

BY ELECTRONIC SUBMITTAL

December 4, 2019

Ms. Rachel Patton
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Virginia Beach, Virginia 23462
Rachel.Patton@deq.virginia.gov

RE: Chesapeake Energy Center Industrial Landfill, Solid Waste Facility Permit No. 440:

Nature & Extent/Assessment of Corrective Measures Addendum for Antimony and

Beta-BHC

Dear Ms. Patton

In accordance with Permit Module XI.H.1, Dominion Energy is submitting the attached Nature and Extent (N&E)/Assessment of Corrective Measures (ACM) addendum for antimony and beta-BHC at the Chesapeake Energy Center (CEC) Industrial Landfill.

The CEC Industrial Landfill currently monitors groundwater on a semi-annual basis in accordance with the VSWMR Phase II and corrective action programs. The existing groundwater Corrective Action Plan (CAP) addresses arsenic, beryllium, cobalt, selenium, and sulfide in response to previous groundwater protection standard (GPS) exceedances. Antimony and beta-BHC are being added to the CAP in response to being identified at concentrations above the GPS in one or both 2018 sampling events as detailed in our letter to the Department dated June 7, 2019.

If you have any questions regarding this submittal, please contact Kelly Hicks at (804) 273-4903 or via email at kelly.a.hicks@dominionenergy.com.

Sincerely,

Lisa C. Messinger

Director, Environmental Services

Loa C. Messing

Attachment

Ms. Rachel Patton December 4, 2019 Page 2 of 2

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NATURE AND EXTENT STUDY AND ASSESSMENT OF CORRECTIVE MEASURES ADDENDUM

Chesapeake Energy Center Industrial Landfill, Permit No. 440 Chesapeake, Virginia

Prepared for:



Virginia Electric Power and Company

(d/b/a) Dominion Energy Virginia 5000 Dominion Boulevard Glen Allen, Virginia 23060



EXECUTIVE SUMMARY

Virginia Electric and Power Company (d/b/a Dominion Energy) notified the Virginia Department of Environmental Quality (DEQ) of groundwater protection standard (GPS) exceedances for two new constituents of concern (COCs; antimony and beta-BHC) at four compliance wells at the Chesapeake Energy Center Industrial Landfill (Facility) on June 7, 2019. Subsequent to the notification and consistent with the requirements in the Virginia Solid Waste Management Regulations (VSWMR), a limited Nature and Extent Study (NES) was completed to delineate the nature and extent of antimony and beta-BHC concentrations in groundwater and surface water adjoining the Facility. The NES was completed with a series of existing monitoring wells that have been installed around the perimeter of the Facility. Data from groundwater samples collected from these wells in February 2019 and groundwater and surface water samples collected in June 2019, were used to complete the required delineation activities.

Based on evaluation of the laboratory analytical results for the samples used in the investigation, the nature and extent of the antimony and beta-BHC impacts to groundwater at the Facility have been delineated. There were no detections of antimony or beta-BHC at concentrations above the Facility GPS in sampled groundwater wells or adjacent surface water sampled for this NES.

Based on the investigation results the existing groundwater Corrective Action Plan (CAP; Revision 1 dated June 2011) and Corrective Action Monitoring Plan (CAMP; 2nd Revision dated March 2015) for the Facility were reviewed to determine if the existing remedy is suitable for remediation of the new COCs. Based on our review, Golder believes that the monitored natural attenuation remedy presented in the CAP and the associated monitoring activities presented in the CAMP are sufficient to meet the regulatory requirements for corrective action with respect to the new COCs. Consistent with the CAMP conditions, the COCs have been added to the constituent list for performance and sentinel wells, as well as the surface water monitoring locations that are monitored under the existing corrective action program. Therefore, no modifications to the existing CAP or CAMP are proposed at this time.



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1.0 INTRODUCTION

This Nature and Extent Study (NES) / Assessment of Corrective Measures (ACM) Addendum (Addendum) has been prepared for the Chesapeake Energy Center (CEC) Industrial Landfill (Facility) in Chesapeake, Virginia. The Facility is owned and maintained by Virginia Electric and Power Company (d/b/a Dominion Energy). The Addendum was completed in response to the following Groundwater Protection Standard (GPS) exceedances that were documented in a June 7, 2019, letter to the Department of Environmental Quality (DEQ).

Constituent	Well ID	GPS (μg/L)	March 2018 Concentration (μg/L)	August 2018 Concentration (μg/L)
	CECW-2	6	ND	7.0
Antimony	CECW-6I		12.5	ND
	CECW-10R		9.1	ND
beta-BHC	PO-9	0.025 or RL	0.11	

Notes:

GPS = Groundwater Protection Standard

ND = Not detected above laboratory method detection limit

RL = Laboratory Reporting Limit

μg/L = Micrograms per liter

This Addendum was completed consistent with the requirements in Solid Waste Facility Permit Number 440 and its references to the Virginia Solid Waste Management Regulations (VSWMR; 9VAC20-81 *et seq.*). The following sections of this Addendum present relevant information pertaining to the nature and extent of the observed antimony and beta-BHC concentrations in groundwater followed by an evaluation of these new corrective action constituents against the Facility's existing corrective action permit and associated documents.

1.1 Site Information

As shown on Drawing 1, the 36.5 acre Facility is an Industrial Landfill (Solid Waste Permit #440) that is located at 2701 Vepco Street, in Chesapeake, Virginia. The 213.6-acre CEC property is owned and operated by Dominion Energy and is bounded to the north by the Norfolk and Western rail line and Military Highway (Route 13/460), to the east by the Southern Branch of the Elizabeth River (SBER), and to the west by a former non-contact cooling water discharge channel. The Facility was constructed in 1985 with a synthetic liner and was used as an area fill industrial landfill that was used exclusively for the disposal of coal combustion by-products generated at CEC.

The Facility is located on an inverted L-shaped peninsula measuring approximately 6,000 feet (ft) from south to north and 1,200 to 4,000 ft from west to east. The peninsula, on which the Facility is situated, is surrounded by the SBER, Deep Creek, and a former cooling water discharge canal on its eastern, southern, and western flanks, respectively. The ground surface topography of the peninsula is relatively flat and ranges from an approximate elevation of 5 to 12 feet mean sea level (msl). The Facility has a top elevation of approximately 65 feet msl. Adjoining land use around the landfill is zoned M-2 general industrial district with various industrial facilities located across the SBER from the landfill. It is Dominion Energy's understanding that there are no known users of the shallow water aguifer as a drinking water source in the area of the Facility.



1.2 Compliance Groundwater Monitoring Network

As a permitted solid waste facility, the groundwater beneath the Facility is monitored on a semi-annual basis in accordance with the VSWMR. These activities are conducted in accordance with various permit-attached documents, including the Facility's *Groundwater Monitoring Plan*, and include the sampling and analysis of groundwater samples collected from the following compliance monitoring wells:

Upgradient Wells	MW-4R, MW-5
Downgradient Wells	CECW-1, CECW-2, CECW-3, CECW-4, CECW-5, CECW-6I, CECW-10R, PO-8, PO-9, PO-10, PO-11

It is noted that MW-10R was added to the compliance network in 2015 and that the Facility's permit amendment reflecting this addition is still pending.

The locations of the compliance wells are shown on Drawing 2. As presented, the compliance wells are located around the perimeter of the Facility and are screened in the uppermost aquifer beneath the Facility. The uppermost aquifer is comprised of the surficial sediments of the Columbia Aquifer, which is underlain by the Yorktown confining zone, and the Yorktown-Eastover aquifer. The Columbia Aquifer is an unconfined water table aquifer; however, clayey fine sand, silt, clay, and peat deposits within the aquifer cause local confined to semi-confined conditions in some areas (Smith and Harlow, 2002). Groundwater movement through the unconfined and confined aquifers is generally lateral in nature with discharge into surrounding water bodies including the SBER and Deep Creek. Some groundwater movement also occurs vertically through confining units into deeper confined aquifers.

Groundwater monitoring at the Facility is currently conducted in accordance with the Phase II Monitoring Program in the VSWMR and the Corrective Action Program as outlined in the VSWMR and the Facility's solid waste permit. Key details pertaining to the Corrective Action Program at the Facility are summarized in the following section.

1.3 Additional Monitoring Wells

In addition to the compliance wells Dominion Energy operates several wells at the Facility including the following performance and sentinel wells that are maintained for the Corrective Action Program.

Performance Wells	MW-5, MW-5D, CECW-1, CECW-1D, CECW-2, CECW-2D, CECW-3, CECW-3D, CECW-6I, PO-8, PO-8D, PO-10, PO-10D
Sentinel Wells	CECW-10R, CECW-15, CECW-6D, CECW-8, CECW-8D

To comply with the Coal Combustion Residuals (CCRs) Rule, additional groundwater monitoring wells have been installed at the Facility, including the following with the shallow well (denoted by the "S" postscript) installed in the sediments comprising the uppermost water table Columbia Aquifer and the well with the "D" postscript being installed in the lower Yorktown Formation.

	CW-01S/01D, CW-02S/02D, CW-03S/03D, CW-04S/04D, CW-05S/05D,
Additional Wells	CW-06S/06D, CW-07S/07D, CW-08S/08D, CW-09S/09D, CW-10S/10D,
	CW-11S/11D, CW-12S/12D



1.4 Corrective Action Program

Consistent with the requirements of the Phase II Monitoring Program Dominion Energy established GPS for the Facility on May 23, 2001. Subsequently, arsenic was reported in the uppermost water-bearing zone underlying the Facility at concentrations above the GPS during the 2002 second semi-annual sampling event (September 17, 2002). As a result, an ACM and NES were completed and submitted to DEQ on June 19, 2003. In response to DEQ comments dated October 2, 2003, revised NES and ACM Reports including sulfide were submitted to the DEQ in January 2004.

In response to ACM comments received from the DEQ, Dominion Energy installed six deep wells at the following locations: CECW-2, CECW-3, CECW-8, CECW-5, PO-8, and PO-10 in November 2005. The wells were installed to generate additional hydrogeological data for the remedial alternative evaluation. Following installation of the additional wells, the finalized Corrective Action Plan (CAP) was submitted to DEQ on January 23, 2007.

In response to identified concentrations of cobalt and beryllium above the GPS during the 2010 first semi-annual sampling event, Dominion Energy submitted an addendum to the ACM report on July 22, 2010. Subsequent to the addendum submittal, cobalt and beryllium were added to the CAP for the Facility on March 10, 2011, with the addition of the CAP (Revision 1) and Corrective Action Monitoring Plan (CAMP) to the Facility's solid waste permit.

As required in the CAMP, the first Corrective Action Site Evaluation (CASE) report, dated March 16, 2012, was submitted to DEQ to summarize the first year of CAP sampling. The CASE indicated that natural attenuation was occurring as expected and that the corrective action monitoring program should continue unchanged until the next CASE is due or until remedial objectives have been met.

On March 24, 2014, the second CASE report was submitted to the DEQ to evaluate CAP sampling results from the monitoring period of April 2011 to March 2014. CAP monitoring results indicated a geochemical environment conducive to a speciation-based groundwater remedy and provided evidence that conditions at the landfill are suitable for monitored natural attenuation. Future CAP sampling data will be compared to the results of this CASE period to determine if the implemented remedy has the ability to achieve GPS.

On January 15, 2015, Dominion Energy requested a minor permit amendment to incorporate an updated Groundwater Monitoring Plan (GMP) and CAMP to reflect the planned decommissioning of groundwater monitoring wells CECW-3 and CECW-3D in support of planned landfill closure activities and a top of casing elevation change for well PO-11. GMP and CAMP revisions are pending DEQ approval.

In response to a confirmed concentration of selenium above the GPS during the 2016 first semi-annual sampling event, Dominion Energy has included selenium in the CAP for the site. An NES/ACM Report Addendum for selenium was submitted to DEQ on August 5, 2016.

On March 10, 2017, the third CASE report was submitted to the DEQ to evaluate CAP sampling results from the monitoring period of March 2014 to March 2017. CAP monitoring results continue to indicate a geochemical environment conducive to a speciation-based groundwater remedy and provide evidence that conditions at the landfill are suitable for monitored natural attenuation. The collection of additional data with future comparisons to previous CASE periods will determine whether the implemented remedy may achieve GPS within a reasonable time frame.



2.0 GROUNDWATER FLOW EVALUATION

Static water level data for the Facility from February 2019 are summarized in Table 1. The Groundwater Surface Contour overlay presented on Drawing 2 was prepared using static water level data obtained from perimeter monitoring and observation wells. The interpreted data present an approximation of the groundwater potentiometric surface in the uppermost aquifer beneath and adjacent to the regulated unit. As presented, the general groundwater flow directions remain consistent with previous interpretations for the facility (radial in nature towards the east, south, and west).

2.1 Horizontal Flow Rate

Using the idealized groundwater flow lines shown on Drawing 2, which roughly run east to west and north to south, the average groundwater flow rate for the Facility was calculated.

The average hydraulic gradient (i) beneath the landfill is calculated to be 1.8E-02 along the groundwater flow line on Drawing 2 using the following equation:

$$igw1 = \frac{h_L}{L} = \frac{(6-2)}{210} = 2.0E - 02$$

$$igw2 = \frac{h_L}{L} = \frac{(10 - 4)}{400} = 1.5E - 02$$

$$igw\ Average = \frac{(2.0E - 02 + 1.5E - 02)}{2} = 1.8E - 02$$

Where: i = h

i = hydraulic gradient (unitless)

 h_L = head loss (elevation difference in feet)

L = length (horizontal distance in feet)

Porosity for the uppermost aquifer beneath the Facility is estimated to be 30% (θ = 0.30), and the hydraulic conductivity, k, for the site is 6.48E-04 foot per minute.

The groundwater flow rate was calculated using the following formula:

$$V\left(\frac{ft}{s}\right) = \frac{k\left(\frac{ft}{s}\right) * i}{\theta} = \frac{\left(6.48E - 04\frac{ft}{min} * 1.8E - 02\right)}{0.30} = 3.9E - 05\frac{ft}{min}$$

Where:

k = hydraulic conductivity (ft/s)

i = hydraulic gradient (unitless)

 θ = assumed porosity (unitless)

Using conversion factors to express the groundwater flow rate in feet per year (ft/year):

$$V\left(\frac{ft}{y}\right) = \left(3.9E - 05\frac{ft}{min}\right) * \left(1,440\frac{min}{d}\right) * (365 d) = 21\frac{ft}{y}$$

The estimated average groundwater flow rate beneath the Facility based on the interpreted groundwater potentiometric surface for February 2019 is approximately 21 feet per year, which is generally consistent with previous estimates. It is noted that the groundwater velocity at this Facility is variable due to changes in the hydraulic gradient as groundwater flow in the uppermost aquifer beneath the Facility converges on the receiving stream systems that border the waste management unit to the east, south, and west.

2.2 Vertical Flow Rate

Using similar equations and groundwater elevations measured on March 16, 2019, the vertical rate of groundwater flow was estimated from selected nested well pairs that have been installed at the Facility as follows:

	Groundwater Elevation (ft MSL)	Well Pair					Estimated
Well Identification		Groundwater Elevation Difference (feet)	Mid-Point Screen Separation (feet)	Gradient (unitless)	Hydraulic Conductivity (feet/min)	Effective Porosity (unitless)	Vertical Flow Rate (feet/year)
CW-1S	1.80	0.19	23.4	8.03E-03	6.48E-04	0.30	9.22
CW-1D	1.99	0.10	23.4	6.03E-03	0.402-04	0.50	9.22
CW-3S	1.70	0.07	35.3	1.96E-03	6.48E-04	0.30	2.25
CW-3D	1.77	0.07	00.0	1.502 00	0.102 01	0.00	
CW-5S	2.14	(0.58)	26.1	(2.22E-02)	6.48E-04	0.30	(25.20)
CW-5D	1.56	(0.00)	20.1	(=:=== =)	0.102 01	0.00	(20.20)
CW-7S	2.17	(0.17)	25.0	(6.80E-03)	6.48E-04	0.30	(7.72)
CW-7D	2.00	(0.17)	20.0	(0.002 00)	0.402 04	0.00	(1.12)
CW-9S	2.06	(0.34)	21.80	(1.56E-02)	6.48E-04	0.30	(17.71)
CW-9D			21.00	(1.002-02)	0.40L 04	0.00	(11.11)
CW-11S	2.37	(0.07)	22.70	(3.08E-03)	6.48E-04	0.30	(3.50)
CW-11D	2.30	(0.07)	.01)	(3.332 30)	3.102 04	0.00	(0.00)

Notes:

Positive Difference indicate upward flow.

MSL = Mean sea level

As presented, the vertical groundwater flow regime at the Facility is variable with upward flow regime from the lower Yorktown Aquifer to the uppermost Columbia Aquifer northeastern side of the Facility and a downward flow regime from the Columbia Aquifer to the lower Yorktown Aquifer observed along the southern and western perimeter of the Facility. The existing monitoring system is sufficient to monitor upward as well as downward flow regimes.



3.0 GROUNDWATER PROTECTION STANDARD EXCEEDANCES

As documented in the June 7, 2019, letter to DEQ, GPS exceedances for antimony were reported during the first semi-annual 2018 event at CECW-6I and CECW-10R with a GPS exceedance for antimony reported at CECW-2 for the second semi-annual event. A GPS exceedance for beta-BHC was reported for the sample collected from PO-9 for the first semi-annual 2018 event.

4.0 NATURE AND EXTENT SAMPLING

To support the NES delineation activities, Dominion Energy completed additional groundwater and surface water sampling and analysis activities as discussed in the following sections.

4.1 Groundwater Sampling

4.2 Compliance Wells

The solid waste compliance and corrective action wells were sampled in June 2019. The compliance well locations are shown on Drawing 2. During the sampling event the compliance monitoring wells were sampled in accordance with the procedures presented in the Facility's Groundwater Monitoring Plan (GMP). In general, the compliance monitoring wells were purged and sampled using micropurge sampling procedures and dedicated bladder pumps. Prior to purging, the depth to static water level in each well was measured with an electronic water level indicator, accurate to 0.01 foot. Using calibrated water quality meters, field parameter measurements were recorded at each well during the micropurge procedures, including pH, specific conductance, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity. After the water quality parameters stabilized, groundwater samples were collected in pre-preserved, laboratory-supplied sample containers. Following collection, the samples were placed in a cooler on ice under chain-of-custody control. The samples were shipped to Eurofins TestAmerica under chain-of-custody control using a commercial courier for analysis following the completion of the sampling event. Eurofins TestAmerica is a Virginia Environmental Laboratory Accreditation Program (VELAP)-accredited laboratory for the analyses completed.

The laboratory certificates of analysis and chain-of-custody forms for the June 2019 compliance event are presented in Appendix A. The sample results are summarized in Table 2.

4.3 Additional Wells

In support of the NES investigation for antimony and beta-BHC, data obtained from additional CCR wells located around the perimeter of the Facility during the February 2019 CCR background event have been used to assist with the horizontal and vertical delineation of these constituents of concern in the uppermost aquifer beneath the Facility. The additional CCR well locations are listed in Section 1.3 and shown on Drawing 2.

Golder understands that these wells were sampled for the CCR Rule Appendix III and Appendix IV constituents permit-required constituents and parameters, including antimony using dedicated bladder pumps and low-flow micropurge sampling procedures consistent with the provisions in the Facility's CCR Rule GMP (Haley & Aldrich, 2019a). Following collection in laboratory-provided, pre-preserved, pre-labeled sample containers the samples were placed in a cooler on ice under chain-of-custody control. The samples were shipped to PACE Analytical Services LLC under chain-of-custody control using a commercial courier for analysis following the completion of the sampling event. Pace Analytical Services is a VELAP-accredited laboratory for the analyses completed.



The laboratory certificates of analysis and chain-of-custody form for the February 2019 sampling event are presented in the *Initial CCR Groundwater Monitoring and Corrective Action Report* prepared for the Facility (Haley & Aldrich, 2019b) and are not represented herein. The sample results for antimony are presented in Table 3.

4.4 Surface Water Sampling

In support of the NES investigation, surface water samples were collected from four compliance surface water sampling locations designated in the CAMP for the Facility on June 27, 2019. For consistency with previous sampling events, the samples were collected at high tide from the subsurface water column approximately 1 foot above the river bottom. The four surface water locations are shown on Drawing 2.

The samples were collected using the surface water sampling procedures outlined in the CAMP. Following collection in pre-preserved, pre-labeled, laboratory-provided sample containers, the samples were placed in a cooler on ice under chain-of-custody control and shipped using a commercial courier to Eurofins TestAmerica in North Canton, Ohio for analysis.

A copy of the laboratory certificates of analysis and chain-of-custody form is presented in Appendix A. As presented, the samples were analyzed for beta-BHC and antimony. Eurofins TestAmerica is a VELAP-accredited laboratory for the requested analyses.

The results of the analyses are summarized below:

Analyte	SW-1 (ug/L)	SW-2 (ug/L)	SW-3 (ug/L)	SW-4 (ug/L)
Antimony	<0.57	<0.57	<0.57	<0.57
Beta-BHC	<0.0048	<0.0047	<0.0044	<0.0047

Notes: ug/L = micrograms per liter

5.0 CONSTITUENT OF CONCERN DELINEATION

Using the sampling results from the groundwater and surface water sampling activities, Golder plotted the analytical results on Drawings 3 and 4. The results of the delineation are discussed in the following sections.

5.1 Antimony Delineation

Antimony concentrations from the sampling events used in this investigation are plotted on Drawing 3. The plotted antimony concentrations are not contoured since most of the sampling results are less than the method reporting limit and since none of the reported antimony concentrations, including the results reported for CECW-2, CECW-6I, and CECW-10R, exceed the antimony GPS of 6.0 ug/L.

Cross Sections A-A' and B-B', presented on Drawing 5, illustrate the antimony concentrations in profile with a groundwater flow net that illustrates the approximate direction of groundwater flow in the aquifers underlying the Facility. As shown, the depicted groundwater flow regime is consistent with historical interpretations with groundwater flow down through the landfill and out under the berms up into the surface water system. As with the plan view, the antimony concentrations in the cross sections are not contoured since none of the reported antimony concentrations, including the results reported for CECW-2, CECW-6I, and CECW-10R, exceed the antimony GPS of 6.0 ug/L.

5.2 Beta-BHC delineation

Beta-BHC concentrations from the sampling events used in this investigation are plotted on Drawing 4. The plotted beta-BHC concentrations are not contoured since the sample results, including the surface water sample results, are less than the method reporting limit. As presented, the method detection limits are less than the beta-BHC GPS of 0.025 ug/L for this Facility, which is based on the Alternate Concentration Limit (ACL) as listed in the DEQ November 2018 (effective January 18, 2019) ACL for groundwater table.

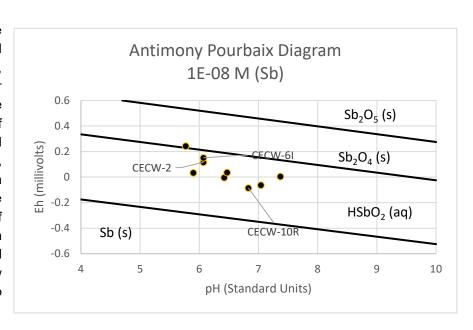
Cross Sections A-A' and B-B', presented on Drawing 6, illustrate the beta-BHC concentrations in profile with a groundwater flow net that illustrates the approximate direction of groundwater flow in the aquifers underlying the Facility. As shown, the depicted groundwater flow regime is consistent with historical interpretations with groundwater flow down through the landfill and out under the berms up into the surface water system. As with the plan view, the beta-BHC concentrations in the cross sections are not contoured as the sample results are less than the method reporting limit.

6.0 FATE AND TRANSPORT EVALUATION

The expected fate and transport conditions for the constituents of concern are discussed in the following sections.

6.1 Antimony

The mobility of antimony in the subsurface environment is controlled by the pH and Eh of the groundwater, the organic content of the aguifer matrix, and its oxidation state (speciation). Sequestering antimony has also been documented with oxyhydroxides iron. manganese, and aluminum (Herath, 2017). As shown in the inset Eh-pH diagram, the mobility of antimony generally increases in an acidic environment under normal and expected redox potential for shallow groundwater (typically expected to be in the positive Eh range).



A summary table of observed pH and Eh (corrected to Eh readings from the June 2019 sampling event using a standard hydrogen electrode correction is presented below.

Well	pH (standard units)	Oxidation-Reduction Potential (millivolts)	Standard Hydrogen Electrode Corrected Eh (millivolts)
CECW-2	6.07	-91.1	115.9



Well	pH (standard units)	Oxidation-Reduction Potential (millivolts)	Standard Hydrogen Electrode Corrected Eh (millivolts)
CECW-4	7.04	-270.5	-63.5
CECW-5	6.42	-211.7	-4.7
CECW-6I	6.07	-56.0	151
CECW-10R	6.83	-292.5	-85.5
PO-8	6.47	-171.0	36
PO-9	5.90	-174.3	32.7
PO-10	7.37	-203.3	3.7
PO-11	5.77	35.6	242.6

As plotted on the Pourbaix Diagram, these data indicate that the geochemical conditions in the uppermost aquifer are present along the antimonious acid (soluble) / antimony tetroxide boundary (insoluble) such that antimony, if present in the aquifer matrix, is expected to go into solution as antimonious acid.

The migration rate of antimony in solution is expected to be retarded relative to the groundwater flow rate due to sorption and desorption processes. Using published soil-water partitioning coefficient (Kd; 45) from the United States Environmental Protection Agency's (EPA) online Soil Screening Level guidance, the retardation factor for antimony is estimated as follows:

$$R(unitless) = 1 + \frac{p*Kd}{\theta} = \frac{Vgw}{Vcont} = 1 + \frac{\left(2.0 \frac{grams}{cm^3} * 45 \frac{cm^3}{grams}\right)}{0.25} = 361$$

$$V\ contaminant = \frac{Vgw}{R} = \frac{\left(21\ \frac{feet}{year}\right)}{361} = 0.058\ feet/year$$

As presented, antimony is expected to migrate at a much slower rate (approximately 0.28%) than the advective groundwater flow velocity. As such, antimony is expected to attenuate naturally consistent with other inorganic COCs.

6.2 Beta-BHC

Unlike alpha-BHC, beta-BHC is a recalcitrant pesticide that is resistant to biodegradation under both anaerobic and aerobic conditions. Most pesticides by design are relatively immobile and are designed to adsorb to organic matter.

Using the octanol-water partitioning coefficient (Kow; 2,139) for beta-BHC, the soil-water partitioning coefficient (Kd) was estimated as follows assuming a total organic carbon concentration in the aquifer matrix of approximately 2,000 milligrams per kilogram.

$$Kd = Koc * Foc$$

Where Foc = fraction of organic carbon

$$foc = \frac{\left(2,000 \frac{milligrams}{kilogram}\right)}{1,000,000 \frac{milligrams}{kilogram}} = 2.0E - 03$$

$$Kd = 2,139 \frac{L}{Kg} * 2.0E - 03 = 4.28 \frac{L}{Kg} \text{ or } 4.28 \frac{cm^3}{grams}$$

$$R(unitless) = 1 + \frac{p * Kd}{\theta} = \frac{Vgw}{Vcont} = 1 + \frac{\left(2.0 \frac{grams}{cm^3} * 4.28 \frac{cm^3}{grams}\right)}{0.25} = 35.2$$

$$V contaminant = \frac{Vgw}{R} = \frac{\left(21 \frac{feet}{year}\right)}{35.2} = 0.6 \text{ feet/year}$$

As presented, beta-BHC is expected to migrate at a much slower rate (approximately 2.8%) than the advective groundwater flow velocity. As such, it is expected that beta-BHC will attenuate in the subsurface. It should be noted that beta-BHC is not a COC of CCR material.

7.0 RISK EVALUATION

Antimony and beta-BHC detections in 2018 initially triggered the NES/ACM; however, data collected during this investigation does not support any possible risk issues associated with these two COCs. This finding is demonstrated in a preliminary evaluation of risk for the COCs using the established GPS as the risk assessment screening levels (*i.e.*, concentrations that are below the GPS are expected to pose an acceptable level of risk). The evaluation was performed by evaluating the three components of risk for the Facility as follows:

Component of Risk	Data	Risk Component is Complete?			
Constituents of Concern	Groundwater: Antimony, Beta- BHC detections above GPS	Complete (COCs detected at concentration above GPS in 2018)			
Constituents of Consent	Surface Water: Antimony and beta-BHC not detected	Incomplete (COCs not detected at concentration above GPS)			
Receptor	Groundwater Users	Incomplete (none known)			
recopies	Surface Water Users	Complete			
Exposure Pathway	Groundwater Users	Complete			
Exposure : alliway	Surface Water Users	Complete (dermal contact expected)			

Based on the three components of risk, no real risk is expected to be present in association with the observed groundwater impacts since there are no known groundwater users and concentrations are less than Federal drinking water standards.

The risk pathway for surface water is also not complete since neither antimony nor beta-BHC were detected in the surface water samples at concentrations that exceed the risk assessment screening levels based on the established Facility GPS.

8.0 ASSESSMENT OF CORRECTIVE MEASURE

Although the COCs were not detected during the NES addendum work, Golder completed an evaluation of the existing Corrective Action Plan (CAP) to determine if the current remedial strategy of MNA is appropriate for the new COCs consistent with the requirements in the VSWMR. Details for this evaluation are presented in the following sections.

8.1 Remedy Performance

Based on review of the existing MNA remedy monitoring results as documented in the CASE reports that have been submitted for the Facility, Golder believes that MNA is an appropriate remedy for the new COCs and that the performance of MNA as a remedy will be equal to or greater than other remedial alternatives.

8.2 Remedy Reliability

MNA as a remedy is extremely reliable for meeting remedial goals when appropriate aquifer conditions are present to support the attenuation of the COCs. Based on review of the existing MNA remedy monitoring results as documented in the CASE reports that have been submitted for the Facility in addition to subsequent sampling for these specific COCs, Golder believes that MNA will be a reliable remedy for the new COCs.

8.3 Remedy Implementation Ease

The existing MNA program, which is based on a series of performance and sentinel wells coupled with periodic sampling and analysis activities, has already been established and with the addition of the new COCs to the analyte list is sufficient to address the remediation of the new COCs.



8.4 Remedy Impacts

As discussed in the existing CAP, there are no major remediation related impacts expected with MNA (including no impacts to the existing synthetic liner or cap). Specifically, MNA does not require any intrusive activities that could impact the unit and the COCs are attenuated via destruction or sorption or precipitation within the uppermost aquifer beneath the unit. Minor operational impacts may include the generation of contaminated purge water, which would have to be disposed of at an appropriately permitted wastewater disposal facility. Potential safety impacts for commercial and industrial workers via contamination exposure would also be present on site, since the source would not be removed.

8.5 Remedy Exposure Control

As the Facility is a closed lined landfill, no potential for COC exposure under the MNA remedy is expected, with the exception of potential exposure during well installation and groundwater sampling activities. Provided site personnel are appropriately trained in the hazards of the COCs and that they use appropriate personal protection equipment (PPE) for onsite activities, the exposures to hazards associated with the MNA remedy can be minimized.

8.6 Remedy Time to Completion

As discussed in the 2011 CAP, the existing MNA remedy is expected to require at least 17.4 years to complete. Based on the addition of the new COCs, coupled with the 2019 sampling results for the new COCs, Golder does not expect the existing MNA remedy timeframe to be impacted by the new COCs.

8.7 Remedy Institutional Requirements

No significant institutional requirements for implementation of the MNA remedy are required other than DEQ permitting of the remedial alternative. The existing MNA remedy was permitted by the DEQ (most recent amendment for the corrective action program was on March 10, 2011). Since the existing MNA remedy is deemed sufficient for the new COCs, no new institutional requirements are identified.

9.0 CONCLUSION

Based on the results presented herein, the extent of the groundwater impacts associated with GPS exceedances for antimony and beta-BHC in 2018 has been delineated. There are currently no detections of antimony or beta-BHC at concentrations above the GPS in sampled groundwater wells or adjacent surface water.

Based on the investigation results, Golder believes that the existing Facility corrective action as outlined in the Corrective Action Plan (CAP; Revision 1 dated June 2011), the Corrective Action Monitoring Plan (CAMP; 2nd Revision dated March 2015), and the Facility's solid waste permit is sufficient for remediation of the new COCs. Specifically, Golder believes that the MNA remedy presented in the CAP and the associated monitoring activities presented in the CAMP are sufficient to meet the regulatory requirements for corrective action with respect to the new COCs. Consistent with the CAMP conditions, the COCs have been added to the constituent list for performance and sentinel wells, as well as the surface water monitoring locations that are monitored under the existing corrective action program. Therefore, no modifications to the existing CAP or CAMP are proposed at this time.

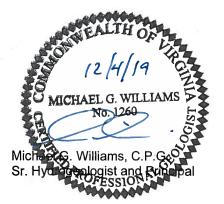


10.0 SIGNATURE SECTION

The Report has been prepared on behalf of Dominion Energy for the closed Chesapeake Energy Center Industrial Landfill, Permit No. 440 to satisfy the requirements specified in 9VAC20-81-260 of the VSWMR. This document was prepared by qualified groundwater scientists and engineers who have received baccalaureate and/or post-graduate degrees in the natural sciences or engineering and who have sufficient training and experience in groundwater hydrology, engineering, statistical evaluations, and related fields as demonstrated by state professional registrations and completion of an accredited university program that enables sound professional judgments consistent with the industry standard of care for groundwater monitoring, contaminant fate and transport, environmental corrective actions, and cost estimate development.

GOLDER ASSOCIATES INC.

FOR Rachel Powell, EIT Project Engineer



11.0 REFERENCES

Haley & Aldrich. 2019a. CCR Groundwater Monitoring Plan, Chesapeake Energy Center, Bottom Ash Pond (Including Historic Pond Area). April.

