, HCL		
18L0240-09 A	Glass NM, Amber, 500 mL, HCl		
18L0240-09 B	Small OJ, 500 mL		
18L0240-09 C	Small OJ, 500 mL		
18L0240-09 D	HDPE NM, 500 mL, 1:1 HNO ₃ (FF)	✓	Pass
18L0240-09 E	VOA Vial, Clear, 40 mL, HCL		
18L0240-09 F	VOA Vial, Clear, 40 mL, HCL		
18L0240-09 G	VOA Vial, Clear, 40 mL, HCL		
18L0240-10 A	Glass NM, Amber, 500 mL, HCl		
18L0240-10 B	Small OJ, 500 mL		



WORK ORDER

18L0240

Client: Pacific Groundwater Group

Project Manager: Kelly Bottem

Project: Carnation Landfill JS0903

Project Number: Carnation Landfill JS0903

18L0240-10 C	Small OJ, 500 mL		
18L0240-10 D	HDPE NM, 500 mL, 1:1 HNO ₃ (FF)	LD	PASS
18L0240-10 E	VOA Vial, Clear, 40 mL, HCL		
18L0240-10 F	VOA Vial, Clear, 40 mL, HCL		
18L0240-10 G	VOA Vial, Clear, 40 mL, HCL		
18L0240-11 A	Glass NM, Amber, 500 mL, HCl		
18L0240-11 B	Small OJ, 500 mL		
18L0240-11 C	Small OJ, 500 mL		
18L0240-12 A	Glass NM, Amber, 500 mL, HCl		
18L0240-12 B	Small OJ, 500 mL		
18L0240-12 C	Small OJ, 500 mL		
18L0240-12 D	HDPE NM, 500 mL, 1:1 HNO ₃ (FF)	LD	PASS
18L0240-12 E	VOA Vial, Clear, 40 mL, HCL		
18L0240-12 F	VOA Vial, Clear, 40 mL, HCL		
18L0240-12 G	VOA Vial, Clear, 40 mL, HCL		
18L0240-13 A	VOA Vial, Clear, 40 mL, HCL	Bubble	
18L0240-13 B	VOA Vial, Clear, 40 mL, HCL		

JBW
Preservation Confirmed By

12/13/18
Date

Reviewed By

Date



Cooler Receipt Form

ARI Client: PGG
COC No(s): _____
Assigned ARI Job No: 18L0240 NA

Project Name: Coronation
Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
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 YES NO
Were custody papers properly filled out (ink, signed, etc.) YES YES NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 1.3 1.8
Time: 1125
If cooler temperature is out of compliance fill out form 00070F
Cooler Accepted by: Self Date: 12-13-18 Time: 1052 Temp Gun ID#: D002568

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: _____
Was sufficient ice used (if appropriate)? NA YES YES NO
Were all bottles sealed in individual plastic bags? YES YES NO
Did all bottles arrive in good condition (unbroken)? YES YES NO
Were all bottle labels complete and legible? YES YES NO
Did the number of containers listed on COC match with the number of containers received? YES YES NO
Did all bottle labels and tags agree with custody papers? YES YES NO
Were all bottles used correct for the requested analyses? YES YES NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES YES NO
Were all VOC vials free of air bubbles? NA YES YES NO
Was sufficient amount of sample sent in each bottle? YES YES NO
Date VOC Trip Blank was made at ARI: NA 12/15/18
Was Sample Split by ARI: NA YES Date/Time: _____ Equipment: _____ Split by: _____
Samples Logged by: JSW Date: 12/13/18 Time: 1155

** Notify Project Manager of discrepancies or concerns **

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions: vials w/ air bubbles marked on preservation sheet. Lab to determine sizes.

By: JSW Date: 12/13/18

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)



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-1S
18L0240-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 09:40

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 13:21

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0568 Sample Size: 10 mL
Prepared: 20-Dec-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
10-Jan-2019 14:56

MW-1S
18L0240-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 09:40

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 13:21

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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2377 Eastlake Ave. E. Suite 200
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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-1S
18L0240-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 09:40

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 13:21

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 1,2-Dichloroethane-d4		80-129 %	105	%	
Surrogate: Toluene-d8		80-120 %	92.5	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	91.8	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	105	%	



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Reported:
10-Jan-2019 14:56

MW-1S
18L0240-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 12/12/2018 09:40

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/20/2018 22:46

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0573 Sample Size: 25 mL
Prepared: 20-Dec-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.313	ug/L	



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Reported:
10-Jan-2019 14:56

MW-1S
18L0240-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 12/12/2018 09:40

Instrument: ICP2 Analyst: TCH

Analyzed: 12/20/2018 13:37

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BGL0547

Prepared: 19-Dec-2018

Sample Size: 25 mL

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	ND	mg/L	U
Manganese, Dissolved	7439-96-5	1	0.0010	ND	mg/L	U



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Reported:
10-Jan-2019 14:56

MW-1S
18L0240-01 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 12/12/2018 09:40

Instrument: [CALC] Analyst: AGW

Analyzed: 12/28/2018 21:06

Sample Preparation:

Preparation Method: [CALC]

Preparation Batch: [CALC]

Prepared: 13-Dec-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	5	0.0500	1.92	mg/L	



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Reported:
10-Jan-2019 14:56

MW-1S
18L0240-01 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 12/12/2018 09:40

Instrument: LACHAT2 Analyst: AGW

Analyzed: 01/08/2019 17:26

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BHA0147

Prepared: 07-Jan-2019

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	4.29	mg/L	



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-1S
18L0240-01 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/12/2018 09:40

Instrument: Accumet AR60 Analyst: UW

Analyzed: 12/14/2018 13:34

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0406

Prepared: 14-Dec-2018

Sample Size: 100 mL

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	129	mg/L CaCO ₃	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	129	mg/L CaCO ₃	



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-1S
18L0240-01 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 12/12/2018 09:40

Instrument: UV1800-2 Analyst: CDE

Analyzed: 12/13/2018 16:38

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0372

Prepared: 13-Dec-2018

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		1	0.040	0.040	0.078	mg/L	H



Pacific Groundwater Group
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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-1S
18L0240-01RE1 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 12/12/2018 09:40

Instrument: LACHAT2 Analyst: AGW

Analyzed: 12/28/2018 21:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0388

Prepared: 13-Dec-2018

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		5	0.050	0.050	1.92	mg/L	D



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-1D
18L0240-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 09:45

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 13:41

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0568 Sample Size: 10 mL
Prepared: 20-Dec-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-1D
18L0240-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 09:45

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 13:41

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-1D
18L0240-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 09:45

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 13:41

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 1,2-Dichloroethane-d4		80-129 %	108	%	
Surrogate: Toluene-d8		80-120 %	93.0	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	92.6	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	105	%	



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Reported:
10-Jan-2019 14:56

MW-1D
18L0240-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 12/12/2018 09:45

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/20/2018 22:51

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGL0573 Sample Size: 25 mL
Prepared: 20-Dec-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.691	ug/L	



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Reported:
10-Jan-2019 14:56

MW-1D
18L0240-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 12/12/2018 09:45

Instrument: ICP2 Analyst: TCH

Analyzed: 12/20/2018 13:41

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BGL0547

Prepared: 19-Dec-2018

Sample Size: 25 mL

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	ND	mg/L	U
Manganese, Dissolved	7439-96-5	1	0.0010	ND	mg/L	U



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Reported:
10-Jan-2019 14:56

MW-1D
18L0240-02 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 12/12/2018 09:45

Instrument: [CALC] Analyst: AGW

Analyzed: 12/28/2018 19:25

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Dec-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0100	0.421	mg/L	

Instrument: LACHAT2 Analyst: AGW

Analyzed: 12/28/2018 19:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGL0388
Prepared: 13-Dec-2018

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.421	mg/L	



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Reported:
10-Jan-2019 14:56

MW-1D
18L0240-02 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 12/12/2018 09:45

Instrument: LACHAT2 Analyst: AGW

Analyzed: 01/08/2019 17:27

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BHA0147

Prepared: 07-Jan-2019

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	5.37	mg/L	



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Reported:
10-Jan-2019 14:56

MW-1D
18L0240-02 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/12/2018 09:45

Instrument: Accumet AR60 Analyst: UW

Analyzed: 12/14/2018 14:40

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0406

Prepared: 14-Dec-2018

Sample Size: 100 mL

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	64.1	mg/L CaCO ₃	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	64.1	mg/L CaCO ₃	



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Reported:
10-Jan-2019 14:56

MW-1D
18L0240-02 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 12/12/2018 09:45

Instrument: UV1800-2 Analyst: CDE

Analyzed: 12/13/2018 16:38

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0372

Prepared: 13-Dec-2018

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		1	0.040	0.040	0.142	mg/L	H



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-3S
18L0240-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 10:35

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 14:01

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0568 Sample Size: 10 mL
Prepared: 20-Dec-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
10-Jan-2019 14:56

MW-3S
18L0240-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 10:35

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 14:01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Reported:
10-Jan-2019 14:56

MW-3S
18L0240-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 10:35

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 14:01

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 1,2-Dichloroethane-d4		80-129 %	109	%	
Surrogate: Toluene-d8		80-120 %	91.5	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	95.1	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	103	%	



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Reported:
10-Jan-2019 14:56

MW-3S
18L0240-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 12/12/2018 10:35

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/20/2018 23:00

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0573 Sample Size: 25 mL
Prepared: 20-Dec-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	2.85	ug/L	



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Reported:
10-Jan-2019 14:56

MW-3S
18L0240-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2 Analyst: TCH

Sampled: 12/12/2018 10:35

Analyzed: 12/20/2018 12:20

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGL0547
Prepared: 19-Dec-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	0.458	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	0.673	mg/L	



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Reported:
10-Jan-2019 14:56

MW-3S
18L0240-03 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 12/12/2018 10:35

Instrument: [CALC] Analyst: AGW

Analyzed: 12/28/2018 19:26

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Dec-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0100	0.455	mg/L	

