Environment

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2016 Annual Monitoring Report South Cass Lake Pumping Station Mile Post 952.98

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1.0 Background & Introduction

AECOM has prepared this letter report to document the groundwater sampling and monitoring activities conducted at the Enbridge Energy (Enbridge) South Cass Lake Pumping Station (Site) during 2016. This report includes the results of four quarterly groundwater monitoring events completed in 2016. **Figure 1** shows the Site location and **Figure 2** depicts the pumping station layout, property boundaries, and the monitoring well network.

In 2001, as part of Enbridge's voluntary Groundwater Monitoring Program, four monitoring wells (MW-1 through MW-4) were installed at the Site and petroleum compounds were detected in Site groundwater samples. In February 2002, a leaking flange was discovered through which crude oil had released to the subsurface. The flange was repaired and approximately 304 cubic yards of petroleum contaminated soil were removed at that time.

Since 2001, a series of investigations have been conducted to determine the extent and magnitude of the release. Several feasibility studies have also been completed to better understand the free-phase petroleum body (contamination source area) and groundwater plume characteristics in order to determine the best path forward to remediate the release in soil and groundwater.

In September of 2014, AECOM and its subcontractors installed a bioventing remediation system at the Site with the goal of increasing oxygen concentration in the subsurface and to enhance degradation of residual free-phase product at the Site. The system came on line in October 2014. Details pertaining to the bioventing system operation and performance during 2016 will be presented in a separate report.

2.0 2016 Groundwater Monitoring & Sampling Results

Quarterly groundwater monitoring activities were conducted in March, June, September, and December 2016. Prior to monitoring well purging and sample collection, the depth to groundwater was measured at each monitoring well location using a water level meter. Water table elevations for the monitoring wells exhibit seasonal variability as has been previously documented for this release Site. A summary of the groundwater elevation data is included in **Table 1**.

Due to fouling of well screens by apparent weathered, viscous light non-aqueous phase liquid (LNAPL), it was not possible to gauge fluid levels or collect groundwater samples from wells MW-3, MW-5, MW-11 or MW-13 in 2016. As a result of well fouling, new monitoring well (MW-23) was installed in July 2016 with the intent of monitoring LNAPL within the release area. A groundwater sample was collected from MW-23 in September 2016. LNAPL was first detected in this well in December 2016 and the well was not sampled. See Section 4 below for LNAPL monitoring and well installation information.

Groundwater Flow Results

Horizontal groundwater flow at the Site has been determined to be to the east/ southeast. Based on the 2016 groundwater level measurements, the groundwater flow direction

remains to the southeast. **Figures 3 through 6** depict the quarterly groundwater elevations and groundwater flow direction.

Vertical groundwater flow at nested wells has been estimated using the following calculation: Vertical Gradient (dH/dL) = (difference in piezometric head)/ (vertical difference in screened intervals) $(H_2-H_1)/(Z_2-Z_1)$. The results of the vertical gradient calculations indicate that a slight downward groundwater flow gradient was present at the MW-16A/MW-16B well nest in 2016. Downward gradient ranged from 0.0007 to 0.0014 ft. /ft. Please see **Table 2** for the vertical groundwater gradient calculation results. Downward vertical gradients are generally present in groundwater recharge areas.

Groundwater Analytical Results

Groundwater samples were submitted to Pace Analytical Laboratories in Minneapolis for analysis of benzene, toluene, ethylbenzene and xylenes (BTEX), Extended Range Diesel Range Organics (ERDRO), methane, nitrate + nitrite and sulfate. ERDRO C10-32 was reported for March, June, and September 2016; carbon range C10-36 was requested in December 2106 to provide a broader range of petroleum hydrocarbon results. In addition to ERDRO, ERDRO with silica gel cleanup (ERDRO- SGC) was added to the analytical sampling routine for the June, September, and December events for the following wells: MW-9, MW-10, MW-16A, MW-16B, MW-19, MW-22, USGS-1A, USGS-2A, USGS-3A, and USGS-4A.

Dissolved oxygen, specific conductivity, pH and oxidation reduction potential (ORP) were measured in the field and are documented in this report. **Table 3** and **Table 4** provide cumulative summaries of the groundwater data collected as part of this investigation. The analytical laboratory reports are provided in **Appendix A**.

Benzene Results

The highest dissolved benzene concentration recorded since the start of Site investigation activities in 2001 is 2,600 micrograms per Liter (μg/L) from MW-10 in August 2004. The benzene concentrations at MW-10 ranged from 3.6 to 26 μg/L (MW-10 duplicate) in the 2016 quarterly groundwater samples, suggesting a decreasing trend in the concentration of this compound over time. New monitoring well MW-23, located up-gradient from MW-10 and within the source area, was sampled in September and the benzene concentration in this sample was 278 μg/L. For reference, the Minnesota Department of Health (MDH) Health Risk Limit (HRL) for benzene in groundwater is 2 μg/L, and the Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL) is 5 μg/L. **Figure 7** depicts the approximate lateral extent of dissolved phase benzene over the last four groundwater sampling events.

Dissolved benzene concentrations at the Site remain quite variable both spatially and temporally, ranging several orders of magnitude at some monitoring wells from quarter to quarter. Benzene concentrations at MW-9 ranged from non-detect (<1.0 μg/L) in June 2016 to 248 μg/L in September 2016. Benzene concentrations at USGS-2A ranged from 201 μg/L in March 2016 to 3.1 μg/L in September.

The following table summarizes dissolved benzene concentrations near and down-gradient of the source area at monitoring wells for the last four groundwater monitoring events.

Dissolved Benzene Concentrations *
(Micrograms per Liter)

Event	MW-23	MW-10	MW-9	USGS-1A	USGS-2A	USGS-3A	USGS-4A	MW-16A
03/16	-	24.4	135	10	201	<1.0	<1.0	<1.0
06/16	-	14.6	<1.0	1.7	33	3.8	<1.0	<1.0
09/16	278	10.7	248	37.8	3.1	2.5	5	2.6
12/16	NS	3.6	70.2	49.8	11.2	<1.0	<1.0	<1.0

*Wells presented up-gradient to down-gradient from left to right.

ERDRO Results

Detections of ERDRO (C10-32) were documented at monitoring wells: MW-9, MW-10, MW-16A, MW-16B, MW-19, MW-22, USGS-1A, USGS-2A, USGS-3A, and USGS-4A during all four of the 2016 quarterly monitoring events. Concentrations at these locations range from 180 µg/L at MW-22 in June to 33,800 µg/L at MW-9 in September. Groundwater was sampled from new well MW-23 in September and the ERDRO concentration was 38,000 µg/L.

Low-level (near detection limits) ERDRO was also detected in MW-22 (180µg/L, June event only). ERDRO was detected in MW-22 for the first time in 2015 since the well was installed in 2013. This well is located furthest downgradient of the source area and samples collected from this well have not contained selected analytes (BTEX) above laboratory detection limits. In general, the ERDRO concentrations generally decrease down gradient of the source area.

Neither Tribal, nor State of Minnesota nor federal (EPA) health based regulatory standards exist for gasoline range organics (GRO), diesel range organics (DRO) or total petroleum hydrocarbons (TPH) in groundwater.

The following table summarizes ERDRO concentrations near and down-gradient of the source area at monitoring wells for the last four groundwater monitoring events.

ERDRO (C10-32) Concentrations at Select Down-gradient Wells *
(Micrograms per Liter)

Event	MW-23	MW-10	MW-9	USGS-1A	USGS-2A	USGS-3A	USGS-4A	MW-16A
03/16	-	21,200	6,000	6,900	16,400	2,500	1,700	2,600
06/16	-	17,900	1,500	2,900	3,700	4,700	2,200	1,600
09/16	38,000	7,700	33,800	20,900	9,000	7,900	5,100	2,600
12/16	NS	25,200	14,600	19,900	7,300	1,900	3,100	2,200

*Wells presented up-gradient to down-gradient from left to right.

ERDRO-SGC Results

ERDRO-SGC analysis was conducted for the June, September, and December events for the following wells: MW-9, MW-10, MW-16A, MW-16B, MW-19, MW-22, USGS-1A, USGS-2A, USGS-3A, and USGS-4A. This analysis was selected to aid in determining how much of the ERDRO response signal (detection) is represented by non-hydrocarbons. In general, ERDRO analysis detects extracted hydrocarbons eluting within a specified boiling point range and reports the detections as an unresolved concentration of a complex mixture of compounds; however, in practice the method also detects polar compounds that co-elute within the same boiling point range. Silica gel cleanup, a laboratory sample preparation method, removes polar compounds from the sample extract. Polar non-hydrocarbons can be present naturally as organic matter or as byproducts (metabolites) of biodegradation of petroleum contamination source areas *(Bekins et al, 2016).*

Concentrations of ERDRO-SGC (i.e. hydrocarbon) at monitoring wells MW-9, MW-10, MW-16A, MW-16B, USGS-1A, USGS-2A, USGS-3A, and USGS-4A during the last three of the 2016 quarterly monitoring events ranged from 120 μg/L at MW-22 in September to 18,300 μg/L at MW-9 in September. Low-level ERDRO-SGC detections were recorded at MW-19 and MW-22 during select monitoring events. Comparison of the 2016 ERDRO and ERDRO-SGC data indicates that the ERDRO-SGC results account for approximately 20-60%of the ERDRO detections, indicating that 40-80% of the ERDRO signal is actually composed of polar compounds (i.e. metabolites; see **Table 5** and Graphs **B4-B6**). In general, and with some exceptions, ratios of ERDRO-SGC to ERDRO appear to decrease from quarter to quarter, indicating that polar metabolites as a component of ERDRO detections are increasing over time. For example, the ratio of ERDRO-SGC to ERDRO at MW-10 decreased from 0.60 in June to 0.42 in September to 0.37 in December.

The following table summarizes ERDRO-SGC concentrations near and down-gradient of the source area at monitoring wells for the last three groundwater monitoring events.

ERDRO-SGC (C10-32) Concentrations at Select Down-gradient Wells *
(Micrograms per Liter)

Event	MW-23	MW-10	MW-9	USGS-1A	USGS-2A	USGS-3A	USGS-4A	MW-16A
03/16	ERDRO-SGC analysis was not requested in March 2016							
06/16	-	10,700	640	1,300	2,100	2,500	1,200	530
09/16	NS	3,200	18,200	9,000	3,100	2,700	2,000	790
12/16**	NS	9,200	4,900	7,500	2,700	560	1,000	590

*Wells presented up-gradient to down-gradient from left to right.

** December 2016 ERDRO-SGC results reported as C10-28

Natural Attenuation Results

Natural attenuation field parameters and samples were collected during the 2016 quarterly groundwater monitoring events. Analytical samples were submitted to the laboratory for analysis of methane, nitrate/nitrite (as nitrogen) and sulfate. Additionally, oxidation-reduction potential (ORP) and dissolved oxygen (DO) were measured as part of the biodegradation

evaluation. **Table 4** presents both the analytical results and field measurements collected during these groundwater monitoring events.

The 2016 natural attenuation data indicate the presence of varying biogeochemical conditions across the Site. In general DO concentrations and ORP values are highest outside the identified plume area, with higher values being present at up-gradient and side-gradient locations. At wells MW-1, MW-4, MW-6, MW-7 and MW-8 the ORP is positive (>0.0 milli-Volts (mV)) and the DO is typically greater than 5 milligrams per Liter (mg/L), indicating a fairly oxygenated environment. Conversely, low DO/ORP results are present within the plume near the source area. At wells MW-10, MW-9, USGS-1A, USGS-2A, USGS-3A and USGS-4A the ORP is typically negative (<0.0 mV) and the DO is typically depressed at concentrations indicative of an oxygen deficient environment (< 1 mg/L). DO/ORP increase with distance downgradient with values at the furthest downgradient well (MW-22) approaching background concentrations. The DO and ORP data suggest that biodegradation of petroleum compounds at and near the source area has depleted the contaminated portion of the aquifer of oxygen (or other terminal electron acceptors) and thereby also reduced the electron accepting capacity of the hydrogeologic unit *(Bekins et al, 2016).*

Methane appears to be produced at locations near the source area and down-gradient within the dissolved groundwater plume. The highest methane concentrations in groundwater have been recorded at MW-9 and MW-10. Methane detections in these wells range from 7.1-14,000 µg/L. These wells are near the source area and are also immediately down-gradient of the active bioremediation system. Methane concentrations in these wells appear to be increasing since 2014, possibly correlated to the operation of the bioremediation system. Methane detections at up-gradient and side-gradient wells appear to be low (< 10 µg/L).

Nitrate/nitrite and sulfate are found in lower concentrations within the groundwater plume, suggesting conversion of these species through microbial respiration to nitrogen gas and hydrogen sulfide gas or reduced sulfur precipitates. In general, nitrogen and sulfate are not typically detected above laboratory method detection levels in groundwater from wells located within the plume down-gradient from the source area (MW-10, USGS-1A, USGS-2A, USGS-3A, and USGS-4A). On the contrary, nitrogen and sulfate are both typically detected in the low mg/L range in groundwater at wells located outside of the plume (MW-1, MW-4, MW-6, MW-7, and MW-8). During 2016, detections of nitrogen at up-gradient and side-gradient wells ranged from approximately 0.14 mg/L to 3.3 mg/L and detections of sulfate at the same wells ranged from approximately 4.0 mg/L to 7.7 mg/L. Observed differences in nitrogen and sulfate concentrations from within to outside the plume indicate that anaerobic biodegradation is also occurring at the Site.

Potable Well Results

AECOM sampled the South Cass Lake active potable well (SCDW) for BTEX and ERDRO during the 2016 field events. The potable well samples did not contain petroleum compounds above the minimum laboratory detection limits. Potable water from this location has historically contained low-level concentrations of nitrogen and sulfate. Results from the 2016 sampling events documented 0.79-1.1 mg/L of nitrogen and 2.5-3.6 mg/L of sulfate,

which is comparable to background concentrations of these electron acceptors in groundwater samples from wells located outside of the hydrocarbon plume.

Trend Analysis

During 2016, the water table elevation at the Site increased from March through September, followed by a seasonal low in December (as illustrated by the plot of water levels in **Graph B1** in **Appendix B**). Similar seasonal water elevation trends were observed in 2013, 2014, and 2015 with groundwater elevation maximums occurring in September each year. The historically highest magnitude water table elevations were recorded in September 2014. As has been previously reported, these seasonal changes in water table elevations cause variability in the amount of the source area that is submerged below the water table. Rises in water table elevation have generally been followed by increases in benzene concentrations at down-gradient wells. This pattern is evident in the varying extent of the benzene plume through four quarterly events in 2016, with the maximum down-gradient extent of the plume occurring coincident with the water table maximums recorded in September 2016 (see **Figure 7**).

Following the seasonal water table high and concurrent spike in benzene concentration observed in September 2013, a significant downward trend in benzene concentrations has been observed within the identified plume (see **Graph B2**). Benzene concentrations at MW-10, located immediately down-gradient of the source area and nearest to the Site bioventing system, have been generally lower than in further down-gradient wells in 2015 and 2016 (MW-9 and USGS-1A). The apparent reduction in dissolved benzene at MW-10 may be due to increased microbial metabolism of benzene at or upgradient of this location due to operation of the bioventing system.

Unlike benzene, ERDRO concentrations do not appear to have a strong correlation to seasonal water table elevations. Through June 2014, a decreasing ERDRO concentration trend is evident (see **Graph B3**). Beginning in fall of 2014 (coincident with startup of the Site bioventing system), ERDRO concentrations appear to be generally increasing. During 2016, ERDRO concentrations spiked as high as 38,000 µg/L (MW-9: September sample). Similar magnitude but slightly lower ERDRO detections were recorded in MW-10 and USGS-1A in 2016. Spikes in ERDRO concentrations were also observed at USGS-2A, USGS-3A, and USGS-4A. ERDRO detections at the furthest downgradient monitoring well (MW-22) were below reporting limits or very low.

AECOM conducted Mann-Kendall statistical trend analysis for benzene and ERDRO for key monitoring wells along the main axis of the dissolved plume: MW-9, MW-10, USGS-1A, USGS-2A, USGS-3A, USGS-4A and MW-16A. Mann-Kendall analysis is a widely accepted industry practice for quantitatively evaluating concentration trends in groundwater. The method is used to determine if concentrations are increasing, decreasing or stable over time. AECOM utilized the GSI Mann-Kendall Toolkit produced by GSI Environmental Inc., and based on “MAROS: A Decision Support System for Optimizing Monitoring Plans”, J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003. Copies of the Mann-Kendall spreadsheets are included in **Appendix C**.

Mann-Kendall Trends*

Monitoring Well	# Sampling Events	Benzene Trend	ERDRO Trend
MW-9	31	Probably Increasing	Increasing
MW-10	30	Decreasing	Stable
MW-16A	21	No Trend	Increasing
USGS-1A	22	No Trend	Probably Increasing
USGS-2A	22	Probably Decreasing	Increasing
USGS-3A	22	Probably Decreasing	Probably Increasing
USGS-4A	22	No Trend	Probably Increasing

*all data collected through December 2016

With the exception of MW-9, which is “probably increasing”, no increasing concentration trends were identified for benzene at the above plume monitoring wells. Benzene concentrations are “decreasing” or “probably decreasing” along the main axis of the plume at MW-10, USGS-2A, and USGS-3A. Variability in the detected benzene concentrations through time resulted in “No Trend” at wells MW-16A, USGS-1A, and USGS-4A on the periphery of the plume. The cause for the increasing benzene concentration at MW-9 is not understood at this time; however, MW-9 is located somewhat side-gradient from the bioventing system and main axis of the dissolved groundwater plume. For ERDRO results, with the exception of MW-10 which is “stable”, no decreasing trends were identified.

The increasing trends in ERDRO concentrations in groundwater appear to be the result of increased concentrations of petroleum metabolites resulting from operation of the bioventing system. Recent research by the United States Geological Survey (USGS) has suggested that as biodegradation of petroleum hydrocarbons increases within a plume, concentrations of benzene tend to decrease while concentrations of petroleum metabolites may increase by a factor of ten *(Bekins et al, 2016).* The USGS has previously documented the presence of petroleum metabolites, also known as nonvolatile dissolved organic carbon (NVDOC), at the Site with concentrations in 2008 ranging from 1.3 to 21 mg/L (Bekins *et al.*, 2016). The ERDRO-SGC results discussed above support the hypothesis that operation of the bioventing system is increasing microbial respiration/metabolism within the saturated zone and the conversion of hydrocarbons to metabolites, which are more soluble in groundwater than their parent hydrocarbons. In the June 2016 ERDRO sampling experiment, ERDRO-SGC detections accounted for 33-61% of the corresponding ERDRO results. However, in the December 2016 sampling experiment, hydrocarbons detected as ERDRO-SGC represented only 21-39% of the corresponding ERDRO results; which means that approximately 61-79% of the December 2016 ERDRO signal was composed of polar compounds or metabolites. This preliminary trend suggests that polar metabolites are increasing as a percentage compared to the detected hydrocarbons.

3.0 LNAPL Results & Characteristics

Light non-aqueous phase liquid (LNAPL) has previously been observed at monitoring wells MW-3, MW-5, MW-11, and MW-13 during this investigation. Over time, the consistency of the product in the wells has become viscous to the point that measurements of LNAPL depth and thickness became impractical using an oil-water interface probe. Therefore, on August 26, 2015, Stevens Drilling Company was subcontracted by AECOM to re-develop these wells that have historically contained LNAPL. Scrubbing the well screen with a bottle brush and air jetting, followed by pumping were utilized to attempt redevelopment of well MW-11 and MW-5; however, these methods failed to establish fluid flow of any significance. The high viscosity continues to limit the collection of accurate fluid gauging measurements from MW-3, MW-5, MW-11, and MW-13.

In an effort to better monitor the presence of LNAPL at the Site, Thein Well Company was subcontracted to install a new 4-inch diameter monitoring well (MW-23) in July 2016. The well was placed adjacent to Vapor Monitoring Point 6, a boring location with documented residual petroleum impacts to soil. (see **Figure 2**). Prior to well installation a soil boring was completed to a depth of 31 feet below ground surface (bgs) using a 4 ¼ inch hollow stem auger (HSA) accompanied by continuous split spoon sampling. Soils logged were primarily fine to medium silty sand. Petroleum coated soils were observed in the 23-26 foot depth interval. Following completion of the soil boring Thein switched drill rig tooling to 6 ¼ inch HSA to complete the well installation to a depth of 30 feet bgs. After the well was constructed a downhole pump was used to develop and purge the well, approximately 110 gallons of fluid were removed from the well. Immediately following development, LNAPL was not present in measurable amounts in this well. MW-23 was subsequently checked for the presence of LNAPL on a quarterly basis coincident with the Site groundwater monitoring schedule. LNAPL was first detected in MW-23 during the December 2016 monitoring event at a thickness of 0.02 feet.

See **Appendix D** for soil boring log, well construction form, and Minnesota Department of Health Well Construction Record.

4.0 Conclusions

Seasonal groundwater fluctuation continued to be observed at the Site in 2016 with water level rising through the summer to an observed peak in September and then decreasing through the fall into winter (December). Seasonal rises in the water table elevation are believed to be linked to increases in benzene concentrations at downgradient wells and variability in the extent of the plume. Groundwater flow direction remains consistently southeasterly at the Site. The vertical groundwater gradient is slightly downward, indicating that the Site is in a groundwater recharge area.

Concentrations of dissolved benzene, particularly at MW-10, exhibit a decreasing trend since fall 2014, suggesting that operation of the bioventing system is enhancing biodegradation of benzene in the saturated zone near the release area. Concentrations of dissolved benzene further down-gradient from the release area continue to exhibit episodic increases and decreases that can vary by several orders of magnitude from quarter to quarter. These

episodic increases or “spikes” in benzene concentrations generally appear to correlate to seasonal increases in water table elevation. The dynamics of contaminant migration complicate comparisons of dissolved benzene concentration to water table data further from the source area. There is reasonable correlation between water table elevation changes and benzene pulses however the correlation is not perfect. A “pulse” of dissolved benzene liberated from the smear zone during a seasonal high ground water may take months to propagate down-gradient to the next well.

Concentrations of dissolved ERDRO at numerous down-gradient wells show an increasing trend since fall 2014, including at far down-gradient perimeter wells MW-19 and MW-22. This trend suggests that as a result of enhanced bioremediation of source area petroleum compounds, petroleum metabolites are produced. Silica gel cleanup ERDRO results indicate that 39% of more of the ERDRO signal is represented by polar compounds (metabolites).

As was hypothesized in the 2015 annual monitoring report, it appears that operation of the bioventing system is increasing biodegradation of residual hydrocarbon at rates resulting in significant increases in metabolites in dissolved groundwater and detected in the ERDRO range.

5.0 References

Bekins, B.A., Cozzarelli, I.M., Erickson, M.L., Steenson, R.A., Thorn, K.E., 2016, Crude Oil Metabolites n Groundwater at Two Spill Sites, *Groundwater*, Volume 54, Issue 5, p. 681-691.