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Smith, B.S., and G.E. Harlow, Jr. 2002. Conceptual Hydrogeologic Framework of the Shallow Aquifer System at Virginia Beach, Virginia. Water-Resources Investigations Report 01-4262. United States Geological Survey.

https://golderassociates.sharepoint.com/sites/104587/reports/nes-acm addendum - antimony and beta-bhc/2019-12-04 cec nes-acm antimony and beta-bhc.docx

Summary of Static Water Level Measurements (February 2019)

Chesapeake Energy Center Industrial Landfill

Table 1

Measurement Date	Well Identification	Top of Casing Elevation (feet MSL)	Depth to Water (feet)	Groundwater Elevation (feet MSL)
2/25/2019	CECW-1	22.94	10.40	12.54
2/26/2019	CECW-1D	21.85	18.61	3.24
2/25/2019	CECW-2	23.35	13.40	9.95
2/26/2019	CECW-2D	21.79	20.67	1.12
2/25/2019	CECW-3	28.75	ВТОР	<8.26
2/26/2019	CECW-3D	27.42	20.20	7.22
2/25/2019	CECW-4	23.40	16.81	6.59
2/25/2019	CECW-5	21.87	20.93	0.94
2/26/2019	CECW-6D	22.14	21.19	0.95
2/25/2019	CECW-6I	22.12	20.30	1.82
2/25/2019	CECW-8	3.87	2.33	1.54
2/26/2019	CECW-8D	4.58	3.35	1.23
2/26/2019	CECW-10R	5.52	3.63	1.89
2/26/2019	CECW-15	6.45	6.35	0.10
2/25/2019	MW-4R	14.12	5.20	8.92
2/25/2019	MW-5	14.43	8.52	5.91
2/25/2019	MW-5D	12.41	8.18	4.23
2/25/2019	PO-10	7.49	3.00	4.49
2/27/2019	PO-10D	6.04	3.51	2.53
2/25/2019	PO-11	20.70	12.13	8.57
2/25/2019	PO-8	14.68	7.45	7.23
2/27/2019	PO-8D	23.23	22.51	0.72
2/25/2019	PO-9	9.99	4.43	5.56

Note: MSL = Mean Sea Level

Table 2 **Summary of Nature Extent Monitoring Results (June 2019)** Chesapeake Energy Center Industrial Landfill - Permit #440 Chesapeake, Virginia

	Ī	N	/IW-4R			MW-5			MW-5D		C	ECW-1			CECW-1D			CECW-2	
		6/3	27/2019			6/27/2019			6/27/2019		6/	26/2019			6/26/2019		6	/26/2019	ļ
Parameter Name	Units	Result Qual	MDL	RL	Result Q	ual MDL	RL	Result Qu	al MDL	RL	Result Qual	MDL	RL	Result	Qual MDL	RL	Result Qual	MDL	RL
Antimony, Total	ug/L	< 0.57	0.57	2.0	< 0.57	0.57	2.0	< 0.57	0.57	2.0	< 0.57	0.57	2.0	< 0.57	0.57	2.0	< 0.57	0.57	2.0
Antimony, Dissolved	ug/L	NS			0.57 J	0.57	2.0	< 0.57	0.57	2.0	< 0.57	0.57	2.0	< 0.57	0.57	2.0	< 0.57	0.57	2.0
beta-BHC	ug/L	< 0.0046	0.0046	0.050	< 0.0044	0.0044	0.048	< 0.0049	0.0049	0.054	< 0.0044	0.0044	0.048	< 0.0046	0.0046	0.050	< 0.0044	0.0044	0.048
рН	S.U.	5.69	0.10	0.10	5.81	0.10	0.10	5.86	0.10	0.10	6.29	0.10	0.10	6.27	0.10	0.10	6.07	0.10	0.10
Conductivity	μS/cm	965	0.1	0.1	269.7	0.1	0.1	2478	0.1	0.1	3253	0.1	0.1	18126	0.1	0.1	8091	0.1	0.1
Turbidity	NTU	17.72	0.1	0.1	8.5	0.1	0.1	8.2	0.1	0.1	13.27	0.1	0.1	6.0	0.1	0.1	32.1	0.1	0.1
Dissolved Oxygen	mg/L	0.70	0.1	0.1	0.15	0.1	0.1	0.74	0.1	0.1	0.57	0.1	0.1	0.37	0.1	0.1	0.13	0.1	0.1
Temperature	°C	22.6	0.01	0.01	18.5	0.01	0.01	18.9	0.01	0.01	19.6	0.01	0.01	18.3	0.01	0.01	18.7	0.01	0.01
ORP	mV	-24.5	0.1	0.1	-11.9	0.1	0.1	76.8	0.1	0.1	-54.1	0.1	0.1	-19.5	0.1	0.1	-91.1	0.1	0.1

			CEC	CW-2D		С	ECW-3			CE	CW-3D			CECW-4			CE	CW-5		CI	CW-6D	
			6/26	5/2019		6/2	26/2019			6/2	6/2019			6/27/2019			6/2	7/2019		6/3	27/2019	
Parameter Name	Units	Result C	Qual	MDL	RL	Result Qual	MDL	RL	Result	Qual	MDL	RL	Result	Qual MDL	RL	Result	Qual	MDL	RL	Result Qual	MDL	RL
Antimony, Total	ug/L	< 0.57		0.57	2.0	NS			< 0.57		0.57	2.0	< 0.57	0.57	2.0	< 0.57		0.57	2.0	< 0.57	0.57	2.0
Antimony, Dissolved	ug/L	< 0.57		0.57	2.0	NS			< 0.57		0.57	2.0	NS			NS				< 0.57	0.57	2.0
beta-BHC	ug/L	< 0.0046		0.0046	0.051	NS			< 0.0047		0.0047	0.051	< 0.0044	0.004	0.048	< 0.0044		0.0044	0.048	< 0.0046	0.0046	0.050
рН	S.U.	6.46		0.10	0.10	NS	0.10	0.10	7.46		0.10	0.10	7.04	0.10	0.10	6.42		0.10	0.10	5.92	0.10	0.10
Conductivity	μS/cm	25217		0.1	0.1	NS	0.1	0.1	1438		0.1	0.1	1227	0.1	0.1	3370		0.1	0.1	17410	0.1	0.1
Turbidity	NTU	5.6		0.1	0.1	NS	0.1	0.1	10.5		0.1	0.1	7.65	0.1	0.1	6.9		0.1	0.1	4.7	0.1	0.1
Dissolved Oxygen	mg/L	1.93		0.1	0.1	NS	0.1	0.1	1.97		0.1	0.1	0.42	0.1	0.1	0.30		0.1	0.1	1.10	0.1	0.1
Temperature	°C	20.3		0.01	0.01	NS	0.01	0.01	21.6		0.01	0.01	21.4	0.01	0.01	18.5		0.01	0.01	20.1	0.01	0.01
ORP	mV	-114.0		0.1	0.1	NS	0.1	0.1	-77.3		0.1	0.1	-270.5	0.1	0.1	-211.7		0.1	0.1	57.4	0.1	0.1

			ECW-6I 27/2019			CECW-8 6/27/2019				CW-8D 7/2019		_	ECW-10R /27/2019			CW-15 27/2019			PO-8 27/2019	
		0//	27/2019			0/2//2019			0/2	7/2019		0,	27/2019		0/4	27/2019		0/-	27/2019	
Parameter Name	Units	Result Qual	MDL	RL	Result	Qual MDL	RL	Result	Qual	MDL	RL	Result Qual	MDL	RL	Result Qual	MDL	RL	Result Qual	MDL	RL
Antimony, Total	ug/L	< 0.57	0.57	2.0	< 0.57	0.57	2.0	< 0.57		0.57	2.0	< 0.57	0.57	2.0	< 0.57	0.57	2.0	< 0.57	0.57	2.0
Antimony, Dissolved	ug/L	< 0.57	0.57	2.0	< 0.57	0.57	2.0	< 0.57		0.57	2.0	< 0.57	0.57	2.0	< 0.57	0.57	2.0	< 0.57	0.57	2.0
beta-BHC	ug/L	< 0.0046	0.0046	0.050	< 0.046	0.046	0.51	< 0.0048		0.0048	0.053	< 0.0046	0.0046	0.050	< 0.0044	0.0044	0.048	< 0.0044	0.0044	0.048
pН	S.U.	6.07	0.10	0.10	7.03	0.10	0.10	6.11		0.10	0.10	6.83	0.10	0.10	4.93	0.10	0.10	6.47	0.10	0.10
Conductivity	μS/cm	1560	0.1	0.1	22647	0.1	0.1	23991		0.1	0.1	2223	0.1	0.1	25672	0.1	0.1	2483	0.1	0.1
Turbidity	NTU	4.9	0.1	0.1	2.6	0.1	0.1	9.4		0.1	0.1	5.3	0.1	0.1	14.1	0.1	0.1	3.6	0.1	0.1
Dissolved Oxygen	mg/L	1.26	0.1	0.1	0.13	0.1	0.1	0.58		0.1	0.1	0.13	0.1	0.1	0.15	0.1	0.1	1.41	0.1	0.1
Temperature	°C	20.4	0.01	0.01	25.4	0.01	0.01	19.1		0.01	0.01	20.4	0.01	0.01	18.4	0.01	0.01	20.5	0.01	0.01
ORP	mV	-56.0	0.1	0.1	-341.5	0.1	0.1	14.4		0.1	0.1	-292.5	0.1	0.1	-127.3	0.1	0.1	-171.0	0.1	0.1

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			F	PO-8D				PO-9			F	PO-10			PC	D-10D			PO-11	
			6/2	27/2019			6/2	7/2019			6/2	27/2019			6/2	7/2019			6/26/2019	
Parameter Name	Units	Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result Qu	al MDL	RL
Antimony, Total	ug/L	< 0.57		0.57	2.0	< 0.57		0.57	2.0	< 0.57		0.57	2.0	4.8		0.57	2.0	< 0.57	0.57	2.0
Antimony, Dissolved	ug/L	< 0.57		0.57	2.0	NS				< 0.57		0.57	2.0	3.6		0.57	2.0	NS		
beta-BHC	ug/L	< 0.0048		0.0048	0.053	< 0.0046		0.0046	0.051	< 0.0044		0.0044	0.048	< 0.0051		0.0051	0.055	< 0.0045	0.0045	0.049
pH	S.U.	6.61		0.10	0.10	5.90		0.10	0.10	7.37		0.10	0.10	7.87		0.10	0.10	5.77	0.10	0.10
Conductivity	μS/cm	1480		0.1	0.1	2174		0.1	0.1	2425		0.1	0.1	1472		0.1	0.1	2995	0.1	0.1
Turbidity	NTU	6.1		0.1	0.1	8.3		0.1	0.1	7.14		0.1	0.1	198.33		0.1	0.1	3.6	0.1	0.1
Dissolved Oxygen	mg/L	2.04		0.1	0.1	0.24		0.1	0.1	0.46		0.1	0.1	0.67		0.1	0.1	0.62	0.1	0.1
Temperature	°C	21.2		0.01	0.01	19.9		0.01	0.01	20.7		0.01	0.01	22.0		0.01	0.01	20.2	0.01	0.01
ORP	mV	78.7		0.1	0.1	-174.3		0.1	0.1	-203.3		0.1	0.1	-124.2		0.1	0.1	35.6	0.1	0.1

Notes:

MDL = Method detection limit

RL = Reporting limit

Qual = Data qualifiers

mg/L = Milligram per liter

μg/L = Microgram per liter

< = Less than reporting MDL

NS = Not sampled; dry

μS/cm = MicroSiemen per centimeter S.U. = Standard Unit

NTU = Nephelometric Turbidity Unit

mV = milliVolt

°C = Degrees Celsius

Bold = Detected laboratory constituent

Table 3
Summary of CCR Groundwater Background Monitoring Results - Antimony
Chesapeake Energy Center - Bottom Ash Pond (including Historic Pond area)
Chesapeake, Virginia

Well ID	Well Location	Jun	ne 1-1	2, 2018	3	Ju	ly 16-1	18, 2018	3	Aug	ust 27	7-31, 20	18	Oct	ober 8	-12, 20	18	Nove	mber	r 5-9, 20)18	Dece	mber :	10-13, 2	018	January	7-9, 201	19	February	4-7, 20	19
		Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result Qual	MDL	RL	Result Qual	MDL	RL
CECW-21D	Upgradient	0.13	J	0.12	0.50	<0.077		0.077	0.50	0.21	J	0.077	0.50	<0.38		0.38	2.5	<0.38		0.38	2.5	<0.077		0.077	0.50	<0.077	0.077	0.50	<0.38	0.38	2.5
CECW-21YP	Upgradient	0.15	J	0.12	0.50	<0.077		0.077	0.50	<0.077	UJ	0.077	0.50	<0.38		0.38	2.5	<0.38		0.38	2.5	<0.077		0.077	0.50	<0.38	0.38	2.5	<0.38	0.38	2.5
CECW-22D	Upgradient	<0.12		0.12	0.50	<0.077		0.077	0.50	<0.077	UJ	0.077	0.50	<0.38		0.38	2.5	<0.38		0.38	2.5	<0.077		0.077	0.50	<0.077	0.077	0.50	<0.38	0.38	2.5
CW-01S	Downgradient	<1.2		1.2	5.0	<0.077		0.077	0.50	<0.77	UJ	0.77	5.0	<0.77		0.77	5.0	0.68	J	0.38	2.5	<0.077		0.077	0.50	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-01D	Downgradient	<0.58		0.58	2.5	<0.077		0.077	0.50	<0.77	UJ	0.77	5.0	<0.77		0.77	5.0	<1.5		1.5	10.0	<0.077		0.077	0.50	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-02S	Downgradient	0.17	J	0.12	0.50	<0.077		0.077	0.50	<0.77	UJ	0.77	5.0	<1.5		1.5	10.0	<1.5		1.5	10.0	<0.77		0.77	5.0	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-02D	Downgradient	<0.12		0.12	0.50	<0.077		0.077	0.50	<0.77	UJ	0.77	5.0	<1.5		1.5	10.0	<1.5		1.5	10.0	<0.77		0.77	5.0	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-03S	Downgradient	0.24	J	0.12	0.50	0.18	J	0.077	0.50	<0.77	UJ	0.77	5.0	0.23	J	0.077	0.50	<0.38		0.38	2.5	<0.77		0.77	5.0	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-03D	Downgradient	<0.58		0.58	2.5	<0.077		0.077	0.50	<0.77	UJ	0.77	5.0	<0.077		0.077	0.50	<0.38		0.38	2.5	<0.77		0.77	5.0	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-04S	Downgradient	<0.58		0.58	2.5	<0.077		0.077	0.50	<0.77	UJ	0.77	5.0	<0.38		0.38	2.5	<0.38		0.38	2.5	<0.77		0.77	5.0	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-04D	Downgradient	<0.58		0.58	2.5	<0.077		0.077	0.50	<0.77	UJ	0.77	5.0	<0.77		0.77	5.0	<0.38		0.38	2.5	<0.077		0.077	0.50	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-05S	Downgradient	0.85	J	0.58	2.5	1.3		0.077	0.5	<0.77	UJ	0.77	5.0	1.2	J	0.77	5.0	<0.38		0.38	2.5	1.0	J	0.77	5.0	0.55 J	0.38	2.5	0.60 J	0.38	2.5
CW-05D	Downgradient	<0.12		0.12	0.50	<0.077		0.077	0.50	<0.77	UJ	0.77	5.0	<0.77		0.77	5.0	0.62	J	0.38	2.5	<0.077		0.077	0.50	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-06S	Downgradient	<0.12		0.12	0.50	<0.077		0.077	0.50	<1.5	UJ	1.5	10.0	<0.077		0.077	0.50	<0.38		0.38	2.5	<0.77		0.77	5.0	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-06D	Downgradient	0.12	J	0.12	0.50	0.26	J	0.077	0.50	<0.38	UJ	0.38	2.5	<0.077		0.077	0.50	<0.38		0.38	2.5	0.50	U	0.077	0.50	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-07S	Downgradient	<0.58		0.58	2.5	<0.077		0.077	0.50	<0.38	UJ	0.38	2.5	<0.077		0.077	0.50	<0.38		0.38	2.5	<0.077		0.077	0.50	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-07D	Downgradient	<0.58		0.58	2.5	<0.077		0.077	0.50	<1.5	UJ	1.5	10.0	<0.38		0.38	2.5	<0.38		0.38	2.5	0.50	U	0.077	0.50	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-08S	Downgradient	<0.58		0.58	2.5	<0.077		0.077	0.50	<1.5	UJ	1.5	10.0	<0.38		0.38	2.5	<0.38		0.38	2.5	<0.077		0.077	0.50	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-08D	Downgradient	<0.58		0.58	2.5	<0.077		0.077	0.50	<1.5	UJ	1.5	10.0	<0.38		0.38	2.5	<0.38		0.38	2.5	<0.38		0.38	2.5	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-09S	Downgradient	<0.12		0.12	0.50	<0.077		0.077	0.50	<0.77	UJ	0.77	5.0	<0.77		0.77	5.0	<0.38		0.38	2.5	<0.077		0.077	0.50	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-09D	Downgradient	<0.58		0.58	2.5	0.32	J	0.077	0.50	<0.77	UJ	0.77	5.0	<0.077		0.077	0.50	<0.38		0.38	2.5	<0.77		0.77	5.0	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-10S	Downgradient	<0.12		0.12	0.50	<0.077		0.077	0.50	<0.077	UJ	0.077	0.50	<0.077		0.077	0.50	<0.38		0.38	2.5	<0.077		0.077	0.50	<0.077	0.077	0.50	<0.38	0.38	2.5
CW-10D	Downgradient	<0.12		0.12	0.50	<0.077		0.077	0.50	<0.077	UJ	0.077	0.50	<0.077		0.077	0.50	<0.38		0.38	2.5	<0.077		0.077	0.50	<0.077	0.077	0.50	<0.38	0.38	2.5
CW-11S	Downgradient	<0.12		0.12	0.50	<0.077		0.077	0.50	<0.077	UJ	0.077	0.50	<0.077		0.077	0.50	<0.38		0.38	2.5	<0.077		0.077	0.50	<0.077	0.077	0.50	<0.38	0.38	2.5
CW-11D	Downgradient	<0.12		0.12	0.50	<0.077		0.077	0.50	<0.077	UJ	0.077	0.50	<0.077		0.077	0.50	<0.38		0.38	2.5	<0.077		0.077	0.50	<0.077	0.077	0.50	<0.38	0.38	2.5
CW-12S	Downgradient	<0.12		0.12	0.50	<0.077		0.077	0.50	<0.077	UJ	0.077	0.50	<0.38		0.38	2.5	<0.38		0.38	2.5	<0.38		0.38	2.5	<0.38	0.38	2.5	<0.38	0.38	2.5
CW-12D	Downgradient	<0.12		0.12	0.50	<0.077		0.077	0.50	<0.77	UJ	0.77	5.0	<0.38		0.38	2.5	<0.38		0.38	2.5	<0.38		0.38	2.5	<0.38	0.38	2.5	<0.38	3.80	2.5

Notes:

Antimony concentrations in micrograms per liter ($\mu g/L$)

MDL = Method detection limit

RL = Reporting limit

< = Not detected; value represents the method detection limit

Bold font = Detected concentration

Qualifiers (Qual):

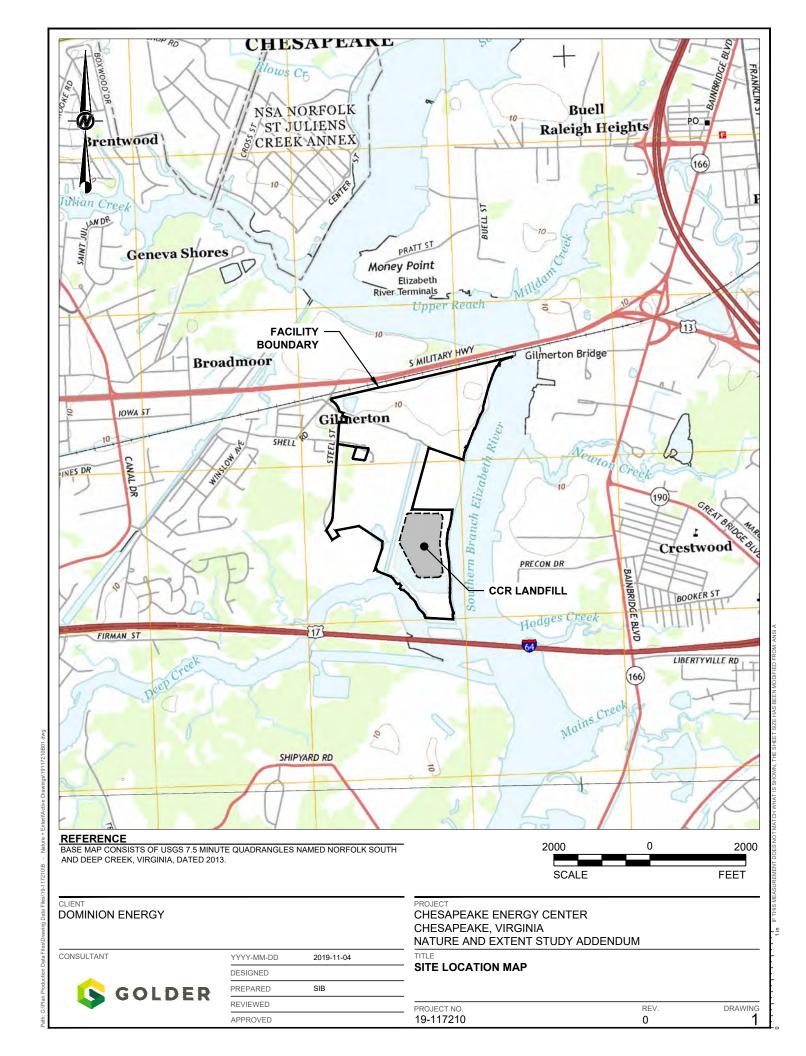
Laboratory qualifiers:

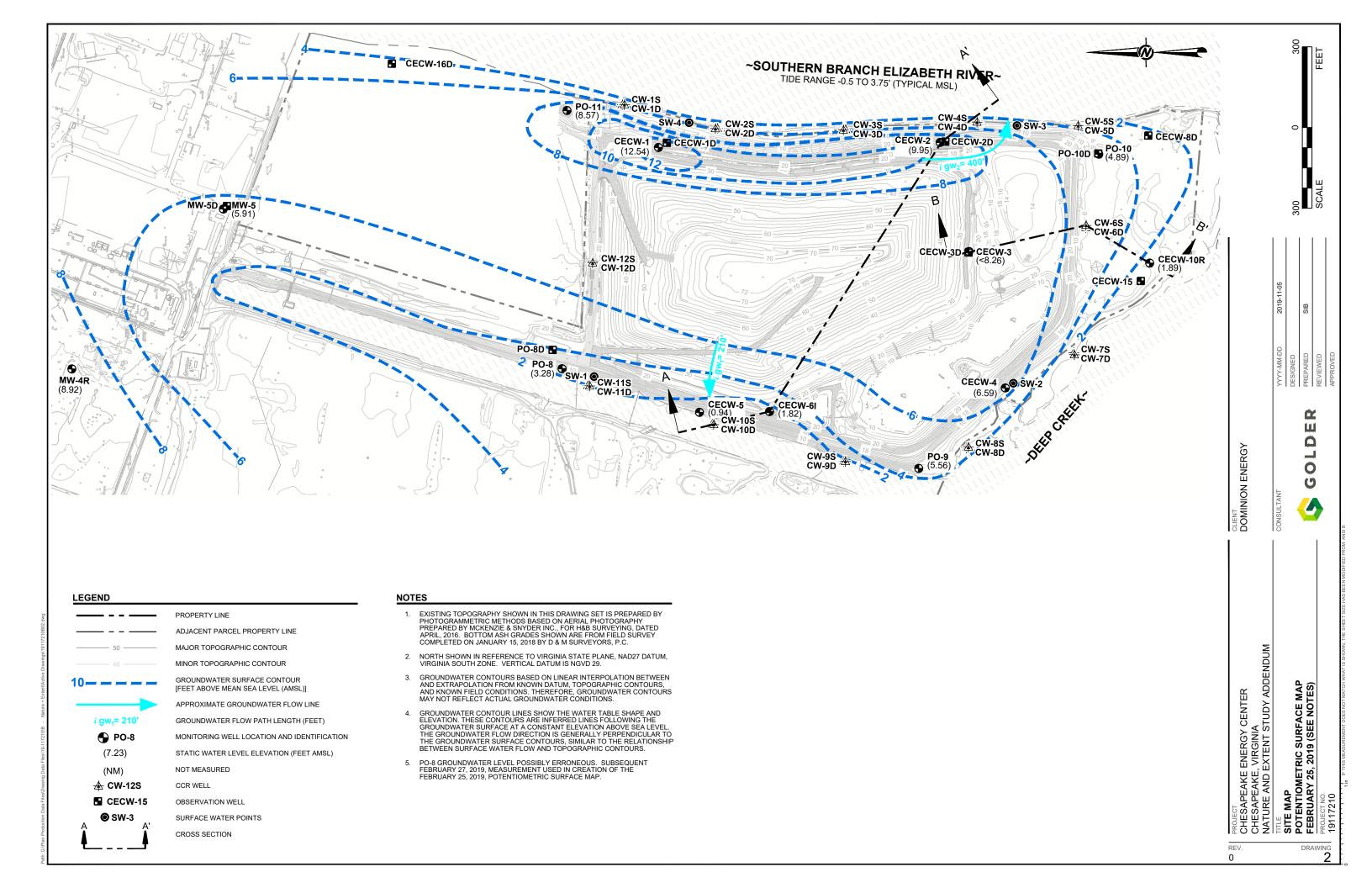
J = Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

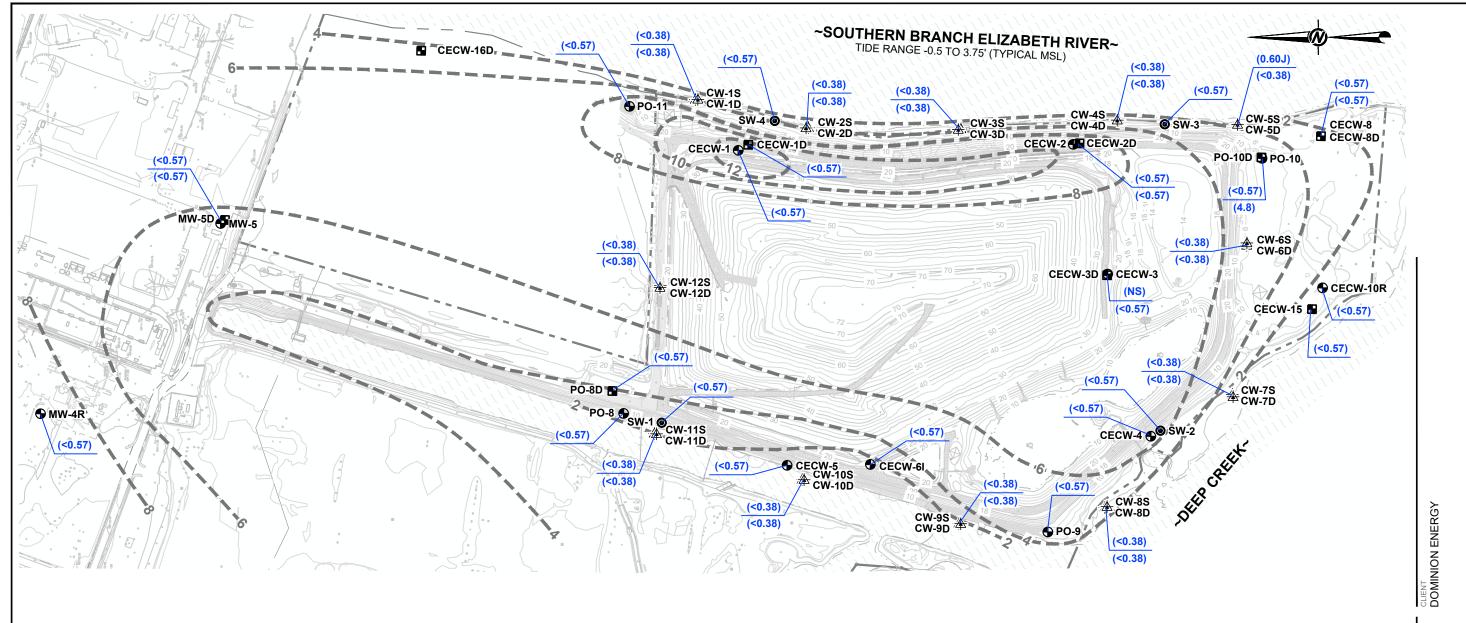
Data validation qualifiers:

U = not detected, value is the compound quantitation limit or the minimum detectable concentration

UJ = compound was not detected above the reported sample quantitation limit; however, the reported limit is approximate and may or may not represent the actual limit of quantitation







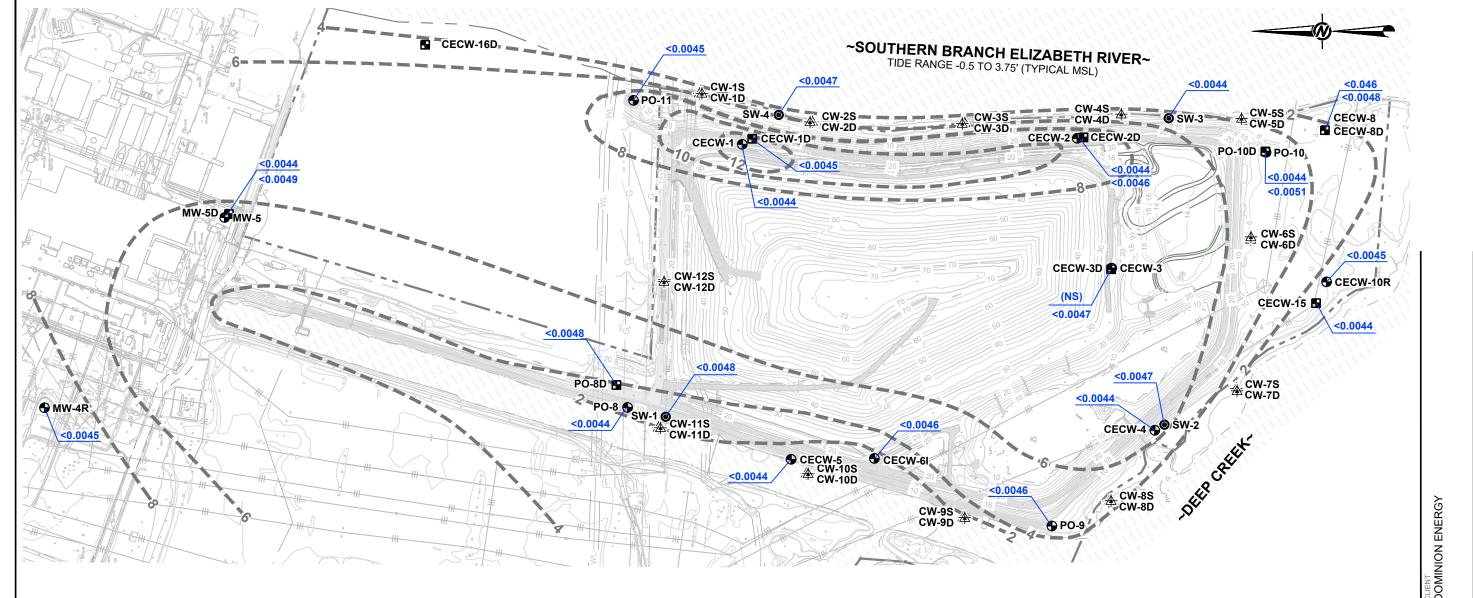
	PROPERTY LINE
	ADJACENT PARCEL PROPERTY LINE
50	MAJOR TOPOGRAPHIC CONTOUR
	MINOR TOPOGRAPHIC CONTOUR
10	GROUNDWATER SURFACE CONTOUR [FEET ABOVE MEAN SEA LEVEL (AMSL)]
⊕ PO-8	MONITORING WELL LOCATION AND IDENTIFICATION
(NS)	NOT SAMPLED
♣ CW-12S	CCR WELL
■ CECW-15	OBSERVATION WELL
⊚ SW-3	SURFACE WATER POINTS
(<0.57) (<0.57)	SHALLOW WELL ANTIMONY RESULTS (TOP) DEEP WELL ANTIMONY RESULTS (BOTTOM)

LEGEND

NOTES

- EXISTING TOPOGRAPHY SHOWN IN THIS DRAWING SET IS PREPARED BY PHOTOGRAMMETRIC METHODS BASED ON AERIAL PHOTOGRAPHY PREPARED BY MCKENZIE & SNYDER INC., FOR H&B SURVEYING, DATED APRIL, 2016. BOTTOM ASH GRADES SHOWN ARE FROM FIELD SURVEY COMPLETED ON JANUARY 15, 2018 BY D & M SURVEYORS, P.C.
- NORTH SHOWN IN REFERENCE TO VIRGINIA STATE PLANE, NAD27 DATUM, VIRGINIA SOUTH ZONE. VERTICAL DATUM IS NGVD 29.
- GROUNDWATER CONTOURS BASED ON LINEAR INTERPOLATION BETWEEN AND EXTRAPOLATION FROM KNOWN DATUM, TOPOGRAPHIC CONTOURS, AND KNOWN FIELD CONDITIONS. THEREFORE, GROUNDWATER CONTOURS MAY NOT REFLECT ACTUAL GROUNDWATER CONDITIONS.
- 4. GROUNDWATER CONTOUR LINES SHOW THE WATER TABLE SHAPE AND ELEVATION. THESE CONTOURS ARE INFERRED LINES FOLLOWING THE GROUNDWATER SURFACE AT A CONSTANT ELEVATION ABOVE SEA LEVEL. THE GROUNDWATER FLOW DIRECTION IS GENERALLY PERPENDICULAR TO THE GROUNDWATER SURFACE CONTOURS, SIMILAR TO THE RELATIONSHIP BETWEEN SURFACE WATER FLOW AND TOPOGRAPHIC CONTOURS.
- 5. PO-8 GROUNDWATER LEVEL POSSIBLY ERRONEOUS. SUBSEQUENT FEBRUARY 27, 2019, MEASUREMENT USED IN CREATION OF THE FEBRUARY 25, 2019, POTENTIOMETRIC SURFACE MAP.
- ANTIMONY RESULTS FOR SW-1, SW-2, SW-3, AND SW-4 FROM SEPTEMBER 17, 2019 SAMPLING EVENT.
- 7. ANTIMONY RESULTS FROM CW-SERIES WELLS FROM FEBRUARY 4, 2019 EVENT.
- 8. ANTIMONY RESULTS FROM COMPLIANCE WELLS FROM SEPTEMBER 2019 EVENT.
- 9. ALL ANALYTICAL RESULTS IN OR PARTS PER BILLION ug/L. J FLAG INDICATES ESTIMATED CONCENTRATION.
- DATA NOT CONTOURED SINCE ALL RESULTS LESS THEN GPS BASED ON THE MAXIMUM CONTAMINANT LEVEL OF 6.0 ug/L.