Instrument: LACHAT2 Analyst: AGW

Analyzed: 12/28/2018 19:26

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGL0388
Prepared: 13-Dec-2018

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.455	mg/L	



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Reported:
10-Jan-2019 14:56

MW-3S
18L0240-03 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 12/12/2018 10:35

Instrument: LACHAT2 Analyst: AGW

Analyzed: 01/08/2019 16:06

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BHA0147

Prepared: 07-Jan-2019

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	7.35	mg/L	



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Reported:
10-Jan-2019 14:56

MW-3S
18L0240-03 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/12/2018 10:35

Instrument: Accumet AR60 Analyst: UW

Analyzed: 12/14/2018 14:40

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0406

Prepared: 14-Dec-2018

Sample Size: 100 mL

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	49.9	mg/L CaCO ₃	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	49.9	mg/L CaCO ₃	



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-3S
18L0240-03 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 12/12/2018 10:35

Instrument: UV1800-2 Analyst: CDE

Analyzed: 12/13/2018 16:38

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0372

Prepared: 13-Dec-2018

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		1	0.040	0.040	0.536	mg/L	H



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-3D
18L0240-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 10:40

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 14:21

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0568 Sample Size: 10 mL
Prepared: 20-Dec-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-3D
18L0240-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 10:40

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 14:21

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



Pacific Groundwater Group
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Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-3D
18L0240-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 10:40

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 14:21

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 1,2-Dichloroethane-d4		80-129 %	105	%	
Surrogate: Toluene-d8		80-120 %	92.1	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	92.3	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	102	%	



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Reported:
10-Jan-2019 14:56

MW-3D
18L0240-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 12/12/2018 10:40

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/20/2018 22:56

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0573 Sample Size: 25 mL
Prepared: 20-Dec-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.521	ug/L	



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Reported:
10-Jan-2019 14:56

MW-3D
18L0240-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 12/12/2018 10:40

Instrument: ICP2 Analyst: TCH

Analyzed: 12/20/2018 13:45

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BGL0547

Prepared: 19-Dec-2018

Sample Size: 25 mL

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	ND	mg/L	U
Manganese, Dissolved	7439-96-5	1	0.0010	ND	mg/L	U



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Reported:
10-Jan-2019 14:56

MW-3D
18L0240-04 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC] Analyst: AGW

Sampled: 12/12/2018 10:40

Analyzed: 12/28/2018 19:29

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Dec-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0100	0.428	mg/L	

Instrument: LACHAT2 Analyst: AGW

Analyzed: 12/28/2018 19:29

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGL0388
Prepared: 13-Dec-2018 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.428	mg/L	



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-3D
18L0240-04 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 12/12/2018 10:40

Instrument: LACHAT2 Analyst: AGW

Analyzed: 01/08/2019 17:28

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BHA0147

Prepared: 07-Jan-2019

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	5.50	mg/L	



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-3D
18L0240-04 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/12/2018 10:40

Instrument: Accumet AR60 Analyst: UW

Analyzed: 12/14/2018 14:40

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0406

Prepared: 14-Dec-2018

Sample Size: 100 mL

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	66.1	mg/L CaCO ₃	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	66.1	mg/L CaCO ₃	



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Reported:
10-Jan-2019 14:56

MW-3D
18L0240-04 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 12/12/2018 10:40

Instrument: UV1800-2 Analyst: CDE

Analyzed: 12/13/2018 16:40

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0372

Prepared: 13-Dec-2018

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		1	0.040	0.040	ND	mg/L	H, U



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Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-2S
18L0240-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 11:35

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 14:41

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0568 Sample Size: 10 mL
Prepared: 20-Dec-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
10-Jan-2019 14:56

MW-2S
18L0240-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 11:35

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 14:41

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-2S
18L0240-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 11:35

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 14:41

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 1,2-Dichloroethane-d4		80-129 %	107	%	
Surrogate: Toluene-d8		80-120 %	91.3	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	92.6	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	104	%	



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-2S
18L0240-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 12/12/2018 11:35

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/20/2018 23:32

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0573 Sample Size: 25 mL
Prepared: 20-Dec-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	1.43	ug/L	



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-2S
18L0240-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 12/12/2018 11:35

Instrument: ICP2 Analyst: TCH

Analyzed: 12/20/2018 13:49

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BGL0547

Prepared: 19-Dec-2018

Sample Size: 25 mL

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	1.99	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	0.146	mg/L	



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-2S
18L0240-05 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC] Analyst: AGW

Sampled: 12/12/2018 11:35

Analyzed: 12/28/2018 19:36

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Dec-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0100	0.0166	mg/L	

Instrument: LACHAT2 Analyst: AGW

Analyzed: 12/28/2018 19:36

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGL0388
Prepared: 13-Dec-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.017	mg/L	



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-2S
18L0240-05 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 12/12/2018 11:35

Instrument: LACHAT2 Analyst: AGW

Analyzed: 01/08/2019 17:30

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BHA0147

Prepared: 07-Jan-2019

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	ND	mg/L	U



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-2S
18L0240-05 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/12/2018 11:35

Instrument: Accumet AR60 Analyst: UW

Analyzed: 12/14/2018 14:40

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGL0406 Sample Size: 100 mL
Prepared: 14-Dec-2018 Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	25.3	mg/L CaCO ₃	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	25.3	mg/L CaCO ₃	



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-2S
18L0240-05 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 12/12/2018 11:35

Instrument: UV1800-2 Analyst: CDE

Analyzed: 12/13/2018 16:40

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0372

Prepared: 13-Dec-2018

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		1	0.040	0.040	1.90	mg/L	H



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-2D
18L0240-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 11:40

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 15:01

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0568 Sample Size: 10 mL
Prepared: 20-Dec-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
10-Jan-2019 14:56

MW-2D
18L0240-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 11:40

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 15:01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project: Carnation Landfill JS0903
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Reported:
10-Jan-2019 14:56

MW-2D
18L0240-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 11:40

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 15:01

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 1,2-Dichloroethane-d4		80-129 %	105	%	
Surrogate: Toluene-d8		80-120 %	91.7	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	93.8	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	105	%	



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Reported:
10-Jan-2019 14:56

MW-2D
18L0240-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 12/12/2018 11:40

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/20/2018 23:37

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGL0573 Sample Size: 25 mL
Prepared: 20-Dec-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	9.12	ug/L	



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Reported:
10-Jan-2019 14:56

MW-2D
18L0240-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 12/12/2018 11:40

Instrument: ICP2 Analyst: TCH

Analyzed: 12/20/2018 13:53

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BGL0547

Prepared: 19-Dec-2018

Sample Size: 25 mL

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	1.90	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	2.61	mg/L	



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Reported:
10-Jan-2019 14:56

MW-2D
18L0240-06 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC] Analyst: AGW

Sampled: 12/12/2018 11:40

Analyzed: 12/28/2018 19:37

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Dec-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0100	0.232	mg/L	

Instrument: LACHAT2 Analyst: AGW Analyzed: 12/28/2018 19:37

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGL0388 Sample Size: 10 mL
Prepared: 13-Dec-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.232	mg/L	



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Reported:
10-Jan-2019 14:56

MW-2D
18L0240-06 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 12/12/2018 11:40

Instrument: LACHAT2 Analyst: AGW

Analyzed: 01/08/2019 17:31

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BHA0147

Prepared: 07-Jan-2019

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	3.95	mg/L	



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Reported:
10-Jan-2019 14:56

MW-2D
18L0240-06 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/12/2018 11:40

Instrument: Accumet AR60 Analyst: UW

Analyzed: 12/14/2018 13:34

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0406

Prepared: 14-Dec-2018

Sample Size: 100 mL

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	138	mg/L CaCO ₃	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	138	mg/L CaCO ₃	



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Reported:
10-Jan-2019 14:56

MW-2D
18L0240-06 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 12/12/2018 11:40

Instrument: UV1800-2 Analyst: CDE

Analyzed: 12/13/2018 16:41

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0372

Prepared: 13-Dec-2018

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		1	0.040	0.040	1.76	mg/L	H



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Project: Carnation Landfill JS0903
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Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-22D
18L0240-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 11:45

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 15:21

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0568 Sample Size: 10 mL
Prepared: 20-Dec-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.21	ug/L	
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-22D
18L0240-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 11:45

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 15:21

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-22D
18L0240-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 11:45

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 15:21

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 1,2-Dichloroethane-d4		80-129 %	107	%	
Surrogate: Toluene-d8		80-120 %	93.8	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	93.0	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	102	%	



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Reported:
10-Jan-2019 14:56

MW-22D
18L0240-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 12/12/2018 11:45

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/20/2018 23:42

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0573 Sample Size: 25 mL
Prepared: 20-Dec-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	9.14	ug/L	



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Reported:
10-Jan-2019 14:56

MW-22D
18L0240-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 12/12/2018 11:45

Instrument: ICP2 Analyst: TCH

Analyzed: 12/20/2018 13:57

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BGL0547

Prepared: 19-Dec-2018

Sample Size: 25 mL

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	1.93	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	2.60	mg/L	



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Reported:
10-Jan-2019 14:56

MW-22D
18L0240-07 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 12/12/2018 11:45

Instrument: [CALC] Analyst: AGW

Analyzed: 12/28/2018 19:38

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Dec-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0100	0.216	mg/L	

Instrument: LACHAT2 Analyst: AGW

Analyzed: 12/28/2018 19:38

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGL0388
Prepared: 13-Dec-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.216	mg/L	



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Reported:
10-Jan-2019 14:56

MW-22D
18L0240-07 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 12/12/2018 11:45

Instrument: LACHAT2 Analyst: AGW

Analyzed: 01/08/2019 17:32

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BHA0147

Prepared: 07-Jan-2019

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	3.91	mg/L	



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Reported:
10-Jan-2019 14:56

MW-22D
18L0240-07 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/12/2018 11:45

Instrument: Accumet AR60 Analyst: UW

Analyzed: 12/14/2018 13:34

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0406

Prepared: 14-Dec-2018

Sample Size: 100 mL

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	138	mg/L CaCO3	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	1.00	ND	mg/L CaCO3	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	138	mg/L CaCO3	