Tables

Table 1
South Cass Lake Station Groundwater Monitoring Results
Enbridge Energy, Limited Partnership

Well ID	Unique Well No.	Date	Top of Casing Elevation (ft NGVD)	Depth to Groundwater (feet)	Depth to Oil (feet)	Oil Thickness (feet)	Equivalent Depth to Groundwater * (feet)	Groundwater Elevation (ft NGVD)	Top of Screen (ft NGVD)	Top of Screen Above Groundwater (feet)
MW-1	662109	06-Jun-01	100.00	26.29				73.71	77.00	3.29
		10-May-02	100.00	27.57				72.43	77.00	4.57
		14-May-02	100.00	27.60				72.40	77.00	4.60
		21-Jul-03	100.00	28.07				71.93	77.00	5.07
		06-Jan-04	100.00	28.50				71.50	77.00	5.50
		02-Apr-04	100.00	28.53				71.47	77.00	5.53
		12-May-04	100.00	28.55				71.45	77.00	5.55
		26-Aug-04	100.00	27.97				72.03	77.00	4.97
		30-Dec-04	100.00	27.00				73.00	77.00	4.00
		06-Apr-05	100.00	27.35				72.65	77.00	4.35
		26-Jun-08	100.00	27.33				72.67	77.00	4.33
		25-Nov-08	100.00	27.22				72.78	77.00	4.22
		04-Jun-09	100.00	26.75				73.25	77.00	3.75
		26-Oct-09	1340.19	27.25				1312.94	1317.19	4.25
		29-Jun-10	1340.19	27.52				1312.67	1317.19	4.52
		01-Dec-10	1340.19	27.10				1313.09	1317.19	4.10
		01-Dec-11	1340.19	27.18				1313.01	1317.19	4.18
		07-Jun-12	1340.19	27.80				1312.39	1317.19	4.80
		03-Dec-12	1340.19	28.26				1311.93	1317.19	5.26
		17-Jun-13	1340.19	27.43				1312.76	1317.19	4.43
		18-Sep-13	1340.19	27.50				1312.69	1317.19	4.50
		16-Dec-13	1340.19	27.87				1312.32	1317.19	4.87
		17-Mar-14	1340.19	28.31				1311.88	1317.19	5.31
		17-Jun-14	1340.19	27.12				1313.07	1317.19	4.12
		3-Sep-14	1340.19	25.95				1314.24	1317.19	2.95
		15-Dec-14	1340.19	26.95				1313.24	1317.19	3.95
		10-Mar-15	1340.19	27.55				1312.64	1317.19	4.55
		15-Jun-15	1340.19	27.14				1313.05	1317.19	4.14
		8-Sep-15	1340.19	27.17				1313.02	1317.19	4.17
		8-Dec-15	1340.19	27.35				1312.84	1317.19	4.35
		16-Mar-16	1340.19	27.57				1312.62	1317.19	4.57
		16-Jun-16	1340.19	27.37				1312.82	1317.19	4.37
		12-Sep-16	1340.19	27.26				1312.93	1318.19	5.26
		20-Dec-16	1340.19	27.75				1312.44	1318.19	5.75
MW-2	662110	06-Jun-01	99.57	25.87				73.70	77.07	3.37
		10-May-02	99.57	Not Recorded						
		14-May-02	99.57	27.25				72.32	77.07	4.75
		21-Jul-03	99.57	27.71				71.86	77.07	5.21
		06-Jan-04	99.57	28.12				71.45	77.07	5.62
		02-Apr-04	99.57	28.11				71.46	77.07	5.61
		12-May-04	99.57	28.28				71.29	77.07	5.78
		26-Aug-04	99.57	27.60				71.97	77.07	5.10
		30-Dec-04	99.57	26.62				72.95	77.07	4.12
		06-Apr-05	99.57	26.92				72.65	77.07	4.42
		26-Jun-08	99.57	27.13				72.44	77.07	4.63
		25-Nov-08	99.57	26.86				72.71	77.07	4.36
		04-Jun-09	99.57	26.52				73.05	77.07	4.02
			WELL ABANDONED							

Table 1
South Cass Lake Station Groundwater Monitoring Results
Enbridge Energy, Limited Partnership

Well ID	Unique Well No.	Date	Top of Casing Elevation (ft NGVD)	Depth to Groundwater (feet)	Depth to Oil (feet)	Oil Thickness (feet)	Equivalent Depth to Groundwater * (feet)	Groundwater Elevation (ft NGVD)	Top of Screen (ft NGVD)	Top of Screen Above Groundwater (feet)
MW-3	662111	06-Jun-01	99.60	25.92	25.32	0.60	25.37	74.23	78.10	3.87
		10-May-02	99.60	27.19	26.51	0.68	26.57	73.03	78.10	5.07
		14-May-02	99.60	27.22	26.6	0.62	26.66	72.94	78.10	5.16
		21-Jul-03	99.60	28.30	27.77	0.53	27.82	71.78	78.10	6.32
		5-Jan-04	99.60	29.12	28.05	1.07	28.15	71.45	78.10	6.65
		2-Apr-04	99.60	28.77	28.09	0.68	28.15	71.45	78.10	6.65
		12-May-04	99.60	29.15	28.2	0.95	28.29	71.31	78.10	6.79
		26-Aug-04	99.60	28.05	27.62	0.43	27.66	71.94	78.10	6.16
		30-Dec-04	99.60	26.99	26.7	0.29	26.73	72.87	78.10	5.23
		06-Apr-05	99.60	27.51	26.97	0.54	27.02	72.58	78.10	5.52
		26-Jun-08	99.60	27.29	27.15	0.14	27.16	72.44	78.10	5.66
		25-Nov-08	99.60	27.10	26.87	0.23	26.89	72.71	78.10	5.39
		06-Feb-09	99.60	27.92	27.67	0.25	27.69	71.91	78.10	6.19
		04-Jun-09	99.60	26.57	26.56	0.01	26.56	73.04	78.10	5.06
		26-Oct-09	1339.79	26.92	26.91	0.01	26.91	1312.88	1318.29	5.41
		29-Jun-10	1339.79	27.95	27.25	0.70	27.31	1312.48	1318.29	5.81
		02-Dec-10	1339.79	27.19	26.8	0.39	26.83	1312.96	1318.29	5.33
		02-Dec-11	1339.79	26.68	26.68	0.00	26.68	1313.11	1318.29	5.18
		07-Jun-12	1339.79	29.38	27.2	2.18	27.40	1312.39	1318.29	5.90
		03-Dec-12	1339.79	28.47	27.52	0.95	27.61	1312.18	1318.29	6.11
		17-Jun-13	1339.79	27.27	27.07	0.20	27.09	1312.70	1318.29	5.59
		19-Dec-13	The well was dry. No level was obtained.							
		19-Mar-14	1339.79	30.45	27.82	2.63	28.06	1311.73	1318.29	6.56
		17-Jun-14	1339.79	31.04	26.82	4.22	27.20	1312.59	1318.29	5.70
		04-Sep-14	1339.79	25.90	25.58	0.32	25.61	1314.18	1318.29	4.11
		15-Dec-14	Accurate readings could not be determined due to the highly viscous nature of LNAPL in well							
		10-Mar-15	Not Measured - Bailer Frozen in Well							
		15-Jun-15	Accurate readings could not be determined due to the highly viscous nature of LNAPL in well							
		8-Sep-15	Probe detected product fumes as it was lowered inside the well casing							
		9-Dec-15	Not Measured							
		16-Mar-16	Not Measured							
		16-Jun-16	Not Measured							
		12-Sep-16	Not Measured							
MW-4	662112	06-Jun-01	100.39	26.68				73.71	77.89	4.18
		10-May-02	100.39	27.92				72.47	77.89	5.42
		14-May-02	100.39	27.96				72.43	77.89	5.46
		21-Jul-03	100.39	28.35				72.04	77.89	5.85
		06-Jan-04	100.39	28.75				71.64	77.89	6.25
		02-Apr-04	100.39	28.80				71.59	77.89	6.30
		12-May-04	100.39	28.85				71.54	77.89	6.35
		26-Aug-04	100.39	28.22				72.17	77.89	5.72
		30-Dec-04	100.39	27.36				73.03	77.89	4.86
		06-Apr-05	100.39	27.71				72.68	77.89	5.21
		26-Jun-08	100.39	27.76				72.63	77.89	5.26
		25-Nov-08	100.39	27.56				72.83	77.89	5.06
		04-Jun-09	100.39	27.21				73.18	77.89	4.71
		26-Oct-09	1340.58	27.59				1312.99	1318.08	5.09
		29-Jun-10	1340.58	27.90				1312.68	1318.08	5.40
		01-Dec-10	1340.58	27.45				1313.13	1318.08	4.95
		01-Dec-11	1340.58	27.53				1313.05	1318.08	5.03
		07-Jun-12	1340.58	28.10				1312.48	1318.08	5.60
		03-Dec-12	1340.58	28.55				1312.03	1318.08	6.05
		17-Jun-13	1340.58	27.79				1312.79	1318.08	5.29
		18-Sep-13	1340.58	27.80				1312.78	1318.08	5.30
		16-Dec-13	1340.58	28.17				1312.41	1318.08	5.67

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Enbridge Energy, Limited Partnership

Well ID	Unique Well No.	Date	Top of Casing Elevation (ft NGVD)	Depth to Groundwater (feet)	Depth to Oil (feet)	Oil Thickness (feet)	Equivalent Depth to Groundwater * (feet)	Groundwater Elevation (ft NGVD)	Top of Screen (ft NGVD)	Top of Screen Above Groundwater (feet)
		17-Mar-14	1340.58	28.59				1311.99	1318.08	6.09
		14-Jun-14	1340.58	27.59				1312.99	1318.08	5.09
		3-Sep-14	1340.58	26.32				1314.26	1318.08	3.82
		15-Dec-14	1340.58	27.31				1313.27	1318.08	4.81
		10-Mar-15	1340.58	27.88				1312.70	1318.08	5.38
		15-Jun-15	1340.58	27.58				1313.00	1318.08	5.08
		8-Sep-15	1340.58	27.48				1313.10	1318.08	4.98
		8-Dec-15	1340.58	27.92				1312.66	1318.08	5.42
		16-Mar-16	1340.58	27.71				1312.87	1318.08	5.21
		16-Jun-16	1340.58	27.76				1312.82	1318.08	5.26
		12-Sep-16	1340.58	27.59				1312.99	1319.08	6.09
		20-Dec-16	1340.58	28.06				1312.52	1319.08	6.56
MW-5	705515	05-Jan-04	99.58	29.65	28.18	1.47	28.27	71.31	76.08	4.77
		2-Apr-04	99.58	29.72	28.47	1.25	28.55	71.03	76.08	5.05
		12-May-04	99.58	29.75	28.14	1.61	28.24	71.34	76.08	4.74
		26-Aug-04	99.58	28.05	27.6	0.45	27.63	71.95	76.08	4.13
		30-Dec-04	99.58	27.20	26.65	0.55	26.68	72.90	76.08	3.18
		06-Apr-05	99.58	28.03	26.94	1.09	27.01	72.57	76.08	3.51
		26-Jun-08	99.58	28.05	27.1	0.95	27.16	72.42	76.08	3.66
		25-Nov-08	99.58	27.17	26.9	0.27	26.92	72.66	76.08	3.42
		06-Feb-09	99.58	28.90	28.56	0.34	28.58	71.00	76.08	5.08
		04-Jun-09	99.58	26.82	26.56	0.26	26.58	73.00	76.08	3.08
		26-Oct-09	1339.78	27.11	26.9	0.21	26.91	1312.87	1316.28	3.41
		29-Jun-10	1339.78	28.86	27.24	1.62	27.34	1312.44	1316.28	3.84
		01-Dec-10	1339.78	26.95						
		02-Dec-11	1339.78	27.05	26.67	0.38	26.69	1313.09	1316.28	3.19
		07-Jun-12	1339.78	28.88	27.1	1.78	27.21	1312.57	1316.28	3.71
		03-Dec-12	1339.78	28.98	27.74	1.24	27.82	1311.96	1316.28	4.32
		17-Jun-13	1339.78	28.18	27.05	1.13	27.12	1312.66	1316.28	3.62
		18-Sep-13	1339.78	26.89			26.89	1312.89	1316.28	3.39
		19-Dec-13	Accurate readings could not be determined due to the highly viscous nature of LNAPL in well							
		19-Mar-14	1339.78	31.95	27.82	4.13	28.08	1311.70	1316.28	4.58
		17-Jun-14	1339.78	27.98	27.58	0.40	27.60	1312.18	1316.28	4.10
		04-Sep-14	1339.78	29.85	25.50	4.35	25.77	1314.01	1316.28	2.27
		17-Dec-14	Accurate readings could not be determined due to the highly viscous nature of LNAPL in well							
		10-Mar-15	1339.78	27.11	27.09	0.02	27.09	1312.69	1316.28	3.59
		15-Jun-15	Accurate readings could not be determined due to the highly viscous nature of LNAPL in well							
		8-Sep-15	Accurate readings could not be determined due to the highly viscous nature of LNAPL in well							
		9-Dec-15	Not Measured							
		16-Mar-16	Not Measured							
		16-Jun-16	Not Measured							
		12-Sep-16	Not Measured							
		20-Dec-16	Not Measured							
MW-6	680691	21-Jul-03	100.71	28.75				71.96	72.71	0.75
		06-Jan-04	100.71	29.05				71.66	72.71	1.05
		02-Apr-04	100.71	29.15				71.56	72.71	1.15
		12-May-04	100.71	29.15				71.56	72.71	1.15
		26-Aug-04	100.71	28.62				72.09	72.71	0.62
		30-Dec-04	100.71	27.76				72.95	72.71	-0.24
		06-Apr-05	100.71	28.09				72.62	72.71	0.09
		26-Jun-08	100.71	28.17				72.54	72.71	0.17
		25-Nov-08	100.71	28.43				72.28	72.71	0.43
		04-Jun-09	100.71	27.60				73.11	72.71	-0.40
		26-Oct-09	1340.90	27.98				1312.92	1311.90	-1.02

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		29-Jun-10	1340.90	28.28				1312.62	1311.90	-0.72
		01-Dec-10	1340.90	27.89				1313.01	1311.90	-1.11
		01-Dec-11	1340.90	27.89				1313.01	1311.90	-1.11
		07-Jun-12	1340.90	28.53				1312.37	1311.90	-0.47
		03-Dec-12	1340.90	28.89				1312.01	1311.90	-0.11
		17-Jun-13	1340.90	28.12				1312.78	1311.90	-0.88
		18-Sep-13	1340.90	28.12				1312.78	1311.90	-0.88
		17-Dec-13	1340.90	28.52				1312.38	1311.90	-0.48
		17-Mar-14	1340.90	28.91				1311.99	1311.90	-0.09
		17-Jun-14	1340.90	28.03				1312.87	1311.90	-0.97
		3-Sep-14	1340.90	26.77				1314.13	1311.90	-2.23
		15-Dec-14	1340.90	27.69				1313.21	1311.90	-1.31
		10-Mar-15	1340.90	28.21				1312.69	1311.90	-0.79
		15-Jun-15	1340.90	28.02				1312.88	1311.90	-0.98
		8-Sep-15	1340.90	27.91				1312.99	1311.90	-1.09
		8-Dec-15	1340.90	28.08				1312.82	1311.90	-0.92
		16-Mar-16	1340.90	28.29				1312.61	1311.90	-0.71
		16-Jun-16	1340.90	28.13				1312.77	1311.90	-0.87
		12-Sep-16	1340.90	28.00				1312.90	1311.90	-1.00
		20-Dec-16	1340.90	28.42				1312.48	1311.90	-0.58
MW-7	680692	21-Jul-03	99.83	28.09				71.74	73.33	1.59
		06-Jan-04	99.83	28.34				71.49	73.33	1.84
		02-Apr-04	99.83	28.43				71.40	73.33	1.93
		12-May-04	99.83	28.46				71.37	73.33	1.96
		26-Aug-04	99.83	28.00				71.83	73.33	1.50
		30-Dec-04	99.83	27.05				72.78	73.33	0.55
		06-Apr-05	99.83	27.34				72.49	73.33	0.84
		26-Jun-08	99.83	27.15				72.68	73.33	0.65
		25-Nov-08	99.83	27.28				72.55	73.33	0.78
		04-Jun-09	99.83	26.87				72.96	73.33	0.37
		26-Oct-09	1340.03	27.24				1312.79	1313.53	0.74
		29-Jun-10	1340.03	27.61				1312.42	1313.53	1.11
		01-Dec-10	1340.03	27.21				1312.82	1313.53	0.71
		01-Dec-11	1340.03	27.11				1312.92	1313.53	0.61
		07-Jun-12	1340.03	27.80				1312.23	1313.53	1.30
		03-Dec-12	1340.03	28.16				1311.87	1313.53	1.66
		17-Jun-13	1340.03	27.39				1312.64	1313.53	0.89
		18-Sep-13	1340.03	27.42				1312.61	1313.53	0.92
		17-Dec-13	1340.03	27.80				1312.23	1313.53	1.30
		17-Mar-14	1340.03	28.16				1311.87	1313.53	1.66
		17-Jun-14	1340.03	27.40				1312.63	1313.53	0.90
		3-Sep-14	1340.03	26.01				1314.02	1313.53	-0.49
		15-Dec-14	1340.03	26.91				1313.12	1313.53	0.41
		10-Mar-15	1340.03	27.47				1312.56	1313.53	0.97
		15-Jun-15	1340.03	27.39				1312.64	1313.53	0.89
		8-Sep-15	1340.03	27.15				1312.88	1313.53	0.65
		9-Dec-15	1340.03	27.36				1312.67	1313.53	0.86
		16-Mar-16	1340.03	27.59				1312.44	1313.53	1.09
		16-Jun-16	1340.03	27.44				1312.59	1313.53	0.94
		12-Sep-16	1340.03	27.28				1312.75	1314.53	1.78
		20-Dec-16	1340.03	27.65				1312.38	1314.53	2.15
MW-8	680693	21-Jul-03	101.00	29.37				71.63	74.50	2.87
		06-Jan-04	101.00	29.70				71.30	74.50	3.20
		02-Apr-04	101.00	29.77				71.23	74.50	3.27

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		12-May-04	101.00	29.85				71.15	74.50	3.35
		26-Aug-04	101.00	29.21				71.79	74.50	2.71
		30-Dec-04	101.00	28.20				72.80	74.50	1.70
		06-Apr-05	101.00	28.54				72.46	74.50	2.04
		26-Jun-08	101.00	28.73				72.27	74.50	2.23
		25-Nov-08	101.00	28.45				72.55	74.50	1.95
		04-Jun-09	101.00	28.09				72.91	74.50	1.59
		26-Oct-09	1341.21	28.45				1312.76	1315.16	2.40
		29-Jun-10	1341.21	28.83				1312.38	1315.16	2.78
		01-Dec-10	1341.21	28.34				1312.87	1315.16	2.29
		01-Dec-11	1341.21	28.27				1312.94	1315.16	2.22
		07-Jun-12	1341.21	29.10				1312.11	1315.16	3.05
		03-Dec-12	1341.21	29.42				1311.79	1315.16	3.37
		17-Jun-13	1341.21	28.73				1312.48	1315.16	2.68
		18-Sep-13	1341.21	28.67				1312.54	1315.16	2.62
		17-Dec-13	1341.21	29.08				1312.13	1315.16	3.03
		17-Mar-14	1341.21	29.46				1311.75	1315.16	3.41
		17-Jun-14	1341.21	28.63				1312.58	1315.16	2.58
		3-Sep-14	1341.21	27.11				1314.10	1315.16	1.06
		16-Dec-14	1341.21	28.06				1313.15	1315.16	2.01
		10-Mar-15	1341.21	28.71				1312.50	1315.16	2.66
		15-Jun-15	1341.21	28.56				1312.65	1315.16	2.51
		8-Sep-15	1341.21	28.31				1312.90	1315.16	2.26
		9-Dec-15	1341.21	28.58				1312.63	1315.16	2.53
		16-Mar-16	1341.21	28.80				1312.41	1315.16	2.75
		16-Jun-16	1341.21	28.64				1312.57	1315.16	2.59
		12-Sep-16	1341.21	28.45				1312.76	1316.16	3.40
		20-Dec-16	1341.21	28.91				1312.30	1316.16	3.86
MW-9	680694	21-Jul-03	98.25	26.41				71.84	73.75	1.91
		06-Jan-04	98.25	26.79				71.46	73.75	2.29
		02-Apr-04	98.25	26.81				71.44	73.75	2.31
		12-May-04	98.25	26.91				71.34	73.75	2.41
		26-Aug-04	98.25	26.29				71.96	73.75	1.79
		30-Dec-04	98.25	25.35				72.90	73.75	0.85
		06-Apr-05	98.25	25.65				72.60	73.75	1.15
		26-Jun-08	98.25	25.83				72.42	73.75	1.33
		25-Nov-08	98.25	25.57				72.68	73.75	1.07
		04-Jun-09	98.25	25.22				73.03	73.75	0.72
		26-Oct-09	1338.45	25.59				1312.86	1314.38	1.52
		29-Jun-10	1338.45	25.94				1312.51	1314.38	1.87
		01-Dec-10	1338.45	25.49				1312.96	1314.38	1.42
		01-Dec-11	1338.45	25.45				1313.00	1314.38	1.38
		07-Jun-12	1338.45	26.14				1312.31	1314.38	2.07
		03-Dec-12	1338.45	26.55				1311.90	1314.38	2.48
		17-Jun-13	1338.45	25.83				1312.62	1314.38	1.76
		18-Sep-13	1338.45	25.80				1312.65	1314.38	1.73
		17-Dec-13	1338.45	26.18				1312.27	1314.38	2.11
		17-Mar-14	1338.45	26.59				1311.86	1314.38	2.52
		17-Jun-14	1338.45	25.70				1312.75	1314.38	1.63
		3-Sep-14	1338.45	24.29				1314.16	1314.38	0.22
		15-Dec-14	1338.45	25.23				1313.22	1314.38	1.16
		10-Mar-15	1338.45	25.84				1312.61	1314.38	1.77
		15-Jun-15	1338.45	25.64				1312.81	1314.38	1.57
		8-Sep-15	1338.45	25.36				1313.09	1314.38	1.29
		9-Dec-15	1338.45	25.70				1312.75	1314.38	1.63

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		16-Mar-16	1338.45	25.90				1312.55	1314.38	1.83
		16-Jun-16	1338.45	25.75				1312.70	1314.38	1.68
		12-Sep-16	1338.45	25.56				1312.89	1315.38	2.49
		20-Dec-16	1338.45	26.06				1312.39	1315.38	2.99
MW-10	705513	05-Jan-04	99.66	28.38				71.28	77.16	5.88
		2-Apr-04	99.66	28.30				71.36	77.16	5.80
		12-May-04	99.66	28.36				71.30	77.16	5.86
		26-Aug-04	99.66	27.76				71.90	77.16	5.26
		30-Dec-04	99.66	27.72				71.94	77.16	5.22
		06-Apr-05	99.66	27.02				72.64	77.16	4.52
		26-Jun-08	99.66	27.20				72.46	77.16	4.70
		25-Nov-08	99.66	26.94				72.72	77.16	4.44
		04-Jun-09	99.66	26.61				73.05	77.16	4.11
		26-Oct-09	1339.87	26.96				1312.91	1317.87	4.96
		29-Jun-10	1339.87	27.33				1312.54	1317.87	5.33
		01-Dec-10	1339.87	26.84				1313.03	1317.87	4.84
		01-Dec-11	1339.87	26.83				1313.04	1317.87	4.83
		07-Jun-12	1339.87	27.55				1312.32	1317.87	5.55
		03-Dec-12	1339.87	27.97				1311.90	1317.87	5.97
		17-Jun-13	1339.87	27.28				1312.59	1317.87	5.28
		19-Sep-13	1339.87	27.15				1312.72	1317.87	5.15
		19-Dec-13	1339.87	27.58				1312.29	1317.87	5.58
		17-Mar-14	1339.87	28.00				1311.87	1317.87	6.00
		17-Jun-14	1339.87	27.02				1312.85	1317.87	5.02
		3-Sep-14	1339.87	25.62				1314.25	1317.87	3.62
		16-Dec-14	1339.87	26.63				1313.24	1317.87	4.63
		10-Mar-15	1339.87	27.26				1312.61	1317.87	5.26
		16-Jun-15	1339.87	26.98				1312.89	1317.87	4.98
		8-Sep-15	1339.87	26.57				1313.30	1317.87	4.57
		9-Dec-15	1339.87	27.10				1312.77	1317.87	5.10
		16-Mar-16	1339.87	27.27				1312.60	1317.87	5.27
		16-Jun-16	1339.87	27.14				1312.73	1317.87	5.14
		12-Sep-16	1339.87	26.92				1312.95	1318.87	5.92
		20-Dec-16	1339.87	27.46				1312.41	1318.87	6.46
MW-11	705514	17-Dec-04	99.99	28.66	28.5	0.16	28.51	71.48	76.49	5.01
		05-Jan-04	99.99	29.70	28.49	1.21	28.60	71.39	76.49	5.10
		2-Apr-04	99.99	29.78	28.45	1.33	28.57	71.42	76.49	5.07
		12-May-04	99.99	29.75	28.5	1.25	28.61	71.38	76.49	5.11
		26-Aug-04	99.99	28.68	27.94	0.74	28.01	71.98	76.49	4.51
		30-Dec-04	99.99	27.60	27.06	0.54	27.11	72.88	76.49	3.61
		06-Apr-05	99.99	28.07	27.38	0.69	27.44	72.55	76.49	3.94
		26-Jun-08	99.99	27.79	27.58	0.21	27.60	72.39	76.49	4.10
		25-Nov-08	99.99	27.59	27.28	0.31	27.31	72.68	76.49	3.81
		29-Jan-09	99.99	28.20	27.32	0.88	27.40	72.59	76.49	3.90
		06-Feb-09	99.99	28.28	27.53	0.75	27.60	72.39	76.49	4.10
		04-Jun-09	99.99	27.13	26.95	0.18	26.97	73.02	76.49	3.47
		26-Oct-09	1340.18	27.65	27.30	0.35	27.33	1312.85	1316.68	3.83
		29-Jun-10	1340.18	28.13	27.62	0.51	27.67	1312.51	1316.68	4.17
		02-Dec-10	1340.18	27.50	26.61	0.89	26.69	1313.49	1316.68	3.19
		02-Dec-11	1340.18	27.68	27.02	0.66	27.08	1313.10	1316.68	3.58
		07-Jun-12	1340.18	32.50	27.7	4.80	28.13	1312.05	1316.68	4.63
		03-Dec-12	1340.18	29.31	28.09	1.22	28.20	1311.98	1316.68	4.70
		17-Jun-13	1340.18	27.63	27.5	0.13	27.51	1312.67	1316.68	4.01
		19-Dec-13	1340.18	28.73	27.81	0.92	27.89	1312.29	1316.68	4.39

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Well ID	Unique Well No.	Date	Top of Casing Elevation (ft NGVD)	Depth to Groundwater (feet)	Depth to Oil (feet)	Oil Thickness (feet)	Equivalent Depth to Groundwater * (feet)	Groundwater Elevation (ft NGVD)	Top of Screen (ft NGVD)	Top of Screen Above Groundwater (feet)
		19-Mar-14	1340.18	32.55	27.10	5.45	27.59	1312.59	1316.68	4.09
		17-Jun-14	1340.18	29.05	27.20	1.85	27.37	1312.81	1316.68	3.87
		04-Sep-14	1340.18	32.53	25.98	6.55	26.57	1313.61	1316.68	3.07
		17-Dec-14	Accurate readings could not be determined due to the highly viscous nature of LNAPL in well							
		10-Mar-15	Accurate readings could not be determined due to the highly viscous nature of LNAPL in well							
		17-Jun-15	Accurate readings could not be determined due to the highly viscous nature of LNAPL in well							
		8-Sep-15	Accurate readings could not be determined due to the highly viscous nature of LNAPL in well							
		9-Dec-15	Not Measured							
		16-Mar-16	Not Measured							
		16-Jun-16	Not Measured							
		12-Sep-16	Not Measured							
		20-Dec-16	Not Measured							
MW-13	705516	05-Jan-04	101.02	29.92	29.52	0.40	29.58	71.44	74.52	3.08
		2-Apr-04	101.02	30.57	29.53	1.04	29.68	71.34	74.52	3.18
		12-May-04	101.02	31.22	29.59	1.63	29.83	71.19	74.52	3.33
		26-Aug-04	101.02	29.20	29.07	0.13	29.09	71.93	74.52	2.59
		30-Dec-04	101.02	28.20	28.11	0.09	28.12	72.90	74.52	1.62
		06-Apr-05	101.02	28.80	28.38	0.42	28.44	72.58	74.52	1.94
		26-Jun-08	101.02	28.70	28.62	0.08	28.63	72.39	74.52	2.13
		25-Nov-08	101.02	28.35	28.35	0.00	28.35	72.67	74.52	1.85
		06-Feb-09	101.02	28.62	28.61	0.01	28.61	72.41	74.52	2.11
		04-Jun-09	101.02	28.01	28.01	0.00	28.01	73.01	74.52	1.51
		26-Oct-09	1341.23	28.42	28.35	0.07	28.36	1312.87	1314.73	1.86
		29-Jun-10	1341.23	28.84	28.72	0.12	28.74	1312.49	1314.73	2.24
		02-Dec-10	1341.23	28.27	28.23	0.04	28.24	1312.99	1314.73	1.74
		02-Dec-11	1341.23	28.13	28.13	0.00	28.13	1313.10	1314.73	1.63
		07-Jun-12	1341.23	29.00	28.88	0.12	28.90	1312.33	1314.73	2.40
		03-Dec-12	1341.23	30.08	29.23	0.85	29.36	1311.87	1314.73	2.86
		17-Jun-13	1341.23	28.61	28.59	0.02	28.59	1312.64	1314.73	2.09
		19-Dec-13	1341.23	32.09	28.84	3.25	29.32	1311.91	1314.73	2.82
		19-Mar-14	1341.23	30.45	29.26	1.19	29.44	1311.79	1314.73	2.94
		17-Jun-14	1341.23	30.69	28.23	2.46	28.59	1312.64	1314.73	2.09
		04-Sep-14	1341.23	27.63	26.92	0.71	27.02	1314.21	1314.73	0.52
		17-Dec-14	Accurate readings could not be determined due to the presence of LNAPL in well							
		10-Mar-15	Accurate readings could not be determined due to the presence of LNAPL and Ice in well							
		17-Jun-15	1341.23	28.25	NA	0.00	28.25	1312.98	1314.73	1.75
		8-Sep-15	1341.23	28.49	28.50	0.01	28.48	1312.75	1314.73	1.98
		9-Dec-15	Not Measured							
		16-Mar-16	Not Measured							
		16-Jun-16	Not Measured							
		12-Sep-16	Not Measured							
		20-Dec-16	Not Measured							
MW-14		26-Jun-08	98.73	26.93				71.80		
		25-Nov-08		25.99				72.74		
		04-Jun-09		26.31				72.42		
			WELL ABANDONED							
MW-15		26-Jun-08	99.35	26.27				73.08	65.68	7.40
		25-Nov-08	99.35	26.66				72.69	65.68	7.01
		04-Jun-09	99.35	25.64				73.71	65.68	8.03
		26-Oct-09	1339.61	26.70				1312.91	1305.94	6.97
		29-Jun-10	1339.61	27.05				1312.56	1305.94	6.62
		01-Dec-10	1339.61	not collected				-	-	-
		01-Dec-11	1339.61	26.54				1313.07	1305.94	7.13