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REV.		CLIENT		
	CHEVAPEAKE ENERGY CENTER	DOMINION ENERGY		
	CHESAPEAKE, VIRGINIA			
	NATURE AND EXTENT STUDY ADDENDUM			
	ППЕ	CONSULTANT	YYYY-MM-DD	
	ANTIMONY ISOCONCENTRATION CONTOUR MAP	(DESIGNED	
DRA			PREPARED	
AWIN	PROJECTINO	21000	REVIEWED	
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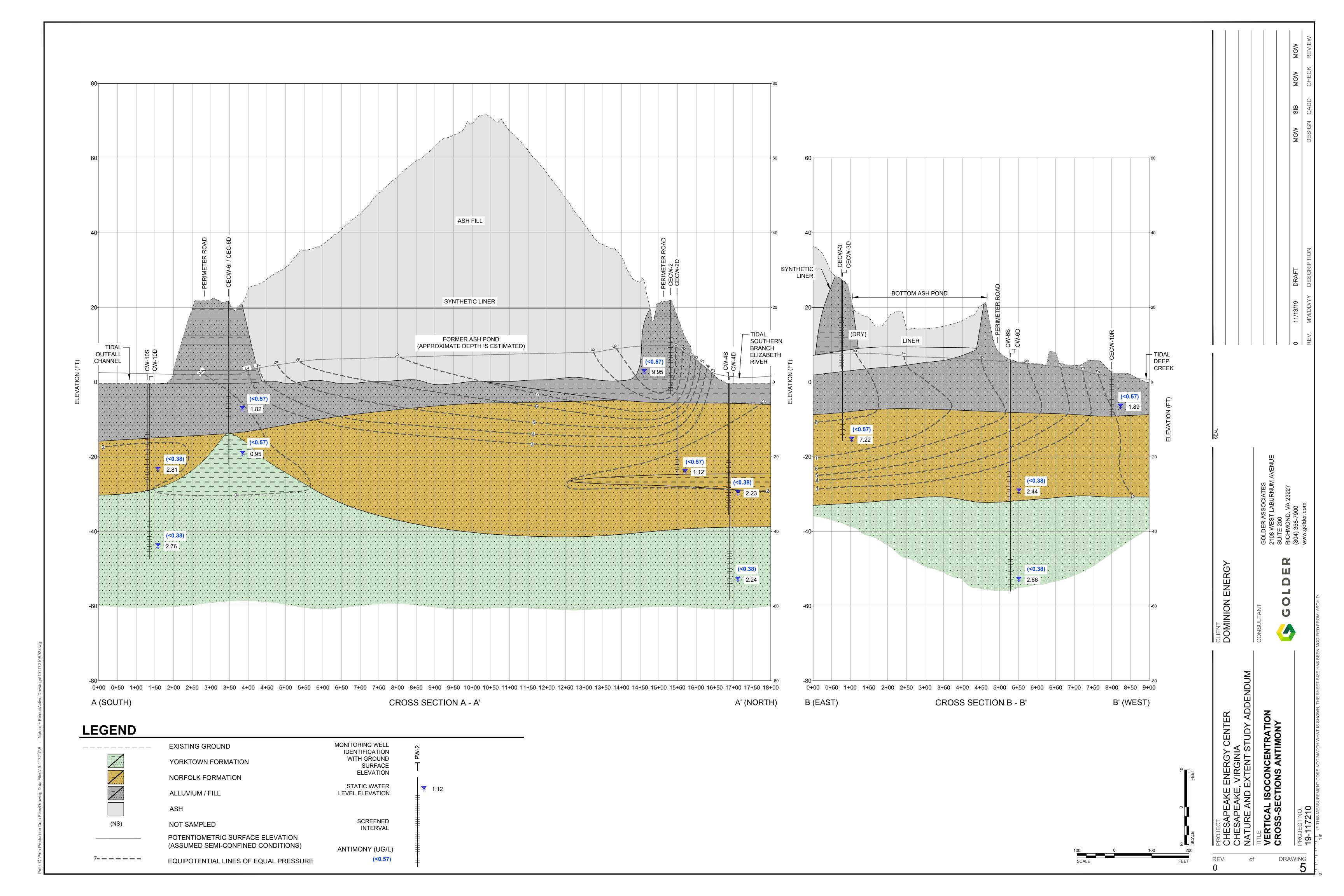
	PROPERTY LINE
	ADJACENT PARCEL PROPERTY LINE
50	MAJOR TOPOGRAPHIC CONTOUR
	MINOR TOPOGRAPHIC CONTOUR
10	GROUNDWATER SURFACE CONTOUR [FEET ABOVE MEAN SEA LEVEL (AMSL)]
⊕ PO-8	MONITORING WELL LOCATION AND IDENTIFICATION
(NS)	NOT SAMPLED
⊕ CW-12S	CCR WELL
CECW-15	OBSERVATION WELL
⊚ SW-3	SURFACE WATER POINTS
<0.0044 <0.0044	SHALLOW WELL BETA-BHC RESULTS DEEP WELL BETA-BHC RESULTS

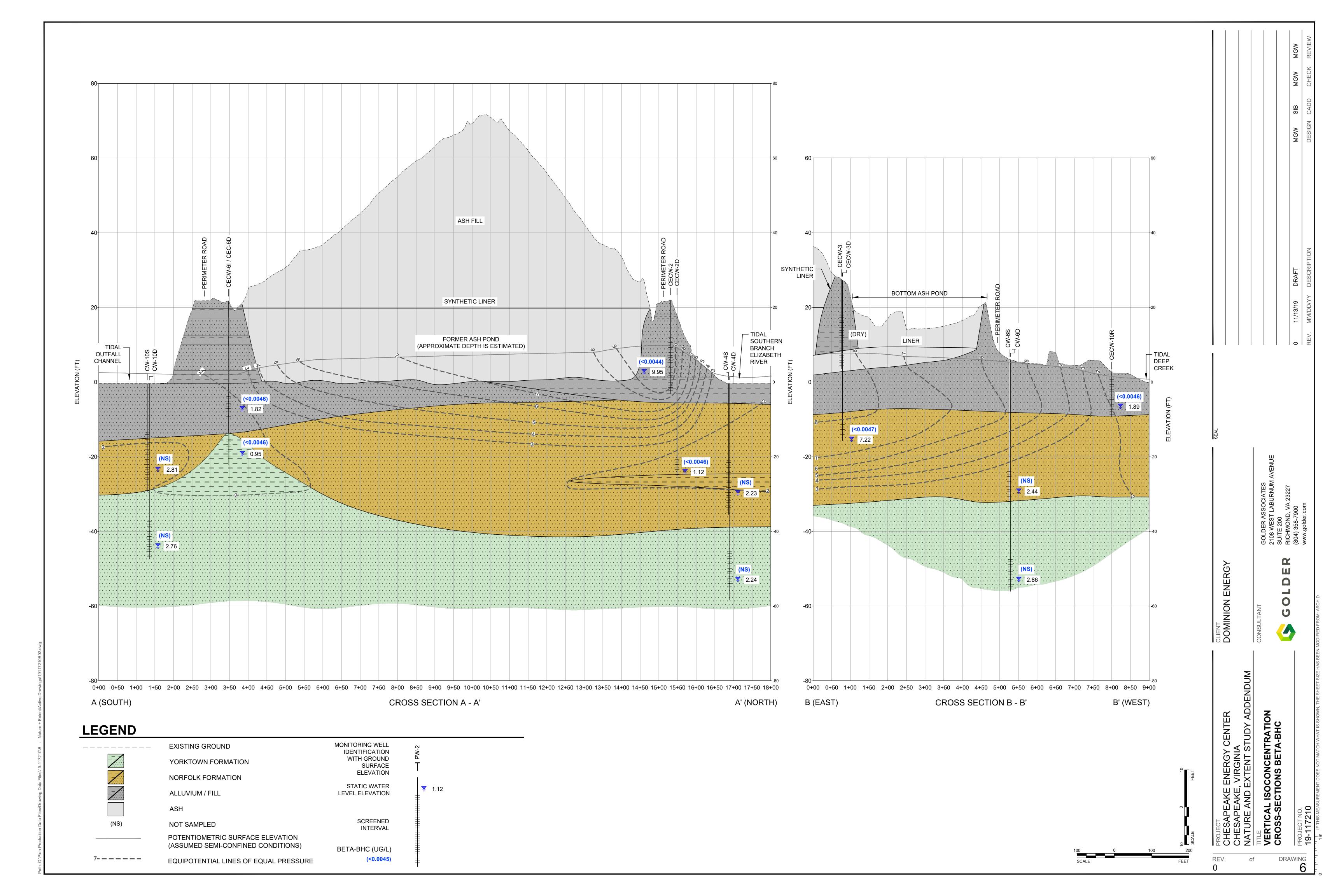
LEGEND

NOTES

- EXISTING TOPOGRAPHY SHOWN IN THIS DRAWING SET IS PREPARED BY PHOTOGRAMMETRIC METHODS BASED ON AERIAL PHOTOGRAPHY PREPARED BY MCKENZIE & SNYDER INC., FOR H&B SURVEYING, DATED APRIL, 2016. BOTTOM ASH GRADES SHOWN ARE FROM FIELD SURVEY COMPLETED ON JANUARY 15, 2018 BY D & M SURVEYORS, P.C.
- NORTH SHOWN IN REFERENCE TO VIRGINIA STATE PLANE, NAD27 DATUM, VIRGINIA SOUTH ZONE. VERTICAL DATUM IS NGVD 29.
- GROUNDWATER CONTOURS BASED ON LINEAR INTERPOLATION BETWEEN AND EXTRAPOLATION FROM KNOWN DATUM, TOPOGRAPHIC CONTOURS, AND KNOWN FIELD CONDITIONS. THEREFORE, GROUNDWATER CONTOURS MAY NOT REFLECT ACTUAL GROUNDWATER CONDITIONS.
- 4. GROUNDWATER CONTOUR LINES SHOW THE WATER TABLE SHAPE AND ELEVATION. THESE CONTOURS ARE INFERRED LINES FOLLOWING THE GROUNDWATER SURFACE AT A CONSTANT ELEVATION ABOVE SEA LEVEL. THE GROUNDWATER FLOW DIRECTION IS GENERALLY PERPENDICULAR TO THE GROUNDWATER SURFACE CONTOURS, SIMILAR TO THE RELATIONSHIP BETWEEN SURFACE WATER FLOW AND TOPOGRAPHIC CONTOURS.
- 5. PO-8 GROUNDWATER LEVEL POSSIBLY ERRONEOUS. SUBSEQUENT FEBRUARY 27, 2019, MEASUREMENT USED IN CREATION OF THE FEBRUARY 25, 2019, POTENTIOMETRIC SURFACE MAP.
- BETA-BHC RESULTS FOR SW-1, SW-2, SW-3, AND SW-4 FROM SEPTEMBER 17, 2019 SAMPLING EVENT.
- 7. BETA-BHC RESULTS FROM COMPLIANCE WELLS FROM SEPTEMBER 2019 EVENT.
- ALL ANALYTICAL RESULTS IN ug/L OR PARTS PER BILLION. J FLAG INDICATES ESTIMATED CONCENTRATION.
- 9. DATA NOT CONTOURED SINCE ALL RESULTS ARE LESS THAN THE GPS BASED ON THE LABORATORY QUANTITATIVE LIMIT.
- 10. THE CW SERIES WELLS WERE NOT SAMPLED (NS) FOR BETA-BHC.

CHESAPEAKE ENERGY CENTER	CLIENT DOMINION ENERGY			l
CHESAPEAKE, VIRGINIA NATURE AND EXTENT STUDY ADDENDUM				
TITLE	CONSULTANT	YYYY-MM-DD	2019-11-05	
BETA-BHC ISOCONCENTRATION CONTOUR MAP		DESIGNED	RIP	
DRA		PREPARED	SIB	
NEOJECT NO.		REVIEWED	MGW	
		APPROVEN	WOW	





Appendix A June 2019 Sampling Event Laboratory Certificates of Analysis and Chain-of-Custody Forms



Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Canton 4101 Shuffel Street NW North Canton, OH 44720 Tel: (330)497-9396

Laboratory Job ID: 240-115234-2

Client Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

For:

Golder Associates Inc. 2108 W Laburnum Ave, Suite 200 Richmond, Virginia 23227

Attn: Mr. Mike Williams

Authorized for release by: 7/17/2019 12:31:33 PM

Eric Lang, Manager of Project Management (708)534-5200

eric.lang@testamericainc.com

.....LINKS

Review your project results through

Have a Question?



Visit us at: www.testamericainc.com

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

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

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QC Association Summary	16
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Certification Summary	18
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Definitions/Glossary

Client: Golder Associates Inc. Job ID: 240-115234-2

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)
MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

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Case Narrative

Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

Job ID: 240-115234-2

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative 240-115234-2

Comments

No additional comments.

Receipt

The samples were received on 6/29/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 13 coolers at receipt time were 1.5° C, 2.3° C, 2.3° C, 2.5° C, 3.1° C, 3.7° C, 4.1° C, 4.7° C, 4.9° C, 4.9° C, 4.9° C, 5.7° C and 5.7° C.

GC Semi VOA

Method(s) 8081B: The following sample was diluted due to the nature of the sample matrix: DUPLICATE (240-115234-5). As such, surrogate recoveries may be below the calibration range, and elevated reporting limits (RLs) are provided.

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

Organic Prep

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

Job ID: 240-115234-2

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Method Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

MethodMethod DescriptionProtocolLaboratory8081BOrganochlorine Pesticides (GC)SW846TAL CAN3510CLiquid-Liquid Extraction (Separatory Funnel)SW846TAL CAN

Protocol References:

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

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Job ID: 240-115234-2

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Sample Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset I
240-115234-1	SW-1	Surface Water	06/27/19 16:30	06/29/19 09:30	
240-115234-2	SW-2	Surface Water	06/27/19 16:10	06/29/19 09:30	
240-115234-3	SW-3	Surface Water	06/27/19 15:50	06/29/19 09:30	
240-115234-4	SW-4	Surface Water	06/27/19 15:20	06/29/19 09:30	
240-115234-5	DUPLICATE	Surface Water	06/27/19 15:35	06/29/19 09:30	
240-115234-6	FIELD BLANK	Surface Water	06/27/19 14:25	06/29/19 09:30	

Job ID: 240-115234-2

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Detection Summary

Client: Golder Associates Inc. Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC	Job ID: 240-115234-2
Client Sample ID: SW-1	Lab Sample ID: 240-115234-1
No Detections.	
Client Sample ID: SW-2	Lab Sample ID: 240-115234-2
No Detections.	
Client Sample ID: SW-3	Lab Sample ID: 240-115234-3
No Detections.	
Client Sample ID: SW-4	Lab Sample ID: 240-115234-4
No Detections.	
Client Sample ID: DUPLICATE	Lab Sample ID: 240-115234-5
No Detections.	
Client Sample ID: FIELD BLANK	Lab Sample ID: 240-115234-6
No Detections.	

This Detection Summary does not include radiochemical test results.

Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

Client Sample ID: SW-1 Lab Sample ID: 240-115234-1

Date Collected: 06/27/19 16:30 Matrix: Surface Water

Date Received: 06/29/19 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0048		0.053	0.0048	ug/L		07/03/19 11:16	07/09/19 19:51	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	70		10 - 120				07/03/19 11:16	07/09/19 19:51	1
DCB Decachlorobiphenyl	68		10 - 120				07/03/19 11:16	07/09/19 19:51	1
Tetrachloro-m-xylene	69		33 - 120				07/03/19 11:16	07/09/19 19:51	1
Tetrachloro-m-xylene	75		33 - 120				07/03/19 11:16	07/09/19 19:51	1

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Job ID: 240-115234-2

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Client: Golder Associates Inc.

Job ID: 240-115234-2

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

Client Sample ID: SW-2 Lab Sample ID: 240-115234-2

Date Collected: 06/27/19 16:10 Matrix: Surface Water Date Received: 06/29/19 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0047		0.051	0.0047	ug/L		07/03/19 11:16	07/09/19 20:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	63		10 - 120				07/03/19 11:16	07/09/19 20:03	1
DCB Decachlorobiphenyl	63		10 - 120				07/03/19 11:16	07/09/19 20:03	1
Tetrachloro-m-xylene	66		33 - 120				07/03/19 11:16	07/09/19 20:03	1
Tetrachloro-m-xylene	69		33 - 120				07/02/10 11:16	07/09/19 20:03	

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Client: Golder Associates Inc.

Job ID: 240-115234-2

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

Client Sample ID: SW-3 Lab Sample ID: 240-115234-3

Date Collected: 06/27/19 15:50 Matrix: Surface Water

Date Received: 06/29/19 09:30

Analyte	chlorine Pesticid Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:16	07/09/19 20:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	67		10 - 120				07/03/19 11:16	07/09/19 20:15	1
DCB Decachlorobiphenyl	67		10 - 120				07/03/19 11:16	07/09/19 20:15	1
Tetrachloro-m-xylene	72		33 - 120				07/03/19 11:16	07/09/19 20:15	1
Tetrachloro-m-xylene	75		33 - 120				07/03/19 11:16	07/09/19 20:15	1

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Client: Golder Associates Inc.

Job ID: 240-115234-2

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

Client Sample ID: SW-4 Lab Sample ID: 240-115234-4

Date Collected: 06/27/19 15:20 Matrix: Surface Water Date Received: 06/29/19 09:30

Method: 8081B - Organoo		Qualifier	RL	MDI	Unit	D	Prepared	Analyzed	Dil Fac
		Qualifier							DII Fac
beta-BHC	<0.0047		0.051	0.0047	ug/L		07/03/19 11:16	07/09/19 20:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	58		10 - 120				07/03/19 11:16	07/09/19 20:28	1
DCB Decachlorobiphenyl	59		10 - 120				07/03/19 11:16	07/09/19 20:28	1
Tetrachloro-m-xylene	54		33 - 120				07/03/19 11:16	07/09/19 20:28	1
Tetrachloro-m-vylene	60		33 120				07/03/10 11:16	07/09/19 20:28	1

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Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

Client Sample ID: DUPLICATE

Date Collected: 06/27/19 15:35

Date Received: 06/29/19 09:30

Lab Sample ID: 240-115234-5

Matrix: Surface Water

Job ID: 240-115234-2

Method: 8081B - Organoc	chlorine Pesticid	les (GC)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.048		0.52	0.048	ug/L		07/03/19 11:16	07/09/19 21:05	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	69		10 - 120				07/03/19 11:16	07/09/19 21:05	10
DCB Decachlorobiphenyl	69		10 - 120				07/03/19 11:16	07/09/19 21:05	10
Tetrachloro-m-xylene	69		33 - 120				07/03/19 11:16	07/09/19 21:05	10
Tetrachloro-m-xylene	68		33 - 120				07/03/19 11:16	07/09/19 21:05	10

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Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

Client Sample ID: FIELD BLANK Lab Sample ID: 240-115234-6

Date Collected: 06/27/19 14:25

Matrix: Surface Water

Date Received: 06/29/19 09:30

Method: 8081B - Organo	chlorine Pesticid	les (GC)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:16	07/09/19 21:18	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	21		10 - 120				07/03/19 11:16	07/09/19 21:18	1
DCB Decachlorobiphenyl	19		10 - 120				07/03/19 11:16	07/09/19 21:18	1
Tetrachloro-m-xylene	71		33 - 120				07/03/19 11:16	07/09/19 21:18	1
Tetrachloro-m-xvlene	64		33 - 120				07/03/19 11:16	07/09/19 21:18	1

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Job ID: 240-115234-2

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Surrogate Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Surface Water Prep Type: Total/NA

			Pe	Percent Surrogate Recov			
		DCBP1	DCBP2	TCX1	TCX2		
Lab Sample ID	Client Sample ID	(10-120)	(10-120)	(33-120)	(33-120)		
240-115234-1	SW-1	70	68	69	75		
240-115234-2	SW-2	63	63	66	69		
240-115234-3	SW-3	67	67	72	75		
240-115234-4	SW-4	58	59	54	60		
240-115234-4 MS	SW-4	56	54	56	61		
240-115234-4 MSD	SW-4	73	66	64	66		
240-115234-5	DUPLICATE	69	69	69	68		
240-115234-6	FIELD BLANK	21	19	71	64		

DCBP = DCB Decachlorobiphenyl

TCX = Tetrachloro-m-xylene

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Water Prep Type: Total/NA

			Pe	rcent Surro	ogate Reco
		DCBP1	DCBP2	TCX1	TCX2
Lab Sample ID	Client Sample ID	(10-120)	(10-120)	(33-120)	(33-120)
LCS 240-389622/23-A	Lab Control Sample	97	101	78	81
MB 240-389622/22-A	Method Blank	99	108	92	88

DCBP = DCB Decachlorobiphenyl

TCX = Tetrachloro-m-xylene

Job ID: 240-115234-2

Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

Job ID: 240-115234-2

Prep Batch: 389622

Prep Batch: 389622

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Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 240-389622/22-A Client Sample ID: Method Blank Prep Type: Total/NA

Matrix: Water

Analysis Batch: 390389

MB MB Analyte RL **MDL** Unit Prepared Analyzed Dil Fac Result Qualifier beta-BHC 0.050 0.0046 ug/L 07/03/19 11:16 07/09/19 18:47 <0.0046

MB MB Qualifier Dil Fac Surrogate %Recovery Limits Prepared Analyzed DCB Decachlorobiphenyl 99 10 - 120 07/03/19 11:16 07/09/19 18:47 108 DCB Decachlorobiphenyl 10 - 120 07/03/19 11:16 07/09/19 18:47 Tetrachloro-m-xylene 92 33 - 120 07/03/19 11:16 07/09/19 18:47 Tetrachloro-m-xylene 88 33 - 120 07/03/19 11:16 07/09/19 18:47

Lab Sample ID: LCS 240-389622/23-A **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 390389

LCS LCS Spike

%Rec. Added %Rec Limits Analyte Result Qualifier Unit beta-BHC 0.250 36 - 140 0.262 105 ug/L

LCS LCS Surrogate %Recovery Qualifier Limits DCB Decachlorobiphenyl 97 10 - 120 101 10 - 120 DCB Decachlorobiphenyl 33 - 120 Tetrachloro-m-xylene 78 Tetrachloro-m-xylene 81 33 - 120

Lab Sample ID: 240-115234-4 MS Client Sample ID: SW-4 **Matrix: Surface Water** Prep Type: Total/NA **Analysis Batch: 390389 Prep Batch: 389622**

Sample Sample Spike MS MS %Rec.

Analyte Result Qualifier Added Result Qualifier Unit D %Rec Limits beta-BHC <0.0047 0.238 0.194 ug/L 82 31 - 120 MS MS

Surrogate %Recovery Qualifier Limits DCB Decachlorobiphenyl 56 10 - 120 DCB Decachlorobiphenyl 54 10 - 120 Tetrachloro-m-xylene 56 33 - 120 Tetrachloro-m-xylene 61 33 - 120

Lab Sample ID: 240-115234-4 MSD Client Sample ID: SW-4 **Matrix: Surface Water** Prep Type: Total/NA

Prep Batch: 389622 Analysis Batch: 390389 Sample Sample Spike MSD MSD %Rec. **RPD**

Result Qualifier Added Limits **Analyte** Result Qualifier Unit D %Rec RPD Limit 0.250 beta-BHC <0.0047 0.236 ug/L 94 31 - 120 19 35

MSD MSD %Recovery Qualifier Surrogate Limits 73 DCB Decachlorobiphenyl 10 - 120 DCB Decachlorobiphenyl 66 10 - 120 Tetrachloro-m-xylene 64 33 - 120 Tetrachloro-m-xylene 66 33 - 120

Eurofins TestAmerica, Canton

7/17/2019

QC Association Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

GC Semi VOA

Prep Batch: 389622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115234-1	SW-1	Total/NA	Surface Water	3510C	
240-115234-2	SW-2	Total/NA	Surface Water	3510C	
240-115234-3	SW-3	Total/NA	Surface Water	3510C	
240-115234-4	SW-4	Total/NA	Surface Water	3510C	
240-115234-5	DUPLICATE	Total/NA	Surface Water	3510C	
240-115234-6	FIELD BLANK	Total/NA	Surface Water	3510C	
MB 240-389622/22-A	Method Blank	Total/NA	Water	3510C	
LCS 240-389622/23-A	Lab Control Sample	Total/NA	Water	3510C	
240-115234-4 MS	SW-4	Total/NA	Surface Water	3510C	
240-115234-4 MSD	SW-4	Total/NA	Surface Water	3510C	

Analysis Batch: 390389

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115234-1	SW-1	Total/NA	Surface Water	8081B	389622
240-115234-2	SW-2	Total/NA	Surface Water	8081B	389622
240-115234-3	SW-3	Total/NA	Surface Water	8081B	389622
240-115234-4	SW-4	Total/NA	Surface Water	8081B	389622
240-115234-5	DUPLICATE	Total/NA	Surface Water	8081B	389622
240-115234-6	FIELD BLANK	Total/NA	Surface Water	8081B	389622
MB 240-389622/22-A	Method Blank	Total/NA	Water	8081B	389622
LCS 240-389622/23-A	Lab Control Sample	Total/NA	Water	8081B	389622
240-115234-4 MS	SW-4	Total/NA	Surface Water	8081B	389622
240-115234-4 MSD	SW-4	Total/NA	Surface Water	8081B	389622

Job ID: 240-115234-2

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Job ID: 240-115234-2

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

Client Sample ID: SW-1 Lab Sample ID: 240-115234-1 Date Collected: 06/27/19 16:30

Matrix: Surface Water

Date Received: 06/29/19 09:30

ı		Batch	Batch		Dilution	Batch	Prepared		
	Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
	Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
	Total/NA	Analysis	8081B		1	390389	07/09/19 19:51	BPM	TAL CAN

Client Sample ID: SW-2 Lab Sample ID: 240-115234-2

Matrix: Surface Water

Date Collected: 06/27/19 16:10 Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/09/19 20:03	BPM	TAL CAN

Client Sample ID: SW-3 Lab Sample ID: 240-115234-3

Matrix: Surface Water

Date Collected: 06/27/19 15:50 Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/09/19 20:15	BPM	TAL CAN

Client Sample ID: SW-4 Lab Sample ID: 240-115234-4

Matrix: Surface Water

Date Collected: 06/27/19 15:20 Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/09/19 20:28	BPM	TAL CAN

Client Sample ID: DUPLICATE Lab Sample ID: 240-115234-5

Date Collected: 06/27/19 15:35 **Matrix: Surface Water**

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		10	390389	07/09/19 21:05	BPM	TAL CAN

Client Sample ID: FIELD BLANK Lab Sample ID: 240-115234-6

Date Collected: 06/27/19 14:25 **Matrix: Surface Water** Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/09/19 21:18	BPM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Beta-BHC

Laboratory: Eurofins TestAmerica, Canton

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Virginia	NELAP	3	460175	09-14-19 *

Job ID: 240-115234-2

^{*} Accreditation/Certification renewal pending - accreditation/certification considered valid.

Form No. CA-C-WI-002, Rev. 4.23, dated 4/16/2019

Company Company

Received in Laboratory by

Date/Time

Сотралу

	Project Manager: Mike Williams/Rachel Powell	midnishacher cower			
Client Contact	Ernat apowellägolier com	mo:	Site Contact: Rachel Powell	Date: 6/27/19	COC No
Golder Associates Inc	Tel/Fax: 804-517-3381		Lab Contact: Eric Lang	Carrier: FedEx	1 of 1 COCs
2108 West Labureum Ave. Sinte 200	Analysis Turi	Analysis Turnaround Time			o Where ear
Richmond, VA. 23227	CALERINAR DAYS	WORKING DAYS			For Lab Use Only: Knowled Cheen
(804) 358-7900	14.1 different from Becom	m Resow 10	_		
(xxx) xxx-xxxx	5 Marsh 5		14		Lab Sampling
Project Name 1SA19 CEC Makeup Sampling Event	Lourit) (
Site Chesapeare Energy Center, Virginia P.O.#. 19117210	, total (ISW/S	18	Job / SDG No
Sample Identification	Sample Sample (Sample Type (G-Comp. # of	Filtered Sa Pertorm Mi Pertorm Mi		Samulo Chenin Melas
1-m5	0601 9/1570	5 50 2	. N N X		
5w-2	6/22/19 1610	6 SW 2	NN/X		
5w-3	6124/19 1550	6 SW 2	XINX		
h-m5	6/24/19 1520	6 Sw 4	3		
Duplicate	6/27/A 1535	6 SW 2	NN		
Field Blank	6/27/9 1425	(SW)	NNX		
	Land 1			240-115234 Chain of Custody	
Preservation Used: 1= lce, 2= HCl: 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Zi	03; 5=NaOH; 6= Other Zinc.	nc Acetate + NaOH			
Possible Mazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste. Comments Section if the lab is to dispose of the sample.	lease List any EPA Waste Coc	Codes for the sample in the		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	nger than 1 month)
Mon-Mazard Eugenmate Skin Intant Payson 6	Brason B	Unknown	Resum to Clent	Decreed that als	T. Constitution of the Con
Special Instructions/QC Requirements & Comments: A	All samples preserved on ice.	Please provide a	Picase provide a Level II Data package. Please see sample memo. Reporting Group	sample memo. Reporting Group (C.	
Custody Seals Intact (es te-	Custody Seal No.		Cooler Temp. ("C). Obs'd	Corr'd:	Therm ID No.
Racket Powell A Ave	Colorany Colorany	6/21/19	Received by Fe of the		Dale/Time.
3 T. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	frankriss	Color miles	Kecenyer / /	Company	Date J. J. C. 3.

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Chain of Custody Record

Eurofins TestAmerica, Canton 4101 Shuffer Street NVV

17. CHAIN OF CUSTOI	DY & SAMPLE DISCREPANCIES	Samples processed by:
18. SAMPLE CONDITIO	ON .	
	were received after the recom	mended holding time had expired.
Sample(s)		were received in a broken container.
Sample(s)	were received with bu	abble >6 mm in diameter. (Notify PM)
19. SAMPLE PRESERV	ATION	
Sample(s)		were further preserved in the laboratory.

WI-NC-099

7/17/2019

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Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	∏F=85 #36	7		Wet ice Blue ice Dry Water None
TA Client Box Other	IR:8 #36	9.5		Wet ice Blue ice Dry
TA Client Box Other	IR-ED) #36		1.5	Water None Wet Ice - Blue Ice Dry
TA Client Box Other	IR-8 #36	4.8	4.9	Wefer None Wet Ice Blue Ice Dry
TA Client Box Other	IR-8 #36	5.11	4.9	Wet ice Blue ice Dry
TA Client Box Other	IR-8 #36	6.6	2.7	Water None Wet Ice Blue Ice Dry
TA Client Box Other	IR-8 #36	41)	4.1	Wet Ice Blue Ice Dry
TA Client Box Other	IR-8 #36	5.13	3.7	Wellice Blue Ice Dry
TA Client Box Other	IR-8 #36	2,12	3.1	Wet Ice Blue Ice Dry
TA Client Box Other	IR-8 #36	5.6	37	Wet Ice Blue Ice Dry I
TA Client Box Other	IR-8 #36	6,6	23	Water None Wel Ice Blue Ice Dry I
TA Client Box Other	1R-8 #36	7,4	75	Water None Wet Ice Blue Ice Dry I
TA Client Box Other	IR-8) #36	4%	4.5	Water Nane Wellice Blue Ice Dry I
TA Client Box Other	IR-B #36		711	Water None Wet Ice Blue Ice Dry I
TA Client Box Other	IR-8 #36			Water None Wet Ice Blue Ice Dry I
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry I
TA Client Box Other	IR-8 #36			Water None Wet Ice Blue Ice Dry I
1A Client Box Other	IR-8 #36	**************************************		Water None Wellice Blue Ice Dry i
TA Client Box Other	IR-8 #36			Water None Wet Ice Blue Ice Dry I
TA Client Box Other	IR-8 #36			Water None Wet Ice Blue Ice Dry I
TA Client Box Other	IR-8 #36			Water None Wet ice Blue ice Dry io
TA Client Box Other	IR-8 #36			Water None Wellice Blue Ice Dry I
TA Client Box Other	IR-6 #36			Water None Wet Ice Blue Ice Dry I
TA Client Box Other	IR-8 #36			Water None Wet ice Blue ice Dry ic
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(A Client Box Other	IR-8 #36			Water None Wet Ice Blue Ice Dry Ic
A Client Box Other	IR-8 #36			Water None Wet Ice Blue Ice Dry Ic
A Client Box Other	IR-8 #36	 		Wellice Blue Ice Dry Id
A Client Box Other	IR-8 #36			Water None Wettice Blue ice Dry ic Water None
A Client Box Other	IR-8 #36			Wellce Blue Ice Dry Ic Waler None

6/29/2019

Login Container Summary Report

240-115234

Temperature readings: Container Preservative Client Sample ID Lab ID Container Type pH Added (mls) Lot = SW-I 240-115234-A-1 Plastic 500ml - with Zn Acetate and 112 SW-1 240-115234-B-1 Plastic 500ml - with Nitric Acid . 2 SW-2 240-115234-A-2 Plastic 500ml - with Zn Acetate and -12 SW-2 240-115234-B-2 Plastic 500ml - with Nitric Acid . 2 SW-3 240-115234-A-3 Plastic 500ml - with Zn Acetate and 12 SW-3 240-115234-B-3 Plastic 500ml - with Nitric Acid . 2 SW-4 240-115234-A-4 Plastic 500ml - with Zn Acetate and 12 SW-I 240-115234-B-4 Plastic 500ml - with Zn Acetate and 12 SW-4 240-115234-C-4 Plastic 500ml - with Nitric Acid 2 SW-4 240-115234-D-4 Plastic 500ml - with Nitric Acid 2 DUPLICATE 240-115234-A-5 Plastic 500ml - with Zn Acetate and .12 DUPLICATE 240-115234-B-5 Plastic 500ml - with Nitric Acid . 2 FIELD BLANK 240-115234-A-6 Plastic 500ml - with Zn Acetate and 12 FIELD BLANK

Plastic 500ml - with Nitric Acid

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240-115234-B-6

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton 4101 Shuffel Street NW North Canton, OH 44720 Tel: (330)497-9396

Laboratory Job ID: 240-115234-3

Client Project/Site: 1SA19 CEC Makeup (C) - Antimony

TestAmerica

For:

🔅 eurofins

Golder Associates Inc. 2108 W Laburnum Ave, Suite 200 Richmond, Virginia 23227

Attn: Mr. Mike Williams

lul 1

Authorized for release by: 7/18/2019 10:54:50 AM

Eric Lang, Manager of Project Management (708)534-5200

eric.lang@testamericainc.com

LINKS

Review your project results through

Have a Question?



Visit us at: www.testamericainc.com

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

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

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QC Sample Results	14
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Definitions/Glossary

Client: Golder Associates Inc. Job ID: 240-115234-3

Project/Site: 1SA19 CEC Makeup (C) - Antimony

Glossary

DL

Abbreviation	These commonly used abbreviations may or may not be present in this report.					
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis					
%R	Percent Recovery					
CFL	Contains Free Liquid					
CNF	Contains No Free Liquid					
DER	Duplicate Error Ratio (normalized absolute difference)					
Dil Fac	Dilution Factor					

DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDI	Fatimated Detection Limit (Dioxin)

Detection Limit (DoD/DOE)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)
MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

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Case Narrative

Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Antimony

Job ID: 240-115234-3

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative 240-115234-3

Comments

No additional comments.

Receipt

The samples were received on 6/29/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 13 coolers at receipt time were 1.5° C, 2.3° C, 2.3° C, 2.5° C, 3.1° C, 3.7° C, 4.1° C, 4.7° C, 4.9° C, 4.9° C, 4.9° C, 5.7° C and 5.7° C.

Metals

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

Job ID: 240-115234-3

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Method Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Antimony

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CAN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN

Protocol References:

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

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Job ID: 240-115234-3

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Sample Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Antimony

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset I
240-115234-1	SW-1	Surface Water	06/27/19 16:30	06/29/19 09:30	
240-115234-2	SW-2	Surface Water	06/27/19 16:10	06/29/19 09:30	
240-115234-3	SW-3	Surface Water	06/27/19 15:50	06/29/19 09:30	
240-115234-4	SW-4	Surface Water	06/27/19 15:20	06/29/19 09:30	
240-115234-5	DUPLICATE	Surface Water	06/27/19 15:35	06/29/19 09:30	
240-115234-6	FIELD BLANK	Surface Water	06/27/19 14:25	06/29/19 09:30	

Job ID: 240-115234-3

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Detection Summary

Client: Golder Associates Inc. Project/Site: 1SA19 CEC Makeup (C) - Antimony	Job ID: 240-115234-3
Client Sample ID: SW-1	Lab Sample ID: 240-115234-1
No Detections.	
Client Sample ID: SW-2	Lab Sample ID: 240-115234-2
No Detections.	
Client Sample ID: SW-3	Lab Sample ID: 240-115234-3
No Detections.	
Client Sample ID: SW-4	Lab Sample ID: 240-115234-4
No Detections.	
Client Sample ID: DUPLICATE	Lab Sample ID: 240-115234-5
No Detections.	
Client Sample ID: FIELD BLANK	Lab Sample ID: 240-115234-6
No Detections.	

This Detection Summary does not include radiochemical test results.

Client: Golder Associates Inc.

Job ID: 240-115234-3

Project/Site: 1SA19 CEC Makeup (C) - Antimony

Client Sample ID: SW-1 Lab Sample ID: 240-115234-1

Date Collected: 06/27/19 16:30 Matrix: Surface Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/N	IS) - Total Recoverable						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	20	0.57 ug/l		07/01/19 14:00	07/09/19 20:04	

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Client: Golder Associates Inc.

Job ID: 240-115234-3

Project/Site: 1SA19 CEC Makeup (C) - Antimony

Client Sample ID: SW-2 Lab Sample ID: 240-115234-2

Date Collected: 06/27/19 16:10 Matrix: Surface Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/N	IS) - Total Recoverable						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	< 0.57	20	0.57 ug/l		07/01/19 14:00	07/09/19 20:06	

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Client: Golder Associates Inc.

Job ID: 240-115234-3

Project/Site: 1SA19 CEC Makeup (C) - Antimony

Client Sample ID: SW-3 Lab Sample ID: 240-115234-3

Date Collected: 06/27/19 15:50 Matrix: Surface Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS	S) - Total Recoverable					
Analyte	Result Qualifier	RL	MDL Unit	D Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57 ug/L	07/01/19 14:00	07/09/19 20:09	1

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Client: Golder Associates Inc.

Job ID: 240-115234-3

Project/Site: 1SA19 CEC Makeup (C) - Antimony

Client Sample ID: SW-4 Lab Sample ID: 240-115234-4

Date Collected: 06/27/19 15:20 Matrix: Surface Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/N	IS) - Total Recoverable						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57 ug/L		07/01/19 14:00	07/09/19 19:47	1

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Client: Golder Associates Inc.

Job ID: 240-115234-3

Project/Site: 1SA19 CEC Makeup (C) - Antimony

Client Sample ID: DUPLICATE Lab Sample ID: 240-115234-5

Date Collected: 06/27/19 15:35 Matrix: Surface Water Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Antimony	< 0.57		2.0	0.57	ua/l		07/01/19 14:00	07/09/19 20:11		

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Client: Golder Associates Inc.