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Reported:
10-Jan-2019 14:56

MW-22D
18L0240-07 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 12/12/2018 11:45

Instrument: UV1800-2 Analyst: CDE

Analyzed: 12/13/2018 16:42

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0372

Prepared: 13-Dec-2018

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		1	0.040	0.040	1.88	mg/L	H



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Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-6D
18L0240-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 13:00

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 15:41

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0568 Sample Size: 10 mL
Prepared: 20-Dec-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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10-Jan-2019 14:56

MW-6D
18L0240-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 13:00

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 15:41

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Reported:
10-Jan-2019 14:56

MW-6D
18L0240-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 13:00

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 15:41

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 1,2-Dichloroethane-d4		80-129 %	105	%	
Surrogate: Toluene-d8		80-120 %	93.2	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	91.6	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	102	%	



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10-Jan-2019 14:56

MW-6D
18L0240-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 12/12/2018 13:00

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/20/2018 23:46

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0573 Sample Size: 25 mL
Prepared: 20-Dec-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	1.33	ug/L	



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10-Jan-2019 14:56

MW-6D
18L0240-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C
Instrument: ICP2 Analyst: TCH

Sampled: 12/12/2018 13:00

Analyzed: 12/20/2018 14:14

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGL0547
Prepared: 19-Dec-2018

Sample Size: 25 mL
Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	0.604	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	0.0806	mg/L	



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MW-6D
18L0240-08 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 12/12/2018 13:00

Instrument: [CALC] Analyst: AGW

Analyzed: 12/28/2018 19:39

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Dec-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0100	ND	mg/L	U

Instrument: LACHAT2 Analyst: AGW

Analyzed: 12/28/2018 19:39

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGL0388
Prepared: 13-Dec-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	ND	mg/L	U



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MW-6D
18L0240-08 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 12/12/2018 13:00

Instrument: LACHAT2 Analyst: AGW

Analyzed: 01/08/2019 17:33

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BHA0147

Prepared: 07-Jan-2019

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	9.74	mg/L	



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MW-6D
18L0240-08 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/12/2018 13:00

Instrument: Accumet AR60 Analyst: UW

Analyzed: 12/14/2018 14:40

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0406

Prepared: 14-Dec-2018

Sample Size: 100 mL

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	68.4	mg/L CaCO ₃	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	68.4	mg/L CaCO ₃	



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Reported:
10-Jan-2019 14:56

MW-6D
18L0240-08 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 12/12/2018 13:00

Instrument: UV1800-2 Analyst: CDE

Analyzed: 12/13/2018 16:42

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0372

Prepared: 13-Dec-2018

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		1	0.040	0.040	0.682	mg/L	H



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Reported:
10-Jan-2019 14:56

MW-7D
18L0240-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 12:55

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 16:02

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0568 Sample Size: 10 mL
Prepared: 20-Dec-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-7D
18L0240-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 12:55

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 16:02

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-7D
18L0240-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 12:55

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 16:02

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 1,2-Dichloroethane-d4		80-129 %	104	%	
Surrogate: Toluene-d8		80-120 %	91.9	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	93.4	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	103	%	



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Reported:
10-Jan-2019 14:56

MW-7D
18L0240-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 12/12/2018 12:55

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/20/2018 23:51

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGL0573 Sample Size: 25 mL
Prepared: 20-Dec-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	ND	ug/L	U



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Reported:
10-Jan-2019 14:56

MW-7D
18L0240-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 12/12/2018 12:55

Instrument: ICP2 Analyst: TCH

Analyzed: 12/20/2018 14:18

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BGL0547

Prepared: 19-Dec-2018

Sample Size: 25 mL

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	ND	mg/L	U
Manganese, Dissolved	7439-96-5	1	0.0010	0.0051	mg/L	



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Reported:
10-Jan-2019 14:56

MW-7D
18L0240-09 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 12/12/2018 12:55

Instrument: [CALC] Analyst: AGW

Analyzed: 12/28/2018 19:40

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Dec-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0100	0.545	mg/L	

Instrument: LACHAT2 Analyst: AGW

Analyzed: 12/28/2018 19:40

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGL0388
Prepared: 13-Dec-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.545	mg/L	



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Reported:
10-Jan-2019 14:56

MW-7D
18L0240-09 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 12/12/2018 12:55

Instrument: LACHAT2 Analyst: AGW

Analyzed: 01/08/2019 17:34

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BHA0147

Prepared: 07-Jan-2019

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	5.56	mg/L	



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Reported:
10-Jan-2019 14:56

MW-7D
18L0240-09 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/12/2018 12:55

Instrument: Accumet AR60 Analyst: UW

Analyzed: 12/14/2018 14:40

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0406

Prepared: 14-Dec-2018

Sample Size: 100 mL

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	43.5	mg/L CaCO ₃	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	43.5	mg/L CaCO ₃	



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Reported:
10-Jan-2019 14:56

MW-7D
18L0240-09 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 12/12/2018 12:55

Instrument: UV1800-2 Analyst: CDE

Analyzed: 12/13/2018 16:42

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0372

Prepared: 13-Dec-2018

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		1	0.040	0.040	ND	mg/L	H, U



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Reported:
10-Jan-2019 14:56

MW-8D
18L0240-10 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 13:50

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 16:22

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0568 Sample Size: 10 mL
Prepared: 20-Dec-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
10-Jan-2019 14:56

MW-8D
18L0240-10 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 13:50

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 16:22

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Reported:
10-Jan-2019 14:56

MW-8D
18L0240-10 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 13:50

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 16:22

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 1,2-Dichloroethane-d4		80-129 %	108	%	
Surrogate: Toluene-d8		80-120 %	92.8	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	91.5	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	103	%	



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10-Jan-2019 14:56

MW-8D
18L0240-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 12/12/2018 13:50

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/20/2018 23:55

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGL0573 Sample Size: 25 mL
Prepared: 20-Dec-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.656	ug/L	



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Reported:
10-Jan-2019 14:56

MW-8D
18L0240-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 12/12/2018 13:50

Instrument: ICP2 Analyst: TCH

Analyzed: 12/20/2018 14:22

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BGL0547

Prepared: 19-Dec-2018

Sample Size: 25 mL

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	0.0718	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0010	0.0101	mg/L	



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Reported:
10-Jan-2019 14:56

MW-8D
18L0240-10 (Water)

Wet Chemistry

Method: EPA 353.2
Instrument: [CALC] Analyst: AGW

Sampled: 12/12/2018 13:50

Analyzed: 12/28/2018 19:42

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Dec-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0100	0.821	mg/L	

Instrument: LACHAT2 Analyst: AGW

Analyzed: 12/28/2018 19:42

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGL0388
Prepared: 13-Dec-2018 Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.821	mg/L	



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-8D
18L0240-10 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 12/12/2018 13:50

Instrument: LACHAT2 Analyst: AGW

Analyzed: 01/08/2019 17:36

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BHA0147

Prepared: 07-Jan-2019

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	7.96	mg/L	



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-8D
18L0240-10 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/12/2018 13:50

Instrument: Accumet AR60 Analyst: UW

Analyzed: 12/14/2018 14:40

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0406

Prepared: 14-Dec-2018

Sample Size: 100 mL

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	70.4	mg/L CaCO ₃	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	70.4	mg/L CaCO ₃	



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-8D
18L0240-10 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 12/12/2018 13:50

Instrument: UV1800-2 Analyst: CDE

Analyzed: 12/13/2018 16:56

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0372

Prepared: 13-Dec-2018

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		1	0.040	0.040	0.096	mg/L	H



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-5S
18L0240-11 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 12/12/2018 14:15

Instrument: [CALC] Analyst: AGW

Analyzed: 12/28/2018 21:07

Sample Preparation:

Preparation Method: [CALC]

Preparation Batch: [CALC]

Prepared: 13-Dec-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	2	0.0200	1.38	mg/L	



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Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-5S
18L0240-11 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 12/12/2018 14:15

Instrument: LACHAT2 Analyst: AGW

Analyzed: 01/08/2019 17:37

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BHA0147

Prepared: 07-Jan-2019

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	9.72	mg/L	



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Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-5S
18L0240-11 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/12/2018 14:15

Instrument: Accumet AR60 Analyst: UW

Analyzed: 12/14/2018 13:34

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0406

Prepared: 14-Dec-2018

Sample Size: 100 mL

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	159	mg/L CaCO ₃	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	159	mg/L CaCO ₃	



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Project: Carnation Landfill JS0903
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Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-5S
18L0240-11 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 12/12/2018 14:15

Instrument: UV1800-2 Analyst: CDE

Analyzed: 12/13/2018 16:57

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0372

Prepared: 13-Dec-2018

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		1	0.040	0.040	0.162	mg/L	H



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-5S
18L0240-11RE1 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 12/12/2018 14:15

Instrument: LACHAT2 Analyst: AGW

Analyzed: 12/28/2018 21:07

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0388

Prepared: 13-Dec-2018

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		2	0.020	0.020	1.38	mg/L	D



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-5D
18L0240-12 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 14:20

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 16:42

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0568 Sample Size: 10 mL
Prepared: 20-Dec-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
10-Jan-2019 14:56

MW-5D
18L0240-12 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 14:20

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 16:42

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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Reported:
10-Jan-2019 14:56

MW-5D
18L0240-12 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 14:20

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 16:42

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 1,2-Dichloroethane-d4		80-129 %	108	%	
Surrogate: Toluene-d8		80-120 %	92.9	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	92.5	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	105	%	



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Reported:
10-Jan-2019 14:56

MW-5D
18L0240-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED

Sampled: 12/12/2018 14:20

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/21/2018 00:00

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BGL0573 Sample Size: 25 mL
Prepared: 20-Dec-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	0.441	ug/L	



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Reported:
10-Jan-2019 14:56

MW-5D
18L0240-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C

Sampled: 12/12/2018 14:20

Instrument: ICP2 Analyst: TCH

Analyzed: 12/20/2018 14:26

Sample Preparation:

Preparation Method: WMN (No Prep)

Preparation Batch: BGL0547

Prepared: 19-Dec-2018

Sample Size: 25 mL

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	0.0500	ND	mg/L	U
Manganese, Dissolved	7439-96-5	1	0.0010	ND	mg/L	U



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Reported:
10-Jan-2019 14:56

MW-5D
18L0240-12 (Water)

Wet Chemistry

Method: EPA 353.2

Sampled: 12/12/2018 14:20

Instrument: [CALC] Analyst: AGW

Analyzed: 12/28/2018 19:44

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 13-Dec-2018

Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0100	0.301	mg/L	

Instrument: LACHAT2 Analyst: AGW

Analyzed: 12/28/2018 19:44

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGL0388
Prepared: 13-Dec-2018

Sample Size: 10 mL
Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	0.301	mg/L	



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Reported:
10-Jan-2019 14:56

MW-5D
18L0240-12 (Water)

Wet Chemistry

Method: EPA 375.2

Sampled: 12/12/2018 14:20

Instrument: LACHAT2 Analyst: AGW

Analyzed: 01/08/2019 17:44

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BHA0147

Prepared: 07-Jan-2019

Sample Size: 10 mL

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	2.00	2.00	7.22	mg/L	



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Reported:
10-Jan-2019 14:56

MW-5D
18L0240-12 (Water)

Wet Chemistry

Method: SM 2320 B-97

Sampled: 12/12/2018 14:20

Instrument: Accumet AR60 Analyst: UW

Analyzed: 12/14/2018 14:40

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0406

Prepared: 14-Dec-2018

Sample Size: 100 mL

Final Volume: 100 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Bicarbonate		1	1.00	1.00	65.8	mg/L CaCO ₃	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Carbonate		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Hydroxide		1	1.00	1.00	ND	mg/L CaCO ₃	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Alkalinity, Total		1	1.00	1.00	65.8	mg/L CaCO ₃	



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

MW-5D
18L0240-12 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 12/12/2018 14:20

Instrument: UV1800-2 Analyst: CDE

Analyzed: 12/13/2018 16:59

Sample Preparation:

Preparation Method: No Prep Wet Chem

Preparation Batch: BGL0372

Prepared: 13-Dec-2018

Sample Size: 5 mL

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		1	0.040	0.040	ND	mg/L	H, U



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

Trip Blanks
18L0240-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 09:40

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 09:58

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0568 Sample Size: 10 mL
Prepared: 20-Dec-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	16.8	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

Trip Blanks
18L0240-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 09:40

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 09:58

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	79-34-5	1	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	ND	ug/L	U



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10-Jan-2019 14:56

Trip Blanks
18L0240-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/12/2018 09:40

Instrument: NT2 Analyst: LH

Analyzed: 12/20/2018 09:58

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 1,2-Dichloroethane-d4		80-129 %	103	%	
Surrogate: Toluene-d8		80-120 %	96.9	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	91.2	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	104	%	



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Reported:
10-Jan-2019 14:56

Volatile Organic Compounds - Quality Control

Batch BGL0568 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGL0568-BLK2)		Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 09:38								
Chloromethane	ND	0.50	ug/L							U
Vinyl Chloride	ND	0.20	ug/L							U
Bromomethane	ND	1.00	ug/L							U
Chloroethane	ND	0.20	ug/L							U
Trichlorofluoromethane	ND	0.20	ug/L							U
Acrolein	ND	5.00	ug/L							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.20	ug/L							U
Acetone	ND	5.00	ug/L							U
1,1-Dichloroethene	ND	0.20	ug/L							U
Bromoethane	ND	0.20	ug/L							U
Iodomethane	ND	1.00	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.20	ug/L							U
Vinyl Acetate	ND	0.20	ug/L							U
1,1-Dichloroethane	ND	0.20	ug/L							U
2-Butanone	ND	5.00	ug/L							U
2,2-Dichloropropane	ND	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Chloroform	ND	0.20	ug/L							U
Bromochloromethane	ND	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.20	ug/L							U
1,1-Dichloropropene	ND	0.20	ug/L							U
Carbon tetrachloride	ND	0.20	ug/L							U
1,2-Dichloroethane	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Trichloroethene	ND	0.20	ug/L							U
1,2-Dichloropropane	ND	0.20	ug/L							U
Bromodichloromethane	ND	0.20	ug/L							U
Dibromomethane	ND	0.20	ug/L							U
2-Chloroethyl vinyl ether	ND	1.00	ug/L							U
4-Methyl-2-Pentanone	ND	5.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.20	ug/L							U
Toluene	ND	0.20	ug/L							U



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10-Jan-2019 14:56

Volatile Organic Compounds - Quality Control

Batch BGL0568 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGL0568-BLK2)		Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 09:38								
trans-1,3-Dichloropropene	ND	0.20	ug/L							U
2-Hexanone	ND	5.00	ug/L							U
1,1,2-Trichloroethane	ND	0.20	ug/L							U
1,3-Dichloropropane	ND	0.20	ug/L							U
Tetrachloroethene	ND	0.20	ug/L							U
Dibromochloromethane	ND	0.20	ug/L							U
1,2-Dibromoethane	ND	0.20	ug/L							U
Chlorobenzene	ND	0.20	ug/L							U
Ethylbenzene	ND	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.20	ug/L							U
m,p-Xylene	ND	0.40	ug/L							U
o-Xylene	ND	0.20	ug/L							U
Xylenes, total	ND	0.60	ug/L							U
Styrene	ND	0.20	ug/L							U
Bromoform	ND	0.20	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.50	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	1.00	ug/L							U
n-Propylbenzene	ND	0.20	ug/L							U
Bromobenzene	ND	0.20	ug/L							U
Isopropyl Benzene	ND	0.20	ug/L							U
2-Chlorotoluene	ND	0.20	ug/L							U
4-Chlorotoluene	ND	0.20	ug/L							U
t-Butylbenzene	ND	0.20	ug/L							U
1,3,5-Trimethylbenzene	ND	0.20	ug/L							U
1,2,4-Trimethylbenzene	ND	0.20	ug/L							U
s-Butylbenzene	ND	0.20	ug/L							U
4-Isopropyl Toluene	ND	0.20	ug/L							U
1,3-Dichlorobenzene	ND	0.20	ug/L							U
1,4-Dichlorobenzene	ND	0.20	ug/L							U
n-Butylbenzene	ND	0.20	ug/L							U
1,2-Dichlorobenzene	ND	0.20	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.50	ug/L							U
1,2,4-Trichlorobenzene	ND	0.50	ug/L							U
Hexachloro-1,3-Butadiene	ND	0.50	ug/L							U



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Reported:
10-Jan-2019 14:56

Volatile Organic Compounds - Quality Control

Batch BGL0568 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGL0568-BLK2)		Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 09:38								
Naphthalene	ND	0.50	ug/L							U
1,2,3-Trichlorobenzene	ND	0.50	ug/L							U
Dichlorodifluoromethane	ND	0.20	ug/L							U
Methyl tert-butyl Ether	ND	0.50	ug/L							U
2-Pentanone	ND	5.00	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5.10		ug/L	5.00		102	80-129			
Surrogate: Toluene-d8	4.75		ug/L	5.00		94.9	80-120			
Surrogate: 4-Bromofluorobenzene	4.71		ug/L	5.00		94.3	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.28		ug/L	5.00		106	80-120			
LCS (BGL0568-BS2)		Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 07:56								
Chloromethane	7.99	0.50	ug/L	10.0		79.9	60-138			Q
Vinyl Chloride	8.98	0.20	ug/L	10.0		89.8	66-133			
Bromomethane	10.0	1.00	ug/L	10.0		100	72-131			
Chloroethane	11.6	0.20	ug/L	10.0		116	60-155			
Trichlorofluoromethane	11.7	0.20	ug/L	10.0		117	80-129			
Acrolein	41.4	5.00	ug/L	50.0		82.9	52-144			
1,1,2-Trichloro-1,2,2-Trifluoroethane	11.8	0.20	ug/L	10.0		118	76-129			
Acetone	49.8	5.00	ug/L	50.0		99.7	58-142			
1,1-Dichloroethene	10.5	0.20	ug/L	10.0		105	69-135			
Bromoethane	10.1	0.20	ug/L	10.0		101	78-128			
Iodomethane	10.6	1.00	ug/L	10.0		106	56-147			
Methylene Chloride	9.48	1.00	ug/L	10.0		94.8	65-135			
Acrylonitrile	8.79	1.00	ug/L	10.0		87.9	64-134			
Carbon Disulfide	10.0	0.20	ug/L	10.0		100	78-125			
trans-1,2-Dichloroethene	9.33	0.20	ug/L	10.0		93.3	78-128			
Vinyl Acetate	8.19	0.20	ug/L	10.0		81.9	55-138			
1,1-Dichloroethane	9.69	0.20	ug/L	10.0		96.9	76-124			
2-Butanone	46.0	5.00	ug/L	50.0		92.0	61-140			
2,2-Dichloropropane	7.52	0.20	ug/L	10.0		75.2	78-125			*, Q
cis-1,2-Dichloroethene	9.79	0.20	ug/L	10.0		97.9	80-121			
Chloroform	9.90	0.20	ug/L	10.0		99.0	80-122			
Bromochloromethane	10.3	0.20	ug/L	10.0		103	80-121			
1,1,1-Trichloroethane	8.93	0.20	ug/L	10.0		89.3	79-123			
1,1-Dichloropropene	10.1	0.20	ug/L	10.0		101	80-120			