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Well ID	Unique Well No.	Date	Top of Casing Elevation (ft NGVD)	Depth to Groundwater (feet)	Depth to Oil (feet)	Oil Thickness (feet)	Equivalent Depth to Groundwater * (feet)	Groundwater Elevation (ft NGVD)	Top of Screen (ft NGVD)	Top of Screen Above Groundwater (feet)
		07-Jun-12	1339.61	27.20				1312.41	1305.94	6.47
		03-Dec-12	1339.61	27.72				1311.89	1305.94	5.95
		17-Jun-13	1339.61	27.00				1312.61	1305.94	6.67
		16-Dec-13	1339.61	27.32				1312.29	1305.94	6.35
		17-Mar-14	1339.61	27.77				1311.84	1305.94	5.90
		17-Jun-14	1339.61	26.67				1312.94	1305.94	7.00
		25-Jun-14	WELL ABANDONED							
MW-16A		29-Jun-10	1338.97	26.70				1312.27	1315.47	3.20
		01-Dec-10	1338.97	26.20				1312.77	1315.47	2.70
		01-Dec-11	1338.97	26.15				1312.82	1315.47	2.65
		07-Jun-12	1338.97	26.92				1312.05	1315.47	3.42
		03-Dec-12	1338.97	27.28				1311.69	1315.47	3.78
		17-Jun-13	1338.97	25.60				1313.37	1315.47	2.10
		19-Sep-13	1338.97	26.52				1312.45	1315.47	3.02
		17-Dec-13	1338.97	26.92				1312.05	1315.47	3.42
		17-Mar-14	1338.97	27.33				1311.64	1315.47	3.83
		17-Jun-14	1338.97	26.44				1312.53	1315.47	2.94
		3-Sep-14	1338.97	25.03				1313.94	1315.47	1.53
		16-Dec-14	1338.97	25.90				1313.07	1315.47	2.40
		10-Mar-15	1338.97	26.55				1312.42	1315.47	3.05
		15-Jun-15	1338.97	26.42				1312.55	1315.47	2.92
		8-Sep-15	1338.97	26.25				1312.72	1315.47	2.75
		9-Dec-15	1338.97	26.44				1312.53	1315.47	2.94
		16-Mar-16	1338.97	26.66				1312.31	1315.47	3.16
		16-Jun-16	1338.97	26.49				1312.48	1315.47	2.99
		12-Sep-16	1338.97	26.35				1312.62	1316.47	3.85
		20-Dec-16	1338.97	26.77				1312.20	1316.47	4.27
MW-16B		29-Jun-10	1339.52	27.26				1312.26	1301.02	-11.24
		01-Dec-10	1339.52	26.78				1312.74	1301.02	-11.72
		01-Dec-11	1339.52	26.71				1312.81	1301.02	-11.79
		07-Jun-12	1339.52	27.50				1312.02	1301.02	-10.24
		03-Dec-12	1339.52	27.82				1311.70	1301.02	-10.68
		17-Jun-13	1339.52	27.10				1312.42	1301.02	-11.40
		19-Sep-13	1339.52	27.12				1312.40	1301.02	-11.38
		17-Dec-13	1339.52	27.47				1312.05	1301.02	-11.03
		17-Mar-14	1339.52	27.86				1311.66	1301.02	-10.64
		17-Jun-14	1339.52	26.98				1312.54	1301.02	-11.52
		3-Sep-14	1339.52	25.63				1313.89	1301.02	-12.87
		16-Dec-14	1339.52	26.49				1313.03	1301.02	-12.01
		10-Mar-15	1339.52	27.12				1312.40	1301.02	-11.38
		15-Jun-15	1339.52	26.98				1312.54	1301.02	-11.52
		8-Sep-15	1339.52	26.80				1312.72	1301.02	-11.70
		9-Dec-15	1339.52	27.01				1312.51	1301.02	-11.49
		16-Mar-16	1339.52	27.23				1312.29	1301.02	-11.27
		16-Jun-16	1339.52	27.05				1312.47	1301.02	-11.45
		12-Sep-16	1339.52	26.91				1312.61	1302.02	-10.59
		20-Dec-16	1339.52	27.33				1312.19	1302.02	-10.17
MW-17		29-Jun-10	1338.79	26.56				1312.23	1315.29	3.06
		01-Dec-10	1338.79	26.08				1312.71	1315.29	2.58
		01-Dec-11	1338.79	26.00				1312.79	1315.29	2.50
		07-Jun-12	1338.79	26.80				1311.99	1315.29	3.30
		03-Dec-12	1338.79	27.11				1311.68	1315.29	3.61
		17-Jun-13	1338.79	26.41				1312.38	1315.29	2.91

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		18-Sep-13	1338.79	26.37				1312.42	1315.29	2.87
		17-Dec-13	1338.79	26.74				1312.05	1315.29	3.24
		17-Mar-14	1338.79	27.17				1311.62	1315.29	3.67
		17-Jun-14	1338.79	26.35				1312.44	1315.29	2.85
		3-Sep-14	1338.79	24.89				1313.90	1315.29	1.39
		15-Dec-14	1338.79	25.76				1313.03	1315.29	2.26
		10-Mar-15	1338.79	26.40				1312.39	1315.29	2.90
		15-Jun-15	1338.79	26.31				1312.48	1315.29	2.81
		8-Sep-15	1338.79	26.09				1312.70	1315.29	2.59
		9-Dec-15	1338.79	26.29				1312.50	1315.29	2.79
		16-Mar-16	1338.79	26.52				1312.27	1315.29	3.02
		16-Jun-16	1338.79	26.35				1312.44	1315.29	2.85
		12-Sep-16	1338.79	26.21				1312.58	1316.29	3.71
		20-Dec-16	1338.79	26.63				1312.16	1316.29	4.13
MW-18		29-Jun-10	1340.29	27.92				1312.37	1316.79	4.42
		01-Dec-10	1340.29	27.41				1312.88	1316.79	3.91
		01-Dec-11	1340.29	27.35				1312.94	1316.79	3.85
		07-Jun-12	1340.29	28.15				1312.14	1316.79	4.65
		03-Dec-12	1340.29	28.50				1311.79	1316.79	5.00
		17-Jun-13	1340.29	27.78				1312.51	1316.79	4.28
		19-Sep-13	1340.29	27.75				1312.54	1316.79	4.25
		17-Dec-13	1340.29	28.13				1312.16	1316.79	4.63
		17-Mar-14	1340.29	28.55				1311.74	1316.79	5.05
		17-Jun-14	1340.29	27.65				1312.64	1316.79	4.15
		3-Sep-14	1340.29	26.24				1314.05	1316.79	2.74
		16-Dec-14	1340.29	27.12				1313.17	1316.79	3.62
		10-Mar-15	1340.29	27.76				1312.53	1316.79	4.26
		15-Jun-15	1340.29	27.63				1312.66	1316.79	4.13
		8-Sep-15	1340.29	27.46				1312.83	1316.79	3.96
		9-Dec-15	1340.29	27.67				1312.62	1316.79	4.17
		16-Mar-16	1340.29	27.88				1312.41	1316.79	4.38
		16-Jun-16	1340.29	27.70				1312.59	1316.79	4.20
		12-Sep-16	1340.29	27.56				1312.73	1317.79	5.06
		20-Dec-16	1340.29	28.02				1312.27	1317.79	5.52
MW-19		29-Jun-10	1334.72	22.54				1312.18	1315.22	3.04
		01-Dec-10	1334.72	22.03				1312.69	1315.22	2.53
		01-Dec-11	1334.72	21.97				1312.75	1315.22	2.47
		07-Jun-12	1334.72	22.76				1311.96	1315.22	4.04
		03-Dec-12	1334.72	23.10				1311.62	1315.22	3.60
		17-Jun-13	1334.72	22.37				1312.35	1315.22	2.87
		18-Sep-13	1334.72	22.37				1312.35	1315.22	2.87
		17-Dec-13	1334.72	22.77				1311.95	1315.22	3.27
		17-Mar-14	1334.72	23.15				1311.57	1315.22	3.65
		17-Jun-14	1334.72	23.24				1311.48	1315.22	3.74
		3-Sep-14	1334.72	20.90				1313.82	1315.22	1.40
		15-Dec-14	1334.72	21.74				1312.98	1315.22	2.24
		10-Mar-15	1334.72	22.37				1312.35	1315.22	2.87
		15-Jun-15	1334.72	22.28				1312.44	1315.22	2.78
		8-Sep-15	1334.72	22.08				1312.64	1315.22	2.58
		9-Dec-15	1334.72	22.28				1312.44	1315.22	2.78
		16-Mar-16	1334.72	22.50				1312.22	1315.22	3.00
		16-Jun-16	1334.72	22.32				1312.40	1315.22	2.82
		12-Sep-16	1334.72	22.21				1312.51	1316.22	3.71
		20-Dec-16	1334.72	22.58				1312.14	1316.22	4.08

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MW-20		15-Oct-13	1340.06	25.30				1314.76	1317.22	2.46
		18-Dec-13	1340.06	28.11				1311.95	1317.22	5.27
		17-Mar-14	1340.06	28.51				1311.55	1317.22	5.67
		17-Jun-14	1340.06	27.60				1312.46	1317.22	4.76
		3-Sep-14	1340.06	26.22				1313.84	1317.22	3.38
		16-Dec-14	1340.06	27.07				1312.99	1317.22	4.23
		10-Mar-15	1340.06	27.73				1312.33	1317.22	4.89
		15-Jun-15	1340.06	27.60				1312.46	1317.22	4.76
		8-Sep-15	1340.06	27.44				1312.62	1317.22	4.60
		9-Dec-15	1340.06	27.62				1312.44	1317.22	4.78
		16-Mar-16	1340.06	27.84				1312.22	1317.22	5.00
		16-Jun-16	1340.06	27.65				1312.41	1317.22	4.81
		12-Sep-16	1340.06	27.55				1312.51	1318.22	5.71
		20-Dec-16	1340.06	27.96				1312.10	1318.22	6.12
MW-21		18-Dec-13	1337.70	25.72				1311.98	1318.90	6.92
		17-Mar-14	1337.70	28.14				1309.56	1318.90	9.34
		17-Jun-14	1337.70	25.32				1312.38	1318.90	6.52
		3-Sep-14	1337.70	23.84				1313.86	1318.90	5.04
		15-Dec-14	1337.70	24.70				1313.00	1318.90	5.90
		10-Mar-15	1337.70	25.34				1312.36	1318.90	6.54
		15-Jun-15	1337.70	25.23				1312.47	1318.90	6.43
		8-Sep-15	1337.70	25.07				1312.63	1318.90	6.27
		9-Dec-15	1337.70	25.23				1312.47	1318.90	6.43
		16-Mar-16	1337.70	25.47				1312.23	1318.90	6.67
		16-Jun-16	1337.70	25.28				1312.42	1318.90	6.48
		12-Sep-16	1337.70	25.17				1312.53	1319.90	7.37
		20-Dec-16	1337.70	25.57				1312.13	1319.90	7.77
MW-22		18-Dec-13	1333.64	21.70				1311.94	1318.24	6.30
		17-Mar-14	1333.64	22.10				1311.54	1318.24	6.70
		17-Jun-14	1333.64	21.20				1312.44	1318.24	5.80
		3-Sep-14	1333.64	19.88				1313.76	1318.24	4.48
		15-Dec-14	1333.64	20.72				1312.92	1318.24	5.32
		10-Mar-15	1333.64	21.34				1312.30	1318.24	5.94
		15-Jun-15	1333.64	21.24				1312.40	1318.24	5.84
		8-Sep-15	1333.64	21.06				1312.58	1318.24	5.66
		8-Dec-15	1333.64	21.22				1312.42	1318.24	5.82
		17-Mar-16	1333.64	21.50				1312.14	1318.24	6.10
		16-Jun-16	1333.64	21.30				1312.34	1318.24	5.90
		12-Sep-16	1333.64	21.16				1312.48	1319.24	6.76
		20-Dec-16	1333.64	21.56				1312.08	1319.24	7.16
MW-23		12-Sep-16	1337.18	24.20				1312.98	1327.20	14.22
		20-Dec-16	1337.13	24.76	24.74	0.02	24.74	1312.44	1327.15	14.71
USGS 1A		26-Oct-09	1341.60	28.78				1312.82	1312.60	-0.22
		29-Jun-10	1341.60	29.15				1312.45	1312.60	0.15
		02-Dec-10	1341.60	28.70				1312.90	1312.60	-0.30
		01-Dec-11	1341.60	28.64				1312.96	1312.60	-0.36
		07-Jun-12	1341.60	29.38				1312.22	1312.60	0.38
		03-Dec-12	1341.60	29.77				1311.83	1312.60	0.77
		17-Jun-13	1341.60	29.07				1312.53	1312.60	0.07
		19-Sep-13	1341.60	28.96				1312.64	1312.60	-0.04
		17-Dec-13	1341.60	29.39				1312.21	1312.60	0.39

Table 1
South Cass Lake Station Groundwater Monitoring Results
Enbridge Energy, Limited Partnership

Well ID	Unique Well No.	Date	Top of Casing Elevation (ft NGVD)	Depth to Groundwater (feet)	Depth to Oil (feet)	Oil Thickness (feet)	Equivalent Depth to Groundwater * (feet)	Groundwater Elevation (ft NGVD)	Top of Screen (ft NGVD)	Top of Screen Above Groundwater (feet)
		17-Mar-14	1341.60	29.82				1311.78	1312.60	0.82
		17-Jun-14	1341.60	28.91				1312.69	1312.60	-0.09
		3-Sep-14	1341.60	27.45				1314.15	1312.60	-1.55
		16-Dec-14	1341.60	28.40				1313.20	1312.60	-0.60
		10-Mar-15	1341.60	29.05				1312.55	1312.60	0.05
		15-Jun-15	1341.60	28.86				1312.74	1312.60	-0.14
		8-Sep-15	1341.60	28.54				1313.06	1312.60	-0.46
		9-Dec-15	1341.60	29.73				1311.87	1312.60	0.73
		17-Mar-16	1341.60	29.10				1312.50	1312.60	0.10
		16-Jun-16	1341.60	28.95				1312.65	1312.60	-0.05
		12-Sep-16	1341.60	28.76				1312.84	1313.60	0.76
		20-Dec-16	1341.60	29.27				1312.33	1313.60	1.27
USGS 2A		26-Oct-09	1342.37	29.60				1312.77	1311.97	-0.80
		29-Jun-10	1342.37	29.97				1312.40	1311.97	-0.43
		02-Dec-10	1342.37	29.49				1312.88	1311.97	-0.91
		01-Dec-11	1342.37	29.42				1312.95	1311.97	-0.98
		07-Jun-12	1342.37	30.18				1312.19	1311.97	-0.22
		03-Dec-12	1342.37	30.57				1311.80	1311.97	0.17
		17-Jun-13	1342.37	29.89				1312.48	1311.97	-0.51
		19-Sep-13	1342.37	29.74				1312.63	1311.97	-0.66
		17-Dec-13	1342.37	30.23				1312.14	1311.97	-0.17
		17-Mar-14	1342.37	30.64				1311.73	1311.97	0.24
		17-Jun-14	1342.37	29.75				1312.62	1311.97	-0.65
		3-Sep-14	1342.37	28.28				1314.09	1311.97	-2.12
		16-Dec-14	1342.37	29.22				1313.15	1311.97	-1.18
		10-Mar-15	1342.37	29.84				1312.53	1311.97	-0.56
		15-Jun-15	1342.37	29.70				1312.67	1311.97	-0.70
		8-Sep-15	1342.37	29.42				1312.95	1311.97	-0.98
		9-Dec-15	1342.37	28.91				1313.46	1311.97	-1.49
		17-Mar-16	1342.37	29.95				1312.42	1311.97	-0.45
		16-Jun-16	1342.37	29.79				1312.58	1311.97	-0.61
		12-Sep-16	1342.37	29.61				1312.76	1312.97	0.21
		20-Dec-16	1342.37	30.07				1312.30	1312.97	0.67
USGS 3A		26-Oct-09	1341.26	28.54				1312.72	1311.92	-0.80
		29-Jun-10	1341.26	28.93				1312.33	1311.92	-0.41
		02-Dec-10	1341.26	28.44				1312.82	1311.92	-0.90
		01-Dec-11	1341.26	28.36				1312.90	1311.92	-0.98
		07-Jun-12	1341.26	29.13				1312.13	1311.92	-0.21
		03-Dec-12	1341.26	29.51				1311.75	1311.92	0.17
		17-Jun-13	1341.26	28.82				1312.44	1311.92	-0.52
		19-Sep-13	1341.26	28.76				1312.50	1311.92	-0.58
		17-Dec-13	1341.26	29.18				1312.08	1311.92	-0.16
		17-Mar-14	1341.26	29.57				1311.69	1311.92	0.23
		17-Jun-14	1341.26	28.70				1312.56	1311.92	-0.64
		3-Sep-14	1341.26	27.24				1314.02	1311.92	-2.10
		16-Dec-14	1341.26	28.16				1313.10	1311.92	-1.18
		10-Mar-15	1341.26	28.81				1312.45	1311.92	-0.53
		15-Jun-15	1341.26	28.64				1312.62	1311.92	-0.70
		8-Sep-15	1341.26	28.40				1312.86	1311.92	-0.94
		9-Dec-15	1341.26	28.69				1312.57	1311.92	-0.65
		17-Mar-16	1341.26	28.92				1312.34	1311.92	-0.42
		16-Jun-16	1341.26	28.80				1312.46	1311.92	-0.54
		12-Sep-16	1341.26	28.55				1312.71	1312.92	0.21
		20-Dec-16	1341.26	29.03				1312.23	1312.92	0.69

Table 1
South Cass Lake Station Groundwater Monitoring Results
Enbridge Energy, Limited Partnership

Well ID	Unique Well No.	Date	Top of Casing Elevation (ft NGVD)	Depth to Groundwater (feet)	Depth to Oil (feet)	Oil Thickness (feet)	Equivalent Depth to Groundwater * (feet)	Groundwater Elevation (ft NGVD)	Top of Screen (ft NGVD)	Top of Screen Above Groundwater (feet)
USGS 4A		26-Oct-09	1339.63	26.95				1312.68	1311.49	-1.19
		29-Jun-10	1339.63	27.32				1312.31	1311.49	-0.82
		02-Dec-10	1339.63	26.85				1312.78	1311.49	-1.29
		01-Dec-11	1339.63	26.76				1312.87	1311.49	-1.38
		07-Jun-12	1339.63	27.53				1312.10	1311.49	-0.61
		03-Dec-12	1339.63	27.90				1311.73	1311.49	-0.24
		17-Jun-13	1339.63	27.22				1312.41	1311.49	-0.92
		19-Sep-13	1339.63	27.10				1312.53	1311.49	-1.04
		16-Dec-13	1339.63	27.56				1312.07	1311.49	-0.58
		17-Mar-14	1339.63	27.98				1311.65	1311.49	-0.16
		17-Jun-14	1339.63	27.12				1312.51	1311.49	-1.02
		3-Sep-14	1339.63	25.62				1314.01	1311.49	-2.52
		16-Dec-14	1339.63	26.58				1313.05	1311.49	-1.56
		10-Mar-15	1339.63	27.18				1312.45	1311.49	-0.96
		15-Jun-15	1339.63	27.08				1312.55	1311.49	-1.06
		8-Sep-15	1339.63	26.86				1312.77	1311.49	-1.28
		9-Dec-16	1339.63	27.11				1312.52	1311.49	-1.03
		17-Mar-16	1339.63	27.33				1312.30	1311.49	-0.81
		16-Jun-16	1339.63	27.15				1312.48	1310.49	-1.99
		12-Sep-16	1339.63	27.00				1312.63	1311.49	-1.14
		20-Dec-16	1339.63	27.42				1312.21	1311.49	-0.72

Notes: NGVD - National Geodetic Vertical Datum

* Assumed specific gravity for oil = 0.9105

** A re-survey was conducted in August 2009 to tie in the Enbridge and USGS monitoring wells to a common benchmark (MNDOT). Prior to that, top of inner casing elevations were based on an assumed inner casing elevation of 100.00 at monitoring well MW-1.

*** In June 2010, monitoring wells MW-16A, -16B, -17, -18, and -19 were surveyed by NREC. The wells were tied into a known elevation from monitoring well USGS-4A.

Table 2
Vertical Groundwater Gradient Table
South Cass Lake

Table 2

South Cass Lake Station Groundwater Monitoring Results
Enbridge Energy, Limited Partnership

Monitoring Well	Measured Date	Top of Casing Elevation (TOC) - feet above msl	Depth to Water (feet below TOC)	GW Elevation (feet above msl)	Top of Screen Elevation (feet above msl)	Bottom Screen Elevation (feet above msl)	Top of Screen Depth (feet)	Mid Point Elevation (middle) (feet above msl)	Screen Length (feet)	Vertical Gradient	Vertical Flow Direction
MW-16A	3/10/2015	1338.97	26.55	1312.42	1315.47	1305.47	21	1310.47	10	0.0014	Down
MW-16B		1339.52	27.12	1312.40	1301.02	1291.02	36	1296.02	10		
MW-16A	6/15/2015	1338.97	26.42	1312.55	1315.47	1305.47	21	1310.47	10	0.0007	Down
MW-16B		1339.52	26.98	1312.54	1301.02	1291.02	36	1296.02	10		
MW-16A	9/9/2015	1338.97	26.25	1312.72	1315.47	1305.47	21	1310.47	10	0.0000	None
MW-16B		1339.52	26.80	1312.72	1301.02	1291.02	36	1296.02	10		
MW-16A	12/8/2015	1338.97	26.44	1312.53	1315.47	1305.47	21	1310.47	10	0.0014	Down
MW-16B		1339.52	27.01	1312.51	1301.02	1291.02	36	1296.02	10		
MW-16A	3/16/2016	1338.97	26.66	1312.31	1315.47	1305.47	21	1310.47	10	0.0014	Down
MW-16B		1339.52	27.23	1312.29	1301.02	1291.02	36	1296.02	10		
MW-16A	6/16/2016	1338.97	26.49	1312.48	1315.47	1305.47	21	1310.47	10	0.0007	Down
MW-16B		1339.52	27.05	1312.47	1301.02	1291.02	36	1296.02	10		
MW-16A	9/15/2016	1338.97	26.35	1312.62	1315.47	1305.47	21	1310.47	10	0.0007	Down
MW-16B		1339.52	26.91	1312.61	1301.02	1291.02	36	1296.02	10		
MW-16A	12/20/2016	1338.97	26.77	1312.20	1315.47	1305.47	21	1310.47	10	0.0007	Down
MW-16B		1339.52	27.33	1312.19	1301.02	1291.02	36	1296.02	10		

Vertical Gradient (DH/DL) = (difference in head elevation)/(vertical difference in screened intervals) $(H_2-H_1)/(Z_2-Z_1)$

Flow Direction: If the shallow well has a higher head (higher groundwater elevation), the vertical gradient is downward and conversely, if the shallow well has a lower head (lower groundwater elevation), the vertical gradient is upward

MSL: mean sea level

Table 3
South Cass Lake Station Groundwater Sampling Results
Enbridge Energy, Limited Partnership

Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO C10-C32 (ug/L)	ERDRO C10-36 (ug/L)
MW-1	6/6/2001	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	7/16/2003	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	1/6/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 110	NA
	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	< 100	NA
	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	< 100	NA
	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	91.6	NA
	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	< 23.1	NA
	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5	NA
	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 76.9	NA
	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	157	NA
	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 100	< 100
	6/13/2012	< 1.0	< 1.0	< 1.0	< 3.0		120	140
	12/3/2012	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 100	110
	9/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	12/16/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 100	NA
	3/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	9/3/2014	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	12/15/2014	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	3/10/2015	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	6/15/2015	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	9/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		< 100	NA
	12/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/12/2016	NS						
	12/20/2016	NS						
MW-2	6/6/2001	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	7/16/2003	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	1/6/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	140	NA
	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	114	NA
	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	242	NA
	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	159	NA
	10/26/2009	NS						
MW-4	6/6/2001	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	7/16/2003	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	1/6/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	< 100	NA
	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	276	NA

Table 3
South Cass Lake Station Groundwater Sampling Results
Enbridge Energy, Limited Partnership

Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO C10-C32 (ug/L)	ERDRO C10-36 (ug/L)
	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	137	NA
	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	<23.1	NA
	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5	NA
	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5	NA
	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5	NA
	12/1/2011	< 1.0	2.1	< 1.0	< 3.0		110	120
	6/13/2012	< 1.0	1.2	< 1.0	< 3.0		< 100	< 100
	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	6/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 100	<100
	9/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 100	NA
	12/16/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 100	NA
	3/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	9/3/2014	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	12/15/2014	< 1.0	< 1.0	< 1.0	< 3.0		210	NA
	3/10/2015	< 1.0	< 1.0	< 1.0	< 3.0		520	NA
	6/15/2015	< 1.0	< 1.0	< 1.0	< 3.0		190	NA
	9/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	12/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/12/2016	NS						
	12/20/2016	NS						
MW-6	7/16/2003	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	1/6/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	130	NA
	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	188	NA
	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	128	NA
	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	209	NA
	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	<23.1	NA
	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5	NA
	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 76.9	NA
	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	290	NA
	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 110	< 110
	6/12/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 100	110
	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 100	NA
	6/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		120	150
	9/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		150	NA
	12/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		110	NA
	3/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		< 100	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		< 100	NA
	9/3/2014	< 1.0	< 1.0	< 1.0	< 3.0		< 100	NA
	12/15/2014	< 1.0	< 1.0	< 1.0	< 3.0		< 100	NA
	3/10/2015	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	6/15/2015	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	9/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	12/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/12/2016	NS						
	12/20/2016	NS						

Table 3
South Cass Lake Station Groundwater Sampling Results
Enbridge Energy, Limited Partnership

Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO C10-C32 (ug/L)	ERDRO C10-36 (ug/L)
MW-7	7/16/2003	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	1/6/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	118	NA
	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	< 100	NA
	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	134	NA
	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	<23.1	NA
	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5	NA
	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 76.9	NA
	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	180	NA
	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 110	< 110
	6/12/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 100	110
	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	6/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		<100	110
	9/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	12/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	3/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/3/2014	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	12/15/2014	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	3/10/2015	< 1.0	< 1.0	< 1.0	< 3.0		110	NA
	6/15/2015	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	9/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	12/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/12/2016	NS						
	12/20/2016	NS						
MW-8	7/16/2003	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	1/6/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	150	NA
	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	149	NA
	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	< 100	NA
	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	143	NA
	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	<23.1	NA
	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5	NA
	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	114	NA
	6/14/2011	273	< 1.0	< 1.0	< 2.0	< 1.0	2,050	NA
	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		110	120
	6/12/2012	< 1.0	< 1.0	< 1.0	< 3.0		150	200
	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		110	NA
	6/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		210	250
	9/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	12/16/2013	<1.0	<1.0	<1.0	< 3.0		<110	NA
	3/17/2014	<1.0	<1.0	<1.0	< 3.0		<110	NA
	6/17/2014	<1.0	<1.0	<1.0	< 3.0		<110	NA
	9/3/2014	<1.0	<1.0	<1.0	< 3.0		<100	NA

Table 3
South Cass Lake Station Groundwater Sampling Results
Enbridge Energy, Limited Partnership

Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO C10-C32 (ug/L)	ERDRO C10-36 (ug/L)
	12/16/2014	<1.0	<1.0	<1.0	< 3.0		<110	NA
	3/11/2015	<1.0	<1.0	<1.0	< 3.0		<110	NA
	6/15/2015	<1.0	<1.0	<1.0	< 3.0		<100	NA
	9/8/2015	<1.0	<1.0	<1.0	< 3.0		110	NA
	12/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/12/2016	< 1.0	< 1.0	< 1.0	< 3.0		150	NA
	12/20/2016	< 1.0	< 1.0	< 1.0	< 3.0		130	140
MW-9	7/16/2003	0.51	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	1/6/2004	<1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	210	NA
	12/30/2004	7.5	3.7	< 1.0	< 2.0	< 1.0	260	NA
	4/6/2005	18	< 1.0	< 1.0	< 2.0	< 1.0	230	NA
	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	101	NA
	11/25/2008	25.7	2.6	< 0.36	< 0.74	< 0.36	364	NA
	6/4/2009	132	< 1.0	< 1.0	< 2.0	< 1.0	1,860	NA
	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	831	NA
	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5	NA
	12/1/2010	573	95.4	< 5.0	18.1	< 5.0	3,690	NA
	6/14/2011	573	7.0	< 5.0	< 10.0	< 5.0	3,460	NA
	12/1/2011	500	5.5	2.7	< 3.0		2,100	2,200
	6/13/2012	48.9	< 1.0	< 1.0	< 3.0		1,800	1,900
	12/7/2012	3.9	< 1.0	< 1.0	< 3.0		630	NA
	6/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		190	230
	9/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 100	NA
	12/16/2013	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/3/2014	702	1.6	< 1.0	< 3.0		5,700	NA
	12/15/2014	213	<1.0	< 1.0	< 3.0		4,800	NA
	3/10/2015	103	<1.0	< 1.0	< 3.0		2,500	NA
	6/15/2015	326	<1.0	< 1.0	< 3.0		2,700	NA
	9/8/2015	240	<1.0	< 1.0	< 3.0		5,000	NA
	12/9/2015	13	< 1.0	< 1.0	< 3.0		7,300	NA
	3/16/2016	135	< 1.0	< 1.0	< 3.0		6,000	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		1,500	NA
	9/12/2016	248	4.3	< 1.0	3.6		33,800	NA
	12/20/2016	70.2	< 1.0	< 1.0	< 3.0		14,600	15,300
MW-9 Duplicate	12/1/2011	498	4.8	2.5	< 6.0		3,400	3,600
MW-10	1/5/2004	1,100	110	<5.0	520	<5.0	30,000	NA
	5/12/2004	2,100	210	< 10	350	< 10	6,500	NA
	8/26/2004	2,600	240	< 25	180	< 25	7,800	NA
	12/30/2004	1,400	160	< 10	61	< 10	6,500	NA
	4/6/2005	1,100	220	< 10	62	< 10	6,500	NA
	6/26/2008	1,830	44.2	< 3.6	< 7.4	< 3.6	9,000	NA
	11/25/2008	595	18.1	< 0.71	3.3	< 0.72	65,900	NA
	6/4/2009	305	15	<1.0	3.4	<1.0	50,800	NA
	10/26/2009	159	5.6	< 0.36	3	< 0.36	22,400	NA
	6/29/2010	2,180	< 25.0	< 25.0	< 50.0	< 25.0	33,700	NA
	12/1/2010	193	4.8	< 1.0	10.5	< 1.0	28,100	NA

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Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO C10-C32 (ug/L)	ERDRO C10-36 (ug/L)
	6/14/2011	35.2	< 2.0	< 2.0	< 4.0	< 2.0	15,500	NA
	12/1/2011	38.3	1.6	4.4	4.1		4,300	4,600
	6/13/2012	103	1.2	3.2	3.4		5,300	5,500
	12/6/2012	653	1.7	< 1.0	< 3.0		7,400	NA
	6/19/2013	1,880	6.3	< 5.0	<15.0		13,400	14,000
	9/19/2013	2,100	36.1	< 20.0	< 60.0		9,300	NA
	12/19/2013	1,390	36.2	< 5.0	<15.0		9,200	NA
	3/19/2014	713	23.7	< 5.0	<15.0		5,400	NA
	6/18/2014	1,180	15.2	< 5.0	<15.0		9,300	NA
	9/3/2014	128	16.7	< 1.0	< 3.0		2,800	NA
	12/16/2014	57.4	15.2	< 1.0	< 3.0		7,600	NA
	3/11/2015	23.8	11.8	< 1.0	< 3.0		6,900	NA
	6/16/2015	128.0	5.5	< 1.0	5.6		6,400	NA
	9/8/2015	31.1	33.5	< 1.0	16.7		5,200	NA
	12/9/2015	12.4	10.5	< 1.0	< 3.0		6,000	NA
	3/16/2016	24.4	3.4				21,200	NA
	6/16/2016	14.6	1.9	< 1.0	< 3.0		17,900	NA
	9/12/2016	10.7	< 1.0	< 1.0	< 3.0		7,700	NA
	12/20/2016	3.6	1.8	< 1.0	< 3.0		25,200	26,700
MW-10 Duplicate	6/13/2012	81.2	1.8	2.8	3.1		500	5.2
	12/6/2012	579.0	1.9	1	< 3.0		7,700	NA
	6/19/2013	1,550	5.2	< 1.0	< 3.0		13,400	14,000
	9/19/2013	1,850	39.9	< 1.0	< 3.0		9,000	NA
	12/19/2013	1,360	34.7	< 5.0	<15.0		9,700	NA
	3/19/2014	699	22	< 2.0	< 6.0		6,600	NA
	6/18/2014	1,130	13.6	< 2.0	<15.0		9,800	NA
	9/3/2014	170	29.9	< 1.0	4.3		470	NA
	12/16/2014	66.8	17.4	< 1.0	< 3.0		7,200	NA
	3/11/2015	20.7	11.8	< 1.0	3.2		6,900	NA
	6/16/2015	125.0	5.3	< 1.0	5.3		6,200	NA
	9/8/2015	26.3	34.9	< 1.0	16.3		5,900	NA
	12/9/2015	11.8	9.6	< 1.0	< 3.0		6,600	NA
	3/16/2016	26	3.6	< 1.0	< 3.0		20,800	NA
	6/16/2016	14.8	2	< 1.0	< 3.0		17,900	NA
	9/12/2016	8.7	3.6	< 1.0	< 3.0		5,200	NA
	12/20/2016	3.9	1.7	< 1.0	< 3.0		26,400	26,500
MW-15	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 110	< 110
	6/13/2012	< 1.0	< 1.0	< 1.0	< 3.0		<100	110
	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	6/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 100	< 100
	9/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	12/16/2013	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	3/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/25/2014	WELL ABANDONED						
MW-16A	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	234	NA
	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	1,150	NA
	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	413	NA
	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		220	240
	6/12/2012	< 1.0	< 1.0	< 1.0	< 3.0		640	710
	12/5/2012	59.8	< 1.0	< 1.0	< 3.0		1,000	NA
	6/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		950	1,000

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Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO C10-C32 (ug/L)	ERDRO C10-36 (ug/L)
	9/19/2013	< 1.0	< 1.0	< 1.0	< 3.0		650	NA
	12/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		270	NA
	3/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		120	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		110	NA
	9/3/2014	1.3	< 1.0	< 1.0	< 3.0		970	NA
	12/16/2014	< 1.0	< 1.0	< 1.0	< 3.0		1,200	NA
	3/10/2015	< 1.0	< 1.0	< 1.0	< 3.0		1,200	NA
	6/15/2015	< 1.0	< 1.0	< 1.0	< 3.0		1,300	NA
	9/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		1,900	NA
	12/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		1,900	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		2,600	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		1,600	NA
	9/12/2016	2.6	< 1.0	< 1.0	< 3.0		2,600	NA
	12/20/2016	< 1.0	< 1.0	< 1.0	< 3.0		2,200	2,300
MW-16B	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	1,310	NA
	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	9,470	NA
	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	2,790	NA
	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		530	590
	6/12/2012	< 1.0	< 1.0	< 1.0	< 3.0		200	230
	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		250	NA
	6/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		200	240
	9/19/2013	< 1.0	< 1.0	< 1.0	< 3.0		510	NA
	12/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		320	NA
	3/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		140	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		160	NA
	9/3/2014	< 1.0	< 1.0	< 1.0	< 3.0		490	NA
	12/16/2014	2.3	< 1.0	< 1.0	< 3.0		1,000	NA
	3/10/2015	< 1.0	< 1.0	< 1.0	< 3.0		1,000	NA
	6/16/2015	< 1.0	< 1.0	< 1.0	< 3.0		830	NA
	9/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		740	NA
	12/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		680	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		580	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		540	NA
	9/12/2016	< 1.0	< 1.0	< 1.0	< 3.0		1,000	NA
	12/20/2016	< 1.0	< 1.0	< 1.0	< 3.0		760	900
MW-17	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	75.7	NA
	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 76.2	NA
	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	184	NA
	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 110	110
	6/12/2012	< 1.0	< 1.0	< 1.0	< 3.0		110	140
	12/6/2012	< 1.0	< 1.0	< 1.0	< 3.0		170	NA
	6/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		120	160
	9/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	12/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		150	NA
	3/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		< 100	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		< 100	NA
	9/3/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	12/16/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/10/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/16/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	12/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA

Table 3
South Cass Lake Station Groundwater Sampling Results
Enbridge Energy, Limited Partnership

Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO C10-C32 (ug/L)	ERDRO C10-36 (ug/L)
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/12/2016	NS						
	12/20/2016	NS						
MW-18	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 77.7	NA
	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5	NA
	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	134	NA
	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 110	< 110
	6/12/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 100	130
	12/6/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 100	NA
	6/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 100	110
	9/19/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 100	NA
	12/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	6/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/3/2014	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	12/16/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/10/2015	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	6/15/2015	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	9/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	12/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		180	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/12/2016	NS						
	12/20/2016	NS						
MW-19	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	347	NA
	12/1/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	843	NA
	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	608	NA
	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 110	< 110
	6/12/2012	< 1.0	< 1.0	< 1.0	< 3.0		180	210
	12/6/2012	< 1.0	< 1.0	< 1.0	< 3.0		370	NA
	6/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		360	420
	9/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		290	NA
	12/19/2013	< 1.0	< 1.0	< 1.0	< 3.0		190	NA
	3/19/2014	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		100	NA
	9/3/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	12/15/2014	< 1.0	< 1.0	< 1.0	< 3.0		190	NA
	3/10/2015	< 1.0	< 1.0	< 1.0	< 3.0		290	NA
	6/15/2015	< 1.0	< 1.0	< 1.0	< 3.0		270	NA
	9/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		700	NA
	12/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		540	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		780	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		880	NA
	9/12/2016	< 1.0	< 1.0	< 1.0	< 3.0		680	NA
	12/20/2016	< 1.0	< 1.0	< 1.0	< 3.0		560	590
MW-20	12/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/3/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	12/16/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/11/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/16/2015	< 1.0	< 1.0	< 1.0	< 3.0		<120	NA

Table 3
South Cass Lake Station Groundwater Sampling Results
Enbridge Energy, Limited Partnership

Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO C10-C32 (ug/L)	ERDRO C10-36 (ug/L)
	9/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	12/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/12/2016	NS						
	12/20/2016	NS						
MW-21	12/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		320	NA
	3/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		280	NA
	6/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		230	NA
	9/3/2014	< 1.0	< 1.0	< 1.0	< 3.0		490	NA
	12/15/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/10/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/15/2015	< 1.0	< 1.0	< 1.0	< 3.0		150	NA
	9/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	12/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/12/2016	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	12/20/2016	< 1.0	< 1.0	< 1.0	< 3.0		110	120
MW-22	12/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	3/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	6/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/3/2014	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	12/15/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/10/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/15/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		230	NA
	12/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		340	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		240	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		180	NA
	9/12/2016	< 1.0	< 1.0	< 1.0	< 3.0		490	NA
	12/20/2016	< 1.0	< 1.0	< 1.0	< 3.0		320	340
MW-23	9/12/2016	278	48	< 1.0	43.7		38,000	NA
	12/20/2016	Not sampled due to the presence of LNAPL in well.						
USGS 1A	10/26/2009	776	142	< 1.8	< 3.7	< 1.8	4,930	NA
	6/29/2010	39.7	< 1.0	< 1.0	< 2.0	< 1.0	2,990	NA
	12/2/2010	791	< 10.0	< 10.0	< 20.0	< 10.0	5,370	NA
	6/14/2011	1,590	< 10.0	< 10.0	< 20.0	< 10.0	5,410	NA
	12/1/2011	67.8	1.2	3.2	< 3.0		2,700	2,900
	6/13/2012	6.4	< 1.0	1.0	< 3.0		1,500	1,600
	12/6/2012	5.4	< 1.0	1.0	< 3.0		1,000	NA
	6/18/2013	< 1.0	< 1.0	<1.0	< 3.0		310	370
	9/19/2013	< 1.0	< 1.0	<1.0	< 3.0		110	NA
	12/17/2013	< 1.0	< 1.0	<1.0	< 3.0		<110	NA
	3/18/2014	< 1.0	< 1.0	<1.0	< 3.0		<100	NA
	6/18/2014	< 1.0	< 1.0	<1.0	< 3.0		<110	NA
	9/3/2014	684	12.2	<1.0	< 3.0		8,200	NA
	12/16/2014	258	< 2.0	< 2.0	< 6.0		8,500	NA
	3/11/2015	30.5	< 1.0	<1.0	< 3.0		4,900	NA
	6/16/2015	120	< 1.0	<1.0	< 3.0		2,900	NA
	9/9/2015	474	24.2	<1.0	8.6		11,700	NA

Table 3
South Cass Lake Station Groundwater Sampling Results
Enbridge Energy, Limited Partnership

Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO C10-C32 (ug/L)	ERDRO C10-36 (ug/L)
	12/9/2015	247	< 1.0	< 1.0	< 3.0		11,900	NA
	3/17/2016	10	< 1.0	< 1.0	< 3.0		6,900	NA
	6/16/2016	1.7	< 1.0	< 1.0	< 3.0		2,900	NA
	9/12/2016	37.8	1.8	< 1.0	< 3.0		20,900	NA
	12/20/2016	49.8	< 1.0	< 1.0	< 3.0		19,900	20,700
USGS 2A	10/26/2009	705	< 2.0	< 1.8	< 3.7	< 1.8	5,520	NA
	6/29/2010	63.5	< 1.0	< 1.0	< 2.0	< 1.0	2,150	NA
	12/2/2010	239	< 1.0	< 1.0	< 2.0	< 1.0	3,370	NA
	6/14/2011	81.7	< 1.0	< 1.0	< 2.0	< 1.0	2,670	NA
	12/1/2011	21.1	< 1.0	1.4	< 3.0		1,200	1,300
	6/13/2012	282	< 1.0	1.6	< 3.0		2,400	2,500
	12/6/2012	554	< 1.0	1	< 3.0		4,900	NA
	6/18/2013	21.1	< 1.0	< 1.0	< 3.0		2,300	2,400
	9/19/2013	< 1.0	< 1.0	< 1.0	< 3.0		290	NA
	12/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		270	NA
	3/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		760	NA
	9/3/2014	52.0	< 1.0	< 1.0	< 3.0		4,600	NA
	12/16/2014	9.5	< 1.0	< 1.0	< 3.0		3,400	NA
	3/11/2015	22.3	< 1.0	< 1.0	< 3.0		4,900	NA
	6/16/2015	137.0	< 1.0	< 1.0	< 3.0		3,700	NA
	9/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		4,300	NA
	12/9/2015	1.2	< 1.0	< 1.0	< 3.0		4,000	NA
	3/17/2016	201	< 1.0	< 1.0	< 3.0		16,400	NA
	6/16/2016	33	< 1.0	< 1.0	< 3.0		3,700	NA
	9/12/2016	3.1	< 1.0	< 1.0	< 3.0		9,000	NA
	12/20/2016	11.2	< 1.0	< 1.0	< 3.0		7,300	7,600
USGS 3A	10/26/2009	147	0.74	< 0.36	1.5	< 0.36	4,060	NA
	6/29/2010	202	< 1.0	< 1.0	< 2.0	< 1.0	2,470	NA
	12/2/2010	6.2	< 1.0	< 1.0	< 2.0	< 1.0	1,810	NA
	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	1,420	NA
	12/1/2011	< 1.0	< 1.0	1.1	< 3.0		810	870
	6/13/2012	14.7	< 1.0	1	< 3.0		1,900	2,000
	12/6/2012	1	< 1.0	1	< 3.0		2,200	NA
	6/18/2013	20.5	< 1.0	< 1.0	< 3.0		3,200	3,300
	9/19/2013	< 1.0	< 1.0	< 1.0	< 3.0		1,200	NA
	12/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		500	NA
	3/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		190	NA
	6/17/2014	2.8	< 1.0	< 1.0	< 3.0		190	NA
	9/3/2014	7.7	< 1.0	< 1.0	< 3.0		4,800	NA
	12/16/2014	< 1.0	< 1.0	< 1.0	< 3.0		2,500	NA
	3/11/2015	< 1.0	< 1.0	< 1.0	< 3.0		1,900	NA
	6/16/2015	3.7	< 1.0	< 1.0	< 3.0		3,200	NA
	9/9/2015	4.5	< 1.0	< 1.0	< 3.0		4,600	NA
	12/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		2,200	NA
	3/17/2016	< 1.0	< 1.0	< 1.0	< 3.0		2,500	NA
	6/16/2016	3.8	< 1.0	< 1.0	< 3.0		4,700	NA
	9/12/2016	2.5	< 1.0	< 1.0	< 3.0		7,900	NA
	12/20/2016	< 1.0	< 1.0	< 1.0	< 3.0		1,900	2,000
USGS 4A	10/26/2009	13.8	< 0.40	< 0.36	< 0.74	< 0.36	1,670	NA
	6/29/2010	44.8	< 1.0	< 1.0	< 2.0	< 1.0	4,130	NA
	12/2/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	2,010	NA

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Enbridge Energy, Limited Partnership

Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO C10-C32 (ug/L)	ERDRO C10-36 (ug/L)
	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	2,420	NA
	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		440	470
	6/13/2012	< 1.0	< 1.0	< 1.0	< 3.0		720	770
	12/6/2012	7.2	< 1.0	< 1.0	< 3.0		1,700	NA
	6/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		1,500	1,600
	9/19/2013	< 1.0	< 1.0	< 1.0	< 3.0		490	NA
	12/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		120	NA
	3/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		700	NA
	9/3/2014	4.2	< 1.0	< 1.0	< 3.0		2,100	NA
	12/16/2014	< 1.0	< 1.0	< 1.0	< 3.0		780	NA
	3/11/2015	< 1.0	< 1.0	< 1.0	< 3.0		1,000	NA
	6/16/2015	< 1.0	< 1.0	< 1.0	< 3.0		2,200	NA
	9/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		1,900	NA
	12/9/2015	< 1.0	< 1.0	< 1.0	< 3.0		2,400	NA
	3/17/2016	< 1.0	< 1.0	< 1.0	< 3.0		1,700	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		2,200	NA
	9/12/2016	5	< 1.0	< 1.0	< 3.0		5,100	NA
	12/20/2016	< 1.0	< 1.0	< 1.0	< 3.0		3,100	3,300
SCDW	9/21/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 300	NA
	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 330	NA
	6/25/2012							
	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/17/2013	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	9/18/2013	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	12/19/2013	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	3/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/3/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	12/16/2014	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	3/11/2015	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	6/15/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	12/8/2016	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	9/12/2016	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	12/20/2016	< 1.0	< 1.0	< 1.0	< 3.0		<100	<100
Field Blank	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 100	NA
	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	< 100	NA
	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	< 100	NA
	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	106	NA
	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	NA	NA
	6/29/2010	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5	NA
	12/1/2010						389	NA
	6/14/2011	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 75.5	NA
	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		< 300	NA
	6/13/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 330	NA
	12/5/2012	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	6/19/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	9/19/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA
	12/19/2013	< 1.0	< 1.0	< 1.0	< 3.0		< 110	NA

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Location	Date	Benzene (ug/l)	Ethylbenzene (ug/l)	Toluene (ug/l)	Xylenes, -m, -p (ug/L)	Xylenes, -o (ug/L)	ERDRO C10-C32 (ug/L)	ERDRO C10-36 (ug/L)
	3/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	9/3/2014	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	12/16/2014	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	3/11/2015	< 1.0	< 1.0	< 1.0	< 3.0		<110	NA
	6/15/2015	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	9/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	12/8/2016	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		<100	NA
	9/12/2016	< 1.0	< 1.0	< 1.0	< 3.0		<100	<100
Trip Blank	7/16/2003	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	NS	NA
	1/6/2004	Froze during the sampling event.						
	5/12/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	NS	NA
	8/26/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	NS	NA
	12/30/2004	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	NS	NA
	4/6/2005	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	NS	NA
	6/26/2008	< 0.14	< 0.40	< 0.36	< 0.74	< 0.36	NS	NA
	11/25/2008	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	NS	NA
	6/4/2009	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	NS	NA
	10/26/2009	< 0.23	< 0.40	< 0.36	< 0.74	< 0.36	NS	NA
	12/1/2011	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	6/13/2012	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	6/19/2013	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	9/19/2013	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	12/19/2013	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	3/18/2014	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	6/17/2014	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	9/3/2014	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	12/16/2014	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	3/10/2015	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	6/15/2015	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	9/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	12/8/2015	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	3/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	6/16/2016	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA
	9/12/2016	< 1.0	< 1.0	< 1.0	< 3.0		NS	NA

Notes: NS = No sample collected

NA= Not Analyzed

During the December 2011- December 2016 sampling events, xylenes were reported as xylene (total).