Job ID: 240-115234-3

Project/Site: 1SA19 CEC Makeup (C) - Antimony

Client Sample ID: FIELD BLANK Lab Sample ID: 240-115234-6

Date Collected: 06/27/19 14:25

Date Received: 06/29/19 09:30

Matrix: Surface Water

Method: 6020A - Metals (ICP/N	IS) - Total Recoverable						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57 ug/L		07/01/19 14:00	07/09/19 20:14	

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QC Sample Results

Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Antimony

Job ID: 240-115234-3

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-389203/1-A

Matrix: Water

Analyte

Antimony

Analysis Batch: 391579

Client Sample ID: Method Blank Prep Type: Total Recoverable Prep Batch: 389203

 Prepared
 Analyzed
 Dil Fac

 07/01/19 14:00
 07/09/19 19:43
 1

Lab Sample ID: LCS 240-389203/2-A

Matrix: Water

Analysis Batch: 391579

Spike

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 389203

Rec.

RL

2.0

MDL Unit

0.57 ug/L

 Analyte
 Added
 Result ug/L
 Unit ug/L
 D was 101
 WRec.

 Antimony
 100
 101
 ug/L
 101
 80 - 120

MB MB

<0.57

Result Qualifier

Lab Sample ID: 240-115234-4 MS Client Sample ID: SW-4 **Matrix: Surface Water Prep Type: Total Recoverable Analysis Batch: 391579 Prep Batch: 389203** Sample Sample Spike MS MS %Rec. Analyte Result Qualifier Added Result Qualifier Unit Limits D %Rec <0.57 100 75 - 125 **Antimony** 102 ug/L 102

Lab Sample ID: 240-115234-4 MSD

Matrix: Surface Water

Analysis Batch: 391579

Sample Sample Spike MSD MSD

Client Sample ID: SW-4

Prep Type: Total Recoverable

Prep Batch: 389203

Rec. RPD

RPD Result Qualifier Added Limits Limit Analyte Result Qualifier D %Rec Unit Antimony <0.57 100 102 ug/L 102 75 - 125 20

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QC Association Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Antimony

Prep Batch: 389203

Metals

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115234-1	SW-1	Total Recoverable	Surface Water	3005A	
240-115234-2	SW-2	Total Recoverable	Surface Water	3005A	
240-115234-3	SW-3	Total Recoverable	Surface Water	3005A	
240-115234-4	SW-4	Total Recoverable	Surface Water	3005A	
240-115234-5	DUPLICATE	Total Recoverable	Surface Water	3005A	
240-115234-6	FIELD BLANK	Total Recoverable	Surface Water	3005A	
MB 240-389203/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-389203/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
240-115234-4 MS	SW-4	Total Recoverable	Surface Water	3005A	
240-115234-4 MSD	SW-4	Total Recoverable	Surface Water	3005A	

Analysis Batch: 391579

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115234-1	SW-1	Total Recoverable	Surface Water	6020A	389203
240-115234-2	SW-2	Total Recoverable	Surface Water	6020A	389203
240-115234-3	SW-3	Total Recoverable	Surface Water	6020A	389203
240-115234-4	SW-4	Total Recoverable	Surface Water	6020A	389203
240-115234-5	DUPLICATE	Total Recoverable	Surface Water	6020A	389203
240-115234-6	FIELD BLANK	Total Recoverable	Surface Water	6020A	389203
MB 240-389203/1-A	Method Blank	Total Recoverable	Water	6020A	389203
LCS 240-389203/2-A	Lab Control Sample	Total Recoverable	Water	6020A	389203
240-115234-4 MS	SW-4	Total Recoverable	Surface Water	6020A	389203
240-115234-4 MSD	SW-4	Total Recoverable	Surface Water	6020A	389203

Job ID: 240-115234-3

Job ID: 240-115234-3

Client Sample ID: SW-1

Date Collected: 06/27/19 16:30 Date Received: 06/29/19 09:30

Lab Sample ID: 240-115234-1

Matrix: Surface Water

Batch Batch Dilution Batch **Prepared** Method **Prep Type** Type Run Factor Number or Analyzed Analyst Lab TAL CAN Total Recoverable Prep 3005A 389203 07/01/19 14:00 MRL Total Recoverable Analysis 6020A 391579 07/09/19 20:04 DSH TAL CAN 1

Client Sample ID: SW-2 Lab Sample ID: 240-115234-2

Matrix: Surface Water

Date Collected: 06/27/19 16:10 Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			389203	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 20:06	DSH	TAL CAN

Client Sample ID: SW-3 Lab Sample ID: 240-115234-3

Date Collected: 06/27/19 15:50 **Matrix: Surface Water**

Date Received: 06/29/19 09:30

Dilution Batch Batch Batch **Prepared** Туре Method Run Factor Number or Analyzed **Prep Type** Analyst Lab Total Recoverable 3005A 389203 07/01/19 14:00 TAL CAN Prep MRL Total Recoverable Analysis 6020A 1 391579 07/09/19 20:09 DSH TAL CAN

Client Sample ID: SW-4 Lab Sample ID: 240-115234-4

Date Collected: 06/27/19 15:20 **Matrix: Surface Water**

Date Received: 06/29/19 09:30

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			389203	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 19:47	DSH	TAL CAN

Lab Sample ID: 240-115234-5 Client Sample ID: DUPLICATE

Date Collected: 06/27/19 15:35 **Matrix: Surface Water**

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			389203	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 20:11	DSH	TAL CAN

Client Sample ID: FIELD BLANK Lab Sample ID: 240-115234-6

Date Collected: 06/27/19 14:25 **Matrix: Surface Water** Date Received: 06/29/19 09:30

Batch **Batch** Dilution **Batch** Prepared Prep Type Type Method Run Factor Number or Analyzed Analyst Total Recoverable Prep 3005A 389203 07/01/19 14:00 MRL TAL CAN Total Recoverable Analysis 6020A 1 391579 07/09/19 20:14 DSH TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Eurofins TestAmerica, Canton

Accreditation/Certification Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 CEC Makeup (C) - Antimony

Job ID: 240-115234-3

Laboratory: Eurofins TestAmerica, Canton

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Virginia	NELAP	3	460175	09-14-19 *

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^{*} Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins TestAmerica, Canton

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Chain of Custody Record

🛟 curofins

Eurofins TestAmerica, Canton 4101 Shutel Syret MV

North Cardon, OH: 44729-6900 phone 330 497 9396 fax 330 497 0772

	Project Manager: Mike Williams/Rachel Poweil	Williams/R	ichel Powe					
Client Contact	Email apowell@colder.com	ar com		Site Contact: Rachel Powell		Date: 1. 193110	COC No	
Golder Associates Inc	Tol/Esv. 804 617 2394	2.4		The Comment washing	men	anc. 0/27/17	2	
2108 West Labamim & Sura 200	Andrew T. 500			Lab Confact: Eric Lang		Carrier: FedEx	l of	cocs
D. character of the Country of the C		urnaround lime	alli				Sampler Kevin Weissgold/Nathan Chien	sgo'd/Nathan Chi
23227	CALENDAR DAYS	WORK	WORKING DAYS				For Lab Use Only:	Rachel Powel
(804) 358-7900 Phone (8xx) xxx-xxxx EAX	The deficient them Below	thert Below	o.	N /			Walk-in Chent	
1SA19 CFC Make	I	Z WEOKS		X)			Lab Sampling	
Site Chesapcake Energy Center, Virginia) char		as.				
P O # 19117210	1	I day		WIS			Job / SDG No.	
Sample Identification	Sample Sample Date Time	Sample Type (C-Comp. G-Comp.	Matrix	# 0 2 :- 5 :- Filtered 53 M morothe VindomitinA	70 THE STATE OF		Carrello Cocodio Mater	Me Market
SW-1	4/27/19 1630	9	Se	X 2 2			do adulado	camp works
5w-7	019) 1/42/0	ی	Sw	XXX				
	0127/19 1550	9	38	XIVIN				
h-ws	6/23/19 1520	ی		2 N Y X				
Duplicate	6127/19 1535	9	SE	N W X				
Field Blank	6/27/19 1425	9	- MS	N/N/X				
Presorvation Used: 1= lce, 2= HCi; 3= H2SO4; 4=HNO3: 5=NaOH; 6= Other		Zinc Acetate + NaOH	Na HORN	 				
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Comments Section if the tab is to dispose of the sample		Codes for th	e sample		A fee may be as	sessed if samples are rel	Sample Disposal (A fee may be assessed if samples are retained longor than 1 month)	(h)
Non-Bazare Faramable Sk.e Indant	Pessan B	Hakesen		Return to Chrot	District	Distracted had also		
Special Instructions/QC Requirements & Comments: All samples preserved on ice. Please provide a Level II Data package. Please see sample memo. Reporting Group	All samples preserved on	ice. Please	provide	a Lovel II Data package. P	loase see samp	e memo. Reporting Gro	up C.	
Custody Seals Intact 🔅 🔥	Custody Scal No			Cooler Te	Cooler Temp. ("C): Obs'd	Corrid	Therm ID No.	
Rackel Some 11 the 2 me	Company	-3	Date/Time:	Received by		Сотрапу	Date/Time	
Rematushed by	Company	J	Date/Time	Received by	1	Company	Ongrame /	140
Reinguished by	Company		Date/Time:	Received in Laboratory by	ary by	Сотрапу	DakiTurk	177
					The second secon			

Page 18 of 21

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	Q

ours: Drop-off Date/Time Storage Location	
eals on the outside of the cooler(s) signed & dated? per/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? per/custody seals intact and uncompromised? king slip attached to the cooler(s)? [] Society [] Societ	nn °C
oles >6 mm in any VOA vials? Larger than this. Yes rip blank present in the cooler(s)? Trip Blank Lot # Yes	No NA No No
CUSTODY & SAMPLE DISCREPANCIES	Samples processed by:

Login# :

TestAmerica Courier

Cooler unpacked by:

17. CHAIN OF CUSTO	DY & SAMPLE DISCREPANCIES	Samples processed by.
Shirt Company		
18. SAMPLE CONDITION	ON	
그래요. 그 어디 이 나타가 그 아랍니다고 하시아 없어 하다.		
Sample(s)	were received after the recomm	nended holding time had expired.
Sample(s) Sample(s)	were received after the recomm	nended holding time had expired. ere received in a broken container.
Sample(s)	were received after the recomm were received with bub	ere received in a broken container.
Sample(s)	were received with bub	ere received in a broken container.
Sample(s) Sample(s) 19. SAMPLE PRESERV	were received with bub	ere received in a broken container. ble >6 mm in diameter. (Notify PM)

Eurofins TestAmerica Canton Sample Receipt Form/Narrative

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity

-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?

6. Was/were the person(s) who collected the samples clearly identified on the COC?

-Were the seals on the outside of the cooler(s) signed & dated?

5. Were the custody papers relinquished & signed in the appropriate place?

If yes. Questions 12-16 have been checked at the originating laboratory

15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____

IR GUN# IR-8 (CF +0.1 °C) Observed Cooler Temp

IR GUN #36 (CF +0.6°C) Observed Cooler Temp.

-Were tamper/custody seals intact and uncompromised?

3. Shippers' packing slip attached to the cooler(s)? The long the

Did custody papers accompany the sample(s)?

7. Did all bottles arrive in good condition (Unbroken)?

9. Were correct bottle(s) used for the test(s) indicated?

14. Were air bubbles >6 mm in any VOA vials?

16. Was a LL Hg or Me Hg trip blank present?

Could all bottle labels be reconciled with the COC?

10. Sufficient quantity received to perform indicated analyses?

12. Were all preserved sample(s) at the correct pH upon receipt?

Packing material used: Bubble Wrap Foam

Site Name

Opened on

UPS FAS Clipper Client Drop Off

Canton Facility

Cooler Received on

FedEx: 1st Grd Exp

TestAmerica Cooler #

COOLANT.

11. Are these work share samples?

13. Were VOAs on the COC?

Contacted PM

Concerning

Receipt After-hours: Drop-off Date/Time

Cooler temperature upon receipt

Client

WI-NC-099

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Cooler Description (Circle)	IR Gun# (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	1 17-8) #36	2.7		Wet ice Blue ice Dry ic
TA Client Box Other	IR-8 #36	9.9	5.5	Wet ice Blue ice Dry in
TA Client Box Other	IR-B) #36	, 1	1.5	Water None Wet Ice Blue Ice Dry Ic
TA Client Box Other	IR-8 #36	4.8	4,9	Wellce Blue Ice Dry Ic
TA Client Box Other	IR-8 #36	11.8	4.9	Wet ice Blue ice Dry ic
TA Cifent Box Other	IR-8 #36	6,6	5.7	Wet ice Blue ice Dry ic
TA Client Box Other	IR-8 #36	41)	41	Wel Ice Blue Ice Dry Ic
TA Client Box Other	IR-8 #36	3.5	3.7	Wet Ice Blue Ice Dry Ic
TA Client Box Other	IR-8 #36	3,1)	311	Wellice Blue Ice Dry Ic
TA Client Box Other	IR-8 #36	5.5	57	Water None Wet Ice Blue Ice Dry Ic
TA Client Box Other	IR-6 #36	6 6	2.3	Water None Wet Ice Blue Ice Dry Ic
TA Clieni Box Other	(IR-8) #36	614	2.5	Water None Wet Ice Blue Ice Dry Ic
TA Client Box Other	IR-8 #36	147	4.5	Wet Ice Slue Ice Dry Ic
TA Client Box Other	IR-8 #36	1.2	711	Water None Wellice Blue Ice Dry Ic
TA Client Box Other	IR-8 #36			Water None Wellice Blue Ice Dry Ic
TA Client Box Other	IR-8 #36			Water None Wetice Blue ice Dry ic
IA Client Box Other	IR-8 #34			Wel ice Blue ice Dry ic
1A Client Box Other	iR-8 #36			Water None Wellice Blue Ice Dry Ic
TA Client Box Other	IR-8 #36			Water None Wet Ice Blue Ice Dry to
IA Client Box Other	IR-5 #36			Water Nane Wet Ice Blue Ice Dry Ic
TA Client Box Other	IR-8 #36			Water None Wellice Blue Ice Dry Ic
TA Client Box Other	IR-8 #36			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-8 #36			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-8 #36			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-8 #36			Water None Wet ice Blue Ice Dry Ice
			* ***********************************	Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-8 #36			Water None Wet Ice Blue Ice Dry Ice
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TA Client Box Other	IR-8 #36			Water None Wellice Blue Ice Dry Ice
TA Client Box Other	IR-8 #36	and the second s		Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-8 #36			Water None Wellice Blue Ice Dry Ice
TA Client Box Other TA Client Box Other	IR-8 #36			Water None Wetice Blue Ice Dry Ice
TA Client Box Other TA Client Box Other	IR-8 #36			Water None Wet ice Blue ice Dry ice

6/29/2019

Login Container Summary Report

240-115234

Temperature readings Container Preservative Client Sample ID Lab ID Container Type pH Added (mls) Lot = SW-I 240-115234-A-1 Plastic 500ml - with Zn Acetate and 12 SW-I 240-115234-B-1 Plastic 500ml - with Nitric Acid 2 SW-2 Plastic 500ml - with Zn Acetate and 240-115234-A-2 12 SW-2 240-115234-B-2 Plastic 500ml - with Nitrie Acid . . SW-3 240-115234-A-3 Plastic 500ml - with Zn Acetate and 12 SW-3 240-115234-B-3 Plastic 500ml - with Nitric Acid . 2 SW-4 240-115234-A-4 Plastic 500ml - with Zn Acetate and 12 54-4 240-115234-B-4 Plastic 500ml - with Zn Acetate and 12 **SW-4** 240-115234-C-4 Plastic 500ml - with Nitrie Acid 2 SW-4 Plastic 500ml - with Nitric Acid 240-115234-D-4 2 DUPLICATE 240-115234-A-5 Plastic 500ml - with Zn Acetate and 12 DUPLICATE 240-115234-B-5 Plastic 500ml - with Nitrie Acid 12 FIELD BLANK Plastic 500ml - with Zn Acetate and 240-115234-A-6 -12 FIELD BLANK 240-115234-B-6 Plastic 500ml - with Nitric Acid

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Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Canton 4101 Shuffel Street NW North Canton, OH 44720 Tel: (330)497-9396

Laboratory Job ID: 240-115237-2

Client Project/Site: 1SA19 Makeup - A - beta-BHC

For:

Golder Associates Inc. 2108 W Laburnum Ave, Suite 200 Richmond, Virginia 23227

Attn: Mr. Mike Williams

Authorized for release by: 7/24/2019 6:55:32 AM

Eric Lang, Manager of Project Management (708)534-5200

eric.lang@testamericainc.com

.....LINKS

Review your project results through

Have a Question?



Visit us at: www.testamericainc.com

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

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

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Definitions/Glossary

Client: Golder Associates Inc. Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Qualifiers

	Se		

Qualifier	Qualifier Description
Н	Sample was prepped or analyzed beyond the specified holding time
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.
X	Surrogate is outside control limits

Cloccomy

QC

RER

RPD TEF

TEQ

RL

Quality Control

Relative Error Ratio (Radiochemistry)

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

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

7/24/2019

Case Narrative

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - beta-BHC

Job ID: 240-115237-2

Job ID: 240-115237-2

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative 240-115237-2

Comments

No additional comments.

Receipt

The samples were received on 6/29/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 13 coolers at receipt time were 1.5° C, 2.3° C, 2.3° C, 2.5° C, 3.1° C, 3.7° C, 4.1° C, 4.7° C, 4.9° C, 4.9° C, 4.9° C, 5.7° C and 5.7° C.

GC Semi VOA

Method(s) 8081B: The following samples required a tetrabutylammonium sulfite (TBA) clean-up to reduce matrix interferences caused by sulfur: CECW-4 (240-115237-9), CECW-5 (240-115237-10), PO-8 (240-115237-17), (LCS 240-389623/23-A) and (MB 240-389623/22-A). The analysis of the method blank, LCS and samples that have been subject to the TBA clean up will be reported with an RA suffix.

Method(s) 8081B: The following samples required a copper clean-up to reduce matrix interferences caused by sulfur: CECW-6I (240-115237-11), PO-9 (240-115237-19) and (MB 240-389623/22-A).

Method(s) 8081B: TBA was used to remove the sulfur interference. PO-10 (240-115237-20) TBA 4260529 Isopropyl Alcohol 3800132 HPLC Water 4160714

Method(s) 8081B: Surrogate recovery for the following samples was outside control limits: PO-10 (240-115237-20). Re-extraction and/or re-analysis was performed outside of holding time with acceptable results. Both sets of data are reported.

Method(s) 8081B: TBA was used to remove the sulfur interference. PO-10 (240-115237-20) TBA 4260529 Isopropyl Alcohol 3800132 HPLC Water 4160714

Method(s) 8081B: Re-extraction of the following sample was performed outside of the holding time due to the original extraction failing surrogate recovery. Both sets of data are reported.: PO-10 (240-115237-20) and DUPLICATE (240-115237-23).

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

Organic Prep

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

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Method Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - beta-BHC

MethodMethod DescriptionProtocolLaboratory8081BOrganochlorine Pesticides (GC)SW846TAL CAN3510CLiquid-Liquid Extraction (Separatory Funnel)SW846TAL CAN

Protocol References:

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

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Job ID: 240-115237-2

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Sample Summary

Client: Golder Associates Inc.

240-115237-20

240-115237-22

240-115237-23

240-115237-24

Project/Site: 1SA19 Makeup - A - beta-BHC

PO-10

PO-11

DUPLICATE

FIELD BLANK

Lab Sample ID Client Sample ID Matrix Collected Received Asset ID 240-115237-1 MW-4R Ground Water 06/27/19 08:55 06/29/19 09:30 240-115237-2 MW-5 **Ground Water** 06/27/19 09:02 06/29/19 09:30 240-115237-4 CECW-1 **Ground Water** 06/26/19 15:50 06/29/19 09:30 240-115237-6 CECW-2 **Ground Water** 06/26/19 14:35 06/29/19 09:30 240-115237-9 CECW-4 **Ground Water** 06/27/19 15:19 06/29/19 09:30 CECW-5 **Ground Water** 240-115237-10 06/27/19 14:40 06/29/19 09:30 240-115237-11 CECW-6I **Ground Water** 06/27/19 12:32 06/29/19 09:30 CECW-10R **Ground Water** 06/29/19 09:30 240-115237-15 06/27/19 12:10 240-115237-17 PO-8 **Ground Water** 06/27/19 13:31 06/29/19 09:30 **Ground Water** 240-115237-19 PO-9 06/27/19 16:07 06/29/19 09:30

Ground Water

Ground Water

Ground Water

Ground Water

06/27/19 11:15

06/26/19 16:25

06/27/19 12:27

06/26/19 16:25

06/29/19 09:30

06/29/19 09:30

06/29/19 09:30 06/29/19 09:30 -

Job ID: 240-115237-2

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Detection Summary

Client: Golder Associates Inc. Project/Site: 1SA19 Makeup - A - beta-BHC	Job ID: 240-115237-2
Client Sample ID: MW-4R	Lab Sample ID: 240-115237-1
No Detections.	
Client Sample ID: MW-5	Lab Sample ID: 240-115237-2
No Detections.	
Client Sample ID: CECW-1	Lab Sample ID: 240-115237-4
No Detections.	
Client Sample ID: CECW-2	Lab Sample ID: 240-115237-6
No Detections.	
Client Sample ID: CECW-4	Lab Sample ID: 240-115237-9
No Detections.	
Client Sample ID: CECW-5	Lab Sample ID: 240-115237-10
No Detections.	
Client Sample ID: CECW-6I	Lab Sample ID: 240-115237-11
No Detections.	
Client Sample ID: CECW-10R	Lab Sample ID: 240-115237-15
No Detections.	
Client Sample ID: PO-8	Lab Sample ID: 240-115237-17
No Detections.	
Client Sample ID: PO-9	Lab Sample ID: 240-115237-19
No Detections.	
Client Sample ID: PO-10	Lab Sample ID: 240-115237-20
No Detections.	
Client Sample ID: PO-11	Lab Sample ID: 240-115237-22
No Detections.	
Client Sample ID: DUPLICATE	Lab Sample ID: 240-115237-23
No Detections.	
Client Sample ID: FIELD BLANK	Lab Sample ID: 240-115237-24

This Detection Summary does not include radiochemical test results.

No Detections.

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Client: Golder Associates Inc.

Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: MW-4R Lab Sample ID: 240-115237-1

Date Collected: 06/27/19 08:55

Date Received: 06/29/19 09:30

Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046		0.050	0.0046	ug/L		07/03/19 11:16	07/09/19 21:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl			10 - 120				07/03/19 11:16	07/09/19 21:30	1
DCB Decachlorobiphenyl	18		10 - 120				07/03/19 11:16	07/09/19 21:30	1
Tetrachloro-m-xylene	34		33 - 120				07/03/19 11:16	07/09/19 21:30	1
Tetrachloro-m-xylene	30	X	33 - 120				07/03/19 11:16	07/09/19 21:30	1

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Client: Golder Associates Inc.

Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: MW-5 Lab Sample ID: 240-115237-2

Date Collected: 06/27/19 09:02 Matrix: Ground Water
Date Received: 06/29/19 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:16	07/09/19 21:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	16		10 - 120				07/03/19 11:16	07/09/19 21:54	1
DCB Decachlorobiphenyl	15		10 - 120				07/03/19 11:16	07/09/19 21:54	1
Tetrachloro-m-xylene	35		33 - 120				07/03/19 11:16	07/09/19 21:54	1
Tetrachloro-m-xylene	36		33 - 120				07/03/19 11:16	07/09/19 21:54	1

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Client: Golder Associates Inc.

Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: CECW-1 Lab Sample ID: 240-115237-4

Date Collected: 06/26/19 15:50 Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 8081B - Organochio	orine Pesticides (G	C)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:21	07/09/19 20:27	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	60		10 - 120				07/03/19 11:21	07/09/19 20:27	1
DCB Decachlorobiphenyl	52		10 - 120				07/03/19 11:21	07/09/19 20:27	1
Tetrachloro-m-xylene	75		33 - 120				07/03/19 11:21	07/09/19 20:27	1
Tetrachloro-m-xylene	62		33 - 120				07/03/19 11:21	07/09/19 20:27	1

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Client: Golder Associates Inc.

Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: CECW-2 Lab Sample ID: 240-115237-6

Date Collected: 06/26/19 14:35

Date Received: 06/29/19 09:30

Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:16	07/09/19 22:44	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	13		10 - 120				07/03/19 11:16	07/09/19 22:44	1
DCB Decachlorobiphenyl	12		10 - 120				07/03/19 11:16	07/09/19 22:44	1
Tetrachloro-m-xylene	38		33 - 120				07/03/19 11:16	07/09/19 22:44	1
Tetrachloro-m-xylene	37		33 - 120				07/03/19 11:16	07/09/19 22:44	1

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Client: Golder Associates Inc.

Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: CECW-4 Lab Sample ID: 240-115237-9

Date Collected: 06/27/19 15:19

Date Received: 06/29/19 09:30

Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:21	07/10/19 02:39	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	28		10 - 120				07/03/19 11:21	07/10/19 02:39	1
DCB Decachlorobiphenyl	24		10 - 120				07/03/19 11:21	07/10/19 02:39	1
Tetrachloro-m-xylene	45		33 - 120				07/03/19 11:21	07/10/19 02:39	1
Tetrachloro-m-xylene	43		33 - 120				07/03/19 11:21	07/10/19 02:39	1

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Client: Golder Associates Inc.

Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: CECW-5 Lab Sample ID: 240-115237-10

Date Collected: 06/27/19 14:40

Date Received: 06/29/19 09:30

Matrix: Ground Water

Method: 8081B - Organochio	orine Pesticides (G	C) - RA							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:21	07/10/19 02:52	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	51		10 - 120				07/03/19 11:21	07/10/19 02:52	1
DCB Decachlorobiphenyl	54		10 - 120				07/03/19 11:21	07/10/19 02:52	1
Tetrachloro-m-xylene	46		33 - 120				07/03/19 11:21	07/10/19 02:52	1
Tetrachloro-m-xylene	45		33 - 120				07/03/19 11:21	07/10/19 02:52	1

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Client: Golder Associates Inc.

Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: CECW-6I Lab Sample ID: 240-115237-11

Date Collected: 06/27/19 12:32 Matrix: Ground Water
Date Received: 06/29/19 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046		0.050	0.0046	ug/L		07/03/19 11:21	07/09/19 23:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	93		10 - 120				07/03/19 11:21	07/09/19 23:00	1
DCB Decachlorobiphenyl	83		10 - 120				07/03/19 11:21	07/09/19 23:00	1
Tetrachloro-m-xylene	82		33 - 120				07/03/19 11:21	07/09/19 23:00	1
Tetrachloro-m-xylene	70		33 - 120				07/03/19 11:21	07/09/19 23:00	1

Client: Golder Associates Inc. Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: CECW-10R

Lab Sample ID: 240-115237-15 Date Collected: 06/27/19 12:10 **Matrix: Ground Water**

Date Received: 06/29/19 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046		0.050	0.0046	ug/L		07/03/19 11:21	07/10/19 00:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	35		10 - 120				07/03/19 11:21	07/10/19 00:43	1
DCB Decachlorobiphenyl	33		10 - 120				07/03/19 11:21	07/10/19 00:43	1
Tetrachloro-m-xylene	165	X	33 - 120				07/03/19 11:21	07/10/19 00:43	1
Tetrachloro-m-xylene	47	D	33 - 120				07/03/19 11:21	07/10/19 00:43	1

Client: Golder Associates Inc.

Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: PO-8 Lab Sample ID: 240-115237-17

Date Collected: 06/27/19 13:31 Matrix: Ground Water
Date Received: 06/29/19 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:21	07/10/19 03:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	76		10 - 120				07/03/19 11:21	07/10/19 03:17	1
DCB Decachlorobiphenyl	81		10 - 120				07/03/19 11:21	07/10/19 03:17	1
Tetrachloro-m-xylene	50		33 - 120				07/03/19 11:21	07/10/19 03:17	1
Tetrachloro-m-xylene	53		33 - 120				07/03/19 11:21	07/10/19 03:17	1

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Client: Golder Associates Inc.

Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: PO-9 Lab Sample ID: 240-115237-19

Date Collected: 06/27/19 16:07

Date Received: 06/29/19 09:30

Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046		0.051	0.0046	ug/L		07/03/19 11:21	07/10/19 02:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	64		10 - 120				07/03/19 11:21	07/10/19 02:00	1
DCB Decachlorobiphenyl	66		10 - 120				07/03/19 11:21	07/10/19 02:00	1
Tetrachloro-m-xylene	97		33 - 120				07/03/19 11:21	07/10/19 02:00	1
Tetrachloro-m-xylene	67		33 - 120				07/03/19 11:21	07/10/19 02:00	

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Client: Golder Associates Inc.

Method: 8081B - Organochlorine Pesticides (GC)

Project/Site: 1SA19 Makeup - A - beta-BHC

Tetrachloro-m-xylene

Client Sample ID: PO-10 Lab Sample ID: 240-115237-20

Date Collected: 06/27/19 11:15 **Matrix: Ground Water** Date Received: 06/29/19 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	DII Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:16	07/10/19 01:50	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	14		10 - 120				07/03/19 11:16	07/10/19 01:50	1
DCB Decachlorobiphenyl	13		10 - 120				07/03/19 11:16	07/10/19 01:50	1
Tetrachloro-m-xylene	25	X	33 - 120				07/03/19 11:16	07/10/19 01:50	1
Tetrachloro-m-xylene	25	X	33 - 120				07/03/19 11:16	07/10/19 01:50	1
Method: 8081B - Organochio Analyte	•	C) - RE Qualifier	RL	MDL	Unit	_			
beta-BHC	Result	Qualifici				n	Dronarod	Analyzod	Dil Fac
	<0.0046	H	0.051	0.0046	ug/L	D	Prepared 07/18/19 10:24	Analyzed 07/19/19 15:21	Dil Fac
Surrogate	<0.0046 %Recovery					<u>B</u>			Dil Fac Dil Fac
Surrogate DCB Decachlorobiphenyl			0.051			<u>b</u>	07/18/19 10:24	07/19/19 15:21	1
	%Recovery		0.051 <i>Limits</i>			В	07/18/19 10:24 Prepared	07/19/19 15:21 Analyzed	1

33 - 120

Job ID: 240-115237-2

07/18/19 10:24

07/19/19 15:21

Client: Golder Associates Inc.

Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: PO-11 Lab Sample ID: 240-115237-22

Date Collected: 06/26/19 16:25

Date Received: 06/29/19 09:30

Matrix: Ground Water

Method: 8081B - Organochio	orine Pesticides (G	C)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0045		0.049	0.0045	ug/L		07/03/19 11:16	07/10/19 00:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	25		10 - 120				07/03/19 11:16	07/10/19 00:11	1
DCB Decachlorobiphenyl	22		10 - 120				07/03/19 11:16	07/10/19 00:11	1
Tetrachloro-m-xylene	60		33 - 120				07/03/19 11:16	07/10/19 00:11	1
Tetrachloro-m-xvlene	60		33 - 120				07/03/19 11:16	07/10/19 00:11	1

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Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: DUPLICATE Lab Sample ID: 240-115237-23

Date Collected: 06/27/19 12:27 Date Received: 06/29/19 09:30

Matrix: Ground Water

Job ID: 240-115237-2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0050		0.054	0.0050	ug/L		07/03/19 11:16	07/10/19 00:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	8	X	10 - 120				07/03/19 11:16	07/10/19 00:36	1
DCB Decachlorobiphenyl	7	Χ	10 - 120				07/03/19 11:16	07/10/19 00:36	1
Tetrachloro-m-xylene	17	X	33 - 120				07/03/19 11:16	07/10/19 00:36	1
Tetrachloro-m-xylene	24	X	33 - 120				07/03/19 11:16	07/10/19 00:36	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046	Н	0.050	0.0046	ug/L		07/18/19 10:24	07/19/19 15:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	14		10 - 120				07/18/19 10:24	07/19/19 15:34	1
DCB Decachlorobiphenyl	18		10 - 120				07/18/19 10:24	07/19/19 15:34	1
Tetrachloro-m-xylene	41		33 - 120				07/18/19 10:24	07/19/19 15:34	1
Tetrachloro-m-xylene	30	X	33 - 120				07/18/19 10:24	07/19/19 15:34	1

Client: Golder Associates Inc. Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: FIELD BLANK

Date Received: 06/29/19 09:30

Lab Sample ID: 240-115237-24 Date Collected: 06/26/19 16:25

Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:16	07/10/19 00:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	71		10 - 120				07/03/19 11:16	07/10/19 00:48	1
DCB Decachlorobiphenyl	74		10 - 120				07/03/19 11:16	07/10/19 00:48	1
Tetrachloro-m-xylene	62		33 - 120				07/03/19 11:16	07/10/19 00:48	1
Tetrachloro-m-xylene	65		33 - 120				07/03/19 11:16	07/10/19 00:48	1

Surrogate Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - beta-BHC

Job ID: 240-115237-2

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Ground Water Prep Type: Total/NA

				Percent Sui	rogate Recover	y (Acceptance Lim
		DCBP1	DCBP2	TCX1	TCX2	
ab Sample ID	Client Sample ID	(10-120)	(10-120)	(33-120)	(33-120)	
40-115237-1	MW-4R	19	18	34	30 X	
40-115237-2	MW-5	16	15	35	36	
40-115237-4	CECW-1	60	52	75	62	
40-115237-4 MS	CECW-1	67	58	75	61	
40-115237-4 MSD	CECW-1	78	69	72	58	
40-115237-6	CECW-2	13	12	38	37	
40-115237-9 - RA	CECW-4	28	24	45	43	
40-115237-10 - RA	CECW-5	51	54	46	45	
40-115237-11	CECW-6I	93	83	82	70	
40-115237-15	CECW-10R	35	33	165 X	47 p	
40-115237-17 - RA	PO-8	76	81	50	53	
40-115237-19	PO-9	64	66	97	67	
40-115237-20	PO-10	14	13	25 X	25 X	
40-115237-20 - RE	PO-10	52	40	47	44	
40-115237-22	PO-11	25	22	60	60	
40-115237-23	DUPLICATE	8 X	7 X	17 X	24 X	
40-115237-23 - RE	DUPLICATE	18	14	30 X	41	
40-115237-24	FIELD BLANK	71	74	62	65	
Surrogate Legend						

TCX = Tetrachloro-m-xylene

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Water Prep Type: Total/NA

				Percent Sur	rrogate Reco
		DCBP1	DCBP2	TCX1	TCX2
Lab Sample ID	Client Sample ID	(10-120)	(10-120)	(33-120)	(33-120)
LCS 240-389622/23-A	Lab Control Sample	93	96	74	76
LCS 240-389622/23-A	Lab Control Sample	97	101	78	81
LCS 240-389623/23-A - RA	Lab Control Sample	98	99	73	70
LCS 240-389623/23-A	Lab Control Sample	93	82	72	66
LCS 240-391827/20-A	Lab Control Sample	61	50	79	72
LCS 240-391827/20-A	Lab Control Sample	43	39	63	61
MB 240-389622/22-A	Method Blank	85	89	75	75
MB 240-389622/22-A	Method Blank	99	108	92	88
MB 240-389623/22-A - RA	Method Blank	110	118	86	83
MB 240-389623/22-A	Method Blank	116	113	92	85
MB 240-391827/19-A	Method Blank	64	51	66	61
MB 240-391827/19-A	Method Blank	64	51	68	62

DCBP = DCB Decachlorobiphenyl

TCX = Tetrachloro-m-xylene

Eurofins TestAmerica, Canton

7/24/2019

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - beta-BHC

Job ID: 240-115237-2

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 240-389622/22-A Client Sample ID: Method Blank **Matrix: Water Prep Type: Total/NA** Analysis Batch: 390389 **Prep Batch: 389622** MR MR

	IVID	IVID							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046		0.050	0.0046	ug/L		07/03/19 11:16	07/09/19 18:47	1
	МВ	МВ							
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac

	MB	МВ				
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	99		10 - 120	07/03/19 11:16	07/09/19 18:47	1
DCB Decachlorobiphenyl	108		10 - 120	07/03/19 11:16	07/09/19 18:47	1
Tetrachloro-m-xylene	92		33 - 120	07/03/19 11:16	07/09/19 18:47	1
Tetrachloro-m-xylene	88		33 - 120	07/03/19 11:16	07/09/19 18:47	1

Lab Sample ID: MB 240-389622/22-A Client Sample ID: Method Blank

Matrix: Water Prep Type: Total/NA **Prep Batch: 389622** Analysis Batch: 390389 MB MB

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046		0.050	0.0046	ug/L		07/03/19 11:16	07/10/19 01:13	1
	МВ	МВ							

Surrogate	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	85	10 - 120	07/03/19 11:16	07/10/19 01:13	1
DCB Decachlorobiphenyl	89	10 - 120	07/03/19 11:16	07/10/19 01:13	1
Tetrachloro-m-xylene	75	33 - 120	07/03/19 11:16	07/10/19 01:13	1
Tetrachloro-m-xylene	75	33 - 120	07/03/19 11:16	07/10/19 01:13	1

Lab Sample ID: LCS 240-389622/23-A **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 390389						Prep Batch: 389622
	Spike	LCS	LCS			%Rec.
Analyte	Added	Result	Qualifier L	Jnit D	%Rec	Limits
beta-BHC	0.250	0.262		Ja/L	105	36 - 140

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
DCB Decachlorobiphenyl	97		10 - 120
DCB Decachlorobiphenyl	101		10 - 120
Tetrachloro-m-xylene	78		33 - 120
Tetrachloro-m-xvlene	81		33 - 120

Lab Sample ID: LCS 240-389622/23-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 390389

Analysis Batch: 390389								Prep	Batch: 389622	2
		Spike	LCS	LCS				%Rec.		
Analyte		Added	Result	Qualifier	Unit	D	%Rec	Limits		
heta-BHC		0.250	0 244		ua/l		98	36 140		_

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
DCB Decachlorobiphenyl	93		10 - 120
DCB Decachlorobiphenyl	96		10 - 120
Tetrachloro-m-xylene	74		33 - 120
Tetrachloro-m-xylene	76		33 - 120

Eurofins TestAmerica, Canton

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - beta-BHC

Job ID: 240-115237-2

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 389623

	MD	IVID							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046		0.050	0.0046	ug/L		07/03/19 11:21	07/09/19 19:09	1
	MB	МВ							

	MB	MB				
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	116		10 - 120	07/03/19 11:21	07/09/19 19:09	1
DCB Decachlorobiphenyl	113		10 - 120	07/03/19 11:21	07/09/19 19:09	1
Tetrachloro-m-xylene	92		33 - 120	07/03/19 11:21	07/09/19 19:09	1
Tetrachloro-m-xylene	85		33 - 120	07/03/19 11:21	07/09/19 19:09	1

Lab Sample ID: LCS 240-389623/23-A					Client	: Sample	ID: Lab Co	ontrol Sample
Matrix: Water							Prep T	ype: Total/NA
Analysis Batch: 391592							Prep E	Batch: 389623
	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
beta-BHC	0.250	0.238		ug/L		95	36 - 140	

	LCS I	LCS	
Surrogate	%Recovery	Qualifier	Limits
DCB Decachlorobiphenyl	82		10 - 120
DCB Decachlorobiphenyl	93		10 - 120
Tetrachloro-m-xylene	66		33 - 120
Tetrachloro-m-xylene	72		33 - 120

Lab Sample ID: 240-115237-4 MS	Client Sample ID: CECW-1
Matrix: Ground Water	Prep Type: Total/NA
Analysis Batch: 390394	Prep Batch: 389623

Sample Sample Spike MS MS %Rec. Result Qualifier Analyte Result Qualifier Added Unit D %Rec Limits beta-BHC <0.0044 0.248 0.256 ug/L 103 31 - 120

	MS	MS	
Surrogate	%Recovery	Qualifier	Limits
DCB Decachlorobiphenyl	67		10 - 120
DCB Decachlorobiphenyl	58		10 - 120
Tetrachloro-m-xylene	75		33 - 120
Tetrachloro-m-xylene	61		33 - 120

Lab Sample ID: 240-115237-4 MSD	Client Sample ID: CECW-1
Matrix: Ground Water	Prep Type: Total/NA

Analysis Batch: 390394 **Prep Batch: 389623** Sample Sample Spike MSD MSD RPD %Rec. Analyte Result Qualifier Added Result Qualifier %Rec Limits RPD Limit Unit beta-BHC 0.238 100 <0.0044 0.237 ug/L 31 - 120 6

	MSD	MSD	
Surrogate	%Recovery	Qualifier	Limits
DCB Decachlorobiphenyl	78		10 - 120
DCB Decachlorobiphenyl	69		10 - 120
Tetrachloro-m-xylene	72		33 - 120
Tetrachloro-m-xylene	58		33 - 120

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Job ID: 240-115237-2

07/18/19 10:24

07/19/19 14:44

Prep Type: Total/NA

Prep Batch: 391827

Project/Site: 1SA19 Makeup - A - beta-BHC

Client: Golder Associates Inc.