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10-Jan-2019 14:56

Volatile Organic Compounds - Quality Control

Batch BGL0568 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGL0568-BS2)		Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 07:56								
Carbon tetrachloride	7.93	0.20	ug/L	10.0		79.3	53-137			Q
1,2-Dichloroethane	10.9	0.20	ug/L	10.0		109	75-123			
Benzene	10.5	0.20	ug/L	10.0		105	80-120			
Trichloroethene	11.0	0.20	ug/L	10.0		110	80-120			
1,2-Dichloropropane	9.56	0.20	ug/L	10.0		95.6	80-120			
Bromodichloromethane	9.53	0.20	ug/L	10.0		95.3	80-121			
Dibromomethane	10.4	0.20	ug/L	10.0		104	80-120			
2-Chloroethyl vinyl ether	10.8	1.00	ug/L	10.0		108	74-127			
4-Methyl-2-Pentanone	50.8	5.00	ug/L	50.0		102	67-133			
cis-1,3-Dichloropropene	9.50	0.20	ug/L	10.0		95.0	80-124			
Toluene	10.3	0.20	ug/L	10.0		103	80-120			
trans-1,3-Dichloropropene	9.49	0.20	ug/L	10.0		94.9	71-127			
2-Hexanone	49.2	5.00	ug/L	50.0		98.5	69-133			
1,1,2-Trichloroethane	10.3	0.20	ug/L	10.0		103	80-121			
1,3-Dichloropropane	9.92	0.20	ug/L	10.0		99.2	80-120			
Tetrachloroethene	11.2	0.20	ug/L	10.0		112	80-120			
Dibromochloromethane	8.83	0.20	ug/L	10.0		88.3	65-135			
1,2-Dibromoethane	10.3	0.20	ug/L	10.0		103	80-121			
Chlorobenzene	10.5	0.20	ug/L	10.0		105	80-120			
Ethylbenzene	10.5	0.20	ug/L	10.0		105	80-120			
1,1,1,2-Tetrachloroethane	9.25	0.20	ug/L	10.0		92.5	80-120			
m,p-Xylene	21.4	0.40	ug/L	20.0		107	80-121			
o-Xylene	10.4	0.20	ug/L	10.0		104	80-121			
Xylenes, total	31.8	0.60	ug/L	30.0		106	76-127			
Styrene	10.5	0.20	ug/L	10.0		105	80-124			
Bromoform	7.77	0.20	ug/L	10.0		77.7	51-134			Q
1,1,2,2-Tetrachloroethane	9.69	0.20	ug/L	10.0		96.9	77-123			
1,2,3-Trichloropropane	10.2	0.50	ug/L	10.0		102	76-125			
trans-1,4-Dichloro 2-Butene	10.9	1.00	ug/L	10.0		109	55-129			
n-Propylbenzene	10.5	0.20	ug/L	10.0		105	78-130			
Bromobenzene	10.3	0.20	ug/L	10.0		103	80-120			
Isopropyl Benzene	9.82	0.20	ug/L	10.0		98.2	80-128			
2-Chlorotoluene	10.0	0.20	ug/L	10.0		100	78-122			
4-Chlorotoluene	10.1	0.20	ug/L	10.0		101	80-121			
t-Butylbenzene	10.3	0.20	ug/L	10.0		103	78-125			



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Reported:
10-Jan-2019 14:56

Volatile Organic Compounds - Quality Control

Batch BGL0568 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGL0568-BS2)										
					Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 07:56					
1,3,5-Trimethylbenzene	10.3	0.20	ug/L	10.0		103	80-129			
1,2,4-Trimethylbenzene	10.1	0.20	ug/L	10.0		101	80-127			
s-Butylbenzene	10.5	0.20	ug/L	10.0		105	78-129			
4-Isopropyl Toluene	10.8	0.20	ug/L	10.0		108	79-130			
1,3-Dichlorobenzene	10.5	0.20	ug/L	10.0		105	80-120			
1,4-Dichlorobenzene	10.5	0.20	ug/L	10.0		105	80-120			
n-Butylbenzene	11.2	0.20	ug/L	10.0		112	74-129			
1,2-Dichlorobenzene	10.7	0.20	ug/L	10.0		107	80-120			
1,2-Dibromo-3-chloropropane	6.88	0.50	ug/L	10.0		68.8	62-123			Q
1,2,4-Trichlorobenzene	11.0	0.50	ug/L	10.0		110	64-124			
Hexachloro-1,3-Butadiene	11.1	0.50	ug/L	10.0		111	58-123			
Naphthalene	9.71	0.50	ug/L	10.0		97.1	50-134			
1,2,3-Trichlorobenzene	11.0	0.50	ug/L	10.0		110	49-133			
Dichlorodifluoromethane	8.85	0.20	ug/L	10.0		88.5	48-147			
Methyl tert-butyl Ether	9.52	0.50	ug/L	10.0		95.2	71-132			
2-Pentanone	47.1	5.00	ug/L	50.0		94.3	69-134			
Surrogate: 1,2-Dichloroethane-d4	4.92		ug/L	5.00		98.4	80-129			
Surrogate: Toluene-d8	4.80		ug/L	5.00		96.0	80-120			
Surrogate: 4-Bromofluorobenzene	5.16		ug/L	5.00		103	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.09		ug/L	5.00		102	80-120			
LCS Dup (BGL0568-BSD2)										
					Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 08:37					
Chloromethane	7.61	0.50	ug/L	10.0		76.1	60-138	4.87	30	Q
Vinyl Chloride	8.39	0.20	ug/L	10.0		83.9	66-133	6.79	30	
Bromomethane	9.68	1.00	ug/L	10.0		96.8	72-131	3.52	30	
Chloroethane	10.7	0.20	ug/L	10.0		107	60-155	8.34	30	
Trichlorofluoromethane	10.4	0.20	ug/L	10.0		104	80-129	12.00	30	
Acrolein	38.3	5.00	ug/L	50.0		76.7	52-144	7.79	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	11.4	0.20	ug/L	10.0		114	76-129	3.09	30	
Acetone	46.9	5.00	ug/L	50.0		93.8	58-142	6.05	30	
1,1-Dichloroethene	9.92	0.20	ug/L	10.0		99.2	69-135	5.57	30	
Bromoethane	9.78	0.20	ug/L	10.0		97.8	78-128	2.70	30	
Iodomethane	10.3	1.00	ug/L	10.0		103	56-147	3.22	30	
Methylene Chloride	9.10	1.00	ug/L	10.0		91.0	65-135	4.03	30	
Acrylonitrile	8.47	1.00	ug/L	10.0		84.7	64-134	3.73	30	



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Reported:
10-Jan-2019 14:56

Volatile Organic Compounds - Quality Control

Batch BGL0568 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BGL0568-BSD2)		Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 08:37								
Carbon Disulfide	9.57	0.20	ug/L	10.0		95.7	78-125	4.69	30	
trans-1,2-Dichloroethene	8.86	0.20	ug/L	10.0		88.6	78-128	5.19	30	
Vinyl Acetate	8.11	0.20	ug/L	10.0		81.1	55-138	1.00	30	
1,1-Dichloroethane	9.39	0.20	ug/L	10.0		93.9	76-124	3.16	30	
2-Butanone	46.0	5.00	ug/L	50.0		92.0	61-140	0.00		
2,2-Dichloropropane	7.30	0.20	ug/L	10.0		73.0	78-125	2.95	30	*, Q
cis-1,2-Dichloroethene	9.37	0.20	ug/L	10.0		93.7	80-121	4.43	30	
Chloroform	9.41	0.20	ug/L	10.0		94.1	80-122	5.14	30	
Bromochloromethane	9.74	0.20	ug/L	10.0		97.4	80-121	6.06	30	
1,1,1-Trichloroethane	8.57	0.20	ug/L	10.0		85.7	79-123	4.17	30	
1,1-Dichloropropene	9.79	0.20	ug/L	10.0		97.9	80-120	2.75	30	
Carbon tetrachloride	7.56	0.20	ug/L	10.0		75.6	53-137	4.75	30	Q
1,2-Dichloroethane	10.4	0.20	ug/L	10.0		104	75-123	4.66	30	
Benzene	10.2	0.20	ug/L	10.0		102	80-120	3.04	30	
Trichloroethene	10.5	0.20	ug/L	10.0		105	80-120	5.15	30	
1,2-Dichloropropane	9.60	0.20	ug/L	10.0		96.0	80-120	0.46	30	
Bromodichloromethane	9.10	0.20	ug/L	10.0		91.0	80-121	4.66	30	
Dibromomethane	10.1	0.20	ug/L	10.0		101	80-120	3.33	30	
2-Chloroethyl vinyl ether	10.7	1.00	ug/L	10.0		107	74-127	1.51	30	
4-Methyl-2-Pentanone	51.1	5.00	ug/L	50.0		102	67-133	0.67	30	
cis-1,3-Dichloropropene	9.45	0.20	ug/L	10.0		94.5	80-124	0.51	30	
Toluene	9.97	0.20	ug/L	10.0		99.7	80-120	3.19	30	
trans-1,3-Dichloropropene	9.50	0.20	ug/L	10.0		95.0	71-127	0.03	30	
2-Hexanone	48.1	5.00	ug/L	50.0		96.3	69-133	2.27	30	
1,1,2-Trichloroethane	10.1	0.20	ug/L	10.0		101	80-121	1.54	30	
1,3-Dichloropropane	9.68	0.20	ug/L	10.0		96.8	80-120	2.44	30	
Tetrachloroethene	10.6	0.20	ug/L	10.0		106	80-120	6.07	30	
Dibromochloromethane	8.33	0.20	ug/L	10.0		83.3	65-135	5.83	30	
1,2-Dibromoethane	10.2	0.20	ug/L	10.0		102	80-121	0.62	30	
Chlorobenzene	10.0	0.20	ug/L	10.0		100	80-120	5.23	30	
Ethylbenzene	9.93	0.20	ug/L	10.0		99.3	80-120	5.17	30	
1,1,1,2-Tetrachloroethane	8.79	0.20	ug/L	10.0		87.9	80-120	5.09	30	
m,p-Xylene	20.2	0.40	ug/L	20.0		101	80-121	5.88	30	
o-Xylene	9.69	0.20	ug/L	10.0		96.9	80-121	6.75	30	
Xylenes, total	29.9	0.60	ug/L	30.0		99.5	76-127	6.16	30	