110/<100* : Indicates sample was analyzed for ERDRO/ ERDRO C10-C32 with silica gel cleanup

110/<100** : Indicates sample was analyzed for ERDRO/ ERDRO C10-C28 with silica gel cleanup

Table 4
South Cass Lake Station Biodegradation Evaluation Results
Enbridge Energy, Limited Partnership

Location	Collection Date	Nitrogen (mg/L)	Sulfate (mg/L)	Methane (ug/L)	ORP (mV)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Fe^{+2} (mg/L)
MW-1	7/16/2003						5.40	<0.1
	1/6/2004	2.1	6.3				5.20	<0.1
	5/12/2004						5.00	<0.1
	8/26/2004	0.69	< 4.0	< 10			7.00	<0.1
	12/30/2004	0.81	< 4.0	< 10			6.50	<0.1
	4/6/2005	0.58	< 4.0	< 10			6.00	<0.1
	11/25/2008	0.62	3.6	4.9			11.35	516
	10/26/2009	0.2	3.3	< 0.93			11.82	0.024
	12/1/2010	0.61	< 4.0	< 2.8			11.06	< 0.12
	12/1/2011	< 0.10	< 2.5	< 10	210.8	0.381	9.90	NM
	6/13/2012	0.42	< 2.5	< 6.6	218.0	0.224	6.12	NM
	12/3/2012	1.2	< 2.5	<6.6	127.5	0.408	15.09	NM
	6/17/2013	0.72	< 2.5	< 6.6	24.3	0.211	12.36	NM
	9/18/2013	0.23	< 2.5	< 6.6	24.3	0.211	12.36	NM
	12/16/2013	0.28	< 2.5	<6.6	269.1	0.204	13.63	NM
	3/17/2014	0.36	< 2.5	<6.6	118.8	0.340	14.42	NM
	6/17/2014	0.62	< 2.5	<6.6	121.7	0.207	9.97	NM
	9/3/2014	0.39	3.6	<6.6	71.4	0.224	13.54	NM
	12/15/2014	0.39	<2.5	<6.6	291.7	0.326	12.94	NM
	3/10/2015	0.23	3.0	<6.6	181.1	0.236	9.30	NM
	6/15/2015	0.47	< 2.5	< 10	149.6	0.267	10.64	NM
	9/8/2015	0.47	< 2.5	< 10	150.1	0.255	10.35	NM
	12/8/2015	0.76	< 2.5	< 10				NM
	3/16/2016	0.54	< 2.5	< 10	5.8	0.720	0.30	NM
	6/16/2016	0.28	< 2.5	< 10	92.3	0.308	9.68	NM
	9/13/2016	Not Sampled						
	12/20/2016	Not Sampled						
MW-2	7/16/2003						4.10	<0.1
	1/6/2004	4.1	< 4.0				4.50	<0.1
	5/12/2004						4.30	<0.1
	11/25/2008	9.7	9.8	< 2.0			7.00	1.52
	10/26/2009	WELL REMOVED due to new construction						
MW-4	7/16/2003						3.80	<0.1
	1/6/2004	1	< 4.0				5.50	<0.1
	5/12/2004						5.70	<0.1
	11/25/2008	5.8	6.3	< 2.0			7.70	2.12
	10/26/2009	6.2	6.6	< 0.93			10.57	< 0.018
	12/1/2010	4.8	5.9	< 2.8			9.78	< 0.05
	12/1/2011	< 0.10	6.1	< 10	217.7	0.505	8.64	NM
	6/13/2012	3.9	5.3	< 6.6	195.8	0.324	3.13	NM
	12/5/2012	3	4.5	< 6.6	138.8	0.585	8.26	NM
	6/17/2013	1.6	2.5	< 6.6	97.1	0.403	9.85	NM
	9/18/2013	2.3	4.0	< 6.6	97.1	0.403	9.85	NM
	12/16/2013	1.7	<2.5	<6.6	157.4	0.316	9.86	NM
	3/17/2014	2.4	2.6	<6.6	-3.7	0.412	13.70	NM
	6/17/2014	1.8	3.1	<6.6	53.9	0.323	12.14	NM
	9/3/2014	3.4	4.3	<6.6	79.9	0.345	12.11	NM
	12/15/2014	4.3	9.3	<6.6	120.8	0.510	12.35	NM
	3/10/2015	3.7	8.7	<6.6	49.1	0.331	7.74	NM
	6/15/2015	2.9	< 2.5	< 10	75.3	0.332	7.61	NM
	9/8/2015	2.4	3.6	< 10	138.2	0.367	7.79	NM
	12/8/2015	2.5	5.5	< 10				NM
	3/16/2016	1.4	4.0	< 10	338.4	0.407	8.29	NM
	6/16/2016	1.6	< 2.5	< 10	121.0	0.459	8.05	NM
	9/13/2016	Not Sampled						

Table 4
South Cass Lake Station Biodegradation Evaluation Results
Enbridge Energy, Limited Partnership

Location	Collection Date	Nitrogen (mg/L)	Sulfate (mg/L)	Methane (ug/L)	ORP (mV)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Fe^{+2} (mg/L)
	12/20/2016	Not Sampled						
MW-6	7/16/2003						2.00	<0.1
	1/6/2004	1.9	5.4				2.60	<0.1
	5/12/2004						2.20	<0.1
	11/25/2008	2.8	7.0	4.2			9.30	22.9
	10/26/2009	2	5.9	< 0.93			11.35	< 0.018
	12/1/2010	1.8	4.9	< 2.8			10.70	< 0.12
	12/1/2011	< 0.10	3.3	< 10	221.5	0.366	9.72	NM
	6/12/2012	2.6	3.6	< 6.6	115.2	0.279	9.05	NM
	12/5/2012	2.3	3.2	< 6.6	92.1	0.362	8.97	NM
	6/17/2013	1.3	3.7	< 6.6	73.4	0.353	12.31	NM
	9/18/2013	1.4	5.7	< 6.6	73.4	0.353	12.31	NM
	12/17/2013	0.97	5.6	<6.6	160.2	0.655	9.68	NM
	3/17/2014	0.84	5.1	<6.6	-101.8	0.396	8.75	NM
	6/17/2014	0.9	6.2	<6.6	73.4	0.456	9.26	NM
	9/3/2014	3.3	5.3	<6.6	37.7	0.277	11.02	NM
	12/15/2014	3.4	3.8	<6.6	188.5	0.401	No Data	NM
	3/10/2015	3.2	4.5	<6.6	179.9	0.278	11.00	NM
	6/15/2015	4.3	4.1	< 10	143.7	0.287	8.78	NM
	9/8/2015	3.8	4.7	< 10	232.6	0.275	11.16	NM
	12/8/2015	3.4	4.9	< 10				NM
	3/16/2016	3.3	5.2	<10.0	159.8	0.322	8.99	NM
	6/16/2016	2.9	5.8	<10.0	334.6	0.434	7.39	NM
	9/13/2016	Not Sampled						
	12/20/2016	Not Sampled						
MW-7	7/16/2003						3.40	<0.1
	1/6/2004	< 0.25	5.7				4.30	<0.1
	5/12/2004						5.50	<0.1
	11/25/2008	0.46	8.3	< 2.0			8.70	9.2
	10/26/2009	0.61	7.8	< 0.93			11.45	< 0.018
	12/1/2010	1.1	7.6	< 2.8			9.29	< 0.05
	12/1/2011	< 0.10	5.6	< 10	247.6	0.430	9.40	NM
	6/12/2012	0.18	5.5	< 6.6	107.5	0.281	3.14	NM
	12/5/2012	0.14	6.4	< 6.6	158.6	0.643	6.92	NM
	6/17/2013	0.14	5.3	< 6.6	79.1	0.303	12.06	NM
	9/18/2013	0.15	7.4	< 6.6	79.1	0.303	12.06	NM
	12/17/2013	<0.10	13.3	< 6.6	11.9	0.381	12.09	NM
	3/17/2014	0.14	5.5	< 6.6	-106.7	0.407	10.69	NM
	6/17/2014	<0.10	15.5	< 6.6	23.6	0.270	12.44	NM
	9/3/2014	0.21	6.0	<6.6	53.7	0.265	11.31	NM
	12/15/2014	0.49	5.1	<6.6	111.1	0.405	No Data	NM
	3/10/2015	0.36	5.3	<6.6	110.9	0.271	13.29	NM
	6/15/2015	0.36	6.1	< 10	107.3	0.252	9.19	NM
	9/8/2015	0.28	7.8	< 10	220.1	0.300	9.99	NM
	12/9/2015	0.21	6.6	< 10				NM
	3/16/2016	0.23	6.5	< 10	214.8	0.359	8.59	NM
	6/16/2016	0.22	5.6	< 10	264.0	0.395	9.85	NM
	9/13/2016	Not Sampled						
	12/20/2016	Not Sampled						
MW-8	7/16/2003						2.50	<0.1
	1/6/2004	0.34	5.5				2.80	<0.1
	5/12/2004						2.00	<0.1
	8/26/2004	0.31	5.2	< 10			6.00	<0.1
	12/30/2004	< 0.25	7.5	< 10			5.00	<0.1
	4/6/2005	< 0.25	11.0	< 10			5.00	<0.1

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Enbridge Energy, Limited Partnership

Location	Collection Date	Nitrogen (mg/L)	Sulfate (mg/L)	Methane (ug/L)	ORP (mV)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Fe^{+2} (mg/L)
	11/25/2008	0.26	9.5	< 2.0			8.30	22.2
	10/26/2009	0.33	10.0	< 0.93			12.75	< 0.018
	12/1/2010	< 0.40	7.4	< 2.8			8.90	< 0.05
	12/1/2011	< 0.10	5.0	< 10	NM	NM	NM	NM
	6/12/2012	0.1	7.3	< 6.6	149.3	0.343	1.91	NM
	12/5/2012	0.11	7.2	< 6.6	73.9	0.430	11.15	NM
	6/18/2013	< 0.10	6.0	< 6.6	188.0	0.767	7.20	NM
	9/18/2013	0.11	7.7	< 6.6	188.0	0.767	7.20	NM
	12/17/2013	<0.10	10.7	<6.6	-216.0	0.468	8.00	NM
	3/17/2014	0.13	9.1	<6.6	-125.4	0.512	8.04	NM
	6/17/2014	<0.10	8.7	<6.6	49.3	0.375	5.73	NM
	9/3/2014	0.2	11.2	<6.6	18.3	0.274	10.20	NM
	12/16/2014	0.53	6.7	<6.6	102.0	0.256	12.70	NM
	3/11/2015	0.22	8.4	<6.6	1.6	0.266	9.22	NM
	6/15/2015	0.24	9.8	< 10	120.9	0.280	8.50	NM
	9/8/2015	0.15	7.8	< 10	80.5	0.365	8.92	NM
	12/9/2015	0.17	7.2	< 10				NM
	3/16/2016	0.14	7.2	< 10	94.6	0.456	9.12	NM
	6/16/2016	<0.10	7.7	< 10	267.8	0.499	8.12	NM
	9/13/2016	<0.10	5.9	< 10	217.0	0.380	10.22	NM
	12/20/2016	0.16	5.4	< 10	223.3	0.539	7.97	NM
MW-9	7/16/2003						2.80	<0.1
	1/6/2004	< 0.25	6.3				2.00	<0.1
	5/12/2004						1.50	<0.1
	8/26/2004	< 0.25	7.2	< 10			1.50	<0.1
	12/30/2004	< 0.25	< 4.0	1800			2.00	<0.1
	4/6/2005	< 0.25	4.7	280			2.00	<0.1
	11/25/2008	0.19	4.0	968			2.52	39.8
	10/26/2009	< 0.20	4.6	543			5.73	0.021
	12/1/2010	< 0.40	< 4.0	3590			0.87	0.09
	12/1/2011	< 0.10	< 2.5	8710	-132.3	NM	0.70	NM
	6/13/2012	< 0.10	< 2.5	1460	-0.2	0.514	1.14	NM
	12/7/2012	<0.10	< 2.5	359	-55.4	0.562	0.70	NM
	6/18/2013	< 0.10	4.6	15.2	-53.0	0.793	1.30	NM
	9/18/2013	< 0.10	4.9	< 6.6	-53.0	0.793	1.30	NM
	12/17/2013	< 0.10	4.1	< 6.6	-51.3	0.501	0.43	NM
	3/17/2014	< 0.10	6.0	< 6.6	-198.8	0.472	0.80	NM
	6/17/2014	< 0.10	5.8	7.1	-74.8	0.333	0.94	NM
	9/3/2014	<0.10	3.2	3920	-12.6	0.550	5.17	NM
	12/15/2014	0.19	15.2	5290	-26.2	No Data	No Data	NM
	3/10/2015	<0.10	6.9	3350	-54.3	0.572	0.74	NM
	6/15/2015	<0.10	< 2.5	918	-71.0	0.581	0.30	NM
	9/8/2015	<0.10	< 2.5	6940	-33.9	0.475	0.33	NM
	12/9/2015	<0.10	< 2.5	3650				
	3/16/2016	<0.10	5.4	1830	-78.8	0.618	0.34	NM
	6/16/2016	<0.10	5.6	1830	-20.2	0.563	0.43	NM
	9/13/2016	<0.10	5.1	11200	-88.8	0.701	0.20	NM
	12/20/2016	<0.10	< 2.5	2360	211.6	0.566	0.86	NM
MW-9 Duplicate	12/1/2011	< 0.10	< 2.5	8830	NM	NM	NM	NM
MW-10	1/5/2004	< 0.25	< 4.0				1.50	<0.1
	5/12/2004						1.00	<0.1
	8/26/2004	< 0.25	< 4.0	4900			0.80	<0.1
	12/30/2004	2.9	4.2	6100			1.00	<0.1
	4/6/2005	0.51	< 4.0	2600			1.50	<0.1
	11/25/2008	1.1	3.3	2290			2.70	54.8

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Location	Collection Date	Nitrogen (mg/L)	Sulfate (mg/L)	Methane (ug/L)	ORP (mV)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Fe^{+2} (mg/L)
	10/26/2009	0.3	2.9	5100			2.50	1.3
	12/1/2010	2.4	4.3	7030			0.72	5.1
	12/1/2011	< 0.10	< 2.5	3720	-56.0		0.30	NM
	6/13/2012	< 0.10	< 2.5	5470	-36.6	0.656	0.08	NM
	12/6/2012	< 0.10	< 2.5	6900	-80.2	1.291	1.11	NM
	6/19/2013	< 0.10	< 2.5	14000	-71.3	1.462	0.87	NM
	9/19/2013	< 0.10	< 2.5	9500	-71.3	1.462	0.87	NM
	12/19/2013	< 0.10	< 2.5	11500	-80.6	0.844	0.41	NM
	3/19/2014	< 0.10	< 2.5	5640	29.9	1.117	5.32	NM
	6/17/2014	< 0.10	< 2.5	4960	-77.3	1.038	0.82	NM
	9/3/2014	2.0	8.1	874	-35.2	0.819	2.53	NM
	12/16/2014	1.5	< 2.5	3890	-54.8	0.722	1.42	NM
	3/11/2015	< 0.10	< 2.5	5080	-82.4	0.661	0.60	NM
	6/15/2015	< 0.10	< 2.5	4230	-75.8	0.637	0.32	NM
	9/8/2015	< 0.10	< 2.5	4730	-58.4	0.649	0.46	NM
	12/9/2015	< 0.10	< 2.5	4270				NM
	3/16/2016	< 0.10	< 2.5	6870	5.8	0.720	0.30	NM
	6/16/2016	< 0.10	< 2.5	6410	-47.7	0.830	1.23	NM
	9/12/2016	1.3	4.7	5260	-70.0	0.700	0.25	NM
	12/20/2016	0.12	< 2.5	12300	-43.7	0.773	0.39	NM
MW-10 Duplicate	6/13/2012	< 0.10	< 2.5	3950				
	12/6/2012	< 0.10	<2.5	3030	NM	NM	NM	NM
	6/19/2013	< 0.10	< 2.5	11600	NM	NM	NM	NM
	9/19/2013	< 0.10	< 2.5	8820	NM	NM	NM	NM
	12/19/2013	< 0.10	3.0	11500	NM	NM	NM	NM
	3/19/2014	< 0.10	<2.5	5800	NM	NM	NM	NM
	6/17/2014	< 0.10	27.9	3190	NM	NM	NM	NM
	9/3/2014	1.5	2.9	696	NM	NM	NM	NM
	12/16/2014	1.7	< 2.5	3580	NM	NM	NM	NM
	3/11/2015	< 0.10	< 2.5	4090	NM	NM	NM	NM
	6/15/2015	< 0.10	< 2.5	3950	NM	NM	NM	NM
	9/8/2015	< 0.10	< 2.5	4900	NM	NM	NM	NM
	12/9/2015	< 0.10	< 2.5	3100	NM	NM	NM	NM
	3/16/2016	< 0.10	< 2.5	5540	NM	NM	NM	NM
	6/16/2016	< 0.10	< 2.5	6630	NM	NM	NM	NM
	9/12/2016	1.4	< 2.5	5220	NM	NM	NM	NM
	12/20/2016	0.12	< 2.5	1140	NM	NM	NM	NM
MW-15	12/1/2011	< 0.10	< 2.5	< 10	202.7	0.328	9.50	NM
	6/13/2012	2	< 2.5	< 6.6	80.8	0.224	4.20	NM
	12/5/2012	3.4	< 2.5	331	100.6	0.431	9.57	NM
	6/17/2013	2.2	2.6	< 6.6	72.7	0.258	10.81	NM
	9/18/2013	1.7	< 2.5	< 6.6	72.7	0.258	10.81	NM
	12/16/2013	2.5	<2.5	<6.6	172.5	0.275	11.89	NM
	3/17/2014	2.8	2.9	<6.6	-15.3	0.360	13.53	NM
	6/17/2014	2.2	2.8	<6.6	17.6	0.239	9.70	NM
	6/25/2014	WELL ABANDONED						
MW-16A	12/1/2010	< 0.40	< 4.0	528			1.41	0.09
	12/1/2011	< 0.10	3.1	81	-178.2	0.540	2.32	NM
	6/12/2012	< 0.10	3.1	20.5	107.5	0.372	0.66	NM
	12/5/2012	< 0.10	< 2.5	297	48.0	0.479	1.88	NM
	6/18/2013	< 0.10	5.2	58.2	31.6	0.747	1.97	NM
	9/19/2013	< 0.10	6.8	15.4	31.6	0.747	1.97	NM
	12/17/2013	<0.10	9.4	7.4	39.1	0.842	1.02	NM
	3/18/2014	<0.10	8.4	<6.6	-131.7	0.554	4.04	NM
	6/17/2014	<0.10	8.6	9.9	16.9	0.547	2.25	NM

Table 4
South Cass Lake Station Biodegradation Evaluation Results
Enbridge Energy, Limited Partnership

Location	Collection Date	Nitrogen (mg/L)	Sulfate (mg/L)	Methane (ug/L)	ORP (mV)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Fe^{+2} (mg/L)
	9/3/2014	<0.10	3.7	71	42.3	0.441	5.62	NM
	12/16/2014	0.32	3.6	243	81.3	0.582	No Data	NM
	3/10/2015	< 0.10	3.8	78.4	104.6	0.432	0.71	NM
	6/15/2015	< 0.10	< 2.5	30.4	68.5	0.414	0.24	NM
	9/9/2015	< 0.10	< 2.5	151	88.3	0.650	0.58	NM
	12/9/2015	< 0.10	< 2.5	151				NM
	3/16/2016	< 0.10	< 2.5	81.7	1.5	0.714	0.34	NM
	6/16/2016	< 0.10	< 2.5	17.2	-3.4	0.672	0.23	NM
	9/12/2016	< 0.10	< 2.5	< 10.0	70.6	0.592	0.22	NM
	12/20/2016	0.1	< 2.5	514	98.6	0.659	0.26	NM
MW-16B	12/1/2010	< 0.40	< 4.0	9.5			0.64	< 0.05
	12/1/2011	< 0.10	7.8	< 10	-143.0	0.620	1.50	NM
	6/12/2012	1.2	9.6	7.4	-8.8	0.417	0.83	NM
	12/5/2012	1.1	11.3	7.9	-34.3	0.503	0.49	NM
	6/18/2013	0.75	9.5	< 6.6	-24.1	0.757	1.05	NM
	9/19/2013	0.76	8.6	19.1	-24.1	0.757	1.05	NM
	12/17/2013	0.42	7.9	24.1	-69.1	0.879	1.58	NM
	3/18/2014	0.88	8.3	7.7	-139.4	0.573	1.45	NM
	6/17/2014	0.6	13.6	10.5	13.0	0.557	0.21	NM
	9/3/2014	0.48	9.2	15.4	17.5	0.442	2.57	NM
	12/16/2014	0.44	6.8	202	52.5	0.621	No Data	NM
	3/10/2015	0.18	7.1	< 6.6	-23.2	0.456	0.46	NM
	6/16/2015	0.2	6.5	72.9	-27.3	0.492	0.24	NM
	9/9/2015	0.46	8.7	56.8	78.0	0.640	0.46	NM
	12/9/2015	0.28	7.6	29.4				NM
	3/16/2016	0.19	7.5	34.4	-75.0	0.546	0.22	NM
	6/16/2016	0.33	8.4	< 10.0	-57.2	0.613	0.08	NM
	9/12/2016	0.32	7.6	< 10.0	77.6	0.597	0.16	NM
	12/20/2016	0.15	6.1	48	-27.0	0.659	1.31	NM
MW-17	12/1/2010	< 0.40	9.5	6.9			8.16	<0.12
	12/1/2011	< 0.10	5.6	< 10	256.0	0.503	7.93	NM
	6/12/2012	0.11	9.4	< 6.6	170.4	0.341	10.06	NM
	12/6/2012	< 0.10	8.5	< 6.6	81.9	0.699	5.99	NM
	6/17/2013	< 0.10	7.4	< 6.6	53.8	0.415	6.46	NM
	9/18/2013	0.13	9.6	< 6.6				
	12/17/2013	0.44	10.2	NM	-32.3	0.380	4.79	NM
	3/18/2014	0.11	10.2	< 6.6	-10.0	0.410	9.23	NM
	6/17/2014	< 0.10	10.7	< 6.6	42.7	0.443	8.68	NM
	9/3/2014	0.25	13.9	<6.6	67.6	0.268	13.95	NM
	12/16/2014	0.5	9.8	<6.6	113.2	0.352	No Data	NM
	3/10/2015	0.28	10.0	<6.6	160.3	0.274	10.56	NM
	6/16/2015	0.31	12.2	< 10	115.6	0.318	9.70	NM
	9/8/2015	0.44	8.3	< 10	53.9	0.373	10.17	NM
	12/9/2015	0.28	8.6	< 10				NM
	3/16/2016	0.21	8.8	< 10	112.7	0.416	9.32	NM
	6/16/2016	0.18	9.6	< 10	149.7	0.359	9.09	NM
	9/13/2016	Not Sampled						
	12/20/2016	Not Sampled						
MW-18	12/1/2010	4.2	5.8	4.4			10.01	<0.05
	12/1/2011	< 0.10	3.7	< 10	-117.0	0.363	9.70	NM
	6/12/2012	4.2	3.6	< 6.6	65.9	0.346	6.16	NM
	12/6/2012	2.8	3.4	< 6.6	97.8	0.400	10.26	NM
	6/18/2013	1.7	4.4	< 6.6	126.5	0.706	9.78	NM
	9/18/2013	1.8	6.7	< 6.6	126.5	0.706	9.78	NM

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Enbridge Energy, Limited Partnership

Location	Collection Date	Nitrogen (mg/L)	Sulfate (mg/L)	Methane (ug/L)	ORP (mV)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Fe^{+2} (mg/L)
	12/17/2013	1.4	5.3	<6.6	Equipment Failure			NM
	3/17/2014	2.2	6.7	<6.6	-123.6	0.525	6.65	NM
	6/18/2014	1.6	8.2	<6.6	120.9	0.404	7.06	NM
	9/3/2014	2.7	6.5	<6.6	60.3	0.347	9.18	NM
	12/16/2014	3.6	4.9	<6.6	116.1	0.314	14.01	NM
	3/10/2015	3	4.5	<6.6	142.5	0.353	8.94	NM
	6/15/2015	5.6	4.6	< 10	137.8	0.340	8.72	NM
	9/8/2015	4.1	5.2	< 10	51.3	0.505	8.85	NM
	12/9/2015	3.5	5.6	< 10				NM
	3/16/2016	3	5.8	< 10	86.5	497.200	8.42	NM
	6/16/2016	4.9	5.3	< 10	336.9	0.486	8.80	NM
	9/13/2016	Not Sampled						
	12/20/2016	Not Sampled						
MW-19	12/1/2010	<0.40	5.2	187			2.10	<0.05
	12/1/2011	< 0.10	6.9	< 10	220.9	0.530	2.12	NM
	6/12/2012	0.13	5.8	< 6.6	125.7	0.339	2.37	NM
	12/6/2012	<0.10	3.5	12.8	57.3	0.657	2.37	NM
	6/18/2013	< 0.10	4.9	43.3	99.1	0.675	2.79	NM
	9/18/2013	0.32	5.2	18.5	99.1	0.675	2.79	NM
	12/17/2013	<0.10	7.4	<6.6	-14.4	0.505	2.36	NM
	3/19/2014	<0.10	6.4	<6.6	-136.7	0.489	4.04	NM
	6/17/2014	<0.10	8.1	<6.6	-49.8	0.587	1.01	NM
	9/3/2014	0.22	10.8	7.2	38.8	0.320	8.82	NM
	12/15/2014	0.53	5.2	14.3	79.8	0.490	6.96	NM
	3/10/2015	0.15	3.6	36.2	15.7	0.316	4.18	NM
	6/15/2015	0.21	4.6	40.5	30.4	0.333	3.70	NM
	9/8/2015	0.14	4.7	24.4	32.3	0.520	3.03	NM
	12/9/2015	0.11	4.9	< 10.0				NM
	3/16/2016	0.1	4.2	38.8	23.0	0.567	1.59	NM
	6/16/2016	<0.10	2.5	14.8	286.6	0.570	2.57	NM
	9/13/2016	0.14	15.0	< 10.0	96.8	0.383	2.21	NM
	12/20/2016	0.17	< 2.5	62.8	254.9	0.584	2.21	NM
MW-20	12/18/2013	1.3	7.0	<6.6	2.9	0.611	4.49	NM
	3/18/2014	1.2	7.8	<6.6	-108.5	0.611	1.98	NM
	6/18/2014	0.76	7.1	<6.6	39.6	0.443	2.72	NM
	9/3/2014	2.3	8.7	<6.6	46.2	0.402	7.33	NM
	12/16/2014	3.2	6.2	<6.6	199.6	0.349	10.07	NM
	3/11/2015	2.4	6.4	<6.6	58.6	0.355	7.58	NM
	6/16/2015	3.9	7.1	< 10	-25.4	0.358	10.04	NM
	9/8/2015	3.4	6.4	< 10	63.0	0.547	7.10	NM
	12/9/2015	2.9	6.9	< 10				NM
	6/16/2016	2.1	7.6	< 10	90.1	0.621	5.50	NM
	6/16/2016	4	8.1	<10	321.1	0.549	7.37	NM
	9/13/2016	Not Sampled						
	12/20/2016	Not Sampled						
MW-21	12/18/2013	<0.10	4.5	53.9	77.9	0.412	0.91	NM
	3/18/2014	<0.10	4.1	11.7	-132.3	0.565	8.43	NM
	6/18/2014	<0.10	5.4	<6.6	91.6	0.620	0.64	NM
	9/3/2014	0.44	7.3	9.3	58.8	0.460	3.26	NM
	12/15/2014	1.8	7.5	<6.6	159.0	0.580	No Data	NM
	3/10/2015	1.6	6.8	<6.6	18.9	0.345	3.05	NM
	6/15/2015	0.82	7.1	< 10	22.1	0.376	1.68	NM
	9/8/2015	2.5	8.4	< 10	66.6	0.586	3.06	NM
	12/9/2015	2.1	8.9	< 10				NM
	3/16/2016	0.67	7.9	< 10	63.4	0.586	1.12	NM

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Location	Collection Date	Nitrogen (mg/L)	Sulfate (mg/L)	Methane (ug/L)	ORP (mV)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Fe^{+2} (mg/L)
	6/16/2016	0.63	7.2	< 10	307.6	0.592	1.55	NM
	9/12/2016	1.7	8.3	< 10	173.7	0.388	1.61	NM
	12/20/2016	1.2	7.2	< 10	350.7	0.603	1.03	NM
MW-22	12/18/2013	<0.10	8.4	<6.6	75.0	0.330	5.19	NM
	3/18/2014	0.1	7.8	<6.6	-100.0	0.438	7.22	NM
	6/18/2014	<0.10	9.8	<6.6	128.4	0.320	6.57	NM
	9/3/2014	0.15	11.7	<6.6	23.3	0.332	7.47	NM
	12/15/2014	0.42	7.7	<6.6	69.7	0.462	7.95	NM
	3/10/2015	0.14	7.1	<6.6	28.7	0.285	6.74	NM
	6/15/2015	0.2	8.0	< 10	33.8	0.281	9.54	NM
	9/8/2015	0.13	6.6	10.2	38.9	0.503	4.98	NM
	12/8/2015	< 0.10	6.1	< 10				NM
	3/16/2016	< 0.10	6.9	< 10	76.2	0.505	4.38	NM
	6/16/2016	0.14	6.7	< 10	292.3	0.507	4.83	NM
	9/12/2016	0.16	6.8	< 10	166.7	0.353	4.59	NM
	12/20/2016	0.18	4.8	< 10	358.6	0.560	4.12	NM
MW-23	9/12/2016	< 0.10	5.9	7310	-106.5	0.650	0.00	NM
	12/20/2016	12/20/2016	Not sampled due to the presence of LNAPL in well.					
USGS-1A	10/26/2009	< 0.20	2.1	11700			1.53	< 0.018
	12/2/2010	< 0.40	< 4.0	10200			1.20	12.3
	12/1/2011	< 0.10	< 2.5	5970	-142.0	0.715	0.50	NM
	6/13/2012	< 0.10	< 2.5	683	-54.2	0.486	11.93	NM
	12/6/2012	< 0.10	< 2.5	395	-99.5	0.818	1.43	NM
	6/18/2013	< 0.10	6.7	69.3	-93.3	0.780	0.98	NM
	9/19/2013	< 0.10	5.7	< 6.6	-93.3	0.780	0.98	NM
	12/17/2013	<0.10	5.4	<6.6	-13.5	0.484	1.55	NM
	3/18/2014	<0.10	6.5	<6.6	-141.1	0.436	1.58	NM
	6/18/2014	<0.10	5.8	222	-97.5	0.412	0.85	NM
	9/3/2014	<0.10	<2.5	8090	-79.0	0.787	0.84	NM
	12/16/2014	0.18	<2.5	5130	-84.2	0.688	1.87	NM
	3/11/2015	<0.10	10.4	2910	-85.4	0.596	0.82	NM
	6/16/2015	< 0.10	< 2.5	3050	-75.7	0.545	1.50	NM
	9/9/2015	< 0.10	< 2.5	10200	-38.2	0.599	0.37	NM
	12/9/2015	< 0.10	< 2.5	7460				NM
	3/17/2016	< 0.10	< 2.5	2880	.40.1	0.503	0.31	NM
	6/15/2016	<0.10	3.2	594	-23.5	0.578	0.40	NM
	9/13/2016	<0.10	< 2.5	< 10.0	-103.7	0.730	0.26	NM
	12/20/2016	<0.10	3.7	514	87.0	0.744	0.49	NM
USGS-2A	10/26/2009	< 0.20	2.5	5480			1.71	< 0.018
	12/2/2010	< 0.40	< 4.0	2310			1.20	2.8
	12/1/2011	< 0.10	< 2.5	1730	-136.0	0.569	0.80	NM
	6/13/2012	< 0.10	< 2.5	5900	NM	NM	NM	NM
	12/6/2012	< 0.10	< 2.5	7210	-85.4	0.602	2.08	NM
	6/18/2013	< 0.10	< 2.5	3500	-88.7	0.958	0.81	NM
	9/19/2013	< 0.10	4.8	95.2	-88.7	0.958	0.81	NM
	12/17/2013	<0.10	4.7	338	Equipment Failure			NM
	3/18/2014	<0.10	8.1	8.1	-87.8	0.535	9.05	NM
	6/17/2014	<0.10	< 2.5	2420	-123.6	0.660	1.72	NM
	9/3/2014	<0.10	< 2.5	2480	-80.6	0.563	0.77	NM
	12/16/2014	0.28	<2.5	1330	-85.2	0.738	No Data	NM
	3/11/2015	<0.10	5.3	1500	-72.9	0.549	0.81	NM
	6/16/2015	< 0.10	< 2.5	3290	-84.0	0.679	0.42	NM
	9/9/2015	< 0.10	< 2.5	2300	-58.3	0.564	0.30	NM
	12/9/2015	< 0.10	< 2.5	1920				