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: MB 240-391827/19-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA Analysis Batch: 391994 **Prep Batch: 391827** MB MB

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Anaiyzed	DII Fac
beta-BHC	<0.0046		0.050	0.0046	ug/L		07/18/19 10:24	07/19/19 14:44	1
	МВ	MB							
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	64		10 - 120				07/18/19 10:24	07/19/19 14:44	1
DCB Decachlorobiphenyl	51		10 - 120				07/18/19 10:24	07/19/19 14:44	1
Tetrachloro-m-xylene	66		33 120				07/18/19 10:24	07/19/19 14:44	1

Lab Sample ID: MB 240-391827/19-A Client Sample ID: Method Blank

33 - 120

Matrix: Water Prep Type: Total/NA **Prep Batch: 391827** Analysis Batch: 391994

MB MB

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	DII Fac
beta-BHC	<0.0046		0.050	0.0046	ug/L		07/18/19 10:24	07/19/19 15:58	1
	МВ	MB							
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac

Surrogate	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	51	10 - 120	07/18/19 10:24	07/19/19 15:58	1
DCB Decachlorobiphenyl	64	10 - 120	07/18/19 10:24	07/19/19 15:58	1
Tetrachloro-m-xylene	62	33 - 120	07/18/19 10:24	07/19/19 15:58	1
Tetrachloro-m-xylene	68	33 - 120	07/18/19 10:24	07/19/19 15:58	1

Lab Sample ID: LCS 240-391827/20-A **Client Sample ID: Lab Control Sample**

Matrix: Water

Tetrachloro-m-xylene

Analysis Batch: 391994

61

Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit D %Rec Limits beta-BHC 0.250 0.243 ug/L 97 36 - 140

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
DCB Decachlorobiphenyl	61		10 - 120
DCB Decachlorobiphenyl	50		10 - 120
Tetrachloro-m-xylene	79		33 - 120
Tetrachloro-m-xylene	72		33 - 120

Lab Sample ID: LCS 240-391827/20-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 391994

Prep Batch: 391827 LCS LCS Spike %Rec. Analyte Added Result Qualifier Limits Unit %Rec beta-BHC 0.250 0.158 ug/L 63 36 - 140

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
DCB Decachlorobiphenyl	39		10 - 120
DCB Decachlorobiphenyl	43		10 - 120
Tetrachloro-m-xylene	61		33 - 120
Tetrachloro-m-xylene	63		33 - 120

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7/24/2019

QC Sample Results

Client: Golder Associates Inc. Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Method: 8081B - Organochlorine Pesticides (GC) - RA

Lab Sample	ID: MB	240-38962	3/22-A
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Matrix: Water Analysis Batch: 390394

Client Sample ID: Method Blank

07/10/19 02:13

07/10/19 02:13

Prep Type: Total/NA

Prep Batch: 389623

Prep Type: Total/NA

Prep Batch: 389623

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC - RA	<0.0046		0.050	0.0046	ug/L		07/03/19 11:21	07/10/19 02:13	1
	MB	МВ							
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl - RA	110		10 - 120				07/03/19 11:21	07/10/19 02:13	1
DCB Decachlorobiphenvl - RA	118		10 - 120				07/03/19 11:21	07/10/19 02:13	1

33 - 120

33 - 120

Lab Sample ID: LCS 240-389623/23-A

Matrix: Water

Surrogate

Tetrachloro-m-xylene - RA

Tetrachloro-m-xylene - RA

Analysis Batch: 390394

Analyte

DCB Decachlorobiphenyl - RA

DCB Decachlorobiphenyl - RA

Tetrachloro-m-xylene - RA

Tetrachloro-m-xylene - RA

beta-BHC - RA

Spike

%Recovery

98

99

73

70

LCS LCS

Qualifier

MB MB

83

Added 0.250

> Limits 10 - 120

> 10 - 120

33 - 120

33 - 120

LCS LCS 0.237

Result Qualifier

Unit ug/L

%Rec

07/03/19 11:21

07/03/19 11:21

95

Limits 36 - 140

Client Sample ID: Lab Control Sample

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - beta-BHC

GC Semi VOA

Prep Batch: 389622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-1	MW-4R	Total/NA	Ground Water	3510C	
240-115237-2	MW-5	Total/NA	Ground Water	3510C	
240-115237-6	CECW-2	Total/NA	Ground Water	3510C	
240-115237-20	PO-10	Total/NA	Ground Water	3510C	
240-115237-22	PO-11	Total/NA	Ground Water	3510C	
240-115237-23	DUPLICATE	Total/NA	Ground Water	3510C	
240-115237-24	FIELD BLANK	Total/NA	Ground Water	3510C	
MB 240-389622/22-A	Method Blank	Total/NA	Water	3510C	
LCS 240-389622/23-A	Lab Control Sample	Total/NA	Water	3510C	

Prep Batch: 389623

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-4	CECW-1	Total/NA	Ground Water	3510C	
240-115237-9 - RA	CECW-4	Total/NA	Ground Water	3510C	
240-115237-10 - RA	CECW-5	Total/NA	Ground Water	3510C	
240-115237-11	CECW-6I	Total/NA	Ground Water	3510C	
240-115237-15	CECW-10R	Total/NA	Ground Water	3510C	
240-115237-17 - RA	PO-8	Total/NA	Ground Water	3510C	
240-115237-19	PO-9	Total/NA	Ground Water	3510C	
MB 240-389623/22-A - RA	Method Blank	Total/NA	Water	3510C	
MB 240-389623/22-A	Method Blank	Total/NA	Water	3510C	
LCS 240-389623/23-A	Lab Control Sample	Total/NA	Water	3510C	
LCS 240-389623/23-A - RA	Lab Control Sample	Total/NA	Water	3510C	
240-115237-4 MS	CECW-1	Total/NA	Ground Water	3510C	
240-115237-4 MSD	CECW-1	Total/NA	Ground Water	3510C	

Analysis Batch: 390389

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-1	MW-4R	Total/NA	Ground Water	8081B	389622
240-115237-2	MW-5	Total/NA	Ground Water	8081B	389622
240-115237-6	CECW-2	Total/NA	Ground Water	8081B	389622
240-115237-20	PO-10	Total/NA	Ground Water	8081B	389622
240-115237-22	PO-11	Total/NA	Ground Water	8081B	389622
240-115237-23	DUPLICATE	Total/NA	Ground Water	8081B	389622
240-115237-24	FIELD BLANK	Total/NA	Ground Water	8081B	389622
MB 240-389622/22-A	Method Blank	Total/NA	Water	8081B	389622
MB 240-389622/22-A	Method Blank	Total/NA	Water	8081B	389622
LCS 240-389622/23-A	Lab Control Sample	Total/NA	Water	8081B	389622
LCS 240-389622/23-A	Lab Control Sample	Total/NA	Water	8081B	389622

Analysis Batch: 390394

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-4	CECW-1	Total/NA	Ground Water	8081B	389623
240-115237-9 - RA	CECW-4	Total/NA	Ground Water	8081B	389623
240-115237-10 - RA	CECW-5	Total/NA	Ground Water	8081B	389623
240-115237-11	CECW-6I	Total/NA	Ground Water	8081B	389623
240-115237-15	CECW-10R	Total/NA	Ground Water	8081B	389623
240-115237-17 - RA	PO-8	Total/NA	Ground Water	8081B	389623
240-115237-19	PO-9	Total/NA	Ground Water	8081B	389623
MB 240-389623/22-A	Method Blank	Total/NA	Water	8081B	389623
MB 240-389623/22-A - RA	Method Blank	Total/NA	Water	8081B	389623

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Job ID: 240-115237-2

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QC Association Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - beta-BHC

GC Semi VOA (Continued)

Analysis Batch: 390394 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 240-389623/23-A - RA	Lab Control Sample	Total/NA	Water	8081B	389623
240-115237-4 MS	CECW-1	Total/NA	Ground Water	8081B	389623
240-115237-4 MSD	CECW-1	Total/NA	Ground Water	8081B	389623

Analysis Batch: 391592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 240-389623/23-A	Lab Control Sample	Total/NA	Water	8081B	389623

Prep Batch: 391827

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-20 - RE	PO-10	Total/NA	Ground Water	3510C	
240-115237-23 - RE	DUPLICATE	Total/NA	Ground Water	3510C	
MB 240-391827/19-A	Method Blank	Total/NA	Water	3510C	
LCS 240-391827/20-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batch: 391994

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-20 - RE	PO-10	Total/NA	Ground Water	8081B	391827
240-115237-23 - RE	DUPLICATE	Total/NA	Ground Water	8081B	391827
MB 240-391827/19-A	Method Blank	Total/NA	Water	8081B	391827
MB 240-391827/19-A	Method Blank	Total/NA	Water	8081B	391827
LCS 240-391827/20-A	Lab Control Sample	Total/NA	Water	8081B	391827
LCS 240-391827/20-A	Lab Control Sample	Total/NA	Water	8081B	391827

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7/24/2019

Job ID: 240-115237-2

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - beta-BHC

Lab Sample ID: 240-115237-1

Matrix: Ground Water

Matrix: Ground Water

Matrix: Ground Water

Client Sample ID: MW-4R

Date Collected: 06/27/19 08:55 Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/09/19 21:30	BPM	TAL CAN

Client Sample ID: MW-5 Lab Sample ID: 240-115237-2

Date Collected: 06/27/19 09:02 Matrix: Ground Water

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/09/19 21:54	BPM	TAL CAN

Client Sample ID: CECW-1 Lab Sample ID: 240-115237-4

Date Collected: 06/26/19 15:50 Matrix: Ground Water

Date Received: 06/29/19 09:30

	Batch	atch Batch		Dilution		Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C		· 	389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390394	07/09/19 20:27	OCR	TAL CAN

Client Sample ID: CECW-2 Lab Sample ID: 240-115237-6

Date Collected: 06/26/19 14:35 Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/09/19 22:44	BPM	TAL CAN

Client Sample ID: CECW-4 Lab Sample ID: 240-115237-9

Date Collected: 06/27/19 15:19

Date Received: 06/29/19 09:30

-	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C	RA		389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B	RA	1	390394	07/10/19 02:39	OCR	TAL CAN

Client Sample ID: CECW-5

Date Collected: 06/27/19 14:40

Lab Sample ID: 240-115237-10

Matrix: Ground Water

Date Collected: 06/27/19 14:40 Date Received: 06/29/19 09:30

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C	RA		389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B	RA	1	390394	07/10/19 02:52	OCR	TAL CAN

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Job ID: 240-115237-2

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: CECW-61

Date Collected: 06/27/19 12:32 Date Received: 06/29/19 09:30 Lab Sample ID: 240-115237-11

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390394	07/09/19 23:00	OCR	TAL CAN

Client Sample ID: CECW-10R

Date Collected: 06/27/19 12:10 Date Received: 06/29/19 09:30 Lab Sample ID: 240-115237-15

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390394	07/10/19 00:43	OCR	TAL CAN

Client Sample ID: PO-8

Date Collected: 06/27/19 13:31

Date Received: 06/29/19 09:30

Lab Sample ID: 240-115237-17

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C	RA		389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B	RA	1	390394	07/10/19 03:17	OCR	TAL CAN

Client Sample ID: PO-9

Date Collected: 06/27/19 16:07 Date Received: 06/29/19 09:30 Lab Sample ID: 240-115237-19

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390394	07/10/19 02:00	OCR	TAL CAN

Client Sample ID: PO-10

Date Collected: 06/27/19 11:15

Date Received: 06/29/19 09:30

5237-20	240-11	ID:	Sample	Lab
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Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/10/19 01:50	BPM	TAL CAN
Total/NA	Prep	3510C	RE		391827	07/18/19 10:24	EMB	TAL CAN
Total/NA	Analysis	8081B	RE	1	391994	07/19/19 15:21	BPM	TAL CAN

Client Sample ID: PO-11

Date Collected: 06/26/19 16:25 Date Received: 06/29/19 09:30

Sample ID: 240-115237-22

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/10/19 00:11	BPM	TAL CAN

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Lab Chronicle

Client: Golder Associates Inc. Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Client Sample ID: DUPLICATE

Lab Sample ID: 240-115237-23 Date Collected: 06/27/19 12:27 **Matrix: Ground Water**

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/10/19 00:36	BPM	TAL CAN
Total/NA	Prep	3510C	RE		391827	07/18/19 10:24	EMB	TAL CAN
Total/NA	Analysis	8081B	RE	1	391994	07/19/19 15:34	BPM	TAL CAN

Client Sample ID: FIELD BLANK

Lab Sample ID: 240-115237-24

Date Collected: 06/26/19 16:25 **Matrix: Ground Water**

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/10/19 00:48	BPM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: Golder Associates Inc. Job ID: 240-115237-2

Project/Site: 1SA19 Makeup - A - beta-BHC

Laboratory: Eurofins TestAmerica, Canton

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Virginia	NELAP	3	460175	09-14-19 *

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^{*} Accreditation/Certification renewal pending - accreditation/certification considered valid.

editation/Certification renewal pending - accreditation/certification considered valid.

Eurofins TestAmerica, Canton

Chain of Custody Record

Eurofins TestAmerica, Canton

4101 Shuffel Street NW

Environment Testing 🔆 eurofins

TestAmerica

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica For Lab Use Only: Ruchel Powel Sampler Kevin Weissgold/Nathan Chien Sample Specific Notes: Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) .ab Sampling: Job / SDG No. Nalk-in Client of Therm ID No. COC No Special Instructions/QC Requirements & Comments: All samples preserved on ice. Please provide a Level II Data package. Please see sample memo. Reporting Group A. 240-115237 Chain of Custody Corr'd: Company: Date: (9/27/19 Carrier: FedEx Disposal by Lab VSWMR/CAP Cooler Temp. (°C): Obs'd Site Contact: Rachel Powell Lab Contact: Eric Lang - Other: Return to Client RCRA N N N N N X × K X × × Deta-BHC - SW846 8081B S 2 2 2 2 Perform MS / MSD (Y / N) Z 2 2 Filtered Sample (Y / N) Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the NPDES # of Cont. 4 2 4 2 4 0 2 4 4 2 Project Manager: Mike Williams/Rachel Powell WORKING DAYS Preservation Used: 1= ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Zinc Acetate + NaOH Matrix 38 35 3 SE SE 3 3 3 3 3 3 Analysis Turnaround Time MO TAT if different from Below 10 Type (C=Comp, G=Grab) Regulatory Program: 0 9 9 9 9 0 9 9 0 0 Email: ripowell@golder.com 2 weeks 1 week 2 days 1 day Tel/Fax: 804-517-3381 5271 P1/45/0 Sample 6127/19 0855 6/27/19 1607 0441 1440 6/23/19 1232 6/27/19 1210 6124/19 0902 1331 6/27/19 1519 S111 W/£7/9 CALENDAR DAYS Custody Seal No. Sample Date 0000 Comments Section if the lab is to dispose of the sample Project Name: 1SA19 CEC Makeup Sampling Event Sample Identification Site: Chesapeake Energy Center, Virginia Phone North Canton, OH 44720-6900 phone 330,497,9396 fax 330,497,0772 Client Contact FAX 2108 West Laburnum Ave. Suite 200 Possible Hazard Identification: Custody Seals Intact Rache Powell Golder Associates Inc. Richmond, VA, 23227 CECW-10R Duplicate CECW- (0) P O# 19117210 CECW-S CECW-4 (804) 358-7900 XXXX-XXX (XXX) MW-4R MW-S 01-00 P-09 Po -8

Form No. CA-C-WI-002, Rev. 4.23, dated 4/16/2019

Date/Time*

Company

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Received in Laboratory by

Date/Time:

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7/24/2019

Golder Associates Inc. 2108 West Laburnum Ave, Suite 200	The state of the s							Cho long	10/1	Date.	1121	5		COC NO.	
Golder Associates Inc. 2108 West Laburnum Ave, Suite 200		- Anna	COLL		1	100 00	olle colliaci. Nachel rowell	Cue Louis	wen.	Date.	9119				
2108 West Laburnum Ave, Suite 200	Tel/Fax: 804-517-3381	517-3381				ab Con	Lab Contact: Eric Lang	c Lang		Carrie	Carrier: FedEx			l of	COCs
	Ans	lysis Tur	Analysis Turnaround Time	Time			Þ							Sampler: Kevin V	Sampler. Kevin Weissgold/Nathan Chien
Richmond, VA, 23227	CALENDAR DAYS	DAYS	WORK!	WORKING DAYS			206							For Lab Use Only:	ily: Reduct Power
(804) 358-7900 Phone	TAT	TAT if different from Below	om Below	10			946		_					Walk-in Client:	
(xxx) xxx-xxxx FAX	ū	2 weeks	eks		IN	11			_	_				Lab Sampling.	
Project Name: 1SA19 CEC Makeup Sampling Event	П	1 week	4		1 1) (
Site: Chesapeake Energy Center, Virginia	7	2 days	, sk		1 0	ISW	_							Job / SDG No.	
P O # 19117210	D	1 day	^		Jue	I/SI	_								
Sample Identification	Sample Sa Date	Sample	Sample Type (C=Comp, G=Grab)	Matrix	Cont.	Filtered S: Perform M Sulfide - S	Sulfide, di							Sample	Sample Specific Notes:
CECW-1	6/26/19 1	1550	9	GW	7	メ	×								
CECW-ID	6/26/19 1545	548	9	S	7	N X	×								
CECW-2	41 11/97/9	1435	9	GW	7	× N	×								
CECW-20	6126/19	1345	9	GE	7	7	×								
CECW-30	6/26/19 1510	Sio	ڻ	SE	2 4	NA	1 4								
Field Blank	6/20/19 10	1625	5	Cie	2	NN	×								
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Zinc Acetate + NaOH Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the	5=NaOH; 6= C	Waste Co	Acetate + NaOH	- NaOH	s in the	Samp	6 Die Dispo	osal (Af	ee may	pe asses	sed if sa	mples an	e retaine	6 6 Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	nonth)
ction if the lab is to dispose of the	Boleon R		Hilphoum			Ī	Continue to	Topics			4	A	shine for	1	
Special Instructions/QC Requirements & Comments: All samples preserved on ice. Please provide a Level II Data package. Please see sample memo. Reporting Group	amples prese	rved on it	ce. Pleasi	e provid	e a Leve	III Dat	Return to Client ata package.	ge. Plea	se see s	Sample memo	emo. Re	porting (Group (8	Months	
Custody Seals Intact: Yes No	Custody Seal No.:	No.:					Coc	Cooler Temp. (°C): Obs'd	p. (°C): (:p,sqc		Corr'd:		Therm ID No.:	
Relinquished by.	Company:			C/28	C/28/19 110	2	Received by:		17		Company:	ny:		Date/Time:	
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eurofins Environment Testing

TestAmerica

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Other: VSWMR/CAP

RCRA

NPDES

Regulatory Program: Dow

North Canton, OH 44720-6900 phone 330-497-9396 fax 330-497,0772

Eurofins TestAmerica, Canton

4101 Shuffel Street NW

Chain of Custody Record

ANALYTICAL REPORT

Eurofins TestAmerica, Canton 4101 Shuffel Street NW North Canton, OH 44720 Tel: (330)497-9396

Laboratory Job ID: 240-115237-3

Client Project/Site: 1SA19 Makeup - A - Antimony

For:

🔅 eurofins

Golder Associates Inc. 2108 W Laburnum Ave, Suite 200 Richmond, Virginia 23227

Attn: Mr. Mike Williams

Authorized for release by: 7/22/2019 10:16:15 AM

Eric Lang, Manager of Project Management (708)534-5200 eric.lang@testamericainc.com

.....LINKS

Review your project results through

Have a Question?



Visit us at: www.testamericainc.com

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

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

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Definitions/Glossary

Client: Golder Associates Inc. Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.						
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis						
%R	Percent Recovery						
CFL	Contains Free Liquid						
CNF	Contains No Free Liquid						
DER	Duplicate Error Ratio (normalized absolute difference)						
Dil Fac	Dilution Factor						
DL	Detection Limit (DoD/DOE)						

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample DLC Decision Level Concentration (Radiochemistry)

EDI Estimated Detection Limit (Dioxin)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)
MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

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Case Narrative

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - Antimony

Job ID: 240-115237-3

Job ID: 240-115237-3

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative 240-115237-3

Comments

No additional comments.

Receipt

The samples were received on 6/29/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 13 coolers at receipt time were 1.5° C, 2.3° C, 2.3° C, 2.5° C, 3.1° C, 3.7° C, 4.1° C, 4.7° C, 4.9° C, 4.9° C, 5.7° C and 5.7° C.

Metals

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

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Method Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - Antimony

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CAN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN

Protocol References:

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

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Job ID: 240-115237-3

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Sample Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - Antimony

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-115237-1	MW-4R	Ground Water	06/27/19 08:55	06/29/19 09:30
0-115237-2	MW-5	Ground Water	06/27/19 09:02	06/29/19 09:30
0-115237-4	CECW-1	Ground Water	06/26/19 15:50	06/29/19 09:30
40-115237-6	CECW-2	Ground Water	06/26/19 14:35	06/29/19 09:30
0-115237-9	CECW-4	Ground Water	06/27/19 15:19	06/29/19 09:30
40-115237-10	CECW-5	Ground Water	06/27/19 14:40	06/29/19 09:30
40-115237-11	CECW-6I	Ground Water	06/27/19 12:32	06/29/19 09:30
0-115237-15	CECW-10R	Ground Water	06/27/19 12:10	06/29/19 09:30
0-115237-17	PO-8	Ground Water	06/27/19 13:31	06/29/19 09:30
0-115237-19	PO-9	Ground Water	06/27/19 16:07	06/29/19 09:30
0-115237-20	PO-10	Ground Water	06/27/19 11:15	06/29/19 09:30
40-115237-22	PO-11	Ground Water	06/26/19 16:25	06/29/19 09:30
40-115237-23	DUPLICATE	Ground Water	06/27/19 12:27	06/29/19 09:30
0-115237-24	FIELD BLANK	Ground Water	06/26/19 16:25	06/29/19 09:30

Job ID: 240-115237-3

Detection Summary

Project/Site: 1SA19 Makeup - A - Antimony	Job ID: 240-115237-3						
Client Sample ID: MW-4R	Lab Sample ID: 240-115237-1						
No Detections.							
Client Sample ID: MW-5	Lab Sample ID: 240-115237-2						
No Detections.							
Client Sample ID: CECW-1	Lab Sample ID: 240-115237-4						
No Detections.							
Client Sample ID: CECW-2	Lab Sample ID: 240-115237-6						
No Detections.							
Client Sample ID: CECW-4	Lab Sample ID: 240-115237-9						
No Detections.							
Client Sample ID: CECW-5	Lab Sample ID: 240-115237-10						
No Detections.							
Client Sample ID: CECW-6I	Lab Sample ID: 240-115237-11						
No Detections.							
Client Sample ID: CECW-10R	Lab Sample ID: 240-115237-15						
No Detections.							
Client Sample ID: PO-8	Lab Sample ID: 240-115237-17						
No Detections.							
Client Sample ID: PO-9	Lab Sample ID: 240-115237-19						
No Detections.							
Client Sample ID: PO-10	Lab Sample ID: 240-115237-20						
No Detections.							
Client Sample ID: PO-11	Lab Sample ID: 240-115237-22						
No Detections.							
Client Sample ID: DUPLICATE	Lab Sample ID: 240-115237-23						
No Detections.							
Client Sample ID: FIELD BLANK	Lab Sample ID: 240-115237-24						

This Detection Summary does not include radiochemical test results.

No Detections.

Client: Golder Associates Inc. Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Client Sample ID: MW-4R Lab Sample ID: 240-115237-1 Date Collected: 06/27/19 08:55

Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/M	S) - Total Recoverable						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57 ug/L		07/01/19 14:00	07/09/19 21:01	1

Client: Golder Associates Inc.

Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Client Sample ID: MW-5 Lab Sample ID: 240-115237-2

Date Collected: 06/27/19 09:02 Matrix: Ground Water
Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	< 0.57	20	0.57 ug/l		07/01/19 14:00	07/09/19 21:03	

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Client: Golder Associates Inc.

Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Client Sample ID: CECW-1 Lab Sample ID: 240-115237-4

Date Collected: 06/26/19 15:50 Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS)	- Total F	Recoverable							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57		2.0	0.57	ug/L		07/01/19 14:00	07/09/19 20:49	1

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Client: Golder Associates Inc.

Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Client Sample ID: CECW-2 Lab Sample ID: 240-115237-6

Matrix: Ground Water

Date Collected: 06/26/19 14:35 Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/N	IS) - Total Recoverable						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	20	0.57 ug/l		07/01/19 14:00	07/09/19 21:15	

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Client: Golder Associates Inc.

Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Client Sample ID: CECW-4 Lab Sample ID: 240-115237-9

Date Collected: 06/27/19 15:19

Date Received: 06/29/19 09:30

Matrix: Ground Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57		0.57 ug/l		07/01/19 14:00	07/09/19 21:22	

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Client: Golder Associates Inc.

Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Client Sample ID: CECW-5 Lab Sample ID: 240-115237-10

Date Collected: 06/27/19 14:40 Matrix: Ground Water Date Received: 06/29/19 09:30

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Client: Golder Associates Inc.

Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Client Sample ID: CECW-6I Lab Sample ID: 240-115237-11

Date Collected: 06/27/19 12:32 Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/N	IS) - Total Recoverable						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57 ua/L		07/01/19 14:00	07/09/19 21:27	

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Client: Golder Associates Inc.

Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Client Sample ID: CECW-10R Lab Sample ID: 240-115237-15

Date Collected: 06/27/19 12:10 Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS)	 Total Recover 	able						
Analyte	Result Qualifier	r RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 21:42	1

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Client: Golder Associates Inc.

Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Client Sample ID: PO-8 Lab Sample ID: 240-115237-17

Matrix: Ground Water

Date Collected: 06/27/19 13:31 Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS) - Total Recoverable
Analyte Result Qualifier RL MDL Unit D Prepared Analyzed

Antimony <0.57 2.0 0.57 ug/L 07/01/19 14:00 07/09/19 21:46

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Client: Golder Associates Inc.

Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Client Sample ID: PO-9 Lab Sample ID: 240-115237-19

Date Collected: 06/27/19 16:07 Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/N							
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57 ug/L		07/01/19 14:00	07/09/19 21:51	1

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Client: Golder Associates Inc.

Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Client Sample ID: PO-10 Lab Sample ID: 240-115237-20

Date Collected: 06/27/19 11:15 Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS)	- Total Recoverable					
Analyte	Result Qualifier	RL	MDL Unit	D Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57 ug/L	07/01/19 14:00	07/09/19 21:54	1

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Client: Golder Associates Inc.

Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Client Sample ID: PO-11 Lab Sample ID: 240-115237-22

Date Collected: 06/26/19 16:25

Date Received: 06/29/19 09:30

Matrix: Ground Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	20	0.57 ug/l		07/01/19 14:00	07/09/19 20:26	

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Client: Golder Associates Inc.

Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Client Sample ID: DUPLICATE Lab Sample ID: 240-115237-23

Date Collected: 06/27/19 12:27

Date Received: 06/29/19 09:30

Matrix: Ground Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Antimony	< 0.57		2.0	0.57	ua/l		07/01/19 14:00	07/09/19 20:33		

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Client: Golder Associates Inc.

Job ID: 240-115237-3

Project/Site: 1SA19 Makeup - A - Antimony

Client Sample ID: FIELD BLANK Lab Sample ID: 240-115237-24

Date Collected: 06/26/19 16:25 Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/M	S) - Total Recoverable					
Analyte	Result Qualifier	RL	MDL Unit	D Pre	pared Analyzed	Dil Fac
Antimony	<0.57	20	0.57 ug/l	07/01/	19 12:18 07/09/19 20:3	5 1

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Job ID: 240-115237-3

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - Antimony

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-389196/1-A

Matrix: Water

Analysis Batch: 391579

Client Sample ID: Method Blank **Prep Type: Total Recoverable**

Prep Batch: 389196

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 2.0 Antimony 0.57 ug/L 07/01/19 14:00 07/09/19 20:45 <0.57

Lab Sample ID: LCS 240-389196/2-A **Matrix: Water Analysis Batch: 391579**

MB MB

Client Sample ID: Lab Control Sample Prep Type: Total Recoverable Prep Batch: 389196

%Rec.

100

LCS LCS Spike Analyte Added Result Qualifier Unit D %Rec Limits 100 80 - 120 Antimony 96.5 ug/L 96

Lab Sample ID: 240-115237-4 MS Client Sample ID: CECW-1 **Matrix: Ground Water Prep Type: Total Recoverable Analysis Batch: 391579 Prep Batch: 389196** Sample Sample Spike MS MS %Rec. Analyte Result Qualifier Added Result Qualifier Unit Limits %Rec <0.57 100 75 - 125

100

ug/L

Lab Sample ID: 240-115237-4 MSD **Client Sample ID: CECW-1 Matrix: Ground Water Prep Type: Total Recoverable Analysis Batch: 391579 Prep Batch: 389196** Spike MSD MSD %Rec. Sample Sample **RPD** Added Limits Analyte Result Qualifier Result Qualifier RPD Limit Unit %Rec Antimony <0.57 100 99.0 99 75 - 125 ug/L

Lab Sample ID: MB 240-389203/1-A

Matrix: Water

Antimony

Analysis Batch: 391579

Client Sample ID: Method Blank Prep Type: Total Recoverable

Prep Batch: 389203

MB MB RL **MDL** Unit Analyte Result Qualifier Prepared Analyzed Dil Fac 2.0 0.57 ug/L 07/01/19 14:00 07/09/19 19:43 **Antimony** <0.57

Lab Sample ID: LCS 240-389203/2-A

Matrix: Water

Analysis Batch: 391579

Client Sample ID: Lab Control Sample Prep Type: Total Recoverable Prep Batch: 389203 LCS LCS Spike %Rec.