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

Volatile Organic Compounds - Quality Control

Batch BGL0568 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BGL0568-BSD2)		Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 08:37								
Styrene	10.1	0.20	ug/L	10.0		101	80-124	4.08	30	
Bromoform	7.38	0.20	ug/L	10.0		73.8	51-134	5.14	30	Q
1,1,2,2-Tetrachloroethane	9.20	0.20	ug/L	10.0		92.0	77-123	5.19	30	
1,2,3-Trichloropropane	9.25	0.50	ug/L	10.0		92.5	76-125	10.10	30	
trans-1,4-Dichloro 2-Butene	10.1	1.00	ug/L	10.0		101	55-129	8.09	30	
n-Propylbenzene	9.75	0.20	ug/L	10.0		97.5	78-130	7.39	30	
Bromobenzene	9.76	0.20	ug/L	10.0		97.6	80-120	5.37	30	
Isopropyl Benzene	9.15	0.20	ug/L	10.0		91.5	80-128	7.11	30	
2-Chlorotoluene	9.41	0.20	ug/L	10.0		94.1	78-122	6.12	30	
4-Chlorotoluene	9.54	0.20	ug/L	10.0		95.4	80-121	6.01	30	
t-Butylbenzene	9.69	0.20	ug/L	10.0		96.9	78-125	5.92	30	
1,3,5-Trimethylbenzene	9.73	0.20	ug/L	10.0		97.3	80-129	5.74	30	
1,2,4-Trimethylbenzene	9.58	0.20	ug/L	10.0		95.8	80-127	5.70	30	
s-Butylbenzene	9.95	0.20	ug/L	10.0		99.5	78-129	5.60	30	
4-Isopropyl Toluene	10.2	0.20	ug/L	10.0		102	79-130	5.91	30	
1,3-Dichlorobenzene	9.98	0.20	ug/L	10.0		99.8	80-120	5.36	30	
1,4-Dichlorobenzene	9.93	0.20	ug/L	10.0		99.3	80-120	5.65	30	
n-Butylbenzene	10.5	0.20	ug/L	10.0		105	74-129	6.07	30	
1,2-Dichlorobenzene	10.2	0.20	ug/L	10.0		102	80-120	5.69	30	
1,2-Dibromo-3-chloropropane	6.62	0.50	ug/L	10.0		66.2	62-123	3.78	30	Q
1,2,4-Trichlorobenzene	10.4	0.50	ug/L	10.0		104	64-124	5.96	30	
Hexachloro-1,3-Butadiene	10.1	0.50	ug/L	10.0		101	58-123	9.65	30	
Naphthalene	9.33	0.50	ug/L	10.0		93.3	50-134	4.03	30	
1,2,3-Trichlorobenzene	10.3	0.50	ug/L	10.0		103	49-133	6.49	30	
Dichlorodifluoromethane	8.24	0.20	ug/L	10.0		82.4	48-147	7.12	30	
Methyl tert-butyl Ether	9.20	0.50	ug/L	10.0		92.0	71-132	3.45	30	
2-Pentanone	47.8	5.00	ug/L	50.0		95.5	69-134	1.32	30	
Surrogate: 1,2-Dichloroethane-d4	5.04		ug/L	5.00		101	80-129			
Surrogate: Toluene-d8	4.90		ug/L	5.00		98.0	80-120			
Surrogate: 4-Bromofluorobenzene	5.11		ug/L	5.00		102	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.00		ug/L	5.00		99.9	80-120			

Matrix Spike (BGL0568-MS1)		Source: 18L0240-03		Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 17:02						
Chloromethane	7.27	0.50	ug/L	10.0	ND	72.7	60-138			Q
Vinyl Chloride	7.87	0.20	ug/L	10.0	ND	78.7	66-133			



Pacific Groundwater Group
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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

Volatile Organic Compounds - Quality Control

Batch BGL0568 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BGL0568-MS1)		Source: 18L0240-03		Prepared: 20-Dec-2018		Analyzed: 20-Dec-2018 17:02				
Bromomethane	8.86	1.00	ug/L	10.0	ND	88.6	72-131			
Chloroethane	10.2	0.20	ug/L	10.0	ND	102	60-155			
Trichlorofluoromethane	11.2	0.20	ug/L	10.0	ND	112	80-129			
Acrolein	34.1	5.00	ug/L	50.0	ND	68.2	52-144			
1,1,2-Trichloro-1,2,2-Trifluoroethane	11.2	0.20	ug/L	10.0	ND	112	76-129			
Acetone	48.5	5.00	ug/L	50.0	ND	97.0	58-142			
1,1-Dichloroethene	9.73	0.20	ug/L	10.0	ND	97.3	69-135			
Bromoethane	9.66	0.20	ug/L	10.0	ND	96.6	78-128			
Iodomethane	9.96	1.00	ug/L	10.0	ND	99.6	56-147			
Methylene Chloride	8.81	1.00	ug/L	10.0	ND	88.1	65-135			
Acrylonitrile	8.31	1.00	ug/L	10.0	ND	83.1	64-134			
Carbon Disulfide	8.99	0.20	ug/L	10.0	ND	89.9	78-125			
trans-1,2-Dichloroethene	8.84	0.20	ug/L	10.0	ND	88.4	78-128			
Vinyl Acetate	6.16	0.20	ug/L	10.0	ND	61.6	55-138			
1,1-Dichloroethane	8.95	0.20	ug/L	10.0	ND	89.5	76-124			
2-Butanone	44.2	5.00	ug/L	50.0	ND	88.4	61-140			
2,2-Dichloropropane	6.08	0.20	ug/L	10.0	ND	60.8	78-125			*, Q
cis-1,2-Dichloroethene	9.05	0.20	ug/L	10.0	ND	90.5	80-121			
Chloroform	9.49	0.20	ug/L	10.0	ND	94.9	80-122			
Bromochloromethane	9.67	0.20	ug/L	10.0	ND	96.7	80-121			
1,1,1-Trichloroethane	8.56	0.20	ug/L	10.0	ND	85.6	79-123			
1,1-Dichloropropene	9.24	0.20	ug/L	10.0	ND	92.4	80-120			
Carbon tetrachloride	7.36	0.20	ug/L	10.0	ND	73.6	53-137			Q
1,2-Dichloroethane	10.2	0.20	ug/L	10.0	ND	102	75-123			
Benzene	9.58	0.20	ug/L	10.0	ND	95.8	80-120			
Trichloroethene	10.1	0.20	ug/L	10.0	ND	101	80-120			
1,2-Dichloropropane	9.00	0.20	ug/L	10.0	ND	90.0	80-120			
Bromodichloromethane	8.72	0.20	ug/L	10.0	ND	87.2	80-121			
Dibromomethane	9.95	0.20	ug/L	10.0	ND	99.5	80-120			
2-Chloroethyl vinyl ether	ND	1.00	ug/L	10.0	ND		74-127			*, U
4-Methyl-2-Pentanone	48.2	5.00	ug/L	50.0	ND	96.5	67-133			
cis-1,3-Dichloropropene	8.29	0.20	ug/L	10.0	ND	82.9	80-124			
Toluene	9.64	0.20	ug/L	10.0	ND	96.4	80-120			
trans-1,3-Dichloropropene	8.66	0.20	ug/L	10.0	ND	86.6	71-127			
2-Hexanone	45.2	5.00	ug/L	50.0	ND	90.4	69-133			



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Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

Volatile Organic Compounds - Quality Control

Batch BGL0568 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BGL0568-MS1)		Source: 18L0240-03		Prepared: 20-Dec-2018		Analyzed: 20-Dec-2018 17:02				
1,1,2-Trichloroethane	9.73	0.20	ug/L	10.0	ND	97.3	80-121			
1,3-Dichloropropane	9.07	0.20	ug/L	10.0	ND	90.7	80-120			
Tetrachloroethene	10.3	0.20	ug/L	10.0	ND	103	80-120			
Dibromochloromethane	8.03	0.20	ug/L	10.0	ND	80.3	65-135			
1,2-Dibromoethane	9.84	0.20	ug/L	10.0	ND	98.4	80-121			
Chlorobenzene	9.74	0.20	ug/L	10.0	ND	97.4	80-120			
Ethylbenzene	9.74	0.20	ug/L	10.0	ND	97.4	80-120			
1,1,1,2-Tetrachloroethane	8.58	0.20	ug/L	10.0	ND	85.8	80-120			
m,p-Xylene	19.6	0.40	ug/L	20.0	ND	98.0	80-121			
o-Xylene	9.36	0.20	ug/L	10.0	ND	93.6	80-121			
Xylenes, total	29.0	0.60	ug/L	30.0	ND	96.6	76-127			
Styrene	9.83	0.20	ug/L	10.0	ND	98.3	80-124			
Bromoform	7.16	0.20	ug/L	10.0	ND	71.6	51-134			Q
1,1,2,2-Tetrachloroethane	8.86	0.20	ug/L	10.0	ND	88.6	77-123			
1,2,3-Trichloropropane	9.02	0.50	ug/L	10.0	ND	90.2	76-125			
trans-1,4-Dichloro 2-Butene	9.95	1.00	ug/L	10.0	ND	99.5	55-129			
n-Propylbenzene	9.49	0.20	ug/L	10.0	ND	94.9	78-130			
Bromobenzene	9.39	0.20	ug/L	10.0	ND	93.9	80-120			
Isopropyl Benzene	8.81	0.20	ug/L	10.0	ND	88.1	80-128			
2-Chlorotoluene	9.11	0.20	ug/L	10.0	ND	91.1	78-122			
4-Chlorotoluene	9.26	0.20	ug/L	10.0	ND	92.6	80-121			
t-Butylbenzene	9.26	0.20	ug/L	10.0	ND	92.6	78-125			
1,3,5-Trimethylbenzene	9.41	0.20	ug/L	10.0	ND	94.1	80-129			
1,2,4-Trimethylbenzene	9.14	0.20	ug/L	10.0	ND	91.4	80-127			
s-Butylbenzene	9.63	0.20	ug/L	10.0	ND	96.3	78-129			
4-Isopropyl Toluene	9.82	0.20	ug/L	10.0	ND	98.2	79-130			
1,3-Dichlorobenzene	9.65	0.20	ug/L	10.0	ND	96.5	80-120			
1,4-Dichlorobenzene	9.71	0.20	ug/L	10.0	ND	97.1	80-120			
n-Butylbenzene	10.2	0.20	ug/L	10.0	ND	102	74-129			
1,2-Dichlorobenzene	9.55	0.20	ug/L	10.0	ND	95.5	80-120			
1,2-Dibromo-3-chloropropane	6.36	0.50	ug/L	10.0	ND	63.6	62-123			Q
1,2,4-Trichlorobenzene	10.1	0.50	ug/L	10.0	ND	101	64-124			
Hexachloro-1,3-Butadiene	10.0	0.50	ug/L	10.0	ND	100	58-123			
Naphthalene	9.03	0.50	ug/L	10.0	ND	90.3	50-134			
1,2,3-Trichlorobenzene	10.4	0.50	ug/L	10.0	ND	104	49-133			