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Location	Collection Date	Nitrogen (mg/L)	Sulfate (mg/L)	Methane (ug/L)	ORP (mV)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Fe^{+2} (mg/L)
	3/17/2016	< 0.10	< 2.5	6380	-53.7	0.590	0.76	NM
	6/16/2016	< 0.10	< 2.5	3480	-110.5	0.644	0.31	NM
	9/13/2016	< 0.10	< 2.5	4370	-88.8	0.520	0.28	NM
	12/20/2016	< 0.10	< 2.5	476	14.8	0.714	0.48	NM
USGS-3A	10/26/2009	< 0.20	2.3	3240			3.72	< 0.018
	12/2/2010	< 0.40	< 4.0	1180			0.70	1.8
	12/1/2011	< 0.10	< 2.5	800	-156.1	0.544	0.40	NM
	6/13/2012	< 0.10	< 2.5	2340	NM	NM	NM	NM
	12/6/2012	< 0.10	<2.5	1860	-106.1	0.534	1.02	NM
	6/18/2013	< 0.10	< 2.5	3860	-114.8	0.889	1.12	NM
	9/19/2013	< 0.10	5.9	1160	-114.8	0.889	1.12	NM
	12/17/2013	<0.10	7.2	618	-117.1	0.990	0.99	NM
	3/18/2014	<0.10	5.5	97.4	-149.3	0.555	11.68	NM
	6/18/2014	<0.10	< 2.5	1550	-132.9	0.701	0.78	NM
	9/3/2014	<0.10	<2.5	1850	-89.7	0.563	1.07	NM
	12/16/2014	0.28	6.4	535	-88.0	0.634	No Data	NM
	3/11/2015	<0.10	5.8	153	-22.4	0.432	0.24	NM
	6/16/2015	< 0.10	< 2.5	1320	-108.8	0.587	0.27	NM
	9/9/2015	< 0.10	< 2.5	2150	-60.8	0.522	0.21	NM
	12/9/2015	< 0.10	< 2.5	515				NM
	3/17/2016	< 0.10	< 2.5	442	-103.1	0.661	0.47	NM
	6/16/2016	< 0.10	< 2.5	1710	-126.1	0.696	0.24	NM
	9/13/2016	< 0.10	< 2.5	1830	-99.7	0.510	0.16	NM
	12/20/2016	< 0.10	< 2.5	696	-48.0	0.643	0.38	NM
USGS-4A	10/26/2009	< 0.20	4.2	665			13.54	< 0.018
	12/2/2010	< 0.40	< 4.0	398			1.90	< 0.05
	12/1/2011	< 0.10	< 2.5	214	-157.0	0.525	1.20	NM
	6/13/2012	< 0.10	< 2.5	142	8.5	0.349	1.30	NM
	12/6/2012	< 0.10	<2.5	270				
	6/18/2013	< 0.10	2.9	536	-79.1	0.803	1.01	NM
	9/19/2013	< 0.10	6.6	130				
	12/17/2013	<0.10	6.9	<6.6	-76.1	0.833	0.76	NM
	3/18/2014	0.12	5.9	7.8	-127.4	0.516	0.86	NM
	6/17/2014	<0.10	10.5	83.5	-88.3	0.600	2.57	NM
	9/3/2014	<0.10	3.7	235	-75.1	0.459	1.88	NM
	12/16/2014	0.30	3.8	133	-69.6	0.406	1.91	NM
	3/11/2015	<0.10	4.8	40.2	-29.0	0.410	0.67	NM
	6/16/2015	< 0.10	< 2.5	168	-64.3	0.517	0.33	NM
	9/9/2015	< 0.10	< 2.5	649	18.1	0.694	0.39	NM
	12/9/2015	< 0.10	< 2.5	359				NM
	3/17/2016	< 0.10	< 2.5	98.5	-53.6	0.663	0.38	NM
	6/17/2016	<0.10	< 2.5	387	-101.3	0.664	0.29	NM
	9/13/2016	<0.10	< 2.5	75.1	-79.5	0.615	0.12	NM
	12/20/2016	<0.10	< 2.5	696	-25.2	0.659	0.22	NM
SCDW	12/1/2011	< 0.10	< 2.5	< 10	NM	NM	NM	NM
	6/25/2012	0.45	3.3	< 6.6	NM	NM	NM	NM
	12/5/2012	0.38	< 2.5	< 6.6	NM	NM	NM	NM
	6/17/2013	0.7	3.8	< 6.6	NM	NM	NM	NM
	9/18/2013	0.53	3.9	< 6.6	NM	NM	NM	NM
	12/19/2013	NM	NM	<6.6	NM	NM	NM	NM
	3/17/2014	0.62	3.7	<6.6	NM	NM	NM	NM
	6/17/2014	0.6	3.9	<6.6	NM	NM	NM	NM
	9/3/2014	0.56	4.3	<6.6	NM	NM	NM	NM
	12/16/2014	0.64	3.2	<6.6	NM	NM	NM	NM
	3/11/2015	0.37	2.6	<6.6	NM	NM	NM	NM

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	6/15/2015	0.76	< 2.5	< 10	NM	NM	NM	NM
	9/8/2015	1.1	3.1	< 10	NM	NM	NM	NM
	12/9/2015	1.2	4.1	< 10	NM	NM	NM	NM
	3/16/2016	1.1	3.6	< 10	NM	NM	NM	NM
	6/17/2016	1.1	2.8	< 10	NM	NM	NM	NM
	9/12/2016	0.79	3.7	< 10	NM	NM	NM	NM
	12/20/2016	0.84	2.5	< 10	NM	NM	NM	NM
Field Blank	12/30/2004	< 0.25	< 4.0	< 10	NM	NM	NM	
	4/6/2005	< 0.25	< 4.0	< 10	NM	NM	NM	
	11/25/2008	< 0.085	< 0.51	< 2.0	NM	NM	NM	0.0115
	12/1/2011	< 0.10	< 2.5	19.8	NM	NM	NM	NM
	6/13/2012	< 0.10	< 2.5	< 6.6	NM	NM	NM	NM
	12/5/2012	< 0.10	<2.5	25.9	NM	NM	NM	NM
	6/19/2013	< 0.10	< 2.5	10	NM	NM	NM	NM
	9/19/2013	NM	NM	NM	NM	NM	NM	NM
	12/19/2013	NM	NM	NM	NM	NM	NM	NM
	3/18/2014	< 0.10	< 2.5	< 6.6	NM	NM	NM	NM
	6/18/2014	< 0.10	< 2.5	< 6.6	NM	NM	NM	NM
	9/3/2014	< 0.10	< 2.5	< 6.6	NM	NM	NM	NM
	12/16/2014	0.2	< 2.5	< 6.6	NM	NM	NM	NM
	3/11/2015	< 0.10	< 2.5	< 6.6	NM	NM	NM	NM
	6/15/2015	< 0.10	< 2.5	< 10	NM	NM	NM	NM
	9/8/2015	< 0.10	< 2.5	< 10	NM	NM	NM	NM
	12/9/2015	< 0.10	< 2.5	< 10	NM	NM	NM	NM
	3/16/2016	< 0.10	< 2.5	< 10	NM	NM	NM	NM
	6/16/2016	< 0.10	< 2.5	< 10	NM	NM	NM	NM
	9/12/2016	< 0.10	< 2.5	< 10	NM	NM	NM	NM
	12/20/2016	< 0.10	< 2.5	< 10	NM	NM	NM	NM

NM - Not measured

Table 5
South Cass Lake Station ERDRO & ERDRO with Silica Gel Cleanup Results
Enbridge Energy, Limited Partnership

	Location	Collection Date	ERDRO (mg/L)	ERDRO-SGC (mg/L)	Organic Fraction (polar compounds) Removed by SGC Method (mg/L)	% of ERDRO Represented by Polar Compounds*	% of ERDRO Represented by Petrogenic Compounds (DRO)	Ratio SGC: ERDRO	Carbon Range
Down← Gradient →Up	MW-10	6/17/2016	17.9	10.7	7.2	40.22%	59.78%	0.60	C10-C32
	MW-9	6/16/2016	1.5	0.64	0.86	57.33%	42.67%	0.43	C10-C32
	USGS-1A	6/17/2016	2.9	1.3	1.6	55.17%	44.83%	0.45	C10-C32
	USGS-2A	6/17/2016	3.7	2.1	1.6	43.24%	56.76%	0.57	C10-C32
	USGS-3A	6/17/2016	4.7	2.5	2.2	46.81%	53.19%	0.53	C10-C32
	USGS-4A	6/17/2016	2.2	1.2	1	45.45%	54.55%	0.55	C10-C32
	MW-16A	6/16/2016	1.6	0.53	1.07	66.88%	33.13%	0.33	C10-C32
	MW-16B	6/16/2016	0.54	0.24	0.3	55.56%	44.44%	0.44	C10-C32
	MW-19	6/16/2016	0.88	0.31	0.57	64.77%	35.23%	0.35	C10-C32
	MW-22	6/16/2016	0.18	0.11	0.07	38.89%	61.11%	0.61	C10-C32
Down← Gradient →Up	MW-10	9/13/2016	7.7	3.2	4.5	58.44%	41.56%	0.42	C10-C32
	MW-9	9/13/2016	33.8	18.2	15.6	46.15%	53.85%	0.54	C10-C32
	USGS-1A	9/13/2016	20.9	9	11.9	56.94%	43.06%	0.43	C10-C32
	USGS-2A	9/13/2016	9	3.1	5.9	65.56%	34.44%	0.34	C10-C32
	USGS-3A	9/13/2016	7.9	2.7	5.2	65.82%	34.18%	0.34	C10-C32
	USGS-4A	9/13/2016	5.1	2	3.1	60.78%	39.22%	0.39	C10-C32
	MW-16A	9/13/2016	2.6	0.79	1.81	69.62%	30.38%	0.30	C10-C32
	MW-16B	9/13/2016	1	0.24	0.76	76.00%	24.00%	0.24	C10-C32
	MW-19	9/13/2016	0.68	0.19	0.49	72.06%	27.94%	0.28	C10-C32
	MW-22	9/13/2016	0.49	0.12	0.37	75.51%	24.49%	0.24	C10-C32
Down← Gradient →Up	MW-10	12/20/2016	24.6	9.2	15.4	62.60%	37.40%	0.37	C10-C28
	MW-9	12/20/2016	14.1	4.9	9.2	65.25%	34.75%	0.35	C10-C28
	USGS-1A	12/20/2016	19.4	7.5	11.9	61.34%	38.66%	0.39	C10-C28
	USGS-2A	12/20/2016	7.1	2.7	4.4	61.97%	38.03%	0.38	C10-C28
	USGS-3A	12/20/2016	1.7	0.56	1.14	67.06%	32.94%	0.33	C10-C28
	USGS-4A	12/20/2016	2.9	1	1.9	65.52%	34.48%	0.34	C10-C28
	MW-16A	12/20/2016	2.1	0.59	1.51	71.90%	28.10%	0.28	C10-C28
	MW-16B	12/20/2016	0.67	0.14	0.53	79.10%	20.90%	0.21	C10-C28
	MW-19	12/20/2016	0.53	0.1	0.43	81.13%	18.87%	0.19	C10-C28
	MW-22	12/20/2016	0.3	0.1	0.2	66.67%	33.33%	0.33	C10-C28

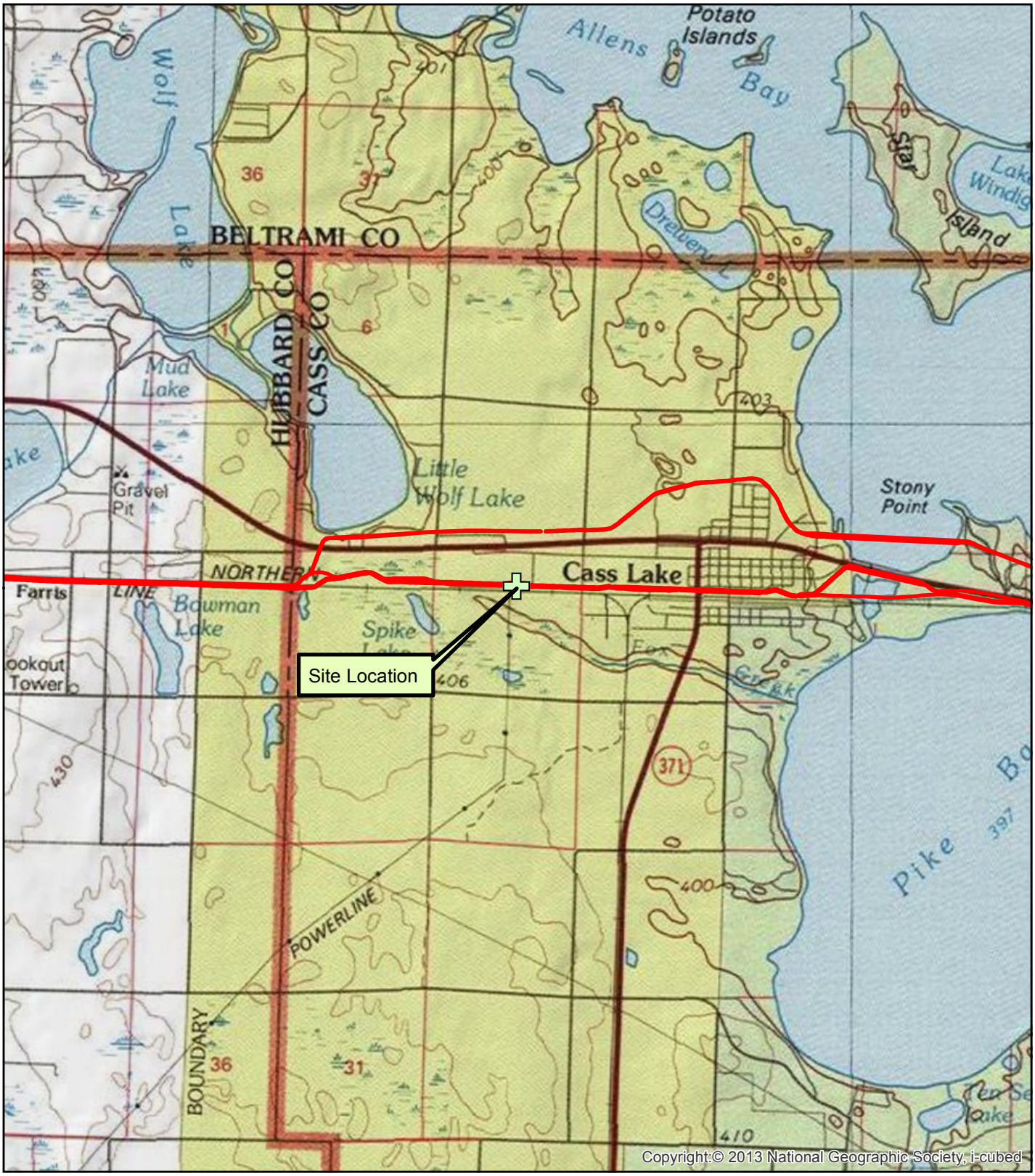
detection limit used for calculations

ERDRO: extended range diesel range organics

ERDRO-SGC: extended range diesel range organics with silica gel cleanup

*Silica gel cleanup is a laboratory procedure that removes polar organic compounds which are typically considered non-petrogenic hydrocarbons

Figures



ENBRIDGE

Prepared by:

AECOM

Enbridge Energy, Limited Partnership
Figure 1: Site Location Map
South Cass Lake Pumping Station

Legend

Site Location

Enbridge Pipeline

Miles
0 0.5 1

Drawn:	JMP	2/13/2016
Approved:	DC	2/13/2016
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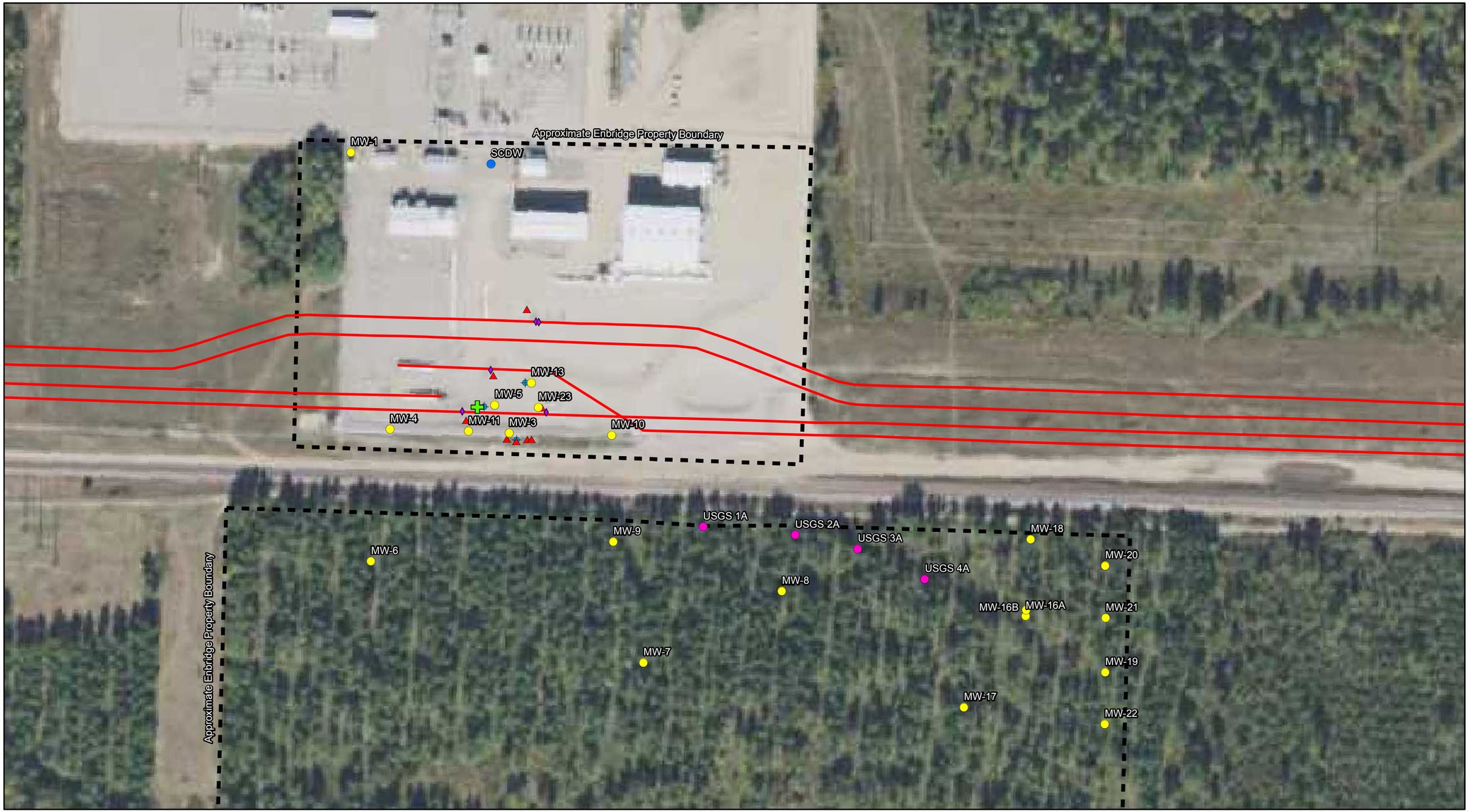
PROJECT NUMBER		60503816
FIGURE NUMBER		1



ENBRIDGE

N

- Historic Release Location
- Enbridge Pipeline
- Monitoring Well
- Potable Well
- USGS Monitoring Well
- Whistle Point
- Bioventing Well
- Vapor Monitoring Point

Enbridge Energy, Limited Partnership
Figure 2: Site Layout Map
South Cass Lake Pumping Station

0 250 500 Feet

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Approved:	DRA	2/2/2017
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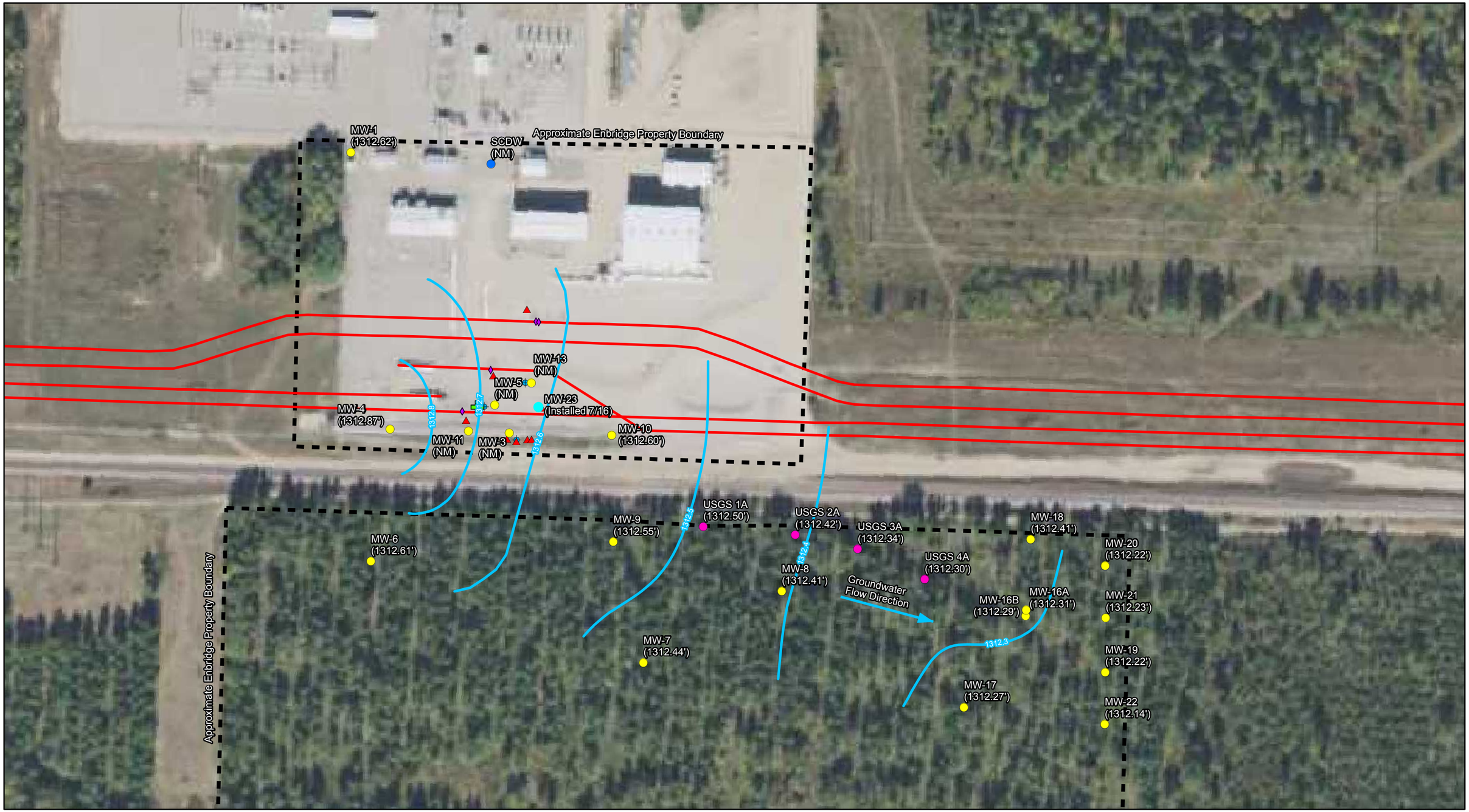

ENBRIDGE

N

- Historic Release Location
- Enbridge Pipeline
- Monitoring Well
- Potable Well
- USGS Monitoring Well
- Whistle Point
- Bioventing Well
- Vapor Monitoring Point

NM- Not Measured: Historic LNAPL Location

Enbridge Energy, Limited Partnership
Figure 3: March 2016
Groundwater Flow Map
South Cass Lake Pumping Station