Analyte Added Result Qualifier Unit %Rec Limits Antimony 100 101 ug/L 101 80 - 120

QC Association Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - Antimony

Metals

Prep Batch: 389196

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-1	MW-4R	Total Recoverable	Ground Water	3005A	
240-115237-2	MW-5	Total Recoverable	Ground Water	3005A	
240-115237-4	CECW-1	Total Recoverable	Ground Water	3005A	
240-115237-6	CECW-2	Total Recoverable	Ground Water	3005A	
240-115237-9	CECW-4	Total Recoverable	Ground Water	3005A	
240-115237-10	CECW-5	Total Recoverable	Ground Water	3005A	
240-115237-11	CECW-6I	Total Recoverable	Ground Water	3005A	
240-115237-15	CECW-10R	Total Recoverable	Ground Water	3005A	
240-115237-17	PO-8	Total Recoverable	Ground Water	3005A	
240-115237-19	PO-9	Total Recoverable	Ground Water	3005A	
240-115237-20	PO-10	Total Recoverable	Ground Water	3005A	
MB 240-389196/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-389196/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
240-115237-4 MS	CECW-1	Total Recoverable	Ground Water	3005A	
240-115237-4 MSD	CECW-1	Total Recoverable	Ground Water	3005A	

Prep Batch: 389203

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-22	PO-11	Total Recoverable	Ground Water	3005A	
240-115237-23	DUPLICATE	Total Recoverable	Ground Water	3005A	
240-115237-24	FIELD BLANK	Total Recoverable	Ground Water	3005A	
MB 240-389203/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-389203/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 391579

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-1	MW-4R	Total Recoverable	Ground Water	6020A	389196
240-115237-2	MW-5	Total Recoverable	Ground Water	6020A	389196
240-115237-4	CECW-1	Total Recoverable	Ground Water	6020A	389196
240-115237-6	CECW-2	Total Recoverable	Ground Water	6020A	389196
240-115237-9	CECW-4	Total Recoverable	Ground Water	6020A	389196
240-115237-10	CECW-5	Total Recoverable	Ground Water	6020A	389196
240-115237-11	CECW-6I	Total Recoverable	Ground Water	6020A	389196
240-115237-15	CECW-10R	Total Recoverable	Ground Water	6020A	389196
240-115237-17	PO-8	Total Recoverable	Ground Water	6020A	389196
240-115237-19	PO-9	Total Recoverable	Ground Water	6020A	389196
240-115237-20	PO-10	Total Recoverable	Ground Water	6020A	389196
240-115237-22	PO-11	Total Recoverable	Ground Water	6020A	389203
240-115237-23	DUPLICATE	Total Recoverable	Ground Water	6020A	389203
240-115237-24	FIELD BLANK	Total Recoverable	Ground Water	6020A	389203
MB 240-389196/1-A	Method Blank	Total Recoverable	Water	6020A	389196
MB 240-389203/1-A	Method Blank	Total Recoverable	Water	6020A	389203
LCS 240-389196/2-A	Lab Control Sample	Total Recoverable	Water	6020A	389196
LCS 240-389203/2-A	Lab Control Sample	Total Recoverable	Water	6020A	389203
240-115237-4 MS	CECW-1	Total Recoverable	Ground Water	6020A	389196
240-115237-4 MSD	CECW-1	Total Recoverable	Ground Water	6020A	389196

Page 23 of 29

Job ID: 240-115237-3

Client Sample ID: MW-4R

Date Collected: 06/27/19 08:55 Date Received: 06/29/19 09:30 Lab Sample ID: 240-115237-1

Matrix: Ground Water

		Batch	Batch		Dilution	Batch	Prepared		
	Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
	Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
ı	Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:01	DSH	TAL CAN

Client Sample ID: MW-5 Lab Sample ID: 240-115237-2

Matrix: Ground Water

Date Collected: 06/27/19 09:02 Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:03	DSH	TAL CAN

Client Sample ID: CECW-1 Lab Sample ID: 240-115237-4

Matrix: Ground Water

Date Collected: 06/26/19 15:50 Date Received: 06/29/19 09:30

Batch Batch Dilution Batch **Prepared** Prep Type Туре Method Run Factor Number or Analyzed Analyst Lab 3005A 389196 07/01/19 14:00 MRL TAL CAN Total Recoverable Prep Total Recoverable Analysis 6020A 391579 07/09/19 20:49 DSH TAL CAN

Client Sample ID: CECW-2 Lab Sample ID: 240-115237-6

Matrix: Ground Water

Date Collected: 06/26/19 14:35 Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:15	DSH	TAL CAN

Lab Sample ID: 240-115237-9 Client Sample ID: CECW-4

Date Collected: 06/27/19 15:19 **Matrix: Ground Water**

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:22	DSH	TAL CAN

Client Sample ID: CECW-5 Lab Sample ID: 240-115237-10 Date Collected: 06/27/19 14:40 **Matrix: Ground Water**

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:25	DSH	TAL CAN

7/22/2019

Client Sample ID: CECW-6I Lab Sample ID: 240

Date Collected: 06/27/19 12:32 Date Received: 06/29/19 09:30 Lab Sample ID: 240-115237-11

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:27	DSH	TAL CAN

Client Sample ID: CECW-10R Lab Sample ID: 240-115237-15

Date Collected: 06/27/19 12:10 Matrix: Ground Water Date Received: 06/29/19 09:30

Batch **Batch** Dilution Batch **Prepared Prep Type** Type Method Run **Factor** Number or Analyzed Analyst Lab Total Recoverable 3005A 07/01/19 14:00 MRL TAL CAN Prep 389196 Total Recoverable Analysis 6020A 391579 07/09/19 21:42 DSH TAL CAN

Client Sample ID: PO-8 Lab Sample ID: 240-115237-17

Date Collected: 06/27/19 13:31 Matrix: Ground Water

Date Received: 06/29/19 09:30

Batch Batch Dilution Batch **Prepared Prep Type** Туре Method Run Factor Number or Analyzed Analyst Lab 389196 07/01/19 14:00 MRL Total Recoverable 3005A TAL CAN Prep Total Recoverable Analysis 6020A 391579 07/09/19 21:46 DSH TAL CAN

Client Sample ID: PO-9 Lab Sample ID: 240-115237-19

Date Collected: 06/27/19 16:07 Matrix: Ground Water

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:51	DSH	TAL CAN

Client Sample ID: PO-10 Lab Sample ID: 240-115237-20

Date Collected: 06/27/19 11:15 Matrix: Ground Water

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:54	DSH	TAL CAN

Client Sample ID: PO-11 Lab Sample ID: 240-115237-22

Date Collected: 06/26/19 16:25 Matrix: Ground Water Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			389203	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 20:26	DSH	TAL CAN

Lab Chronicle

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - A - Antimony

Lab Sample ID: 240-115237-23 **Client Sample ID: DUPLICATE**

Matrix: Ground Water

Job ID: 240-115237-3

Date Collected: 06/27/19 12:27 Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			389203	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 20:33	DSH	TAL CAN

Client Sample ID: FIELD BLANK Lab Sample ID: 240-115237-24

Date Collected: 06/26/19 16:25 **Matrix: Ground Water**

Date Received: 06/29/19 09:30

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			389203	07/01/19 12:18	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 20:35	DSH	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: Golder Associates Inc.

Job ID: 24

Project/Site: 1SA19 Makeup - A - Antimony

Laboratory: Eurofins TestAmerica, Canton

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Virginia	NELAP	3	460175	09-14-19 *

Job ID: 240-115237-3

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^{*} Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins TestAmerica, Canton

Environment Testing

seurofins 🔆

Chain of Custody Record

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

VSWMR/CAP

other:

RCRA

Regulatory Program: Dw Dw

North Canton, OH 44720-6900 phone 330,497,9396 fax 330,497,0772

Eurofins TestAmerica, Canton

4101 Shuffel Street NW

Project Manager: Mike Williams/Rachel Powell

Email: ripowell@golder.com

Client Contact

2108 West Laburnum Ave, Suite 200

Richmond, VA, 23227

(804) 358-7900 XXXX-XXX (XXX)

Golder Associates Inc.

Tel/Fax: 804-517-3381

WORKING DAYS

CALENDAR DAYS

TAT if different from Below

2 weeks

2 days 1 week

DENE

Project Name: 1SA19 CEC Makeup Sampling Event

Phone

Site: Chesapeake Energy Center, Virginia

P O# 19117210

1 day

Analysis Turnaround Time

Facher Bough

For Lab Use Only:

Walk-in Client: ab Sampling: Job / SDG No.

Sample Specific Notes:

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N N

35 39

9

SS80 41/4219

9 9 9 9

2060

6/5+7/9

of Cont.

Matrix

Type (C=Comp, G=Grab)

Sample

Sample

Sample Identification

MW-4R MW-S

01:03 348W2 - ynomitnA

Filtered Sample (Y / N)

Perform MS / MSD (Y / N)

× ×

39

1519

N N ×

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1440

6/27/19 6/27/19

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CECW-10R

Po-8 b-0d

CECW - 5

CECW-4

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Duplicate

Po-10

CECW-(6)

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6/27/19 1331

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9

6127/19 1607

Sampler Kevin Weissgold/Nathan Chien

COCs

ot

COC No:

6127/19

Date: 6-121-119

Site Contact: Rachel Powell Lab Contact: Eric Lang

Carrier: FedEx

350

Date Time 11

Сотрапу

Company

Received in Laboratory by:

Date/Time:

Сотрапу:

Сотрапу

2 L

Yes

Custody Seals Intact

Rachel Powell

Relinquished by

7/22/2019

Relinquished by:

Received by:

Ont At 1100 Date/Time:

Received by: FroEL

Date/Time

Custody Seal No. Colder 13

Therm ID No. Date/Time:

Corr'd:

Cooler Temp. (°C): Obs'd

Company:

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

Months

Disposal by Lab

Return to Client

Special Instructions/QC Requirements & Comments: All samples preserved on ice. Please provide a Level II Data package. Please see sample memo. Reporting Group A

Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the

Comments Section if the lab is to dispose of the sample

Possible Hazard Identification:

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

ı.		

Chain of Custody Record

Environment Testing : eurofins

TestAmerica

Eurofins TestAmerica, Canton

4101 Shuffel Street NW

Regulatory Program: North Canton, OH 44720-6900 phone 330.497.9396 fax 330.497.0772

NPDES

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica For Lab Use Only: Rachel Reveil Sampler. Kevin Weissgold/Nathan Chien Sample Specific Notes: COCs Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Walk-in Client: Job / SDG No. ab Sampling: Months 10 Therm ID No. Date Time Date/Time: COC No: Special Instructions/QC Requirements & Comments: All samples preserved on ice. Please provide a Level II Data package. Please see sample memo. Reporting Group A Corr'd: Date: 6/26/19 Company: Company: Company Carrier: FedEx Cooler Temp. (°C): Obs'd. - Other: VSWMR/CAP Received in Laboratory by: Site Contact: Rachel Powell Lab Contact: Eric Lang Received by: Received by RCRA NNX N NNX 0103 348W2 - ynomitnA Filtered Sample (Y/N)
Perform MS / MSD (Y/N) 6/29/19 1100 2 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the # of Cont. 4 Date/Time: Project Manager: Mike Williams/Rachel Powell Date/Time: WORKING DAYS Preservation Used: 1= Ice, 2= HCl; 3= H2SO4, 4=HNO3; 5=NaOH; 6= Other Zinc Acetate + NaOH Matrix 3 3 35 3 MO . Analysis Turnaround Time TAT if different from Below 10 Type (C=Comp, G=Grab) 9 9 2 9 Email: ripowell@golder.com 2 weeks 2 days I week 1 day Tel/Fax: 804-517-3381 6/26/19 1625 Sample 1625 1550 Time 6/26/19 1435 CALENDAR DAYS Custody Seal No. Golder Sample Company 6/26/19 6/26/19 Company Company Comments Section if the lab is to dispose of the sample. Project Name: 1SA19 CEC Makeup Sampling Event No Sample Identification Site: Chesapeake Energy Center, Virginia Yes Client Contact FAX 2108 West Laburnum Ave., Suite 200 Possible Hazard Identification: Relinquished by: Custody Seals Intact: Golder Associates Inc. Richmond, VA, 23227 Field Blank P O# 19117210 (804) 358-7900 xxxx-xxx (xxx) CECW-2 CECM-11-040



Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Canton 4101 Shuffel Street NW North Canton, OH 44720 Tel: (330)497-9396

Laboratory Job ID: 240-115237-5

Client Project/Site: 1SA19 Makeup - B - beta BHC

For:

Golder Associates Inc. 2108 W Laburnum Ave, Suite 200 Richmond, Virginia 23227

Attn: Mr. Mike Williams

Authorized for release by: 7/24/2019 6:58:20 AM

Eric Lang, Manager of Project Management (708)534-5200

eric.lang@testamericainc.com

LINKS

Review your project results through

Have a Question?



Visit us at: www.testamericainc.com

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

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

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Definitions/Glossary

Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Qualifiers

G				

Qualifier	Qualifier Description
Н	Sample was prepped or analyzed beyond the specified holding time
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.
Χ	Surrogate is outside control limits

Glossary

QC

RER

RPD TEF

TEQ

RL

Quality Control

Relative Error Ratio (Radiochemistry)

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

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

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Case Narrative

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - beta BHC

Job ID: 240-115237-5

Job ID: 240-115237-5

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative 240-115237-5

Comments

No additional comments.

Receipt

The samples were received on 6/29/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 13 coolers at receipt time were 1.5° C, 2.3° C, 2.3° C, 2.5° C, 3.1° C, 3.7° C, 4.1° C, 4.7° C, 4.9° C, 4.9° C, 5.7° C and 5.7° C.

GC Semi VOA

Method(s) 8081B: The following samples required a tetrabutylammonium sulfite (TBA) clean-up to reduce matrix interferences caused by sulfur: CECW-8 (240-115237-13), PO-8 (240-115237-17), (LCS 240-389623/23-A) and (MB 240-389623/22-A). The analysis of the method blank, LCS and samples that have been subject to the TBA clean up will be reported with an RA suffix.

Method(s) 8081B: The following samples required a copper clean-up to reduce matrix interferences caused by sulfur: CECW-6I (240-115237-11), CECW-6D (240-115237-12) and (MB 240-389623/22-A).

Method(s) 8081B: The following sample was diluted due to the nature of the sample matrix: CECW-8 (240-115237-13). As such, surrogate recoveries may be below the calibration range, and elevated reporting limits (RLs) are provided.

Method(s) 8081B: The following sample required a tetrabutylammonium sulfite (TBA) clean-up to reduce matrix interferences caused by sulfur: CECW-8 (240-115237-13). TBA 4260529 HPLC Water 4160714 Isopropyl Alcohol 3800132

Method(s) 8081B: TBA was used to remove the sulfur interference. PO-10 (240-115237-20) TBA 4260529 Isopropyl Alcohol 3800132 HPLC Water 4160714

Method(s) 8081B: Surrogate recovery for the following samples was outside control limits: PO-10 (240-115237-20) and DUPLICATE (240-115237-23). Re-extraction and/or re-analysis was performed outside of holding time with acceptable results. Both sets of data are reported.

Method(s) 8081B: TBA was used to remove the sulfur interference. PO-10 (240-115237-20) TBA 4260529 Isopropyl Alcohol 3800132 HPLC Water 4160714

Method(s) 8081B: Re-extraction of the following sample was performed outside of the holding time due to the original extraction failing surrogate recovery. Both sets of data are reported.: PO-10 (240-115237-20) and DUPLICATE (240-115237-23).

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

Organic Prep

Method(s) 3510C, 608: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 240-391827.

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

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Method Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - beta BHC

Job ID: 240-115237-5

Method	Method Description	Protocol	Laboratory
8081B	Organochlorine Pesticides (GC)	SW846	TAL CAN
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL CAN

Protocol References:

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

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Eurofins TestAmerica, Canton

Sample Summary

Client: Golder Associates Inc.

240-115237-24

Project/Site: 1SA19 Makeup - B - beta BHC

FIELD BLANK

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	1
240-115237-2	MW-5	Ground Water	06/27/19 09:02	06/29/19 09:30	_
240-115237-3	MW-5D	Ground Water	06/27/19 08:50	06/29/19 09:30	
240-115237-4	CECW-1	Ground Water	06/26/19 15:50	06/29/19 09:30	
240-115237-5	CECW-1D	Ground Water	06/26/19 15:45	06/29/19 09:30	
240-115237-6	CECW-2	Ground Water	06/26/19 14:35	06/29/19 09:30	
240-115237-7	CECW-2D	Ground Water	06/26/19 13:45	06/29/19 09:30	
240-115237-8	CECW-3D	Ground Water	06/26/19 15:10	06/29/19 09:30	
240-115237-11	CECW-6I	Ground Water	06/27/19 12:32	06/29/19 09:30	
240-115237-12	CECW-6D	Ground Water	06/27/19 12:20	06/29/19 09:30	
240-115237-13	CECW-8	Ground Water	06/27/19 10:20	06/29/19 09:30	
240-115237-14	CECW-8D	Ground Water	06/27/19 10:30	06/29/19 09:30	
240-115237-15	CECW-10R	Ground Water	06/27/19 12:10	06/29/19 09:30	
240-115237-16	CECW-15	Ground Water	06/27/19 13:17	06/29/19 09:30	
240-115237-17	PO-8	Ground Water	06/27/19 13:31	06/29/19 09:30	
240-115237-18	PO-8D	Ground Water	06/27/19 13:35	06/29/19 09:30	
240-115237-20	PO-10	Ground Water	06/27/19 11:15	06/29/19 09:30	
240-115237-21	PO-10D	Ground Water	06/27/19 12:35	06/29/19 09:30	
240-115237-23	DUPLICATE	Ground Water	06/27/19 12:27	06/29/19 09:30	

Ground Water

06/26/19 16:25 06/29/19 09:30

Job ID: 240-115237-5

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Detection Summary

	Dottotion Cummary
Client: Golder Associates Inc. Project/Site: 1SA19 Makeup - B - beta BHC	Job ID: 240-115237-5
Client Sample ID: MW-5	Lab Sample ID: 240-115237-2
No Detections.	
Client Sample ID: MW-5D	Lab Sample ID: 240-115237-3
No Detections.	
Client Sample ID: CECW-1	Lab Sample ID: 240-115237-4
No Detections.	
Client Sample ID: CECW-1D	Lab Sample ID: 240-115237-5
No Detections.	
Client Sample ID: CECW-2	Lab Sample ID: 240-115237-6
No Detections.	
Client Sample ID: CECW-2D	Lab Sample ID: 240-115237-7
No Detections.	
Client Sample ID: CECW-3D	Lab Sample ID: 240-115237-8
No Detections.	
Client Sample ID: CECW-6I	Lab Sample ID: 240-115237-11
No Detections.	
Client Sample ID: CECW-6D	Lab Sample ID: 240-115237-12
No Detections.	
Client Sample ID: CECW-8	Lab Sample ID: 240-115237-13
No Detections.	
Client Sample ID: CECW-8D	Lab Sample ID: 240-115237-14
No Detections.	
Client Sample ID: CECW-10R	Lab Sample ID: 240-115237-15
No Detections.	
Client Sample ID: CECW-15	Lab Sample ID: 240-115237-16
No Detections.	
Client Sample ID: PO-8	Lab Sample ID: 240-115237-17
No Detections.	
Client Sample ID: PO-8D	Lab Sample ID: 240-115237-18
No Detections.	
Client Sample ID: PO-10	Lab Sample ID: 240-115237-20
No Detections.	

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Canton

Detection Summary

Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: PO-10D Lab Sample ID: 240-115237-21

No Detections.

Client Sample ID: DUPLICATE Lab Sample ID: 240-115237-23

No Detections.

Client Sample ID: FIELD BLANK Lab Sample ID: 240-115237-24

No Detections.

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Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: MW-5 Lab Sample ID: 240-115237-2

Date Collected: 06/27/19 09:02 Matrix: Ground Water
Date Received: 06/29/19 09:30

Method: 8081B - Organochlorine Pesticides (GC)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:16	07/09/19 21:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl			10 - 120				07/03/19 11:16	07/09/19 21:42	1
DCB Decachlorobiphenyl	15		10 - 120				07/03/19 11:16	07/09/19 21:42	1
Tetrachloro-m-xylene	36		33 - 120				07/03/19 11:16	07/09/19 21:42	1
Tetrachloro-m-xylene	36		33 - 120				07/03/19 11:16	07/09/19 21:42	1

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Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: MW-5D Lab Sample ID: 240-115237-3

Date Collected: 06/27/19 08:50 Matrix: Ground Water
Date Received: 06/29/19 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0049		0.054	0.0049	ug/L		07/03/19 11:16	07/09/19 22:07	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	38		10 - 120				07/03/19 11:16	07/09/19 22:07	1
DCB Decachlorobiphenyl	39		10 - 120				07/03/19 11:16	07/09/19 22:07	1
Tetrachloro-m-xylene	47		33 - 120				07/03/19 11:16	07/09/19 22:07	1
Tetrachloro-m-xylene	51		33 - 120				07/03/19 11:16	07/09/19 22:07	1

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Client: Golder Associates Inc. Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: CECW-1

Lab Sample ID: 240-115237-4 Date Collected: 06/26/19 15:50

Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 8081B - Organochlo	rine Pesticides (G	C)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:21	07/09/19 20:27	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	60		10 - 120				07/03/19 11:21	07/09/19 20:27	1
DCB Decachlorobiphenyl	52		10 - 120				07/03/19 11:21	07/09/19 20:27	1
DCB Decachlorobiphenyl	53		10 - 120				07/03/19 11:21	07/09/19 20:39	1
Tetrachloro-m-xylene	75		33 - 120				07/03/19 11:21	07/09/19 20:27	1
Tetrachloro-m-xylene	62		33 - 120				07/03/19 11:21	07/09/19 20:27	1
Tetrachloro-m-xylene	62		33 - 120				07/03/19 11:21	07/09/19 20:39	1

Client: Golder Associates Inc. Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: CECW-1D

Lab Sample ID: 240-115237-5

Date Collected: 06/26/19 15:45 **Matrix: Ground Water** Date Received: 06/29/19 09:30

Method: 8081B - Organochio	orine Pesticides (G	C)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046		0.050	0.0046	ug/L		07/03/19 11:16	07/09/19 22:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	35		10 - 120				07/03/19 11:16	07/09/19 22:20	1
DCB Decachlorobiphenyl	36		10 - 120				07/03/19 11:16	07/09/19 22:20	1
Tetrachloro-m-xylene	58		33 - 120				07/03/19 11:16	07/09/19 22:20	1
Tetrachloro-m-xylene	60		33 - 120				07/03/19 11:16	07/09/19 22:20	1

Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: CECW-2 Lab Sample ID: 240-115237-6

Date Collected: 06/26/19 14:35

Date Received: 06/29/19 09:30

Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:16	07/09/19 22:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl			10 - 120				07/03/19 11:16	07/09/19 22:32	1
DCB Decachlorobiphenyl	12		10 - 120				07/03/19 11:16	07/09/19 22:32	1
Tetrachloro-m-xylene	38		33 - 120				07/03/19 11:16	07/09/19 22:32	1
Tetrachloro-m-xylene	36		33 - 120				07/03/19 11:16	07/09/19 22:32	

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Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: CECW-2D Lab Sample ID: 240-115237-7

Date Collected: 06/26/19 13:45 Matrix: Ground Water

Date Received: 06/29/19 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046		0.051	0.0046	ug/L		07/03/19 11:21	07/09/19 22:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	84		10 - 120				07/03/19 11:21	07/09/19 22:09	1
DCB Decachlorobiphenyl	82		10 - 120				07/03/19 11:21	07/09/19 22:09	1
Tetrachloro-m-xylene	72		33 - 120				07/03/19 11:21	07/09/19 22:09	1
Tetrachloro-m-xvlene	67		33 - 120				07/03/19 11:21	07/09/19 22:09	1

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Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: CECW-3D Lab Sample ID: 240-115237-8

Date Collected: 06/26/19 15:10 Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 8081B - Organochio	orine Pesticides (G	C)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0047		0.051	0.0047	ug/L		07/03/19 11:21	07/09/19 22:22	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	80		10 - 120				07/03/19 11:21	07/09/19 22:22	1
DCB Decachlorobiphenyl	68		10 - 120				07/03/19 11:21	07/09/19 22:22	1
Tetrachloro-m-xylene	75		33 - 120				07/03/19 11:21	07/09/19 22:22	1
Tetrachloro-m-xylene	63		33 - 120				07/03/19 11:21	07/09/19 22:22	1

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Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Date Collected: 06/27/19 12:32

Client Sample ID: CECW-6I

Lab Sample ID: 240-115237-11

Matrix: Ground Water

Date Received: 06/29/19 09:30
Method: 8081B - Organochlorine Pasticides (GC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046		0.050	0.0046	ug/L		07/03/19 11:21	07/09/19 23:13	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	94		10 - 120				07/03/19 11:21	07/09/19 23:13	1
DCB Decachlorobiphenyl	83		10 - 120				07/03/19 11:21	07/09/19 23:13	1
Tetrachloro-m-xylene	81		33 - 120				07/03/19 11:21	07/09/19 23:13	1
Tetrachloro-m-xylene	70		33 - 120				07/03/19 11:21	07/09/19 23:13	1

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Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: CECW-6D Lab Sample ID: 240-115237-12

Matrix: Ground Water

Date Collected: 06/27/19 12:20 Date Received: 06/29/19 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046		0.050	0.0046	ug/L		07/03/19 11:21	07/10/19 00:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	82		10 - 120				07/03/19 11:21	07/10/19 00:04	1
DCB Decachlorobiphenyl	71		10 - 120				07/03/19 11:21	07/10/19 00:04	1
Tetrachloro-m-xylene	75		33 - 120				07/03/19 11:21	07/10/19 00:04	1
Tetrachloro-m-xylene	65		33 - 120				07/03/19 11:21	07/10/19 00:04	1

Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: CECW-8 Lab Sample ID: 240-115237-13

Date Collected: 06/27/19 10:20 Matrix: Ground Water
Date Received: 06/29/19 09:30

Method: 8081B - Organochlo	rine Pesticides (G	C)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.046		0.51	0.046	ug/L		07/03/19 11:21	07/18/19 11:09	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	34		10 - 120				07/03/19 11:21	07/18/19 11:09	10
DCB Decachlorobiphenyl	25		10 - 120				07/03/19 11:21	07/18/19 11:09	10
Tetrachloro-m-xylene	29	X	33 - 120				07/03/19 11:21	07/18/19 11:09	10
Tetrachloro-m-xylene	33		33 - 120				07/03/19 11:21	07/18/19 11:09	10

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Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: CECW-8D Lab Sample ID: 240-115237-14

Date Collected: 06/27/19 10:30 Matrix: Ground Water
Date Received: 06/29/19 09:30

Method: 8081B - Organochio	orine Pesticides (G	C)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0048		0.053	0.0048	ug/L		07/03/19 11:21	07/10/19 00:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	50		10 - 120				07/03/19 11:21	07/10/19 00:30	1
DCB Decachlorobiphenyl	46		10 - 120				07/03/19 11:21	07/10/19 00:30	1
Tetrachloro-m-xylene	73		33 - 120				07/03/19 11:21	07/10/19 00:30	1
Tetrachloro-m-xylene	62		33 - 120				07/03/19 11:21	07/10/19 00:30	1

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Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: CECW-10R

Lab Sample ID: 240-115237-15

Matrix: Ground Water

Date Collected: 06/27/19 12:10	
Date Received: 06/29/19 09:30	

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046		0.050	0.0046	ug/L		07/03/19 11:21	07/10/19 00:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	35		10 - 120				07/03/19 11:21	07/10/19 00:43	1
DCB Decachlorobiphenyl	33		10 - 120				07/03/19 11:21	07/10/19 00:43	1
Tetrachloro-m-xylene	165	Χ	33 - 120				07/03/19 11:21	07/10/19 00:43	1
Tetrachloro-m-xylene	47	D	33 - 120				07/03/19 11:21	07/10/19 00:43	1

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Client: Golder Associates Inc. Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: CECW-15 Lab Sample ID: 240-115237-16 Date Collected: 06/27/19 13:17

Matrix: Ground Water

Date Received: 06/29/19 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:21	07/10/19 01:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	50		10 - 120				07/03/19 11:21	07/10/19 01:09	1
DCB Decachlorobiphenyl	51		10 - 120				07/03/19 11:21	07/10/19 01:09	1
Tetrachloro-m-xylene	63		33 - 120				07/03/19 11:21	07/10/19 01:09	1
Tetrachloro-m-xylene	57		33 - 120				07/03/19 11:21	07/10/19 01:09	1

Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: PO-8 Lab Sample ID: 240-115237-17

Date Collected: 06/27/19 13:31 Matrix: Ground Water
Date Received: 06/29/19 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:21	07/10/19 03:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	76		10 - 120				07/03/19 11:21	07/10/19 03:17	1
DCB Decachlorobiphenyl	81		10 - 120				07/03/19 11:21	07/10/19 03:17	1
DCB Decachlorobiphenyl	82		10 - 120				07/03/19 11:21	07/10/19 03:30	1
Tetrachloro-m-xylene	50		33 - 120				07/03/19 11:21	07/10/19 03:17	1
Tetrachloro-m-xylene	53		33 - 120				07/03/19 11:21	07/10/19 03:17	1
Tetrachloro-m-xylene	53		33 - 120				07/03/19 11:21	07/10/19 03:30	1

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Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: PO-8D Lab Sample ID: 240-115237-18

Date Collected: 06/27/19 13:35

Matrix: Ground Water

Date Received: 06/29/19 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0048		0.053	0.0048	ug/L		07/03/19 11:21	07/10/19 01:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	69		10 - 120				07/03/19 11:21	07/10/19 01:47	1
DCB Decachlorobiphenyl	71		10 - 120				07/03/19 11:21	07/10/19 01:47	1
Tetrachloro-m-xylene	55		33 - 120				07/03/19 11:21	07/10/19 01:47	1
Tetrachloro-m-xylene	51		33 - 120				07/03/19 11:21	07/10/19 01:47	1

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Client: Golder Associates Inc. Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: PO-10 Lab Sample ID: 240-115237-20

Date Collected: 06/27/19 11:15 **Matrix: Ground Water** Date Received: 06/29/19 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:16	07/10/19 01:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	14		10 - 120				07/03/19 11:16	07/10/19 01:38	1
DCB Decachlorobiphenyl	14		10 - 120				07/03/19 11:16	07/10/19 01:38	1
Tetrachloro-m-xylene	25	X	33 - 120				07/03/19 11:16	07/10/19 01:38	1
Tetrachloro-m-xylene	26	X	33 - 120				07/03/19 11:16	07/10/19 01:38	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046	Н	0.051	0.0046	ug/L		07/18/19 10:24	07/19/19 15:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	52		10 - 120				07/18/19 10:24	07/19/19 15:09	1
DCB Decachlorobiphenyl	39		10 - 120				07/18/19 10:24	07/19/19 15:09	1
Tetrachloro-m-xylene	48		33 - 120				07/18/19 10:24	07/19/19 15:09	1
Tetrachloro-m-xylene	44		33 - 120				07/18/19 10:24	07/19/19 15:09	1

Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: PO-10D Lab Sample ID: 240-115237-21

Date Collected: 06/27/19 12:35

Date Received: 06/29/19 09:30

Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0051		0.055	0.0051	ug/L		07/03/19 11:16	07/09/19 23:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl			10 - 120				07/03/19 11:16	07/09/19 23:59	1
DCB Decachlorobiphenyl	18		10 - 120				07/03/19 11:16	07/09/19 23:59	1
Tetrachloro-m-xylene	71		33 - 120				07/03/19 11:16	07/09/19 23:59	1
Tetrachloro-m-xylene	64		33 - 120				07/03/19 11:16	07/09/19 23:59	1

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Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: DUPLICATE

Date Collected: 06/27/19 12:27 Date Received: 06/29/19 09:30

Lab Sample ID: 240-115237-23

Matrix: Ground Water

Job ID: 240-115237-5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0050		0.054	0.0050	ug/L		07/03/19 11:16	07/10/19 00:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	8	X	10 - 120				07/03/19 11:16	07/10/19 00:23	1
DCB Decachlorobiphenyl	8	Χ	10 - 120				07/03/19 11:16	07/10/19 00:23	1
Tetrachloro-m-xylene	18	Χ	33 - 120				07/03/19 11:16	07/10/19 00:23	1
Tetrachloro-m-xylene	24	X	33 - 120				07/03/19 11:16	07/10/19 00:23	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046	Н	0.050	0.0046	ug/L		07/18/19 10:24	07/19/19 15:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	18		10 - 120				07/18/19 10:24	07/19/19 15:46	1
DCB Decachlorobiphenyl	15		10 - 120				07/18/19 10:24	07/19/19 15:46	1
Tetrachloro-m-xylene	33		33 - 120				07/18/19 10:24	07/19/19 15:46	1
Tetrachloro-m-xylene	43		33 - 120				07/18/19 10:24	07/19/19 15:46	1

Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: FIELD BLANK

Date Collected: 06/26/19 16:25 Date Received: 06/29/19 09:30 Lab Sample ID: 240-115237-24

Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0044		0.048	0.0044	ug/L		07/03/19 11:16	07/10/19 01:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	71		10 - 120				07/03/19 11:16	07/10/19 01:01	1
DCB Decachlorobiphenyl	72		10 - 120				07/03/19 11:16	07/10/19 01:01	1
Tetrachloro-m-xylene	62		33 - 120				07/03/19 11:16	07/10/19 01:01	1
Tetrachloro-m-xylene	65		33 - 120				07/03/19 11:16	07/10/19 01:01	1

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Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Ground Water Prep Type: Total/NA

				Percent Su	rrogate Rec
		DCBP1	DCBP2	TCX1	TCX2
Lab Sample ID	Client Sample ID	(10-120)	(10-120)	(33-120)	(33-120)
240-115237-2	MW-5	15	15	36	36
240-115237-3	MW-5D	38	39	47	51
240-115237-4	CECW-1	60	52	75	62
240-115237-4	CECW-1		53		62
240-115237-4 MS	CECW-1	67	58	75	61
240-115237-4 MS	CECW-1		59		60
240-115237-4 MSD	CECW-1	78	69	72	58
240-115237-4 MSD	CECW-1	79	69	71	57
240-115237-5	CECW-1D	35	36	58	60
240-115237-6	CECW-2	11	12	38	36
240-115237-7	CECW-2D	84	82	72	67
240-115237-8	CECW-3D	80	68	75	63
240-115237-11	CECW-6I	94	83	81	70
240-115237-12	CECW-6D	82	71	75	65
240-115237-13	CECW-8	34	25	29 X	33
240-115237-14	CECW-8D	50	46	73	62
240-115237-15	CECW-10R	35	33	165 X	47 p
240-115237-16	CECW-15	50	51	63	57
240-115237-17 - RA	PO-8	76	81	50	53
240-115237-17 - RA	PO-8		82		53
240-115237-18	PO-8D	69	71	55	51
240-115237-20	PO-10	14	14	25 X	26 X
240-115237-20 - RE	PO-10	52	39	48	44
240-115237-21	PO-10D	20	18	71	64
240-115237-23	DUPLICATE	8 X	8 X	18 X	24 X
240-115237-23 - RE	DUPLICATE	18	15	33	43
240-115237-24	FIELD BLANK	71	72	62	65

TCX = Tetrachloro-m-xylene

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Water Prep Type: Total/NA

				Percent Sui	rrogate Reco
		DCBP1	DCBP2	TCX1	TCX2
Lab Sample ID	Client Sample ID	(10-120)	(10-120)	(33-120)	(33-120)
LCS 240-389622/23-A	Lab Control Sample	93	96	74	76
LCS 240-389622/23-A	Lab Control Sample	97	101	78	81
LCS 240-389623/23-A - RA	Lab Control Sample	98	99	73	70
LCS 240-389623/23-A	Lab Control Sample	93	82	72	66
LCS 240-391827/20-A	Lab Control Sample	61	50	79	72
LCS 240-391827/20-A	Lab Control Sample	43	39	63	61
MB 240-389622/22-A	Method Blank	85	89	75	75
MB 240-389622/22-A	Method Blank	99	108	92	88
MB 240-389623/22-A - RA	Method Blank	110	118	86	83
MB 240-389623/22-A	Method Blank	116	113	92	85
MB 240-391827/19-A	Method Blank	64	51	66	61
MB 240-391827/19-A	Method Blank	64	51	68	62

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Surrogate Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - beta BHC

Surrogate Legend

DCBP = DCB Decachlorobiphenyl

TCX = Tetrachloro-m-xylene

Job ID: 240-115237-5

Job ID: 240-115237-5

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - beta BHC

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 240-389622/22-A

Matrix: Water

Analysis Batch: 390389

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 389622

Prep Batch: 389622

Analyte	Result Qu	ualifier RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046	0.050	0.0046	ug/L		07/03/19 11:16	07/09/19 18:47	1

MR MR

	1112	W.D				
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	99		10 - 120	07/03/19 11:16	07/09/19 18:47	1
DCB Decachlorobiphenyl	108		10 - 120	07/03/19 11:16	07/09/19 18:47	1
Tetrachloro-m-xylene	92		33 - 120	07/03/19 11:16	07/09/19 18:47	1
Tetrachloro-m-xylene	88		33 - 120	07/03/19 11:16	07/09/19 18:47	1

Lab Sample ID: MB 240-389622/22-A Client Sample ID: Method Blank Prep Type: Total/NA

Matrix: Water

Analysis Batch: 390389

MB MB

Analyte Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac 07/10/19 01:13 beta-BHC <0.0046 0.050 0.0046 ug/L 07/03/19 11:16

MB MB

Surrogate	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	85	10 - 120	07/03/19 11:16	07/10/19 01:13	1
DCB Decachlorobiphenyl	89	10 - 120	07/03/19 11:16	07/10/19 01:13	1
Tetrachloro-m-xylene	75	33 - 120	07/03/19 11:16	07/10/19 01:13	1
Tetrachloro-m-xylene	75	33 - 120	07/03/19 11:16	07/10/19 01:13	1

Lab Sample ID: LCS 240-389622/23-A **Client Sample ID: Lab Control Sample**

Matrix: Water

Analysis Batch: 390389

Prep Type: Total/NA

Prep Batch: 389622

Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit D %Rec Limits beta-BHC 0.250 0.262 ug/L 105 36 - 140

LCS LCS

Surrogate	%Recovery (Qualifier	Limits
DCB Decachlorobiphenyl	97		10 - 120
DCB Decachlorobiphenyl	101		10 - 120
Tetrachloro-m-xylene	78		33 - 120
Tetrachloro-m-xylene	81		33 120

Lab Sample ID: LCS 240-389622/23-A **Client Sample ID: Lab Control Sample**

Matrix: Water

Analysis Batch: 390389

Prep Type: Total/NA

Prep Batch: 389622

LCS LCS Spike %Rec. Analyte Added Result Qualifier

Limits Unit %Rec beta-BHC 0.250 0.244 ug/L 98 36 - 140

LCS LCS

Surrogate	%Recovery	Qualifier	Limits	
DCB Decachlorobiphenyl	93		10 - 120	
DCB Decachlorobiphenyl	96		10 - 120	
Tetrachloro-m-xylene	74		33 - 120	
Tetrachloro-m-xylene	76		33 - 120	

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7/24/2019

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: MB 240-389623/22-A

Matrix: Water

Analysis Batch: 390394

Client: Golder Associates Inc.