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10-Jan-2019 14:56

Volatile Organic Compounds - Quality Control

Batch BGL0568 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BGL0568-MS1)		Source: 18L0240-03		Prepared: 20-Dec-2018		Analyzed: 20-Dec-2018 17:02				
Dichlorodifluoromethane	8.24	0.20	ug/L	10.0	ND	82.4	48-147			
Methyl tert-butyl Ether	8.43	0.50	ug/L	10.0	ND	84.3	71-132			
2-Pentanone	45.6	5.00	ug/L	50.0	ND	91.1	69-134			
Surrogate: 1,2-Dichloroethane-d4	5.04		ug/L	5.00	5.45	101	80-129			
Surrogate: Toluene-d8	4.82		ug/L	5.00	4.57	96.4	80-120			
Surrogate: 4-Bromofluorobenzene	5.03		ug/L	5.00	4.76	101	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.03		ug/L	5.00	5.14	101	80-120			

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

Matrix Spike Dup (BGL0568-MSD1)		Source: 18L0240-03		Prepared: 20-Dec-2018		Analyzed: 20-Dec-2018 17:22				
Chloromethane	7.04	0.50	ug/L	10.0	ND	70.4	60-138	3.21	30	Q
Vinyl Chloride	7.96	0.20	ug/L	10.0	ND	79.6	66-133	1.11	30	
Bromomethane	9.17	1.00	ug/L	10.0	ND	91.7	72-131	3.37	30	
Chloroethane	9.87	0.20	ug/L	10.0	ND	98.7	60-155	3.81	30	
Trichlorofluoromethane	10.6	0.20	ug/L	10.0	ND	106	80-129	4.78	30	
Acrolein	31.0	5.00	ug/L	50.0	ND	62.0	52-144	9.60	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.7	0.20	ug/L	10.0	ND	107	76-129	3.82	30	
Acetone	45.9	5.00	ug/L	50.0	ND	91.8	58-142	5.47	30	
1,1-Dichloroethene	9.42	0.20	ug/L	10.0	ND	94.2	69-135	3.17	30	
Bromoethane	9.02	0.20	ug/L	10.0	ND	90.2	78-128	6.77	30	
Iodomethane	9.60	1.00	ug/L	10.0	ND	96.0	56-147	3.66	30	
Methylene Chloride	8.58	1.00	ug/L	10.0	ND	85.8	65-135	2.69	30	
Acrylonitrile	7.85	1.00	ug/L	10.0	ND	78.5	64-134	5.80	30	
Carbon Disulfide	8.81	0.20	ug/L	10.0	ND	88.1	78-125	2.07	30	
trans-1,2-Dichloroethene	8.40	0.20	ug/L	10.0	ND	84.0	78-128	5.18	30	
Vinyl Acetate	6.20	0.20	ug/L	10.0	ND	62.0	55-138	0.59	30	
1,1-Dichloroethane	8.59	0.20	ug/L	10.0	ND	85.9	76-124	4.15	30	
2-Butanone	42.7	5.00	ug/L	50.0	ND	85.3	61-140	3.53	30	
2,2-Dichloropropane	5.89	0.20	ug/L	10.0	ND	58.9	78-125	3.12	30	*, Q
cis-1,2-Dichloroethene	8.67	0.20	ug/L	10.0	ND	86.7	80-121	4.23	30	
Chloroform	9.08	0.20	ug/L	10.0	ND	90.8	80-122	4.37	30	
Bromochloromethane	9.52	0.20	ug/L	10.0	ND	95.2	80-121	1.58	30	
1,1,1-Trichloroethane	8.23	0.20	ug/L	10.0	ND	82.3	79-123	4.01	30	
1,1-Dichloropropene	8.85	0.20	ug/L	10.0	ND	88.5	80-120	4.36	30	
Carbon tetrachloride	7.44	0.20	ug/L	10.0	ND	74.4	53-137	1.06	30	Q



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10-Jan-2019 14:56

Volatile Organic Compounds - Quality Control

Batch BGL0568 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BGL0568-MSD1)		Source: 18L0240-03		Prepared: 20-Dec-2018		Analyzed: 20-Dec-2018 17:22				
1,2-Dichloroethane	9.50	0.20	ug/L	10.0	ND	95.0	75-123	7.17	30	
Benzene	9.31	0.20	ug/L	10.0	ND	93.1	80-120	2.85	30	
Trichloroethene	9.75	0.20	ug/L	10.0	ND	97.5	80-120	3.24	30	
1,2-Dichloropropane	8.76	0.20	ug/L	10.0	ND	87.6	80-120	2.63	30	
Bromodichloromethane	8.59	0.20	ug/L	10.0	ND	85.9	80-121	1.44	30	
Dibromomethane	9.70	0.20	ug/L	10.0	ND	97.0	80-120	2.57	30	
2-Chloroethyl vinyl ether	ND	1.00	ug/L	10.0	ND		74-127			*, U
4-Methyl-2-Pentanone	47.3	5.00	ug/L	50.0	ND	94.6	67-133	1.99	30	
cis-1,3-Dichloropropene	8.15	0.20	ug/L	10.0	ND	81.5	80-124	1.60	30	
Toluene	9.34	0.20	ug/L	10.0	ND	93.4	80-120	3.14	30	
trans-1,3-Dichloropropene	8.40	0.20	ug/L	10.0	ND	84.0	71-127	3.03	30	
2-Hexanone	44.1	5.00	ug/L	50.0	ND	88.3	69-133	2.40	30	
1,1,2-Trichloroethane	9.57	0.20	ug/L	10.0	ND	95.7	80-121	1.64	30	
1,3-Dichloropropane	8.75	0.20	ug/L	10.0	ND	87.5	80-120	3.55	30	
Tetrachloroethene	9.62	0.20	ug/L	10.0	ND	96.2	80-120	7.18	30	
Dibromochloromethane	7.87	0.20	ug/L	10.0	ND	78.7	65-135	2.00	30	
1,2-Dibromoethane	9.32	0.20	ug/L	10.0	ND	93.2	80-121	5.38	30	
Chlorobenzene	9.25	0.20	ug/L	10.0	ND	92.5	80-120	5.15	30	
Ethylbenzene	9.00	0.20	ug/L	10.0	ND	90.0	80-120	7.90	30	
1,1,1,2-Tetrachloroethane	8.12	0.20	ug/L	10.0	ND	81.2	80-120	5.49	30	
m,p-Xylene	18.8	0.40	ug/L	20.0	ND	94.2	80-121	4.04	30	
o-Xylene	8.88	0.20	ug/L	10.0	ND	88.8	80-121	5.29	30	
Xylenes, total	27.7	0.60	ug/L	30.0	ND	92.4	76-127	4.44	30	
Styrene	9.21	0.20	ug/L	10.0	ND	92.1	80-124	6.54	30	
Bromoform	7.30	0.20	ug/L	10.0	ND	73.0	51-134	1.88	30	Q
1,1,2,2-Tetrachloroethane	8.86	0.20	ug/L	10.0	ND	88.6	77-123	0.01	30	
1,2,3-Trichloropropane	8.99	0.50	ug/L	10.0	ND	89.9	76-125	0.34	30	
trans-1,4-Dichloro 2-Butene	9.03	1.00	ug/L	10.0	ND	90.3	55-129	9.75	30	
n-Propylbenzene	9.02	0.20	ug/L	10.0	ND	90.2	78-130	5.02	30	
Bromobenzene	9.18	0.20	ug/L	10.0	ND	91.8	80-120	2.26	30	
Isopropyl Benzene	8.42	0.20	ug/L	10.0	ND	84.2	80-128	4.49	30	
2-Chlorotoluene	8.78	0.20	ug/L	10.0	ND	87.8	78-122	3.73	30	
4-Chlorotoluene	8.77	0.20	ug/L	10.0	ND	87.7	80-121	5.48	30	
t-Butylbenzene	8.94	0.20	ug/L	10.0	ND	89.4	78-125	3.52	30	
1,3,5-Trimethylbenzene	8.89	0.20	ug/L	10.0	ND	88.9	80-129	5.73	30	