0 250 500 Feet

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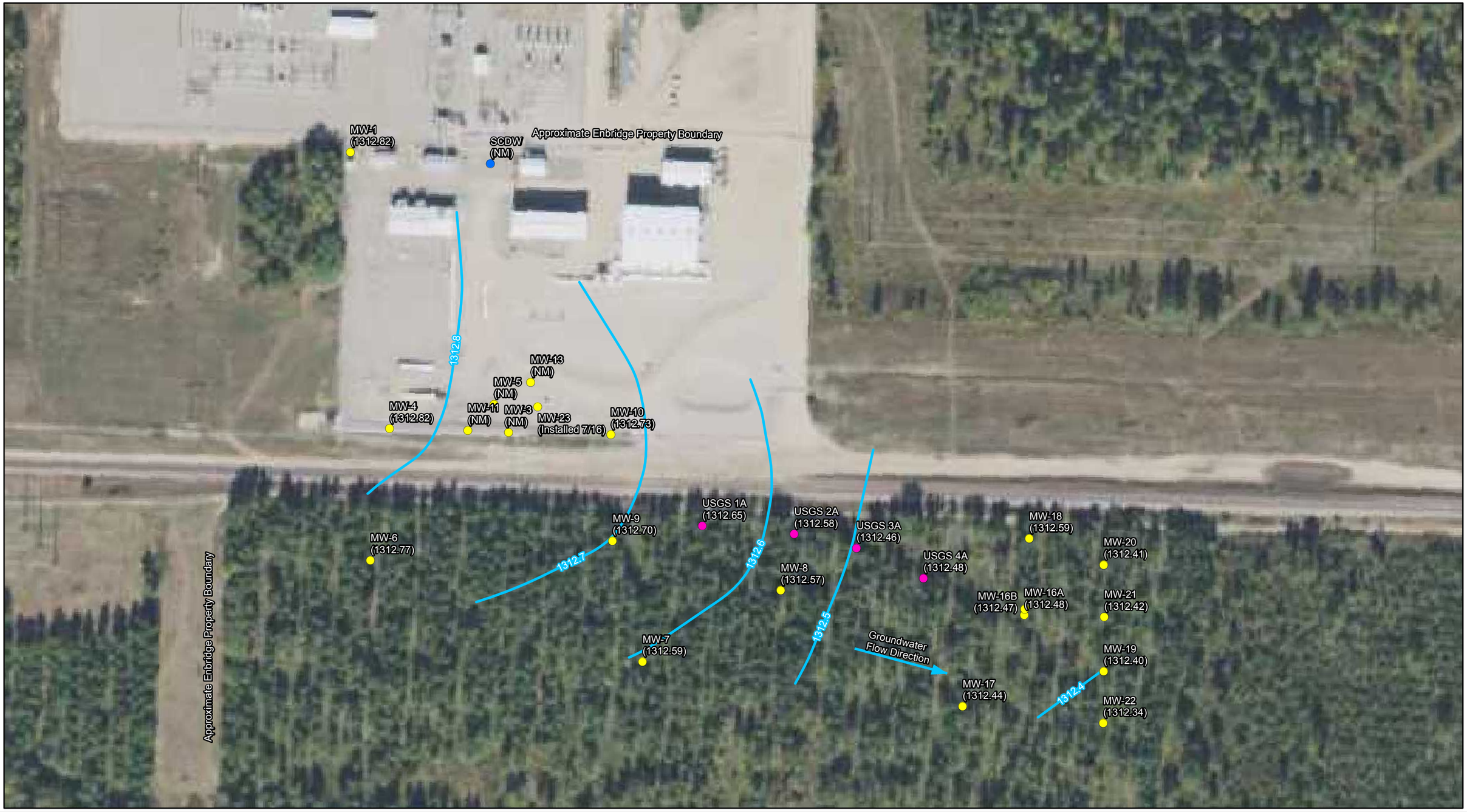

ENBRIDGE

N

- Historic Release Location
- Enbridge Pipeline
- Monitoring Well
- Potable Well
- USGS Monitoring Well
- Whistle Point
- Bioventing Well
- Vapor Monitoring Point

NM- Not Measured: Historic LNAPL Location

Enbridge Energy, Limited Partnership
Figure 4: June 2016
Groundwater Flow Map
South Cass Lake Pumping Station

0 250 500 Feet

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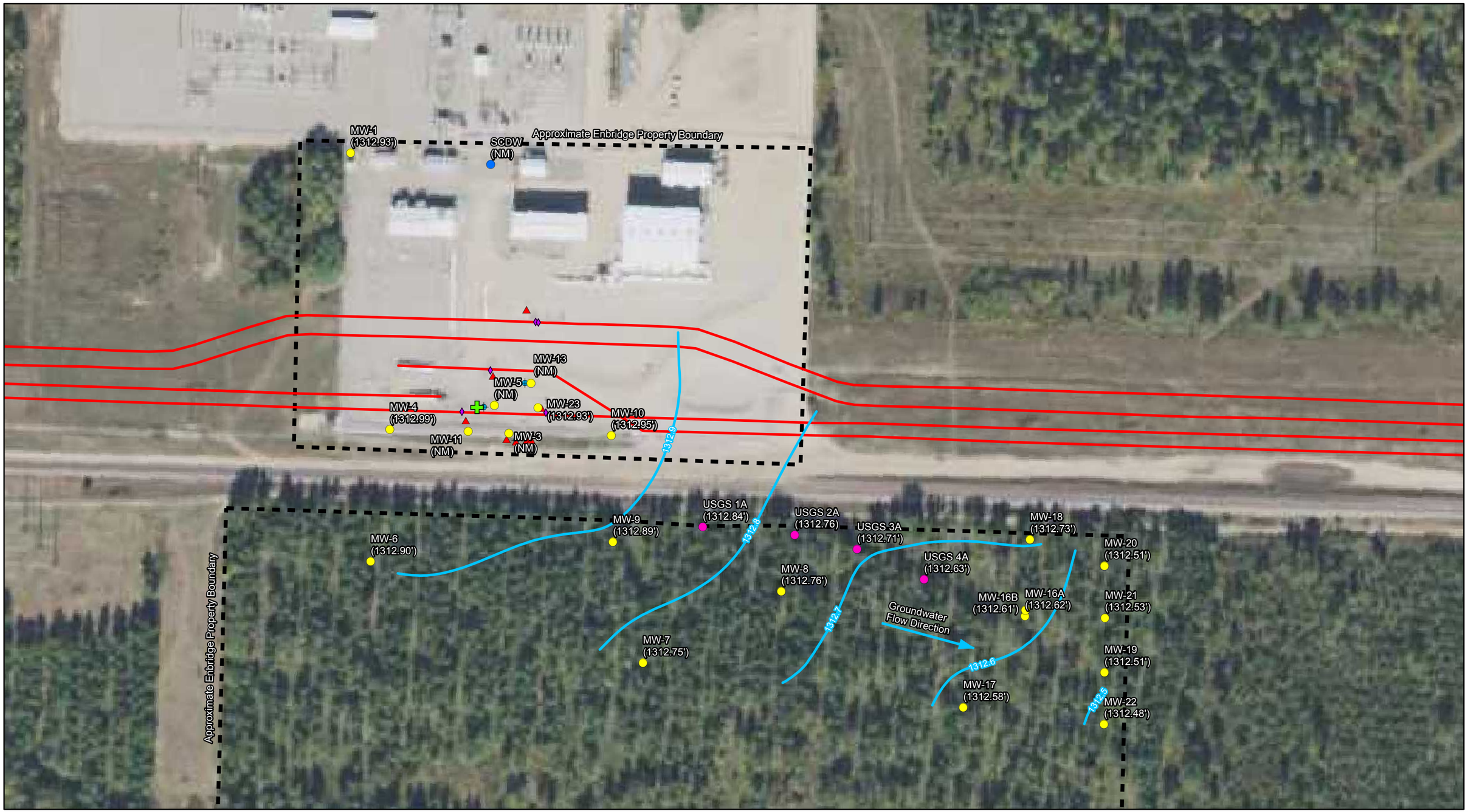

ENBRIDGE

N

- Historic Release Location
- Enbridge Pipeline
- Monitoring Well
- Potable Well
- USGS Monitoring Well
- Whistle Point
- Bioventing Well
- Vapor Monitoring Point

NM- Not Measured: Historic LNAPL Location

Enbridge Energy, Limited Partnership
Figure 5: September 2016
Groundwater Flow Map
South Cass Lake Pumping Station

0 250 500 Feet

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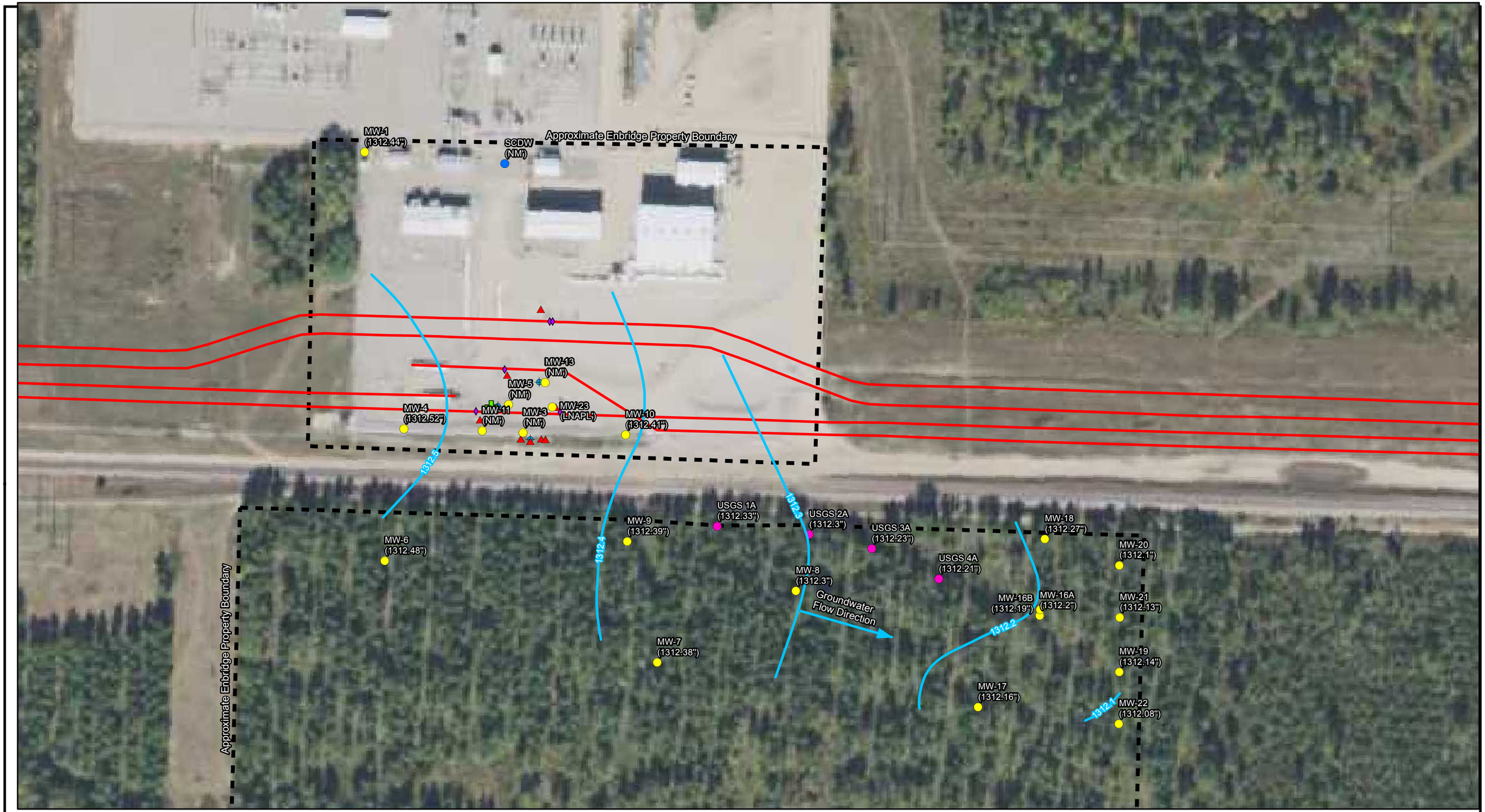

ENBRIDGE

N

- Historic Release Location
- Enbridge Pipeline
- Monitoring Well
- Potable Well
- USGS Monitoring Well
- Whistle Point
- Bioventing Well
- Vapor Monitoring Point

NM- Not Measured: Historic LNAPL Location

Enbridge Energy, Limited Partnership
Figure 6: December 2016
Groundwater Flow Map
South Cass Lake Pumping Station

0 250 500 Feet

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Approved:	DRA	2/2/2017
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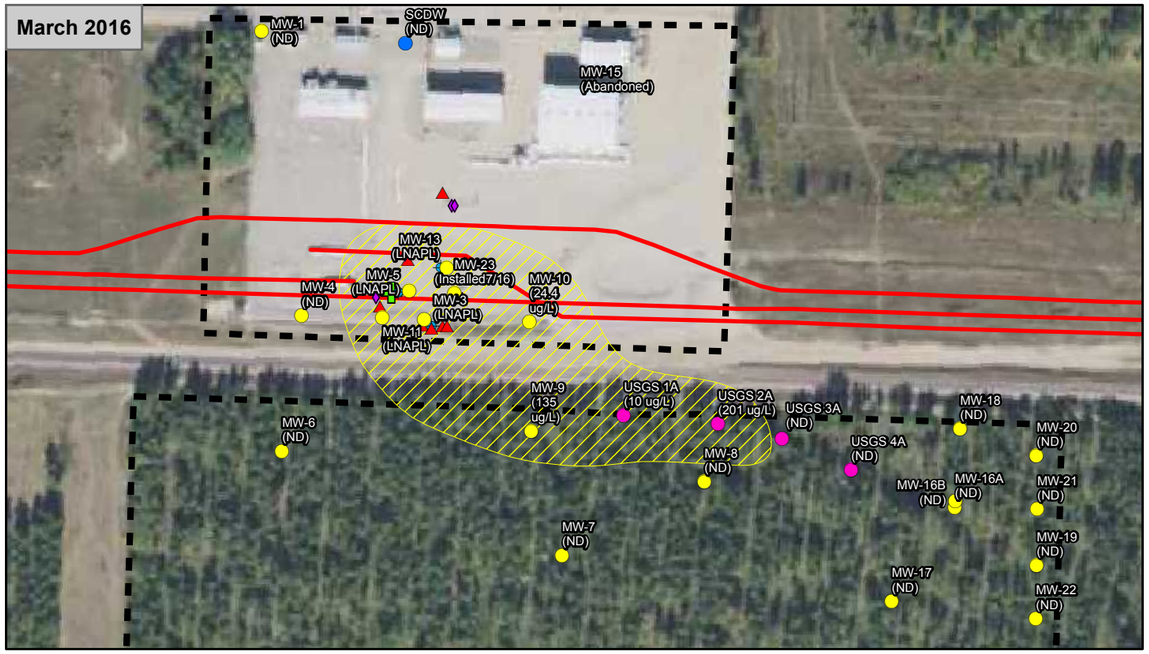

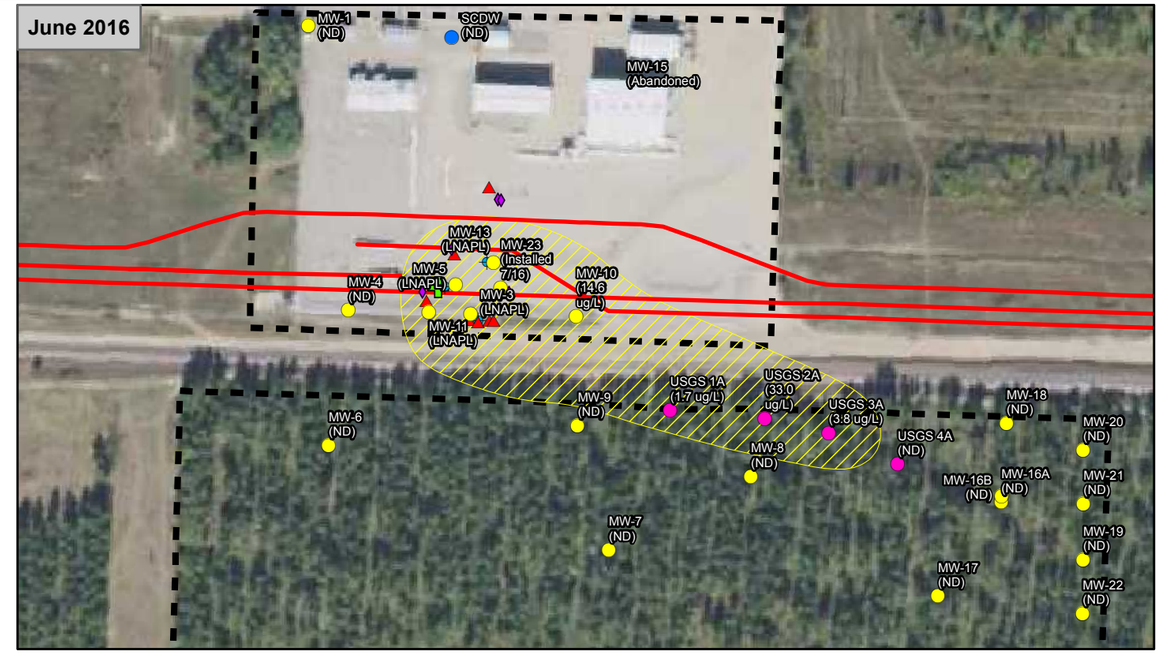

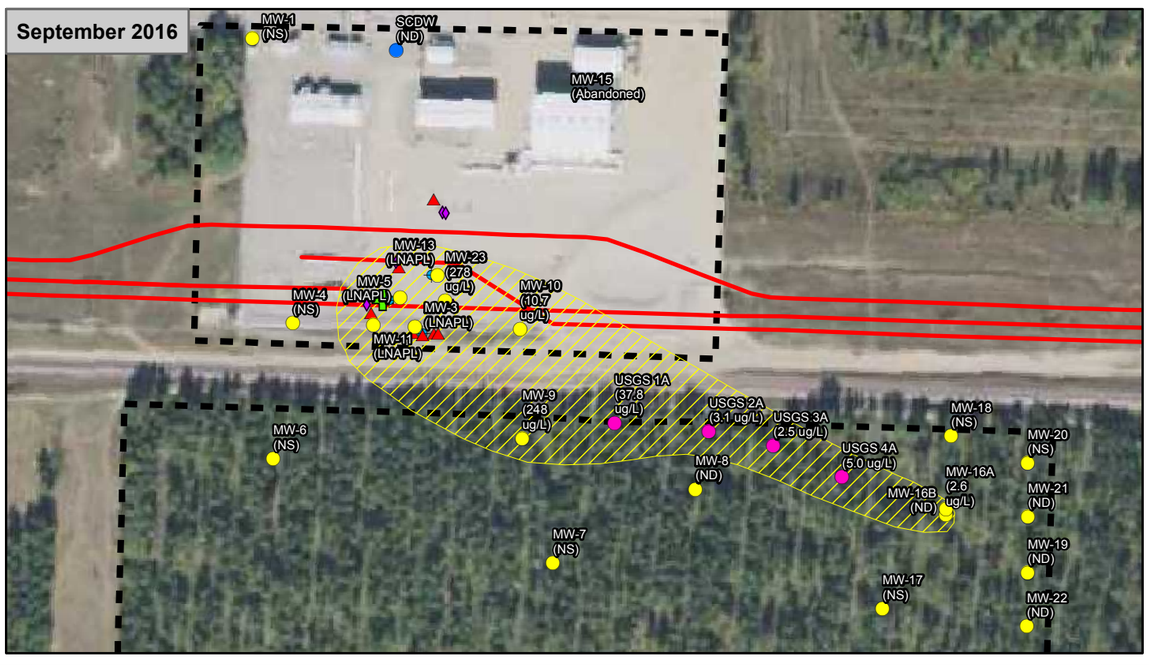

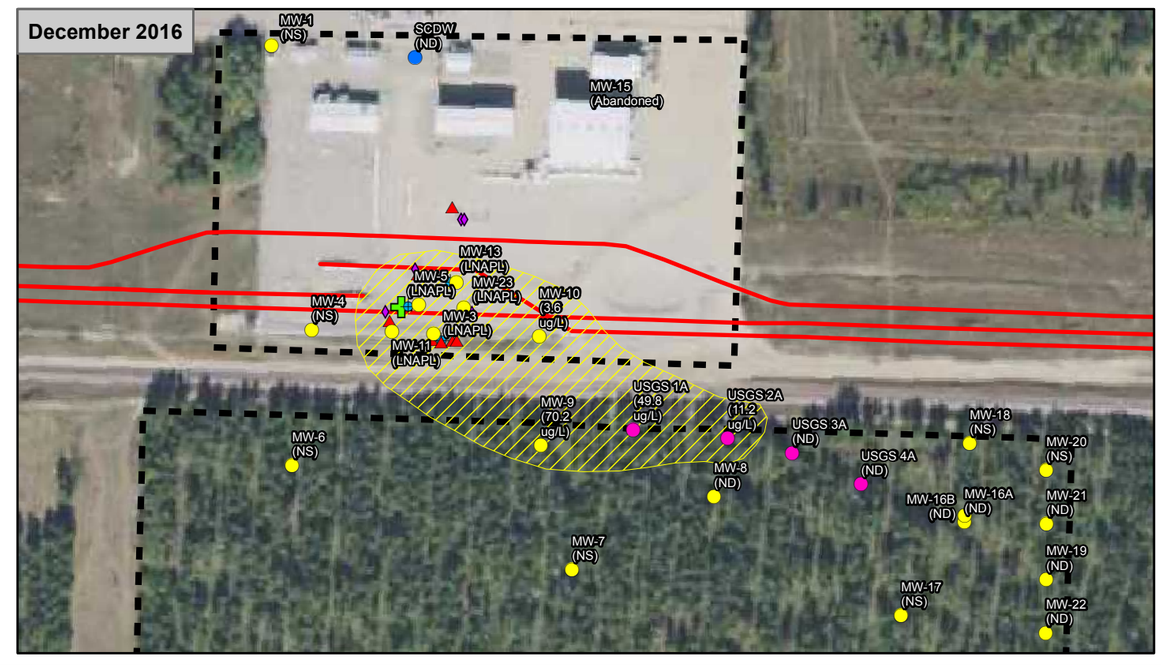

ENBRIDGE

- Historic Release Location
- Enbridge Pipeline
- Monitoring Well
- Potable Well
- Detectable Benzene Limit (>1 ug/L)
- USGS Monitoring Well
- Whistle Point
- Bioventing Well
- Vapor Monitoring Point

Enbridge Energy, Limited Partnership
Figure 7: Groundwater Contaminatin Map
Groundwater Flow Map
South Cass Lake Pumping Station

0 100 200 400 600 800
Feet

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Approved:	DRA	2/2/2017
Scale:		1:2,400
PROJECT NUMBER		60505157
FIGURE NUMBER		7

Appendices

Appendix A
Analytical Laboratory Reports

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

March 25, 2016

Darin Albrecht
AECOM
Duluth Technology Village
11 E Superior St, Suite 260
Duluth, MN 55802

RE: Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Dear Darin Albrecht:

Enclosed are the analytical results for sample(s) received by the laboratory on March 17, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carol Davy
carol.davy@pacelabs.com
Project Manager

Enclosures

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CERTIFICATIONS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10341927001	**MW-1**	Water	03/16/16 10:14	03/17/16 18:00
10341927002	**MW-4**	Water	03/16/16 11:15	03/17/16 18:00
10341927003	**MW-6**	Water	03/16/16 15:17	03/17/16 18:00
10341927004	**MW-7**	Water	03/16/16 16:08	03/17/16 18:00
10341927005	**MW-8**	Water	03/16/16 15:50	03/17/16 18:00
10341927006	**MW-9**	Water	03/16/16 15:00	03/17/16 18:00
10341927007	**MW-10**	Water	03/16/16 12:50	03/17/16 18:00
10341927008	**DUP**	Water	03/16/16 00:00	03/17/16 18:00
10341927009	**MW-16A**	Water	03/16/16 12:17	03/17/16 18:00
10341927010	**MW-16B**	Water	03/16/16 13:00	03/17/16 18:00
10341927011	**MW-17**	Water	03/16/16 11:56	03/17/16 18:00
10341927012	**MW-18**	Water	03/16/16 13:35	03/17/16 18:00
10341927013	**MW-19**	Water	03/16/16 10:05	03/17/16 18:00
10341927014	**MW-20**	Water	03/16/16 10:57	03/17/16 18:00
10341927015	**MW-21**	Water	03/16/16 10:25	03/17/16 18:00
10341927016	**MW-22**	Water	03/16/16 09:36	03/17/16 18:00
10341927017	**USGS-1A**	Water	03/17/16 10:00	03/17/16 18:00
10341927018	**USGS-2A**	Water	03/17/16 09:15	03/17/16 18:00
10341927019	**USGS-3A**	Water	03/17/16 09:15	03/17/16 18:00
10341927020	**USGS-4A**	Water	03/17/16 09:45	03/17/16 18:00
10341927021	**SCL DW**	Water	03/16/16 13:25	03/17/16 18:00
10341927022	**Field Blank**	Water	03/16/16 13:45	03/17/16 18:00
10341927023	**Trip Blank**	Water	03/16/16 00:00	03/17/16 18:00

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SAMPLE ANALYTE COUNT

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10341927001	**MW-1**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927002	**MW-4**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927003	**MW-6**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927004	**MW-7**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927005	**MW-8**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927006	**MW-9**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927007	**MW-10**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927008	**DUP**	RSK 175	MLS	1
		Diesel Range Organics	MT	2

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SAMPLE ANALYTE COUNT

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927009	**MW-16A**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927010	**MW-16B**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927011	**MW-17**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927012	**MW-18**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927013	**MW-19**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927014	**MW-20**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927015	**MW-21**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1

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SAMPLE ANALYTE COUNT

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		ASTM D516	KEO	1
10341927016	**MW-22**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927017	**USGS-1A**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927018	**USGS-2A**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927019	**USGS-3A**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927020	**USGS-4A**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927021	**SCL DW**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927022	**Field Blank**	RSK 175	MLS	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10341927023	**Trip Blank**	EPA 8260B	AH2	7