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 389623

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046		0.050	0.0046	ug/L		07/03/19 11:21	07/09/19 19:09	1

мв мв

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	116		10 - 120	07/03/19 11:21	07/09/19 19:09	1
DCB Decachlorobiphenyl	113		10 - 120	07/03/19 11:21	07/09/19 19:09	1
Tetrachloro-m-xylene	92		33 - 120	07/03/19 11:21	07/09/19 19:09	1
Tetrachloro-m-xylene	85		33 - 120	07/03/19 11:21	07/09/19 19:09	1

Lab Sample ID: LCS 240-389623/23-A

Matrix: Water

Analysis Batch: 391592

Spike

Client Sample ID: Lab Control Sample

Prep Type: Total/NA **Prep Batch: 389623**

%Rec.

LCS LCS Analyte Added Result Qualifier Unit %Rec Limits beta-BHC 0.250 0.238 36 - 140 ug/L 95

LCS LCS

Surrogate	%Recovery	Qualifier	Limits
DCB Decachlorobiphenyl	82		10 - 120
DCB Decachlorobiphenyl	93		10 - 120
Tetrachloro-m-xylene	66		33 - 120
Tetrachloro-m-xylene	72		33 - 120

Lab Sample ID: 240-115237-4 MS

Matrix: Ground Water

Analysis Batch: 390394

Client Sample ID: CECW-1

Prep Type: Total/NA

Prep Batch: 389623

	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
beta-BHC	<0.0044		0.248	0.256		ug/L		103	31 - 120	

MS MS

Surrogate	%Recovery	Qualifier	Limits
DCB Decachlorobiphenyl	67		10 - 120
DCB Decachlorobiphenyl	58		10 - 120
Tetrachloro-m-xylene	75		33 - 120
Tetrachloro-m-xylene	61		33 - 120

Lab Sample ID: 240-115237-4 MS

Matrix: Ground Water

Analysis Batch: 390394

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

Prep Batch: 389623

	MS	MS	
Surrogate	%Recovery	Qualifier	Limits
DCB Decachlorobiphenyl	59		10 - 120
Tetrachloro-m-vylene	60		33 120

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7/24/2019

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - beta BHC

Job ID: 240-115237-5

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: 240-115237-4 M Matrix: Ground Water	ISD							C	lient Sampl Prep T	le ID: CE ype: To	
Analysis Batch: 390394									Prep I	Batch: 3	89623
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
beta-BHC	<0.0044		0.238	0.237		ug/L		100	31 - 120	NC	35

	MSD	MSD	
Surrogate	%Recovery	Qualifier	Limits
DCB Decachlorobiphenyl	78		10 - 120
DCB Decachlorobiphenyl	69		10 - 120
Tetrachloro-m-xylene	72		33 - 120
Tetrachloro-m-xylene	58		33 - 120

Lab Sample ID: 240-115237-4 MSD Client Sample ID: CECW-1 **Matrix: Ground Water** Prep Type: Total/NA

Prep Batch: 389623

Prep Type: Total/NA

Prep Batch: 391827

Analysis Batch: 390394 Sample Sample Spike MSD MSD %Rec. RPD Limit Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD beta-BHC 0.238 NC <0.0044 0.239 100 31 - 120 35 ug/L

MSD MSD Surrogate %Recovery Qualifier Limits 79 10 - 120 DCB Decachlorobiphenyl 10 - 120 DCB Decachlorobiphenyl 69 71 33 - 120 Tetrachloro-m-xylene Tetrachloro-m-xylene 57 33 - 120

Lab Sample ID: MB 240-391827/19-A Client Sample ID: Method Blank **Matrix: Water**

Analysis Batch: 391994

MB MB

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0046		0.050	0.0046	ug/L		07/18/19 10:24	07/19/19 14:44	1

	IVID	IVID				
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	64		10 - 120	07/18/19 10:24	07/19/19 14:44	1
DCB Decachlorobiphenyl	51		10 - 120	07/18/19 10:24	07/19/19 14:44	1
Tetrachloro-m-xylene	66		33 - 120	07/18/19 10:24	07/19/19 14:44	1
Tetrachloro-m-xylene	61		33 - 120	07/18/19 10:24	07/19/19 14:44	1

Lab Sample ID: MB 240-391827/19-A

Result Qualifier

<0.0046

Matrix: Water Analysis Batch: 391994

Analyte

beta-BHC

	Prep Type: Total/NA
	Prep Batch: 391827
MB MB	

MDL Unit

0.0046 ug/L

	MB ME	В			
Surrogate	%Recovery Qu	ualifier Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	64	10 - 120	07/18/19 10:24	07/19/19 15:58	1
DCB Decachlorobiphenyl	51	10 - 120	07/18/19 10:24	07/19/19 15:58	1
Tetrachloro-m-xylene	68	33 - 120	07/18/19 10:24	07/19/19 15:58	1
Tetrachloro-m-xylene	62	33 - 120	07/18/19 10:24	07/19/19 15:58	1

RL

0.050

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Client Sample ID: Method Blank

Analyzed

07/19/19 15:58

Prepared

07/18/19 10:24

Dil Fac

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 240-391827/20-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 391994

Client: Golder Associates Inc.

Prep Batch: 391827 LCS LCS Spike Analyte Added Result Qualifier Unit %Rec Limits beta-BHC 0.250 0.243 97 36 - 140 ug/L

LCS LCS Surrogate %Recovery Qualifier Limits 10 - 120 DCB Decachlorobiphenyl 61 DCB Decachlorobiphenyl 50 10 - 120 Tetrachloro-m-xylene 79 33 - 120 72 33 - 120 Tetrachloro-m-xylene

Lab Sample ID: LCS 240-391827/20-A **Client Sample ID: Lab Control Sample**

Matrix: Water

Analysis Batch: 391994

Prep Type: Total/NA

Prep Batch: 391827

Prep Batch: 389623

Prep Type: Total/NA

Prep Batch: 389623

07/10/19 02:13

07/03/19 11:21

Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit D %Rec Limits beta-BHC 0.250 63 36 - 140 0.158 ug/L

LCS LCS

Surrogate	%Recovery	Qualifier	Limits
DCB Decachlorobiphenyl	43		10 - 120
DCB Decachlorobiphenyl	39		10 - 120
Tetrachloro-m-xylene	63		33 - 120
Tetrachloro-m-xylene	61		33 - 120

Method: 8081B - Organochlorine Pesticides (GC) - RA

Lab Sample ID: MB 240-389623/22-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 390394

beta-BHC - RA

MB MB Analyte Result Qualifier RL MDL Unit D Analyzed Dil Fac Prepared 0.050

0.0046 ug/L

мв мв

<0.0046

Surrogate	%Recovery	Qualifier Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl - RA	110	10 - 12	07/03/19 11:21	07/10/19 02:13	1
DCB Decachlorobiphenyl - RA	118	10 - 12	20 07/03/19 11:21	07/10/19 02:13	1
Tetrachloro-m-xylene - RA	86	33 - 12	20 07/03/19 11:21	07/10/19 02:13	1
Tetrachloro-m-xylene - RA	83	33 - 12	20 07/03/19 11:21	07/10/19 02:13	1

Lab Sample ID: LCS 240-389623/23-A **Client Sample ID: Lab Control Sample**

Matrix: Water Analysis Batch: 390394

Spike LCS LCS %Rec.

Analyte babbA Result Qualifier Unit Limits %Rec beta-BHC - RA 0.250 0.237 95 36 - 140 ug/L

LCS LCS

Surrogate	%Recovery Qua	alifier Limits
DCB Decachlorobiphenyl - RA	98	10 - 120
DCB Decachlorobiphenyl - RA	99	10 - 120
Tetrachloro-m-xvlene - RA	73	33 - 120

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7/24/2019

QC Sample Results

Client: Golder Associates Inc.

Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Method: 8081B - Organochlorine Pesticides (GC) - RA (Continued)

Lab Sample ID: LCS 240-389623/23-A

Matrix: Water

Analysis Batch: 390394

Client Sample ID: Lab Control Sample

Prep Type: Total/NA Prep Batch: 389623

LCS LCS

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Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

GC Semi VOA

Prep Batch: 389622

Client: Golder Associates Inc.

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-2	MW-5	Total/NA	Ground Water	3510C	
240-115237-3	MW-5D	Total/NA	Ground Water	3510C	
240-115237-5	CECW-1D	Total/NA	Ground Water	3510C	
240-115237-6	CECW-2	Total/NA	Ground Water	3510C	
240-115237-20	PO-10	Total/NA	Ground Water	3510C	
240-115237-21	PO-10D	Total/NA	Ground Water	3510C	
240-115237-23	DUPLICATE	Total/NA	Ground Water	3510C	
240-115237-24	FIELD BLANK	Total/NA	Ground Water	3510C	
MB 240-389622/22-A	Method Blank	Total/NA	Water	3510C	
LCS 240-389622/23-A	Lab Control Sample	Total/NA	Water	3510C	

Prep Batch: 389623

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batcl
240-115237-4	CECW-1	Total/NA	Ground Water	3510C	
240-115237-7	CECW-2D	Total/NA	Ground Water	3510C	
240-115237-8	CECW-3D	Total/NA	Ground Water	3510C	
240-115237-11	CECW-6I	Total/NA	Ground Water	3510C	
240-115237-12	CECW-6D	Total/NA	Ground Water	3510C	
240-115237-13	CECW-8	Total/NA	Ground Water	3510C	
240-115237-14	CECW-8D	Total/NA	Ground Water	3510C	
240-115237-15	CECW-10R	Total/NA	Ground Water	3510C	
240-115237-16	CECW-15	Total/NA	Ground Water	3510C	
240-115237-17 - RA	PO-8	Total/NA	Ground Water	3510C	
240-115237-18	PO-8D	Total/NA	Ground Water	3510C	
MB 240-389623/22-A	Method Blank	Total/NA	Water	3510C	
MB 240-389623/22-A - RA	Method Blank	Total/NA	Water	3510C	
LCS 240-389623/23-A	Lab Control Sample	Total/NA	Water	3510C	
LCS 240-389623/23-A - RA	Lab Control Sample	Total/NA	Water	3510C	
240-115237-4 MS	CECW-1	Total/NA	Ground Water	3510C	
240-115237-4 MSD	CECW-1	Total/NA	Ground Water	3510C	

Analysis Batch: 390389

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-2	MW-5	Total/NA	Ground Water	8081B	389622
240-115237-3	MW-5D	Total/NA	Ground Water	8081B	389622
240-115237-5	CECW-1D	Total/NA	Ground Water	8081B	389622
240-115237-6	CECW-2	Total/NA	Ground Water	8081B	389622
240-115237-20	PO-10	Total/NA	Ground Water	8081B	389622
240-115237-21	PO-10D	Total/NA	Ground Water	8081B	389622
240-115237-23	DUPLICATE	Total/NA	Ground Water	8081B	389622
240-115237-24	FIELD BLANK	Total/NA	Ground Water	8081B	389622
MB 240-389622/22-A	Method Blank	Total/NA	Water	8081B	389622
MB 240-389622/22-A	Method Blank	Total/NA	Water	8081B	389622
LCS 240-389622/23-A	Lab Control Sample	Total/NA	Water	8081B	389622
LCS 240-389622/23-A	Lab Control Sample	Total/NA	Water	8081B	389622

Analysis Batch: 390394

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-4	CECW-1	Total/NA	Ground Water	8081B	389623
240-115237-4	CECW-1	Total/NA	Ground Water	8081B	389623
240-115237-7	CECW-2D	Total/NA	Ground Water	8081B	389623

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QC Association Summary

Client: Golder Associates Inc.

Job ID: 240-115237-5 Project/Site: 1SA19 Makeup - B - beta BHC

GC Semi VOA (Continued)

Analysis Batch: 390394 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-8	CECW-3D	Total/NA	Ground Water	8081B	389623
240-115237-11	CECW-6I	Total/NA	Ground Water	8081B	389623
240-115237-12	CECW-6D	Total/NA	Ground Water	8081B	389623
240-115237-14	CECW-8D	Total/NA	Ground Water	8081B	389623
240-115237-15	CECW-10R	Total/NA	Ground Water	8081B	389623
240-115237-16	CECW-15	Total/NA	Ground Water	8081B	389623
240-115237-17 - RA	PO-8	Total/NA	Ground Water	8081B	389623
240-115237-17 - RA	PO-8	Total/NA	Ground Water	8081B	389623
240-115237-18	PO-8D	Total/NA	Ground Water	8081B	389623
MB 240-389623/22-A	Method Blank	Total/NA	Water	8081B	389623
MB 240-389623/22-A - RA	Method Blank	Total/NA	Water	8081B	389623
LCS 240-389623/23-A - RA	Lab Control Sample	Total/NA	Water	8081B	389623
240-115237-4 MS	CECW-1	Total/NA	Ground Water	8081B	389623
240-115237-4 MS	CECW-1	Total/NA	Ground Water	8081B	389623
240-115237-4 MSD	CECW-1	Total/NA	Ground Water	8081B	389623
240-115237-4 MSD	CECW-1	Total/NA	Ground Water	8081B	389623

Analysis Batch: 391592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 240-389623/23-A	Lab Control Sample	Total/NA	Water	8081B	389623

Analysis Batch: 391796

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-13	CECW-8	Total/NA	Ground Water	8081B	389623

Prep Batch: 391827

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-20 - RE	PO-10	Total/NA	Ground Water	3510C	
240-115237-23 - RE	DUPLICATE	Total/NA	Ground Water	3510C	
MB 240-391827/19-A	Method Blank	Total/NA	Water	3510C	
LCS 240-391827/20-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batch: 391994

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-20 - RE	PO-10	Total/NA	Ground Water	8081B	391827
240-115237-23 - RE	DUPLICATE	Total/NA	Ground Water	8081B	391827
MB 240-391827/19-A	Method Blank	Total/NA	Water	8081B	391827
MB 240-391827/19-A	Method Blank	Total/NA	Water	8081B	391827
LCS 240-391827/20-A	Lab Control Sample	Total/NA	Water	8081B	391827
LCS 240-391827/20-A	Lab Control Sample	Total/NA	Water	8081B	391827

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: MW-5

Date Collected: 06/27/19 09:02 Date Received: 06/29/19 09:30

Date Received: 06/29/19 09:30

Lab Sample ID: 240-115237-2

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/09/19 21:42	BPM	TAL CAN

Client Sample ID: MW-5D Lab Sample ID: 240-115237-3

Date Collected: 06/27/19 08:50
Date Received: 06/29/19 09:30

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/09/19 22:07	BPM	TAL CAN

Client Sample ID: CECW-1 Lab Sample ID: 240-115237-4

Date Collected: 06/26/19 15:50 Matrix: Ground Water
Date Received: 06/29/19 09:30

Batch Batch Dilution Batch Prepared Method Factor Prep Type Туре Run Number or Analyzed Lab Analyst 389623 Total/NA Prep 3510C 07/03/19 11:21 **BMB** TAL CAN Total/NA Analysis 8081B 390394 07/09/19 20:27 OCR TAL CAN 1 Total/NA Prep 3510C 389623 07/03/19 11:21 BMB TAL CAN Total/NA Analysis 8081B 390394 07/09/19 20:39 OCR TAL CAN 1

Client Sample ID: CECW-1D Lab Sample ID: 240-115237-5

Date Collected: 06/26/19 15:45

Date Received: 06/29/19 09:30

Matrix: Ground Water

Batch Batch Dilution Batch Prepared Method Number or Analyzed Prep Type Туре Run Factor Analyst Lab 389622 Total/NA 3510C 07/03/19 11:16 BMB TAL CAN Prep Total/NA 8081B 390389 TAL CAN Analysis 1 07/09/19 22:20 **BPM**

Client Sample ID: CECW-2 Lab Sample ID: 240-115237-6

Date Collected: 06/26/19 14:35

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/09/19 22:32	BPM	TAL CAN

Client Sample ID: CECW-2D Lab Sample ID: 240-115237-7

Date Collected: 06/26/19 13:45

Date Received: 06/29/19 09:30

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390394	07/09/19 22:09	OCR	TAL CAN

Matrix: Ground Water

Job ID: 240-115237-5

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - beta BHC

Lab Sample ID: 240-115237-8

Lab Sample ID: 240-115237-12

Lab Sample ID: 240-115237-13

Lab Sample ID: 240-115237-15

Matrix: Ground Water

Client Sample ID: CECW-3D

Date Collected: 06/26/19 15:10 Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390394	07/09/19 22:22	OCR	TAL CAN

Client Sample ID: CECW-61 Lab Sample ID: 240-115237-11

Date Collected: 06/27/19 12:32 Date Received: 06/29/19 09:30

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390394	07/09/19 23:13	OCR	TAL CAN

Client Sample ID: CECW-6D

Date Collected: 06/27/19 12:20

Date Received: 06/29/19 09:30

Γ	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C		- <u> </u>	389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390394	07/10/19 00:04	OCR	TAL CAN

Client Sample ID: CECW-8

Date Collected: 06/27/19 10:20 Date Received: 06/29/19 09:30

Γ	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389623	07/03/19 11:21	BMB	TAL CAN

Date Received: 06/29/19 09:30

Total/NA	Analysis 8081B	10 391796 07/18/19 11:09 BPM TAL CAN
Client Samp	ple ID: CECW-8D	Lab Sample ID: 240-115237-14
Date Collected	d: 06/27/19 10:30	Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390394	07/10/19 00:30	OCR	TAL CAN

Client Sample ID: CECW-10R

Date Collected: 06/27/19 12:10

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390394	07/10/19 00:43	OCR	TAL CAN

Eurofins TestAmerica, Canton

Job ID: 240-115237-5

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: CECW-15

Date Collected: 06/27/19 13:17 Date Received: 06/29/19 09:30 Lab Sample ID: 240-115237-16

Matrix: Ground Water

		Batch	Batch		Dilution	Batch	Prepared		
P	rep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Ŧ	otal/NA	Prep	3510C			389623	07/03/19 11:21	BMB	TAL CAN
Т	otal/NA	Analysis	8081B		1	390394	07/10/19 01:09	OCR	TAL CAN

Client Sample ID: PO-8 Lab Sample ID: 240-115237-17

Date Collected: 06/27/19 13:31 Matrix: Ground Water

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C	RA		389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B	RA	1	390394	07/10/19 03:17	OCR	TAL CAN
Total/NA	Prep	3510C	RA		389623	07/03/19 11:21	BMB	TAL CAN
Total/NA	Analysis	8081B	RA	1	390394	07/10/19 03:30	OCR	TAL CAN

Client Sample ID: PO-8D Lab Sample ID: 240-115237-18

Date Collected: 06/27/19 13:35 Matrix: Ground Water
Date Received: 06/29/19 09:30

Batch Batch Dilution Batch Prepared Prep Type Method Number Туре Run Factor or Analyzed Analyst Lab Total/NA Prep 3510C 389623 07/03/19 11:21 BMB TAL CAN Total/NA Analysis 8081B 390394 07/10/19 01:47 OCR TAL CAN

Client Sample ID: PO-10 Lab Sample ID: 240-115237-20

Date Collected: 06/27/19 11:15

Matrix: Ground Water

Date Received: 06/29/19 09:30

Batch Batch Dilution Batch Prepared Prep Type Method Number or Analyzed Туре Run Factor Analyst Lab Prep 3510C 389622 Total/NA 07/03/19 11:16 BMB TAL CAN Total/NA 8081B 390389 Analysis 07/10/19 01:38 **BPM** TAL CAN Total/NA 07/18/19 10:24 TAL CAN Prep 3510C RE 391827 **FMB** 8081B TAL CAN Total/NA Analysis 1 391994 07/19/19 15:09 **BPM**

Client Sample ID: PO-10D Lab Sample ID: 240-115237-21

Date Collected: 06/27/19 12:35

Matrix: Ground Water

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/09/19 23:59	BPM	TAL CAN

Client Sample ID: DUPLICATE Lab Sample ID: 240-115237-23

Date Collected: 06/27/19 12:27

Date Received: 06/29/19 09:30

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/10/19 00:23	BPM	TAL CAN

Eurofins TestAmerica, Canton

Lab Chronicle

Client: Golder Associates Inc. Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Client Sample ID: DUPLICATE

Lab Sample ID: 240-115237-23 Date Collected: 06/27/19 12:27

Matrix: Ground Water

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C	RE		391827	07/18/19 10:24	EMB	TAL CAN
Total/NA	Analysis	8081B	RE	1	391994	07/19/19 15:46	BPM	TAL CAN

Client Sample ID: FIELD BLANK

Lab Sample ID: 240-115237-24

Matrix: Ground Water

Date Collected: 06/26/19 16:25 Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			389622	07/03/19 11:16	BMB	TAL CAN
Total/NA	Analysis	8081B		1	390389	07/10/19 01:01	BPM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: Golder Associates Inc. Job ID: 240-115237-5

Project/Site: 1SA19 Makeup - B - beta BHC

Laboratory: Eurofins TestAmerica, Canton

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Virginia	NELAP	3	460175	09-14-19 *

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 $^{{}^{\}star}\operatorname{Accreditation/Certification \ renewal \ pending \ - \ accreditation/certification \ considered \ valid.}$

According to the control of the post of the control of the control

Eurofins TestAmerica, Canton

4101 Shuffel Street NW

Chain of Custody Record

eurofins Environment Testing TestAmelica

	Project Manager: Mike Williams/Rachel Powell Email: ripowell@golder.com	achel Powell			
	ipowell@golder.com				
			Site Contact: Rachel Powell	Date: (6/27/19	COC No:
	Tel/Fax: 804-517-3381		Lab Contact: Eric Lang	Carrier: FedEx	2 of 2 COCs
	Analysis Turnaround Time	Time			Sampler: Kevin Weissgold/Nathan Chien
		WORKING DAYS			For Lab Use Only: Rowhel Burell
Project Name: 1SA19 CEC Makeup Sampling Event Site: Chesapeake Energy Center, Virginia P O # 19117210 Sample Identification Dup 1.00 Sample Transfer Sample Sa	TAT if different from Below	10	(N		Walk-in Client:
	2 weeks		11)		Lab Sampling:
	2 days		ası		lob / SDG No
	1 day		V/S		
	Sample Type (C=Comp, Time G=Grab)	# of Matrix Cont.	Filtered S: Perform M bets-BHC		Sample Specific Notes:
	-	6w 2	× 2×		
		20			
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Ot Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA V Comments Section if the lab is to dispose of the sample.					
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Ot Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA V Comments Section if the lab is to dispose of the sample.					
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Of Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA V Comments Section if the lab is to dispose of the sample.		1			
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Ot Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA V Comments Section if the lab is to dispose of the sample.					
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Of Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA V Comments Section if the lab is to dispose of the sample. □ Non-Hazard □ Plammable □ Skin Irritant □ Polson B					
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA \ Comments Section if the lab is to dispose of the sample. □ Non-Hazard □ Flammable □ Skin Irritant □ Polson B	i, 6= Other Zinc Acetate	+ NaOH			
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B	y EPA Waste Codes for I	he sample in t		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	tained longer than 1 month)
	on B Unknown	wn	Return to Client	Disposal by Lab	for Months
Special Instructions/QC Requirements & Comments: All samples preserved on ice. Please provide a Level II Data package. Please see sample memo. Reporting Group	preserved on ice. Plea	se provide a L	evel II Data package. Please s	ee sample memo. Reporting Grou	ъ В.
eals Intact:	y Seal No.:		Cooler Temp. (°C): Obs'd	C): Obs'd: Corr'd:	Therm ID No.:
Relinquished by: Rackel Powell A 4 MC	hy:	COLA // 4	In Received by:	Company	Date/Time:
Relinquished by:	ny:	Date/Time:	Received by:	Company	Date(Time; //6, 6/3)
Relinquished by: Company:	ny:	Date/Time:	Received in Laboratory by.	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.23, dated 4/16/2019

Chain of Custody Record

Environment Testing S eurofins

lostAmencal

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

VSWMR/CAP

- Other:

RCRA

NPDES

MO

Regulatory Program:

North Canton, OH 44720-6900 phone 330,497,9396 fax 330,497,0772

Eurofins TestAmerica, Canton

4101 Shuffel Street NW

For Lab Use Only: Rachel Powell Sampler: Kevin Weissgold/Nathan Chien Sample Specific Notes: COCs Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Date/Fine 9/16 of 2 Walk-in Client: Job / SDG No. ab Sampling Months Therm ID No. Date/Time: COC No Special Instructions/QC Requirements & Comments: All samples preserved on ice. Please provide a Level II Data package. Please see sample memo. Reporting Group 💰 Date: 6/26/19 6/27/19 Corr'd. Company Company: Carrier: FedEx Disposal by Lab Cooler Temp. (°C): Obs'd; Site Contact: Rachel Powell Lab Contact: Eric Lang Return to Client Received by: XX ∑ × × × × × 2 NNX × NNX × × Deta-BHC - SW846 8081B Z NN S Perform MS / MSD (Y / N) Date/Time: 6/24 // 1 [/00 Filtered Sample (Y/N) 2 2 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the # of Cont. 2 N 2 N 4 4 2 2 2 2 2 Project Manager: Mike Williams/Rachel Powell Date/Time WORKING DAYS Matrix 3 3 SE GE 3 3 3 3 Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Zinc Acetate + NaOH 30 30 39 3 Analysis Turnaround Time TAT if different from Below 10 Type (C=Comp, G=Grab) 9 0 9 9 9 0 0 9 9 9 9 9 Email: ripowell@golder.com 2 weeks 1 week 2 days 1 day Tel/Fax: 804-517-3381 CALENDAR DAYS Sample 6/27/19 0856 6127/19 0902 6/23/19 1235 6/27/19 1220 6/24/19 1335 6/27/19 1030 6121 P1/419 6/27/19 1210 6/27/19 1020 6/27/19 1331 6/27/19 1232 6/27/19 1115 Custody Seal No. Company: Sample Company Comments Section if the lab is to dispose of the sample Project Name: 1SA19 CEC Makeup Sampling Event No Sample Identification Site: Chesapeake Energy Center, Virginia Phone Client Contact 2108 West Laburnum Ave., Suite 200 Possible Hazard Identification: Custody Seals Intact Golder Associates Inc. Richmond, VA, 23227 ache Powell CECW-10R CECW -80 CECW - 15 PO-10D CECW-GD P O# 19117210 CECW-61 CECW-8 Relinquished by MW-50 (804) 358-7900 Po-80 P6-10 XXXX-XXX (XXX) MM-S 8-02 7/24/2019

Form No. CA-C-WI-002, Rev. 4.23, dated 4/16/2019

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Company

Received in Laboratory by:

Date/Time:

Company:

Relinquished by:

Form No. CA-C-WI-002, Rev. 4.23, dated 4/16/2019

Temple Search Sample Sam		rioject manager, mine williamsmacher rower	Ber mine	A LINE WILLIAM		1				
200 West Laborator From Laborator From Laborator From Laborator From Laborator From Laborator Market Laborator Lab	Client Contact	Email: ripow	ell@golde	mos.		S	te Contact: Rachel P	Ŋ	Date: 10 /24/19	COC No;
Received VA 20227 Photo	Golder Associates Inc.	Tel/Fax: 804	1-517-338			17	b Contact: Eric Lang		arrier: FedEx	soco l of Cocs
Properties CEC.W 1	2108 West Laburnum Ave, Suite 200	Ar	nalysis Tu	rnaround	Time					Sampler: Kevin Weissgold/Nathan Chien
Phone Phon	Richmond, VA, 23227	CALENDAR	DAYS	- WOR	ING DAYS					For Lab Use Only: Rachal for
Context, Virginia Cont			T if different	from Balow	10		(N			Walk-in Client:
Contest Cont	(xxx) xxx-xxxx FAX		2 4	seeks		(N	11			Lab Sampling:
Contex, Virginia Contex Co	Project Name: 1SA19 CEC Makeup Sampling Event		1.4	reek		/ J .	0			
Sample Sample Company Matrix Condition Company Compa	Site: Chesapeake Energy Center, Virginia		20	ske		alc	SW			Job / SDG No.:
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G 26/14 15-5 G GW Z W M X M M X M M M M M	Sample Identification		Sample	Sample Type (C=Comp, G=Grab)	Matrix		Perform N			Sample Specific Notes:
Company: Compan	-		(\$50	9	SE		7			
6/26/19 1935 G GW 2 N 6/26/19 1910 G GW 2 N	CECW-ID		545	9	SE		5			
Ce, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Zinc Acetate + NaOH cation: cation: sted EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the ab is to dispose of the sample. Planmable	CECW-2		435	0	SE		2			
Ce, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Zinc Acetate + NaOH cation: sted EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the ab is to dispose of the sample. Teammable Skin Intant	CECW-10		345	9	GE GE					
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ce, 2=HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Zinc Acetate + NaOH cation: sted EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the ab is to dispose of the sample. Teammable Skip Irritant Poison B Company: Colombany: Colombany: Date/Time: Colombany: Date/Time:										
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sted EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the ab is to dispose of the sample. Flammable	reservation Used: 1= Ice, 2= HCI; 3= H2SO4; 4=HNO3	5; S=NaOH; 6=	Other Zir	c Acetate	+ NaOH		Į.			
Flammable Skin Irritant Poison B	ossible Hazard Identification: vre any samples from a listed EPA Hazardous Waste? Ple. comments Section if the lab is to dispose of the sample.	ase List any EP	A Waste (codes for t	e sampl	s in the	Sample Disposal (A fee may be a	ssessed if samples	are retained longer than 1 month)
Requirements & Comments: All samples preserved on ice. Please provide a Level II Data package. Please see sample memo. Reporting Group (3) Company: C	Non-Hazard Flammable Skin Irritant	Poison B		Unkno	WD		Return to Client	Dispo	osal by Lab	
Company: Compan	ppecial Instructions/QC Requirements & Comments: AI	samples pres	erved on	ice. Pleas	e provid	e a Leve	II Data package. Ple	ase see samp	ole memo. Reporting	8,
Company: Date/Time: Received by: Company: Company: Date/Time: Received by: Company: Company: Date/Time: Received by: Company: Com	□ Yes □	Custody Sea	I No.:				Cooler Te	emp. (°C): Obs'c		Therm ID No.:
Company: Date/Time: Received in Jahondov by: Company:	A.	Company			624	f (100	Received by:	1	Company:	
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eurofins Environment Testing

Chain of Custody Record

Testâmenca

TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Canton 4101 Shuffel Street NW North Canton, OH 44720 Tel: (330)497-9396

Laboratory Job ID: 240-115237-6

Client Project/Site: 1SA19 Makeup - B - Antimony

For:

🔅 eurofins

Golder Associates Inc. 2108 W Laburnum Ave, Suite 200 Richmond, Virginia 23227

Attn: Mr. Mike Williams

111/7

Authorized for release by: 7/22/2019 10:20:11 AM

Eric Lang, Manager of Project Management (708)534-5200

eric.lang@testamericainc.com

LINKS

Review your project results through

Have a Question?



Visit us at: www.testamericainc.com This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

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

Table of Contents

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Definitions/Glossary

Client: Golder Associates Inc.

Job ID: 240-115237-6 Project/Site: 1SA19 Makeup - B - Antimony

Qualifiers

M	eta	ls
••••		

Qualifier **Qualifier Description**

Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery

CFL Contains Free Liquid **CNF** Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac **Dilution Factor**

Detection Limit (DoD/DOE) DΙ

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

Estimated Detection Limit (Dioxin) **EDL** Limit of Detection (DoD/DOE) LOD LOQ Limit of Quantitation (DoD/DOE)

Minimum Detectable Activity (Radiochemistry) MDA Minimum Detectable Concentration (Radiochemistry) MDC

MDL Method Detection Limit ML Minimum Level (Dioxin)

NC Not Calculated

Not Detected at the reporting limit (or MDL or EDL if shown) ND

PQL Practical Quantitation Limit

QC **Quality Control**

Relative Error Ratio (Radiochemistry) **RER**

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin) **TEQ** Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - Antimony

Job ID: 240-115237-6

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative 240-115237-6

Comments

No additional comments.

Receipt

The samples were received on 6/29/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 13 coolers at receipt time were 1.5° C, 2.3° C, 2.3° C, 2.5° C, 3.1° C, 3.7° C, 4.1° C, 4.7° C, 4.9° C, 4.9° C, 4.9° C, 5.7° C and 5.7° C.

Metals

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

Field Service / Mobile Lab

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

Job ID: 240-115237-6

Method Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - Antimony

 Method
 Method Description
 Protocol
 Laboratory

 6020A
 Metals (ICP/MS)
 SW846
 TAL CAN

 3005A
 Preparation, Total Recoverable or Dissolved Metals
 SW846
 TAL CAN

Protocol References:

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

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Job ID: 240-115237-6

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Sample Summary

Client: Golder Associates Inc.

240-115237-24

Project/Site: 1SA19 Makeup - B - Antimony

FIELD BLANK

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-115237-2	MW-5	Ground Water	06/27/19 09:02	06/29/19 09:30	
240-115237-3	MW-5D	Ground Water	06/27/19 08:50	06/29/19 09:30	
240-115237-4	CECW-1	Ground Water	06/26/19 15:50	06/29/19 09:30	
240-115237-5	CECW-1D	Ground Water	06/26/19 15:45	06/29/19 09:30	
240-115237-6	CECW-2	Ground Water	06/26/19 14:35	06/29/19 09:30	
240-115237-7	CECW-2D	Ground Water	06/26/19 13:45	06/29/19 09:30	
240-115237-8	CECW-3D	Ground Water	06/26/19 15:10	06/29/19 09:30	
240-115237-11	CECW-6I	Ground Water	06/27/19 12:32	06/29/19 09:30	
240-115237-12	CECW-6D	Ground Water	06/27/19 12:20	06/29/19 09:30	
240-115237-13	CECW-8	Ground Water	06/27/19 10:20	06/29/19 09:30	
240-115237-14	CECW-8D	Ground Water	06/27/19 10:30	06/29/19 09:30	
240-115237-15	CECW-10R	Ground Water	06/27/19 12:10	06/29/19 09:30	
240-115237-16	CECW-15	Ground Water	06/27/19 13:17	06/29/19 09:30	
240-115237-17	PO-8	Ground Water	06/27/19 13:31	06/29/19 09:30	
240-115237-18	PO-8D	Ground Water	06/27/19 13:35	06/29/19 09:30	
240-115237-20	PO-10	Ground Water	06/27/19 11:15	06/29/19 09:30	
240-115237-21	PO-10D	Ground Water	06/27/19 12:35	06/29/19 09:30	
240-115237-23	DUPLICATE	Ground Water	06/27/19 12:27	06/29/19 09:30	

Ground Water

06/26/19 16:25 06/29/19 09:30

Job ID: 240-115237-6

Detection Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: MW-5

Analyte Result Qualifier RL MDL Unit Dil Fac D Method Prep Type
Antimopy Dissolved

Arrange Result Qualifier RL MDL Offit Difference of the property of the Artimony 0.57 J 2.0 0.57 ug/L 1 0.57 Dissolved Client Sample ID: MW-5D Lab Sample ID: 240-115237-3

No Detections.