Pacific Groundwater Group
2377 Eastlake Ave. E. Suite 200
Seattle WA, 98102

Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

Volatile Organic Compounds - Quality Control

Batch BGL0568 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BGL0568-MSD1)		Source: 18L0240-03		Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 17:22						
1,2,4-Trimethylbenzene	8.90	0.20	ug/L	10.0	ND	89.0	80-127	2.69	30	
s-Butylbenzene	9.16	0.20	ug/L	10.0	ND	91.6	78-129	4.99	30	
4-Isopropyl Toluene	9.40	0.20	ug/L	10.0	ND	94.0	79-130	4.36	30	
1,3-Dichlorobenzene	9.38	0.20	ug/L	10.0	ND	93.8	80-120	2.77	30	
1,4-Dichlorobenzene	9.37	0.20	ug/L	10.0	ND	93.7	80-120	3.61	30	
n-Butylbenzene	9.82	0.20	ug/L	10.0	ND	98.2	74-129	3.79	30	
1,2-Dichlorobenzene	9.50	0.20	ug/L	10.0	ND	95.0	80-120	0.49	30	
1,2-Dibromo-3-chloropropane	6.25	0.50	ug/L	10.0	ND	62.5	62-123	1.79	30	Q
1,2,4-Trichlorobenzene	9.94	0.50	ug/L	10.0	ND	99.4	64-124	1.76	30	
Hexachloro-1,3-Butadiene	9.93	0.50	ug/L	10.0	ND	99.3	58-123	0.95	30	
Naphthalene	8.76	0.50	ug/L	10.0	ND	87.6	50-134	3.04	30	
1,2,3-Trichlorobenzene	10.2	0.50	ug/L	10.0	ND	102	49-133	2.45	30	
Dichlorodifluoromethane	8.20	0.20	ug/L	10.0	ND	82.0	48-147	0.49	30	
Methyl tert-butyl Ether	8.33	0.50	ug/L	10.0	ND	83.3	71-132	1.28	30	
2-Pentanone	44.0	5.00	ug/L	50.0	ND	88.0	69-134	3.55	30	
Surrogate: 1,2-Dichloroethane-d4	5.00		ug/L	5.00	5.45	100	80-129			
Surrogate: Toluene-d8	4.88		ug/L	5.00	4.57	97.5	80-120			
Surrogate: 4-Bromofluorobenzene	4.93		ug/L	5.00	4.76	98.6	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.00		ug/L	5.00	5.14	99.9	80-120			

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



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGL0547 - WMN (No Prep)

Instrument: ICP2 Analyst: TCH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGL0547-BLK1)										
					Prepared: 19-Dec-2018 Analyzed: 20-Dec-2018 12:04					
Iron, Dissolved	ND	0.0500	mg/L							U
Manganese, Dissolved	ND	0.0010	mg/L							U
LCS (BGL0547-BS1)										
					Prepared: 19-Dec-2018 Analyzed: 20-Dec-2018 12:42					
Iron, Dissolved	1.96	0.0500	mg/L	2.00		98.0	80-120			
Manganese, Dissolved	0.530	0.0010	mg/L	0.500		106	80-120			
Duplicate (BGL0547-DUP1)										
		Source: 18L0240-03		Prepared: 19-Dec-2018 Analyzed: 20-Dec-2018 12:16						
Iron, Dissolved	0.466	0.0500	mg/L		0.458			1.76	20	
Manganese, Dissolved	0.677	0.0010	mg/L		0.673			0.63	20	
Matrix Spike (BGL0547-MS1)										
		Source: 18L0240-03		Prepared: 19-Dec-2018 Analyzed: 20-Dec-2018 12:24						
Iron, Dissolved	2.39	0.0500	mg/L	2.00	0.458	96.3	75-125			
Manganese, Dissolved	1.19	0.0010	mg/L	0.500	0.673	103	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										
Matrix Spike Dup (BGL0547-MSD1)										
		Source: 18L0240-03		Prepared: 19-Dec-2018 Analyzed: 20-Dec-2018 12:30						
Iron, Dissolved	2.43	0.0500	mg/L	2.00	0.458	98.6	75-125	1.85	20	
Manganese, Dissolved	1.20	0.0010	mg/L	0.500	0.673	106	75-125	1.19	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
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Reported:
10-Jan-2019 14:56

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGL0573 - 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 (BGL0573-BLK1)			Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 22:33								
Arsenic, Dissolved	75a	ND	0.200	ug/L							U
LCS (BGL0573-BS1)			Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 22:37								
Arsenic, Dissolved	75a	25.8	0.200	ug/L	25.0		103	80-120			
Duplicate (BGL0573-DUP1)			Source: 18L0240-03		Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 23:05						
Arsenic, Dissolved	75a	2.95	0.200	ug/L		2.85			3.35	20	
Matrix Spike (BGL0573-MS1)			Source: 18L0240-03		Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 23:09						
Arsenic, Dissolved	75a	27.9	0.200	ug/L	25.0	2.85	100	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BGL0573-MSD1)			Source: 18L0240-03		Prepared: 20-Dec-2018 Analyzed: 20-Dec-2018 23:14						
Arsenic, Dissolved	75a	27.0	0.200	ug/L	25.0	2.85	96.8	75-125	2.98	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											



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Reported:
10-Jan-2019 14:56

Wet Chemistry - Quality Control

Batch BGL0372 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: CDE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGL0372-BLK1) Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 16:18											
Ferrous Iron	ND	0.040	0.040	mg/L							U
LCS (BGL0372-BS1) Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 16:18											
Ferrous Iron	0.547	0.040	0.040	mg/L	0.500		109	90-110			
Duplicate (BGL0372-DUP1) Source: 18L0240-03 Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 16:39											
Ferrous Iron	0.537	0.040	0.040	mg/L		0.536			0.19	20	H
Matrix Spike (BGL0372-MS1) Source: 18L0240-03 Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 16:39											
Ferrous Iron	0.933	0.040	0.040	mg/L	0.401	0.536	99.0	75-125			H

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



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Reported:
10-Jan-2019 14:56

Wet Chemistry - Quality Control

Batch BGL0388 - No Prep Wet Chem

Instrument: LACHAT2 Analyst: AGW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BGL0388-BLK1)										
					Prepared: 13-Dec-2018 Analyzed: 28-Dec-2018 19:21					
Nitrate + Nitrite as N	ND	0.010	0.010	mg/L						U
LCS (BGL0388-BS1)										
					Prepared: 13-Dec-2018 Analyzed: 28-Dec-2018 19:22					
Nitrate + Nitrite as N	0.486	0.010	0.010	mg/L	0.500		97.2 90-110			
Duplicate (BGL0388-DUP1)										
		Source: 18L0240-03			Prepared: 13-Dec-2018 Analyzed: 28-Dec-2018 19:27					
Nitrate + Nitrite as N	0.457	0.010	0.010	mg/L		0.455		0.48	20	
Matrix Spike (BGL0388-MS1)										
		Source: 18L0240-03			Prepared: 13-Dec-2018 Analyzed: 28-Dec-2018 19:28					
Nitrate + Nitrite as N	0.958	0.010	0.010	mg/L	0.500	0.455	101 75-125			

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



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Reported:
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Wet Chemistry - Quality Control

Batch BGL0406 - No Prep Wet Chem

Instrument: Accumet AR60 Analyst: UW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGL0406-BLK1) Prepared: 14-Dec-2018 Analyzed: 14-Dec-2018 13:34											
Alkalinity, Total	ND	1.00	1.00	mg/L CaCO3							U
Blank (BGL0406-BLK2) Prepared: 14-Dec-2018 Analyzed: 14-Dec-2018 14:40											
Alkalinity, Total	ND	1.00	1.00	mg/L CaCO3							U
Duplicate (BGL0406-DUP1) Source: 18L0240-03 Prepared: 14-Dec-2018 Analyzed: 14-Dec-2018 14:40											
Alkalinity, Total	50.3	1.00	1.00	mg/L CaCO3		49.9			0.81	20	
Reference (BGL0406-SRM1) Prepared: 14-Dec-2018 Analyzed: 14-Dec-2018 13:34											
Alkalinity, Total	114	1.00	1.00	mg/L CaCO3	116		98.0	85-114.66			



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Reported:
10-Jan-2019 14:56

Wet Chemistry - Quality Control

Batch BHA0147 - No Prep Wet Chem

Instrument: LACHAT2 Analyst: AGW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHA0147-BLK1) Prepared: 07-Jan-2019 Analyzed: 08-Jan-2019 16:02											
Sulfate	ND	2.00	2.00	mg/L							U
LCS (BHA0147-BS1) Prepared: 07-Jan-2019 Analyzed: 08-Jan-2019 16:03											
Sulfate	15.2	2.00	2.00	mg/L	15.0		101	90-110			
Duplicate (BHA0147-DUP1) Source: 18L0240-03 Prepared: 07-Jan-2019 Analyzed: 08-Jan-2019 16:07											
Sulfate	7.24	2.00	2.00	mg/L		7.35			1.51	20	
Matrix Spike (BHA0147-MS1) Source: 18L0240-03 Prepared: 07-Jan-2019 Analyzed: 08-Jan-2019 18:01											
Sulfate	15.0	2.00	2.00	mg/L	15.0	7.35	51.2	75-125			*
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BHA0147-MSD1) Source: 18L0240-03 Prepared: 07-Jan-2019 Analyzed: 08-Jan-2019 18:03											
Sulfate	15.3	2.00	2.00	mg/L	15.0	7.35	53.1	75-125	1.87	20	*
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											



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Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 353.2 in Water	
Nitrate + Nitrite as N	NELAP,DoD-ELAP,WADOE
EPA 375.2 in Water	
Sulfate	WADOE,NELAP
EPA 6010C in Water	
Iron	WADOE,NELAP,DoD-ELAP
Manganese	WADOE,NELAP,DoD-ELAP
EPA 8260C in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrolein	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Iodomethane	DoD-ELAP,NELAP,CALAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,CALAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,CALAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Butanone	DoD-ELAP,NELAP,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,CALAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,CALAP,WADOE
Bromoform	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,CALAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,CALAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,CALAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE



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1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

SM 2320 B-97 in Water

Alkalinity, Bicarbonate	NELAP,WADOE,WA-DW,DoD-ELAP
Alkalinity, Carbonate	WADOE,WA-DW,DoD-ELAP,NELAP
Alkalinity, Hydroxide	WADOE,WA-DW,DoD-ELAP,NELAP
Alkalinity, Total	DoD-ELAP,WADOE,WA-DW,NELAP

SM 3500-Fe B-97 in Water

Ferrous Iron	WADOE,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	01/01/2021
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



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Project: Carnation Landfill JS0903
Project Number: Carnation Landfill JS0903
Project Manager: Glenn Mutti-Driscoll

Reported:
10-Jan-2019 14:56

Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
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.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
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.