Client Sample ID: CECW-1 Lab Sample ID: 240-115237-4

No Detections.

Client Sample ID: CECW-1D Lab Sample ID: 240-115237-5

No Detections.

Client Sample ID: CECW-2 Lab Sample ID: 240-115237-6

No Detections.

Client Sample ID: CECW-2D Lab Sample ID: 240-115237-7

No Detections.

Client Sample ID: CECW-3D Lab Sample ID: 240-115237-8

No Detections.

Client Sample ID: CECW-6I Lab Sample ID: 240-115237-11

No Detections.

Client Sample ID: CECW-6D Lab Sample ID: 240-115237-12

No Detections.

Client Sample ID: CECW-8 Lab Sample ID: 240-115237-13

No Detections.

Client Sample ID: CECW-8D Lab Sample ID: 240-115237-14

No Detections.

Client Sample ID: CECW-10R Lab Sample ID: 240-115237-15

No Detections.

Client Sample ID: CECW-15 Lab Sample ID: 240-115237-16

No Detections.

Client Sample ID: PO-8 Lab Sample ID: 240-115237-17

No Detections.

Client Sample ID: PO-8D Lab Sample ID: 240-115237-18

No Detections.

Client Sample ID: PO-10 Lab Sample ID: 240-115237-20

No Detections.

This Detection Summary does not include radiochemical test results.

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Job ID: 240-115237-6

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7/22/2019

Detection Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - Antimony

Lab Sample ID: 240-115237-21

Job ID: 240-115237-6

Client Sample ID: PO-10D

Analyte	Result Quali	ifier RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	4.8	2.0	0.57	ug/L	1	_	6020A	Total
Antimony	3.6	2.0	0.57	ug/L	1		6020A	Recoverable Dissolved

Client Sample ID: DUPLICATE Lab Sample ID: 240-115237-23

No Detections.

Client Sample ID: FIELD BLANK Lab Sample ID: 240-115237-24

No Detections.

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Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: MW-5 Lab Sample ID: 240-115237-2

Date Collected: 06/27/19 09:02 Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS) - Total Recoverable									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57		2.0	0.57	ug/L		07/01/19 14:00	07/09/19 21:03	1
Method: 6020A - Metals (ICP/MS) - Dissolved									

Method: 6020A - Metals (ICP/N	IS) - Dissolved					
Analyte	Result Qualifier	RL	MDL Unit	D Prepared	Analyzed	Dil Fac
Antimony	0.57 J	2.0	0.57 ug/L	07/01/19 14:00	07/09/19 18:10	1

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Client: Golder Associates Inc. Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: MW-5D Lab Sample ID: 240-115237-3

Date Collected: 06/27/19 08:50 Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS) - Total Recoverable									
	Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 21:10	1
ĺ									

Method: 6020A - Metals (ICP/N	IS) - Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 18:12	1

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Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: CECW-1 Lab Sample ID: 240-115237-4

Date Collected: 06/26/19 15:50 Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS)	- Total Recoverable							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 20:49	1
Mathadi CODOA - Matala (ICD/MC)	Discolused							

Method: 6020A - Metals (ICP	/MS) - Dissolved					
Analyte	Result Qualifier	RL	MDL Unit	D Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57 ug/L	07/01/19 14:00	07/09/19 17:59	

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Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: CECW-1D Lab Sample ID: 240-115237-5

Date Collected: 06/26/19 15:45 Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS)	- Total Recoverable							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 21:13	1
Marthada COOOA Martala (IOD/MO)	Discolated							

Method: 6020A - Metals (ICP/MS) - Dissolved								
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 18:20	1

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Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: CECW-2 Lab Sample ID: 240-115237-6

Date Collected: 06/26/19 14:35

Date Received: 06/29/19 09:30

Matrix: Ground Water

Method: 6020A - Metals	(ICP/MS) - Total Recoverable							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 21:15	1
Method: 6020A - Metals	(ICP/MS) - Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 18:22	1

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Client: Golder Associates Inc. Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: CECW-2D Lab Sample ID: 240-115237-7

Date Collected: 06/26/19 13:45

Date Received: 06/29/19 09:30

Matrix: Ground Water

Method: 6020A - Metals	(ICP/MS) - Total Recoverable							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 21:17	1
Method: 6020A - Metals	(ICP/MS) - Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 18:24	1

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Client: Golder Associates Inc. Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: CECW-3D Lab Sample ID: 240-115237-8

Date Collected: 06/26/19 15:10 Matrix: Ground Water Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP	/MS) - Total Recoverable							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 21:20	1
Method: 6020A - Metals (ICP	/MS) - Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 18:27	1

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Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: CECW-6I Lab Sample ID: 240-115237-11

Date Collected: 06/27/19 12:32 Matrix: Ground Water Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS) - Total Recoverable

	. otal itooottolasi	•					
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57 ug/L	— – (7/01/19 14:00	07/09/19 21:27	1

Method: 6020A - Metals (ICP/M	S) - Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 18:29	1

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Client: Golder Associates Inc. Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Antimony

Client Sample ID: CECW-6D Lab Sample ID: 240-115237-12

Date Collected: 06/27/19 12:20 Matrix: Ground Water Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS) -	Total Recoverable							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L	_	07/01/19 14:00	07/09/19 21:29	1
Method: 6020A - Metals (ICP/MS) -	Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac

2.0

0.57 ug/L

<0.57

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07/01/19 14:00 07/09/19 18:32

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Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: CECW-8 Lab Sample ID: 240-115237-13

Date Collected: 06/27/19 10:20 Matrix: Ground Water Date Received: 06/29/19 09:30

Method: 6020A - Metals (I	CP/MS) - Total Recoverable							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 21:32	1
Method: 6020A - Metals (I	CP/MS) - Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 18:34	1

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Client: Golder Associates Inc. Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Antimony

Client Sample ID: CECW-8D Lab Sample ID: 240-115237-14

Date Collected: 06/27/19 10:30 Matrix: Ground Water Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS	S) - Total Recoverable							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 21:39	1
Method: 6020A - Metals (ICP/MS	S) - Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac

2.0

0.57 ug/L

<0.57

07/01/19 14:00 07/09/19 18:37

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12

Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: CECW-10R Lab Sample ID: 240-115237-15

Date Collected: 06/27/19 12:10 Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS) - Total Recoverable										
	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Antimony	<0.57		2.0	0.57	ug/L		07/01/19 14:00	07/09/19 21:42	1
	Method: 6020A - Metals (ICP/M	S) - Dissolv	ved							

Method: 6020A - Metals (ICP/MS) - Dissolved								
Analyte	Result Qua	alifier RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 18:39	1

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12

Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: CECW-15 Lab Sample ID: 240-115237-16

Date Collected: 06/27/19 13:17

Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS)	- Total Recoverable							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 21:44	1
Method: 6020A Metale (ICD/MC)	Discolved							

Method: 6020A - Metals (ICP/N	IS) - Dissolved	d						
Analyte	Result Qua	ıalifier RL	MDL	Unit [D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 18:41	1

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Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Antimony

Client Sample ID: PO-8 Lab Sample ID: 240-115237-17

Date Collected: 06/27/19 13:31 Matrix: Ground Water Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS	S) - Total Recoverable							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 21:46	1
Method: 6020A - Metals (ICP/MS	S) - Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac

2.0

0.57 ug/L

<0.57

07/01/19 14:00 07/09/19 18:49

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12

Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: PO-8D Lab Sample ID: 240-115237-18

Date Collected: 06/27/19 13:35 Matrix: Ground Water

Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS)	- Total Recoverable							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 21:49	1
Mothed: CO20A Motele (ICD/MC)	Discolved							

Method: 6020A - Metals (ICP/M	IS) - Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 18:51	1

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Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Antimony

Client Sample ID: PO-10 Lab Sample ID: 240-115237-20

Date Collected: 06/27/19 11:15

Date Received: 06/29/19 09:30

Matrix: Ground Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable)						
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 21:54	1
Method: 6020A - Metals (ICP/MS) - Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac

2.0

0.57 ug/L

<0.57

07/01/19 14:00 07/09/19 18:54

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12

Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Antimony

Client Sample ID: PO-10D Lab Sample ID: 240-115237-21

Date Collected: 06/27/19 12:35 Matrix: Ground Water Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS)	- Total Recoverable							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	4.8	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 20:23	1
Method: 6020A - Metals (ICP/MS)	- Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac

2.0

0.57 ug/L

3.6

07/01/19 14:00 07/09/19 20:16

Client: Golder Associates Inc. Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Antimony

Client Sample ID: DUPLICATE Lab Sample ID: 240-115237-23

Date Collected: 06/27/19 12:27

Date Received: 06/29/19 09:30

Matrix: Ground Water

Method: 6020A - Metals (ICP/M	S) - Total Recoverable							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57	ug/L		07/01/19 14:00	07/09/19 20:33	1
Method: 6020A - Metals (ICP/M	S) - Dissolved							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac

2.0

0.57 ug/L

<0.57

8

07/01/19 14:00 07/09/19 20:18

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Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: FIELD BLANK Lab Sample ID: 240-115237-24

Date Collected: 06/26/19 16:25 Matrix: Ground Water Date Received: 06/29/19 09:30

Method: 6020A - Metals (ICP/MS) - Total I	Recoverable							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57		2.0	0.57	ug/L		07/01/19 12:18	07/09/19 20:35	1
Method: 6020A - Metals (ICP/MS	i) - Dissol	ved							

Method: 6020A - Metals (ICP/M	IS) - Dissolved							
Analyte	Result Qualifier	RL	MDL (Jnit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.57	2.0	0.57 ι	ıg/L		07/01/19 14:00	07/09/19 20:21	1

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Project/Site: 1SA19 Makeup - B - Antimony

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-389196/1-A

Matrix: Water

Analysis Batch: 391579

Client Sample ID: Method Blank **Prep Type: Total Recoverable Prep Batch: 389196** MB MB

Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Analyte 0.57 ug/L Antimony 2.0 07/01/19 14:00 07/09/19 20:45 < 0.57

Lab Sample ID: LCS 240-389196/2-A

Matrix: Water

Antimony

Analysis Batch: 391579

Analyte

Spike Added

100

Result Qualifier 96.5

LCS LCS

Unit ug/L

D %Rec

80 - 120 96

%Rec.

Limits

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Client Sample ID: CECW-1

Prep Batch: 389196

Job ID: 240-115237-6

Lab Sample ID: 240-115237-4 MS **Prep Type: Total Recoverable Matrix: Ground Water Analysis Batch: 391579 Prep Batch: 389196** Sample Sample Spike MS MS %Rec.

Analyte Result Qualifier Added Result Qualifier Unit Limits D %Rec 100 75 - 125 **Antimony** < 0.57 100 ug/L 100

Lab Sample ID: 240-115237-4 MSD

Matrix: Ground Water

Analysis Batch: 391579

Analyte

Sample Sample Result Qualifier <0.57

Spike Added 100

MSD MSD Result Qualifier 99.0

Unit ug/L

Unit

ug/L

%Rec

Limits RPD 75 - 125

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Client Sample ID: CECW-1

Prep Batch: 389196

Prep Batch: 389197

Prep Batch: 389197

Prep Batch: 389203

Prep Type: Total Recoverable

%Rec.

Limit

RPD

Lab Sample ID: MB 240-389197/1-A

Matrix: Water

Antimony

Antimony

Analysis Batch: 391579

MB MB

Analyte

Result Qualifier <0.57

RI 2.0

Spike

Added

100

MDL Unit 0.57 ug/L

LCS LCS

101

Result Qualifier

Prepared

%Rec

Prepared

101

Analyzed 07/01/19 14:00 07/09/19 17:54

Prep Type: Total Recoverable

%Rec.

Limits

80 - 120

Client Sample ID: Method Blank

07/01/19 14:00 07/09/19 19:43

Prep Type: Total Recoverable

Client Sample ID: Lab Control Sample

Dil Fac

Lab Sample ID: LCS 240-389197/2-A

Matrix: Water

Analysis Batch: 391579

Analyte

Antimony

Lab Sample ID: MB 240-389203/1-A

Matrix: Water

Analyte

Antimony

Analysis Batch: 391579

Antimony Lab Sample ID: LCS 240-389203/2-A

Matrix: Water

Analysis Batch: 391579

Analyte

MB MB Result Qualifier <0.57

RL 20

Spike

Added

100

LCS LCS Result Qualifier

101

MDL Unit

0.57 ug/L

Unit ug/L

%Rec 101

Client Sample ID: Lab Control Sample Prep Type: Total Recoverable Prep Batch: 389203

Analyzed

%Rec. Limits

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80 - 120

QC Sample Results

Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Method: 6020A - Metals (ICP/MS)

	b Sample ID: 240-115237-4 MS atrix: Ground Water								•	ID: CECW-1 e: Dissolved
Ar	nalysis Batch: 391579									atch: 389197
	Sample	Sample	Spike	MS	MS				%Rec.	
An	alyte Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Ant	imony <0.57		100	106		ug/L		106	75 - 125	

Lab Sample ID: 240-11523 Matrix: Ground Water	7-4 MSD								nt Sample Prep Type		
Analysis Batch: 391579									Prep Ba	atch: 38	39197
-	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Antimony	<0.57		100	104	-	ug/L		104	75 - 125	2	20

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QC Association Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - Antimony

Metals

Prep Batch: 389196

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-2	MW-5	Total Recoverable	Ground Water	3005A	
240-115237-3	MW-5D	Total Recoverable	Ground Water	3005A	
240-115237-4	CECW-1	Total Recoverable	Ground Water	3005A	
240-115237-5	CECW-1D	Total Recoverable	Ground Water	3005A	
240-115237-6	CECW-2	Total Recoverable	Ground Water	3005A	
240-115237-7	CECW-2D	Total Recoverable	Ground Water	3005A	
240-115237-8	CECW-3D	Total Recoverable	Ground Water	3005A	
240-115237-11	CECW-6I	Total Recoverable	Ground Water	3005A	
240-115237-12	CECW-6D	Total Recoverable	Ground Water	3005A	
240-115237-13	CECW-8	Total Recoverable	Ground Water	3005A	
240-115237-14	CECW-8D	Total Recoverable	Ground Water	3005A	
240-115237-15	CECW-10R	Total Recoverable	Ground Water	3005A	
240-115237-16	CECW-15	Total Recoverable	Ground Water	3005A	
240-115237-17	PO-8	Total Recoverable	Ground Water	3005A	
240-115237-18	PO-8D	Total Recoverable	Ground Water	3005A	
240-115237-20	PO-10	Total Recoverable	Ground Water	3005A	
MB 240-389196/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-389196/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
240-115237-4 MS	CECW-1	Total Recoverable	Ground Water	3005A	
240-115237-4 MSD	CECW-1	Total Recoverable	Ground Water	3005A	

Prep Batch: 389197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batcl
240-115237-2	MW-5	Dissolved	Ground Water	3005A	-
240-115237-3	MW-5D	Dissolved	Ground Water	3005A	
240-115237-4	CECW-1	Dissolved	Ground Water	3005A	
240-115237-5	CECW-1D	Dissolved	Ground Water	3005A	
240-115237-6	CECW-2	Dissolved	Ground Water	3005A	
240-115237-7	CECW-2D	Dissolved	Ground Water	3005A	
240-115237-8	CECW-3D	Dissolved	Ground Water	3005A	
240-115237-11	CECW-6I	Dissolved	Ground Water	3005A	
240-115237-12	CECW-6D	Dissolved	Ground Water	3005A	
240-115237-13	CECW-8	Dissolved	Ground Water	3005A	
240-115237-14	CECW-8D	Dissolved	Ground Water	3005A	
240-115237-15	CECW-10R	Dissolved	Ground Water	3005A	
240-115237-16	CECW-15	Dissolved	Ground Water	3005A	
240-115237-17	PO-8	Dissolved	Ground Water	3005A	
240-115237-18	PO-8D	Dissolved	Ground Water	3005A	
240-115237-20	PO-10	Dissolved	Ground Water	3005A	
MB 240-389197/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-389197/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
240-115237-4 MS	CECW-1	Dissolved	Ground Water	3005A	
240-115237-4 MSD	CECW-1	Dissolved	Ground Water	3005A	

Prep Batch: 389203

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-21	PO-10D	Dissolved	Ground Water	3005A	_
240-115237-21	PO-10D	Total Recoverable	Ground Water	3005A	
240-115237-23	DUPLICATE	Dissolved	Ground Water	3005A	
240-115237-23	DUPLICATE	Total Recoverable	Ground Water	3005A	
240-115237-24	FIELD BLANK	Dissolved	Ground Water	3005A	

Eurofins TestAmerica, Canton

7/22/2019

Job ID: 240-115237-6

QC Association Summary

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - Antimony

Metals (Continued)

Prep Batch: 389203 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-24	FIELD BLANK	Total Recoverable	Ground Water	3005A	
MB 240-389203/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-389203/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 391579

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batcl
240-115237-2	MW-5	Dissolved	Ground Water	6020A	38919
240-115237-2	MW-5	Total Recoverable	Ground Water	6020A	38919
240-115237-3	MW-5D	Dissolved	Ground Water	6020A	38919
240-115237-3	MW-5D	Total Recoverable	Ground Water	6020A	38919
240-115237-4	CECW-1	Dissolved	Ground Water	6020A	38919
240-115237-4	CECW-1	Total Recoverable	Ground Water	6020A	38919
240-115237-5	CECW-1D	Dissolved	Ground Water	6020A	38919
240-115237-5	CECW-1D	Total Recoverable	Ground Water	6020A	38919
240-115237-6	CECW-2	Dissolved	Ground Water	6020A	38919
240-115237-6	CECW-2	Total Recoverable	Ground Water	6020A	38919
240-115237-7	CECW-2D	Dissolved	Ground Water	6020A	38919
240-115237-7	CECW-2D	Total Recoverable	Ground Water	6020A	38919
240-115237-8	CECW-3D	Dissolved	Ground Water	6020A	38919
240-115237-8	CECW-3D	Total Recoverable	Ground Water	6020A	38919
240-115237-11	CECW-6I	Dissolved	Ground Water	6020A	38919
240-115237-11	CECW-6I	Total Recoverable	Ground Water	6020A	38919
240-115237-12	CECW-6D	Dissolved	Ground Water	6020A	38919
240-115237-12	CECW-6D	Total Recoverable	Ground Water	6020A	38919
240-115237-13	CECW-8	Dissolved	Ground Water	6020A	38919
240-115237-13	CECW-8	Total Recoverable	Ground Water	6020A	38919
240-115237-14	CECW-8D	Dissolved	Ground Water	6020A	38919
240-115237-14	CECW-8D	Total Recoverable	Ground Water	6020A	38919
240-115237-15	CECW-10R	Dissolved	Ground Water	6020A	38919
240-115237-15	CECW-10R	Total Recoverable	Ground Water	6020A	38919
240-115237-16	CECW-15	Dissolved	Ground Water	6020A	38919
240-115237-16	CECW-15	Total Recoverable	Ground Water	6020A	38919
240-115237-17	PO-8	Dissolved	Ground Water	6020A	38919
240-115237-17	PO-8	Total Recoverable	Ground Water	6020A	38919
240-115237-18	PO-8D	Dissolved	Ground Water	6020A	38919
240-115237-18	PO-8D	Total Recoverable	Ground Water	6020A	38919
240-115237-20	PO-10	Dissolved	Ground Water	6020A	38919
240-115237-20	PO-10	Total Recoverable	Ground Water	6020A	38919
240-115237-21	PO-10D	Dissolved	Ground Water	6020A	38920
240-115237-21	PO-10D	Total Recoverable	Ground Water	6020A	38920
240-115237-21	DUPLICATE	Dissolved	Ground Water	6020A	38920
240-115237-23	DUPLICATE	Total Recoverable	Ground Water	6020A	38920
240-115237-24	FIELD BLANK	Dissolved	Ground Water	6020A	38920
240-115237-24 240-115237-24	FIELD BLANK	Total Recoverable	Ground Water	6020A	38920
	Method Blank	Total Recoverable			38919
MB 240-389196/1-A MB 240-389197/1-A	Method Blank	Total Recoverable	Water Water	6020A 6020A	38919
MB 240-389203/1-A					
	Method Blank	Total Recoverable	Water	6020A	38920
LCS 240-389196/2-A	Lab Control Sample	Total Recoverable	Water	6020A	38919
LCS 240-389197/2-A	Lab Control Sample	Total Recoverable	Water	6020A	38919
LCS 240-389203/2-A	Lab Control Sample	Total Recoverable	Water	6020A	38920
240-115237-4 MS	CECW-1	Dissolved	Ground Water	6020A	38919

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Job ID: 240-115237-6

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QC Association Summary

Client: Golder Associates Inc.

Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Metals (Continued)

Analysis Batch: 391579 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-115237-4 MS	CECW-1	Total Recoverable	Ground Water	6020A	389196
240-115237-4 MSD	CECW-1	Dissolved	Ground Water	6020A	389197
240-115237-4 MSD	CECW-1	Total Recoverable	Ground Water	6020A	389196

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Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: MW-5

Date Collected: 06/27/19 09:02 Date Received: 06/29/19 09:30

Lab Sample ID: 240-115237-2

Matrix: Ground Water

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389197	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 18:10	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:03	DSH	TAL CAN

Client Sample ID: MW-5D Lab Sample ID: 240-115237-3

Date Collected: 06/27/19 08:50 Date Received: 06/29/19 09:30

Batch Batch Dilution Batch Prepared **Prep Type** Type Method Run **Factor** Number or Analyzed Analyst Lab Dissolved Prep 3005A 389197 07/01/19 14:00 MRL TAL CAN Dissolved Analysis 6020A 1 391579 07/09/19 18:12 DSH TAL CAN 3005A TAL CAN Total Recoverable Prep 389196 07/01/19 14:00 MRL Total Recoverable Analysis 6020A 1 391579 07/09/19 21:10 DSH TAL CAN

Client Sample ID: CECW-1

Date Collected: 06/26/19 15:50 Date Received: 06/29/19 09:30

Lab Sample ID: 240-115237-4

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389197	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 17:59	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 20:49	DSH	TAL CAN

Client Sample ID: CECW-1D Lab Sample ID: 240-115237-5 **Matrix: Ground Water**

Date Collected: 06/26/19 15:45 Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389197	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 18:20	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:13	DSH	TAL CAN

Client Sample ID: CECW-2 Lab Sample ID: 240-115237-6

Date Collected: 06/26/19 14:35

Date Received: 06/29/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389197	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 18:22	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:15	DSH	TAL CAN

Matrix: Ground Water

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: CECW-2D

Date Collected: 06/26/19 13:45 Date Received: 06/29/19 09:30

Lab Sample ID: 240-115237-7

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389197	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 18:24	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:17	DSH	TAL CAN

Client Sample ID: CECW-3D

Date Collected: 06/26/19 15:10 Date Received: 06/29/19 09:30

Lab Sample ID: 240-115237-8

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389197	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 18:27	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:20	DSH	TAL CAN

Client Sample ID: CECW-61

Date Collected: 06/27/19 12:32

Date Received: 06/29/19 09:30

Lab Sample ID: 240-115237-11

Lab Sample ID: 240-115237-12

Matrix: Ground Water

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389197	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 18:29	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:27	DSH	TAL CAN

Client Sample ID: CECW-6D

Date Collected: 06/27/19 12:20

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389197	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 18:32	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:29	DSH	TAL CAN

Date Collected: 06/27/19 10:20

Date Received: 06/29/19 09:30

Date Collected: 0	16/27/19 10	1.20					Matrix: Ground Water
Client Sample	ID: CEC	W-8			L	.ab Sam	ple ID: 240-115237-13
Total Recoverable	Analysis	6020A	1	391579	07/09/19 21:29	DSH	TAL CAN
Total Recoverable	Prep	3005A		389196	07/01/19 14:00	MRL	TAL CAN

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389197	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 18:34	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:32	DSH	TAL CAN

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Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: CECW-8D

Date Collected: 06/27/19 10:30 Date Received: 06/29/19 09:30 Lab Sample ID: 240-115237-14

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389197	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 18:37	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:39	DSH	TAL CAN

Client Sample ID: CECW-10R

Date Collected: 06/27/19 12:10 Date Received: 06/29/19 09:30 Lab Sample ID: 240-115237-15

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389197	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 18:39	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:42	DSH	TAL CAN

Client Sample ID: CECW-15

Date Collected: 06/27/19 13:17 Date Received: 06/29/19 09:30 Lab Sample ID: 240-115237-16

Matrix: Ground Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389197	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 18:41	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:44	DSH	TAL CAN

Client Sample ID: PO-8

Date Collected: 06/27/19 13:31 Date Received: 06/29/19 09:30 Lab Sample ID: 240-115237-17

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389197	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 18:49	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:46	DSH	TAL CAN

Client Sample ID: PO-8D

Date Collected: 06/27/19 13:35 Date Received: 06/29/19 09:30 Lab Sample ID: 240-115237-18

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A				07/01/19 14:00		TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 18:51	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:49	DSH	TAL CAN

Eurofins TestAmerica, Canton

Lab Chronicle

Client: Golder Associates Inc.

Project/Site: 1SA19 Makeup - B - Antimony

Client Sample ID: PO-10 Lab Sample ID: 240-115237-20 **Matrix: Ground Water**

Date Collected: 06/27/19 11:15 Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389197	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 18:54	DSH	TAL CAN
Total Recoverable	Prep	3005A			389196	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 21:54	DSH	TAL CAN

Lab Sample ID: 240-115237-21 **Client Sample ID: PO-10D** Date Collected: 06/27/19 12:35 **Matrix: Ground Water**

Date Received: 06/29/19 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389203	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 20:16	DSH	TAL CAN
Total Recoverable	Prep	3005A			389203	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 20:23	DSH	TAL CAN

Client Sample ID: DUPLICATE

Date Collected: 06/27/19 12:27 Date Received: 06/29/19 09:30

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389203	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 20:18	DSH	TAL CAN
Total Recoverable	Prep	3005A			389203	07/01/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 20:33	DSH	TAL CAN

Client Sample ID: FIELD BLANK

Date Collected: 06/26/19 16:25

Date Received: 06/29/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			389203	07/01/19 14:00	MRL	TAL CAN
Dissolved	Analysis	6020A		1	391579	07/09/19 20:21	DSH	TAL CAN
Total Recoverable	Prep	3005A			389203	07/01/19 12:18	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1	391579	07/09/19 20:35	DSH	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Job ID: 240-115237-6

Eurofins TestAmerica, Canton

Lab Sample ID: 240-115237-23

Lab Sample ID: 240-115237-24

Matrix: Ground Water

Matrix: Ground Water

Accreditation/Certification Summary

Client: Golder Associates Inc. Job ID: 240-115237-6

Project/Site: 1SA19 Makeup - B - Antimony

Laboratory: Eurofins TestAmerica, Canton

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Virginia	NELAP	3	460175	09-14-19 *

^{*} Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins TestAmerica, Canton

Form No. CA-C-WI-002, Rev. 4.23, dated 4/16/2019

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ct one X Sampling Event ginia	Regulatory Program: Dw Dw Project Manager: Mike Williams/Rachel Powell	□ wa □	NPDES	RCRA Other:	VSWMRZCAP	TestAmerica	TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica
ct one X Sampling Event ginia	ject Manager: Mike Williar	ne Dachal Da					
le mpling Event nia		is/racilei ro	le)				
one X Sampling Event ginia	Email: ripowell@golder.com		S	Site Contact: Rachel Powell	well Date: (6	: 6/27/19	COC No:
one X Sampling Event ginia	Tel/Fax: 804-517-3381		Ľ	Lab Contact: Eric Lang	Carr	Carrier: FedEx	2 of 2 cocs
	Analysis Turnaround Time	around Time	T	109			Sampler: Kevin Weissgold/Nathan Chien
		STAN DAILY	T				
	TAT It different from Below	Haw 10	()	01 N /			Volk-in Cherry.
ite: Chesapeake Energy Center, Virginia O#19117210			NIX	(X			can camping.
0#19117210			() eld	M846			Job / SDG No.:
	1 d		iwe	s -			
San Sample Identification Da	Sample Sample Type (C=Comp, Date Time G=Grab)	ple ne, np, Matrix	Cont. Filtered S	Mertorm M Antimony Antimony			Sample Specific Notes:
Duplicate (6/2	6127/4 1227 (A	6W	2 4	XXX			
	-						
			T				
Preservation Used: 1= Ice, 2= HCI, 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Zinc Acetate + NaOH	aOH; 6= Other Zinc Ace	tate + NaOH		4 4			
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List Comments Section if the lab is to dispose of the sample.	Please List any EPA Waste Codes	odes for the sample in the	e in the	Sample Disposal (A	fee may be asse	ssed if samples are re	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Non-Hazard Flammable Skin Irritant		Unknown		Return to Client	S Disposal by Lab	y Lab Archive for	for Months
rctions/QC Requirements & Co		lease provid	e a Leve	II Data package, Plea	ise see sample r	. Reportii	, Q dr
☐ Yes ☐ No	Custody Seal No.:			Cooler Ten	Cooler Temp. (°C): Obs'd:	Corr'd.	Therm (D No.:
Relinquished by: Rowell An +12 Com	Company	Date/Time:	16. JI &	Received by:	,	Company:	Date/Time:
	Company:	Date/Time:		Received	X	Company	Date Time 110 Gras
Relinquished by.	Company	Date/Time:	.e.	Received in Laboratory by:	y by:	Company:	

Form No. CA-C-WI-002, Rev. 4.23, dated 4/16/2019

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										TestAmerica
North Canton, OH 44720-6900 phone 330,497,9396 fax 330,497,0772	Regulat	Regulatory Program:	am: □pw		NPDES	RCRA	Other:	VSWMR/CAP		TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica
	Project Manager: Mike		Williams/Rachel Powell	chel Pow						
Client Contact	Email: ripowell@golder.com	Il@golder.	mos		Si	e Contact	Site Contact: Rachel Powell		Date: 6 26/19 6127/19	COC No:
Golder Associates Inc.	Tel/Fax: 804-517-3381	-517-3381			La	b Contact	Lab Contact: Eric Lang	9	Carrier: FedEx	1 of 2 COCs
2108 West Labumum Ave, Suite 200	An	Analysis Turnaround Time	naround	ime	T	109				gold/Natha
23227	CALENDAR DAYS	DAYS	WORKING DAYS	NG DAYS						For Lab Use Only: Knulus Pound
(804) 358-7900 Phone		TAT If different for	from Below	10		_				Walk-in Client:
(xxx) xxx-xxxx FAX		2 weeks	eks		(N	010				Lab Sampling:
Project Name: 1SA19 CEC Makeup Sampling Event		1 week	ek		11	9 91				
Site: Chesapeake Energy Center, Virginia		2 days	12) əlc	₽8W				Job / SDG No.:
P O # 19117210		1 day			awt	s-				
Sample Identification	Sample Date	Sample	Sample Type (C=Comp, G=Grab)	Matrix	Cont.	M mrotra9 ynomitnA ynomitnA		,		Sample Specific Notes:
MW-5	6/23/19	2060	9	Sw	7 7	NXX				
Mw -50	6127119	0880	9	3	7 4	XXN				
	6/12/19	1232	9	39	7 4	NXX				
CECW-60	6127/19	1220	9	SE SE	2 4	XXX				
cecw-8	6/24/19	1020	9	GW	2 1	NXX				
GECW-80	6127/19	1030	9	6w	7 4	NXX				
CECW-108	0/23/19	1210	9	GW	2 1	NXX				
CECW-15	6127/19 1317	317	9	6w	7 4	NXX				
Po-8	6127/19	1331	ى	GW	2 4	NXX				
Po-80	6/23/19	1335	9	GW	7	XXV				
Po-10	6123/19	1115	S	6w	2 1	NXX				
		1235	9	SW.	7 2	NAX				
HCI; 3= H2SO4;	4=HNO3; 5=NaOH; 6= Other Zir		c Acetate	+ NaOH		4 4				
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Comments Section if the lab is to dispose of the sample.	Please List any EPA Waste C	Waste Co	odes for the sample in the	e sample	in the	Sample D	Disposal (A1	ee may be	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	ained longer than 1 month)
Ol Non-Hazard Flammable Skin Irritant	ant Poison B		Unknown	0		Retur	Return to Client	osio 🖂	Disposal by Lab	
Special Instructions/QC Requirements & Comments: All samples preserved on	:: All samples pres		e. Please	provide	a Level	II Data pa	ckage. Plea	se see sam	o. Reporting	9 2.
Custody Seals Infact:	Custody Seal No.:	I No.:					Cooler Tem	Cooler Temp. (°C): Obs'd	d; Con'd:	Therm ID No.:
_	Company			Date/Time: 6 /14 // 1/ 1/ 1/ 1/ 00	1 1100	Received by	. A		Company:	Date/Time:
Relinquished by:	Company:			Date/Time;	e:	Received	The state of the s		Company	Date Vinne
Relinquished by:	Company:			Date/Time:	 G	Regeliyed	Regeliyed in Laboratory by:	by:	Company:	Date/Time/

eurofins Environment Texting

Regulatory Program: Dw INPDES IRCRA
Regulatory Progra
Regulatory Progra
Regulatory Progra

Chain of Custody Record

Eurofins TestAmerica, Canton 4101 Shuffel Street NW

Client Contact	Email: ripowell@golder.com	@golder.c	mo		Sit	Cont	Site Contact: Rachel Powell	el Powell	Date	Date: (0/2/0/19	3	COC No:	
Golder Associates Inc.	Tel/Fax: 804-517-338	17-3381			La	Conta	Lab Contact: Eric Lang	ang	Carr	Carrier: FedEx		l of	cocs
2108 West Laburnum Ave, Suite 200	Ana	Analysis Turnaround Time	around	ime			10					Sampler, Kevin We	Sampler: Kevin Weissgold/Nathan Chien
Richmond, VA, 23227	CALENDAR DAYS	AYS	WORKING DAYS	NG DAYS			9 9t					For Lab Use Only:	y: Kathel Appell
(804) 358-7900 Phone		TAT if different fro	from Below	10			8M8					Walk-in Client:	
(xxx) xxx-xxxx FAX Project Name 1SA19 CEC Makeun Sampling Event	o o	2 weeks	S 48		(N/)	9010	5 - pa					Lab Sampling:	
Site: Chesapeake Energy Center, Virginia		2 days	K s		Y) 9	918/	vios					Job / SDG No	
P O # 19117210	n	tep 1			dwi	vs -	sib						
Sample Identification	Sample Sa Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	Conf. Filtered S	M mnohaq ynomitnA	, YnomitnA					Sample S	Sample Specific Notes;
CECW-1	0126/19 1550	050	9	S	2	×	×						
CECW-ID	6/26/19 19	1545	S	S	4	×	×						
CECW-2	6126/19 1435	135	9	CE	2 4	X	×						
מב-אושם מק	6126/19 1345	45	9	CN	2 4	N	×						
e c c c c - 30	6126/14 1510	0!!	9	GW	7 7	NA	×						
	6/26/19 1625	57	0	SE	3	×	×						
				1									
		+											
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3: 5=NaOH; 6= Other Zinc Acetate + NaOH	03; 5=NaOH; 6= 0	ther Zinc	Acetate	NaOH		4	4						
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste C Comments Section if the lab is to dispose of the sample.	lease List any EPA	Waste Co	odes for the sample in the	e sample	in the	Sample	e Disposa	al (A fee m	ay be ass	ssed if sam	ples are re	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month	onth)
☐ Non-Hazard ☐ Hammable ☐ Skin Irritant	Poison B		Unknown	_		Re	Return to Client		Disposal by Lab	by Lab	Archive for	for Months	
Special Instructions/QC Requirements & Comments: All samples preserved on	All samples preser		e. Pleas	provide	a Level	Data	package.	Please se	e sample	ice. Please provide a Level II Data package. Please see sample memo. Reporting Group	orting Gro	S.	
Custody Seals Intact:	Custody Seal No.:	No.:			П		Coole	Cooler Temp. (°C): Obs'd	:): Obs'd:	Co	Corr'd:	Therm ID No.:	
Recinquished by: Recinquished by:	Company:			Cate/Time:	1600	Received by:	ed by:	×		Company:		Date/Time:	
ZI/Z	Company:			Date/Time:		Receiv	Ned Y	1		Сошоэ	45	Date June 11	9.5%
Relinquished by:	Company:			Date/Time:	6	Regely	Received in Laboratory by	ratory by:		Company		DaterTinfe	



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