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SUMMARY OF DETECTION

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
10341927001	**MW-1**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.54	mg/L	0.10	03/22/16 09:38	
10341927002	**MW-4**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	1.4	mg/L	0.10	03/22/16 09:41	
ASTM D516	Sulfate	4.0	mg/L	2.5	03/23/16 09:46	
10341927003	**MW-6**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	3.3	mg/L	0.10	03/22/16 09:42	
ASTM D516	Sulfate	5.2	mg/L	2.5	03/23/16 09:48	
10341927004	**MW-7**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.23	mg/L	0.10	03/22/16 09:43	
ASTM D516	Sulfate	6.5	mg/L	2.5	03/23/16 10:00	
10341927005	**MW-8**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.14	mg/L	0.10	03/22/16 09:43	
ASTM D516	Sulfate	7.2	mg/L	2.5	03/23/16 10:02	
10341927006	**MW-9**					
RSK 175	Methane	1830	ug/L	10.0	03/18/16 18:24	
Diesel Range Organics	WDRO, Extended C10-C32	6.0	mg/L	0.10	03/23/16 09:34	
EPA 8260B	Benzene	135	ug/L	1.0	03/24/16 05:14	
ASTM D516	Sulfate	5.4	mg/L	2.5	03/23/16 10:02	
10341927007	**MW-10**					
RSK 175	Methane	6870	ug/L	10.0	03/18/16 18:32	
Diesel Range Organics	WDRO, Extended C10-C32	21.2	mg/L	1.1	03/23/16 11:47	
EPA 8260B	Benzene	24.4	ug/L	1.0	03/24/16 05:32	
EPA 8260B	Ethylbenzene	3.4	ug/L	1.0	03/24/16 05:32	
10341927008	**DUP**					
RSK 175	Methane	5540	ug/L	10.0	03/18/16 18:41	
Diesel Range Organics	WDRO, Extended C10-C32	20.8	mg/L	2.1	03/23/16 11:40	
EPA 8260B	Benzene	26.0	ug/L	1.0	03/24/16 05:49	
EPA 8260B	Ethylbenzene	3.6	ug/L	1.0	03/24/16 05:49	
10341927009	**MW-16A**					
RSK 175	Methane	81.7	ug/L	10.0	03/18/16 18:49	
Diesel Range Organics	WDRO, Extended C10-C32	2.6	mg/L	0.10	03/23/16 09:27	
10341927010	**MW-16B**					
RSK 175	Methane	34.4	ug/L	10.0	03/18/16 19:13	
Diesel Range Organics	WDRO, Extended C10-C32	0.58	mg/L	0.10	03/23/16 10:30	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.19	mg/L	0.10	03/22/16 09:52	
ASTM D516	Sulfate	7.5	mg/L	2.5	03/23/16 10:05	
10341927011	**MW-17**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.21	mg/L	0.10	03/22/16 09:53	
ASTM D516	Sulfate	8.8	mg/L	2.5	03/23/16 10:08	

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SUMMARY OF DETECTION

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
10341927012	**MW-18**					
Diesel Range Organics	WDRO, Extended C10-C32	0.18	mg/L	0.10	03/23/16 10:44	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	3.0	mg/L	0.10	03/22/16 09:56	
ASTM D516	Sulfate	5.8	mg/L	2.5	03/23/16 10:08	
10341927013	**MW-19**					
RSK 175	Methane	38.8	ug/L	10.0	03/18/16 19:46	
Diesel Range Organics	WDRO, Extended C10-C32	0.78	mg/L	0.10	03/23/16 10:51	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.10	mg/L	0.10	03/22/16 09:56	
ASTM D516	Sulfate	4.2	mg/L	2.5	03/23/16 10:08	
10341927014	**MW-20**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	2.1	mg/L	0.10	03/22/16 09:57	
ASTM D516	Sulfate	7.6	mg/L	2.5	03/23/16 10:10	
10341927015	**MW-21**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.67	mg/L	0.10	03/22/16 09:57	
ASTM D516	Sulfate	7.9	mg/L	2.5	03/23/16 10:10	
10341927016	**MW-22**					
Diesel Range Organics	WDRO, Extended C10-C32	0.24	mg/L	0.10	03/23/16 11:12	
ASTM D516	Sulfate	6.9	mg/L	2.5	03/23/16 10:10	
10341927017	**USGS-1A**					
RSK 175	Methane	2880	ug/L	10.0	03/21/16 18:59	
Diesel Range Organics	WDRO, Extended C10-C32	6.9	mg/L	0.55	03/23/16 11:55	
EPA 8260B	Benzene	10	ug/L	1.0	03/24/16 07:49	
10341927018	**USGS-2A**					
RSK 175	Methane	6380	ug/L	10.0	03/21/16 19:07	
Diesel Range Organics	WDRO, Extended C10-C32	16.4	mg/L	1.1	03/23/16 12:02	
EPA 8260B	Benzene	201	ug/L	1.0	03/24/16 08:06	
10341927019	**USGS-3A**					
RSK 175	Methane	442	ug/L	10.0	03/22/16 14:42	
Diesel Range Organics	WDRO, Extended C10-C32	2.5	mg/L	0.10	03/23/16 09:41	
10341927020	**USGS-4A**					
RSK 175	Methane	98.5	ug/L	10.0	03/22/16 14:51	
Diesel Range Organics	WDRO, Extended C10-C32	1.7	mg/L	0.10	03/23/16 09:48	
10341927021	**SCL DW**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	1.1	mg/L	0.10	03/22/16 10:15	
ASTM D516	Sulfate	3.6	mg/L	2.5	03/23/16 10:13	

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PROJECT NARRATIVE

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Method: **RSK 175**
Description: RSK 175 AIR Headspace
Client: AECOM- MN ND
Date: March 25, 2016

General Information:
22 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: AIR/25480

R1: RPD value was outside control limits.

- DUP (Lab ID: 2213796)
  - Methane

QC Batch: AIR/25498

R1: RPD value was outside control limits.

- DUP (Lab ID: 2214478)
  - Methane

Additional Comments:

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PROJECT NARRATIVE

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Method: **Diesel Range Organics**
Description: WIDRO Extended GCS
Client: AECOM- MN ND
Date: March 25, 2016

General Information:
22 samples were analyzed for Diesel Range Organics. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with Diesel Range Organics with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: OEXT/32851

S4: Surrogate recovery not evaluated against control limits due to sample dilution.
- DUP (Lab ID: 10341927008)
  - n-Triacontane (S)

S5: Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
- MW-16B (Lab ID: 10341927010)
  - n-Triacontane (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Method: **EPA 8260B**
Description: 8260B MSV UST
Client: AECOM- MN ND
Date: March 25, 2016

General Information:
23 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: MSV/34968

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Method: **SM 4500-NO3 H**
Description: SM4500NO3-H, NO2 + NO3 pres.
Client: AECOM- MN ND
Date: March 25, 2016

General Information:
22 samples were analyzed for SM 4500-NO3 H. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WETA/26658

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10340979001,10341382002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2214421)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2214422)
  - Nitrogen, NO2 plus NO3

QC Batch: WETA/26659

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10341927016,10341927017

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2214426)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2214427)
  - Nitrogen, NO2 plus NO3

Additional Comments:

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PROJECT NARRATIVE

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Method: **ASTM D516**
Description: ASTM D516 Sulfate Water
Client: AECOM- MN ND
Date: March 25, 2016

General Information:
22 samples were analyzed for ASTM D516. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-1 **Lab ID: 10341927001** Collected: 03/16/16 10:14 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.63	1		03/18/16 17:35	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11	0.11	1	03/21/16 14:24	03/23/16 09:55		
Surrogates									
n-Triacontane (S)	89	%.	50-150		1	03/21/16 14:24	03/23/16 09:55	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 02:41	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 02:41	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 02:41	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 02:41	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		03/24/16 02:41	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		03/24/16 02:41	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		03/24/16 02:41	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.54**	mg/L	0.10	0.050	1		03/22/16 09:38		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.2	1		03/23/16 09:46	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-4 **Lab ID: 10341927002** Collected: 03/16/16 11:15 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.63	1		03/18/16 17:51	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11	0.11	1	03/21/16 14:24	03/23/16 10:02		
Surrogates									
n-Triacontane (S)	87	%.	50-150		1	03/21/16 14:24	03/23/16 10:02	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 02:58	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 02:58	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 02:58	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 02:58	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	94	%.	75-125		1		03/24/16 02:58	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		03/24/16 02:58	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		03/24/16 02:58	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**1.4**	mg/L	0.10	0.050	1		03/22/16 09:41		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**4.0**	mg/L	2.5	1.2	1		03/23/16 09:46	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-6 **Lab ID: 10341927003** Collected: 03/16/16 15:17 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.63	1		03/18/16 18:00	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11	0.11	1	03/21/16 14:24	03/23/16 10:09		
Surrogates									
n-Triacontane (S)	88	%.	50-150		1	03/21/16 14:24	03/23/16 10:09	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 04:23	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 04:23	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 04:23	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 04:23	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		03/24/16 04:23	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		03/24/16 04:23	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		03/24/16 04:23	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**3.3**	mg/L	0.10	0.050	1		03/22/16 09:42		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**5.2**	mg/L	2.5	1.2	1		03/23/16 09:48	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-7 **Lab ID: 10341927004** Collected: 03/16/16 16:08 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.63	1		03/18/16 18:08	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11	0.11	1	03/21/16 14:24	03/23/16 10:16		
Surrogates									
n-Triacontane (S)	90	%.	50-150		1	03/21/16 14:24	03/23/16 10:16	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 04:40	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 04:40	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 04:40	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 04:40	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		03/24/16 04:40	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		03/24/16 04:40	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		03/24/16 04:40	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.23**	mg/L	0.10	0.050	1		03/22/16 09:43		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**6.5**	mg/L	2.5	1.2	1		03/23/16 10:00	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-8 **Lab ID: 10341927005** Collected: 03/16/16 15:50 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.63	1		03/18/16 18:16	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.10	0.10	1	03/21/16 14:24	03/23/16 10:23		
Surrogates									
n-Triacontane (S)	85	%.	50-150		1	03/21/16 14:24	03/23/16 10:23	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 04:57	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 04:57	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 04:57	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 04:57	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		03/24/16 04:57	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		03/24/16 04:57	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		03/24/16 04:57	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.14**	mg/L	0.10	0.050	1		03/22/16 09:43		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**7.2**	mg/L	2.5	1.2	1		03/23/16 10:02	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-9 **Lab ID: 10341927006** Collected: 03/16/16 15:00 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**1830**	ug/L	10.0	0.63	1		03/18/16 18:24	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**6.0**	mg/L	0.10	0.10	1	03/21/16 14:24	03/23/16 09:34		
Surrogates									
n-Triacontane (S)	112	%.	50-150		1	03/21/16 14:24	03/23/16 09:34	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**135**	ug/L	1.0	0.21	1		03/24/16 05:14	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 05:14	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 05:14	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 05:14	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		03/24/16 05:14	17060-07-0	
Toluene-d8 (S)	99	%.	75-125		1		03/24/16 05:14	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		03/24/16 05:14	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		03/22/16 09:46		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**5.4**	mg/L	2.5	1.2	1		03/23/16 10:02	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-10 **Lab ID: 10341927007** Collected: 03/16/16 12:50 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**6870**	ug/L	10.0	0.63	1		03/18/16 18:32	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**21.2**	mg/L	1.1	1.1	10	03/21/16 14:24	03/23/16 11:47		
Surrogates									
n-Triacontane (S)	108	%.	50-150		10	03/21/16 14:24	03/23/16 11:47	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**24.4**	ug/L	1.0	0.21	1		03/24/16 05:32	71-43-2	
Ethylbenzene	**3.4**	ug/L	1.0	0.23	1		03/24/16 05:32	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 05:32	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 05:32	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	92	%.	75-125		1		03/24/16 05:32	17060-07-0	
Toluene-d8 (S)	99	%.	75-125		1		03/24/16 05:32	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		03/24/16 05:32	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		03/22/16 09:47		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.2	1		03/23/16 10:05	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: DUP **Lab ID: 10341927008** Collected: 03/16/16 00:00 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**5540**	ug/L	10.0	0.63	1		03/18/16 18:41	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**20.8**	mg/L	2.1	2.1	20	03/21/16 14:24	03/23/16 11:40		
Surrogates									
n-Triacontane (S)	0	%.	50-150		20	03/21/16 14:24	03/23/16 11:40	638-68-6	S4
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**26.0**	ug/L	1.0	0.21	1		03/24/16 05:49	71-43-2	
Ethylbenzene	**3.6**	ug/L	1.0	0.23	1		03/24/16 05:49	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 05:49	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 05:49	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	91	%.	75-125		1		03/24/16 05:49	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		03/24/16 05:49	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	75-125		1		03/24/16 05:49	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		03/22/16 09:47		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.2	1		03/23/16 10:05	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-16A **Lab ID: 10341927009** Collected: 03/16/16 12:17 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**81.7**	ug/L	10.0	0.63	1		03/18/16 18:49	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**2.6**	mg/L	0.10	0.10	1	03/21/16 14:24	03/23/16 09:27		
Surrogates									
n-Triacontane (S)	110	%.	50-150		1	03/21/16 14:24	03/23/16 09:27	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 06:06	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 06:06	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 06:06	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 06:06	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	92	%.	75-125		1		03/24/16 06:06	17060-07-0	
Toluene-d8 (S)	96	%.	75-125		1		03/24/16 06:06	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		03/24/16 06:06	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		03/22/16 09:51		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.2	1		03/23/16 10:05	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-16B **Lab ID: 10341927010** Collected: 03/16/16 13:00 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**34.4**	ug/L	10.0	0.63	1		03/18/16 19:13	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**0.58**	mg/L	0.10	0.10	1	03/21/16 14:24	03/23/16 10:30		
Surrogates									
n-Triacontane (S)	0	%.	50-150		1	03/21/16 14:24	03/23/16 10:30	638-68-6	S5
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 06:23	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 06:23	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 06:23	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 06:23	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	92	%.	75-125		1		03/24/16 06:23	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		03/24/16 06:23	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	75-125		1		03/24/16 06:23	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.19**	mg/L	0.10	0.050	1		03/22/16 09:52		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**7.5**	mg/L	2.5	1.2	1		03/23/16 10:05	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-17 **Lab ID: 10341927011** Collected: 03/16/16 11:56 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.63	1		03/18/16 19:30	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.10	0.10	1	03/21/16 14:24	03/23/16 10:37		
Surrogates									
n-Triacontane (S)	103	%.	50-150		1	03/21/16 14:24	03/23/16 10:37	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 06:40	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 06:40	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 06:40	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 06:40	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	92	%.	75-125		1		03/24/16 06:40	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		03/24/16 06:40	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		03/24/16 06:40	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.21**	mg/L	0.10	0.050	1		03/22/16 09:53		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**8.8**	mg/L	2.5	1.2	1		03/23/16 10:08	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-18 **Lab ID: 10341927012** Collected: 03/16/16 13:35 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.63	1		03/18/16 19:38	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**0.18**	mg/L	0.10	0.10	1	03/21/16 14:24	03/23/16 10:44		
Surrogates									
n-Triacontane (S)	110	%.	50-150		1	03/21/16 14:24	03/23/16 10:44	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 06:57	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 06:57	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 06:57	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 06:57	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	94	%.	75-125		1		03/24/16 06:57	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		03/24/16 06:57	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		03/24/16 06:57	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**3.0**	mg/L	0.10	0.050	1		03/22/16 09:56		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**5.8**	mg/L	2.5	1.2	1		03/23/16 10:08	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-19 **Lab ID: 10341927013** Collected: 03/16/16 10:05 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**38.8**	ug/L	10.0	0.63	1		03/18/16 19:46	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**0.78**	mg/L	0.10	0.10	1	03/21/16 14:24	03/23/16 10:51		
Surrogates									
n-Triacontane (S)	97	%.	50-150		1	03/21/16 14:24	03/23/16 10:51	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 07:15	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 07:15	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 07:15	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 07:15	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	94	%.	75-125		1		03/24/16 07:15	17060-07-0	
Toluene-d8 (S)	96	%.	75-125		1		03/24/16 07:15	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		03/24/16 07:15	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.10**	mg/L	0.10	0.050	1		03/22/16 09:56		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**4.2**	mg/L	2.5	1.2	1		03/23/16 10:08	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-20 **Lab ID: 10341927014** Collected: 03/16/16 10:57 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.63	1		03/18/16 19:54	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.10	0.10	1	03/21/16 14:24	03/23/16 10:58		
Surrogates									
n-Triacontane (S)	106	%.	50-150		1	03/21/16 14:24	03/23/16 10:58	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 07:32	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 07:32	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 07:32	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 07:32	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	94	%.	75-125		1		03/24/16 07:32	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		03/24/16 07:32	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		03/24/16 07:32	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**2.1**	mg/L	0.10	0.050	1		03/22/16 09:57		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**7.6**	mg/L	2.5	1.2	1		03/23/16 10:10	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-21 **Lab ID: 10341927015** Collected: 03/16/16 10:25 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.63	1		03/18/16 20:02	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.10	0.10	1	03/21/16 14:24	03/23/16 11:05		
Surrogates									
n-Triacontane (S)	104	%.	50-150		1	03/21/16 14:24	03/23/16 11:05	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 11:50	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 11:50	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 11:50	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 11:50	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	95	%.	75-125		1		03/24/16 11:50	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		03/24/16 11:50	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	75-125		1		03/24/16 11:50	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.67**	mg/L	0.10	0.050	1		03/22/16 09:57		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**7.9**	mg/L	2.5	1.2	1		03/23/16 10:10	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: MW-22 **Lab ID: 10341927016** Collected: 03/16/16 09:36 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.63	1		03/18/16 20:11	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**0.24**	mg/L	0.10	0.10	1	03/21/16 14:24	03/23/16 11:12		
Surrogates									
n-Triacontane (S)	105	%.	50-150		1	03/21/16 14:24	03/23/16 11:12	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 12:07	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 12:07	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 12:07	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 12:07	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		03/24/16 12:07	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		03/24/16 12:07	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		03/24/16 12:07	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		03/22/16 10:02		M1
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**6.9**	mg/L	2.5	1.2	1		03/23/16 10:10	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: USGS-1A **Lab ID: 10341927017** Collected: 03/17/16 10:00 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**2880**	ug/L	10.0	0.63	1		03/21/16 18:59	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**6.9**	mg/L	0.55	0.55	5	03/21/16 14:24	03/23/16 11:55		
Surrogates									
n-Triacontane (S)	99	%.	50-150		5	03/21/16 14:24	03/23/16 11:55	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**10**	ug/L	1.0	0.21	1		03/24/16 07:49	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 07:49	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 07:49	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 07:49	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		03/24/16 07:49	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		03/24/16 07:49	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		03/24/16 07:49	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		03/22/16 10:07		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.2	1		03/23/16 10:13	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: USGS-2A **Lab ID: 10341927018** Collected: 03/17/16 09:15 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**6380**	ug/L	10.0	0.63	1		03/21/16 19:07	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**16.4**	mg/L	1.1	1.1	10	03/21/16 14:24	03/23/16 12:02		
Surrogates									
n-Triacontane (S)	109	%.	50-150		10	03/21/16 14:24	03/23/16 12:02	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**201**	ug/L	1.0	0.21	1		03/24/16 08:06	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 08:06	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 08:06	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 08:06	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	91	%.	75-125		1		03/24/16 08:06	17060-07-0	
Toluene-d8 (S)	99	%.	75-125		1		03/24/16 08:06	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		03/24/16 08:06	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		03/22/16 10:11		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.2	1		03/23/16 10:13	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: USGS-3A **Lab ID: 10341927019** Collected: 03/17/16 09:15 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**442**	ug/L	10.0	0.63	1		03/22/16 14:42	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**2.5**	mg/L	0.10	0.10	1	03/21/16 14:24	03/23/16 09:41		
Surrogates									
n-Triacontane (S)	107	%.	50-150		1	03/21/16 14:24	03/23/16 09:41	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 08:24	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 08:24	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 08:24	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 08:24	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	94	%.	75-125		1		03/24/16 08:24	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		03/24/16 08:24	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		03/24/16 08:24	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		03/22/16 10:12		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.2	1		03/23/16 10:13	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: USGS-4A **Lab ID: 10341927020** Collected: 03/17/16 09:45 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**98.5**	ug/L	10.0	0.63	1		03/22/16 14:51	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**1.7**	mg/L	0.10	0.10	1	03/21/16 14:24	03/23/16 09:48		
Surrogates									
n-Triacontane (S)	97	%.	50-150		1	03/21/16 14:24	03/23/16 09:48	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 08:40	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 08:40	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 08:40	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 08:40	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		03/24/16 08:40	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		03/24/16 08:40	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		03/24/16 08:40	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		03/22/16 10:15		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.2	1		03/23/16 10:13	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: SCL DW **Lab ID: 10341927021** Collected: 03/16/16 13:25 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.63	1		03/18/16 20:19	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11	0.11	1	03/21/16 14:26	03/23/16 08:17		
Surrogates									
n-Triacontane (S)	93	%.	50-150		1	03/21/16 14:26	03/23/16 08:17	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 12:24	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 12:24	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 12:24	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 12:24	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		03/24/16 12:24	17060-07-0	
Toluene-d8 (S)	96	%.	75-125		1		03/24/16 12:24	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		03/24/16 12:24	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**1.1**	mg/L	0.10	0.050	1		03/22/16 10:15		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**3.6**	mg/L	2.5	1.2	1		03/23/16 10:13	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: Field Blank **Lab ID: 10341927022** Collected: 03/16/16 13:45 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.63	1		03/18/16 20:27	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11	0.11	1	03/21/16 14:26	03/23/16 08:10		
Surrogates									
n-Triacontane (S)	94	%.	50-150		1	03/21/16 14:26	03/23/16 08:10	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 02:24	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 02:24	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 02:24	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 02:24	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	94	%.	75-125		1		03/24/16 02:24	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		03/24/16 02:24	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		03/24/16 02:24	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		03/22/16 10:16		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.2	1		03/23/16 10:13	14808-79-8	

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ANALYTICAL RESULTS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Sample: Trip Blank **Lab ID: 10341927023** Collected: 03/16/16 00:00 Received: 03/17/16 18:00 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.21	1		03/24/16 02:07	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.23	1		03/24/16 02:07	100-41-4	
Toluene	ND	ug/L	1.0	0.13	1		03/24/16 02:07	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.60	1		03/24/16 02:07	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		03/24/16 02:07	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		03/24/16 02:07	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		03/24/16 02:07	460-00-4	

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QUALITY CONTROL DATA

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

QC Batch: AIR/25475 — Analysis Method: RSK 175
QC Batch Method: RSK 175 — Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10341927001, 10341927002, 10341927003, 10341927004, 10341927005, 10341927006, 10341927007, 10341927008, 10341927009

METHOD BLANK: 2212886 — Matrix: Water
Associated Lab Samples: 10341927001, 10341927002, 10341927003, 10341927004, 10341927005, 10341927006, 10341927007, 10341927008, 10341927009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ug/L	ND	10.0	0.63	03/18/16 15:49	

LABORATORY CONTROL SAMPLE & LCSD: 2212887 2212888

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ug/L	60.7	58.6	60.0	97	99	85-115	2	20	

SAMPLE DUPLICATE: 2213770

Parameter	Units	92290354003 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	6.9J	6.7J		20	

SAMPLE DUPLICATE: 2213771

Parameter	Units	10341927001 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	ND	1.5J		20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

QC Batch: AIR/25480 — Analysis Method: RSK 175
QC Batch Method: RSK 175 — Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10341927010, 10341927011, 10341927012, 10341927013, 10341927014, 10341927015, 10341927016, 10341927021, 10341927022

METHOD BLANK: 2213107 — Matrix: Water
Associated Lab Samples: 10341927010, 10341927011, 10341927012, 10341927013, 10341927014, 10341927015, 10341927016, 10341927021, 10341927022

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ug/L	ND	10.0	0.63	03/18/16 19:05	

LABORATORY CONTROL SAMPLE & LCSD: 2213108 2213109

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ug/L	60.7	60.0	58.6	99	97	85-115	2	20	

SAMPLE DUPLICATE: 2213796

Parameter	Units	10341927010 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	34.4	54.0	44	20	R1

SAMPLE DUPLICATE: 2213797

Parameter	Units	10341932001 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	ND	4J		20	

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QUALITY CONTROL DATA

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

QC Batch: AIR/25498 | Analysis Method: RSK 175
QC Batch Method: RSK 175 | Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10341927017, 10341927018

METHOD BLANK: 2214202 | Matrix: Water
Associated Lab Samples: 10341927017, 10341927018

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ug/L	ND	10.0	0.63	03/21/16 16:07	

LABORATORY CONTROL SAMPLE & LCSD: 2214203 2214204

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ug/L	60.7	58.7	57.9	97	95	85-115	1	20	

SAMPLE DUPLICATE: 2214477

Parameter	Units	35234421002 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	2750	2740	1	20	

SAMPLE DUPLICATE: 2214478

Parameter	Units	60215227001 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	624	803	25	20	R1

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QUALITY CONTROL DATA

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

QC Batch: AIR/25505 | Analysis Method: RSK 175
QC Batch Method: RSK 175 | Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10341927019, 10341927020

METHOD BLANK: 2214506 | Matrix: Water
Associated Lab Samples: 10341927019, 10341927020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ug/L	ND	10.0	0.63	03/22/16 13:37	

LABORATORY CONTROL SAMPLE & LCSD: 2214507 2214508

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ug/L	60.7	56.9	57.2	94	94	85-115	1	20	

SAMPLE DUPLICATE: 2215331

Parameter	Units	92290579004 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	3.1J	3.6J		20	

SAMPLE DUPLICATE: 2215332

Parameter	Units	92290631002 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	1.9J	2.2J		20	

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QUALITY CONTROL DATA

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

QC Batch: MSV/34968 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 10341927001, 10341927002, 10341927003, 10341927004, 10341927005, 10341927006, 10341927007, 10341927008, 10341927009, 10341927010, 10341927011, 10341927012, 10341927013, 10341927014, 10341927017, 10341927018, 10341927019, 10341927020, 10341927022, 10341927023

METHOD BLANK: 2215943 Matrix: Water
Associated Lab Samples: 10341927001, 10341927002, 10341927003, 10341927004, 10341927005, 10341927006, 10341927007, 10341927008, 10341927009, 10341927010, 10341927011, 10341927012, 10341927013, 10341927014, 10341927017, 10341927018, 10341927019, 10341927020, 10341927022, 10341927023

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	0.21	03/24/16 01:49	
Ethylbenzene	ug/L	ND	1.0	0.23	03/24/16 01:49	
Toluene	ug/L	ND	1.0	0.13	03/24/16 01:49	
Xylene (Total)	ug/L	ND	3.0	0.60	03/24/16 01:49	
1,2-Dichloroethane-d4 (S)	%.	94	75-125		03/24/16 01:49	
4-Bromofluorobenzene (S)	%.	98	75-125		03/24/16 01:49	
Toluene-d8 (S)	%.	97	75-125		03/24/16 01:49	

LABORATORY CONTROL SAMPLE & LCSD: 2215944 2215945

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/L	20	16.8	18.3	84	91	75-125	9	20	
Ethylbenzene	ug/L	20	18.2	19.9	91	100	75-125	9	20	
Toluene	ug/L	20	18.5	20.2	92	101	75-125	9	20	
Xylene (Total)	ug/L	60	57.6	61.5	96	103	75-125	7	20	
1,2-Dichloroethane-d4 (S)	%.				96	96	75-125			
4-Bromofluorobenzene (S)	%.				99	97	75-125			
Toluene-d8 (S)	%.				100	99	75-125			

MATRIX SPIKE SAMPLE: 2215949

Parameter	Units	10341927001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	ND	20	18.2	91	52-147	
Ethylbenzene	ug/L	ND	20	19.8	99	67-149	
Toluene	ug/L	ND	20	20.1	100	69-139	
Xylene (Total)	ug/L	ND	60	60.3	101	70-147	
1,2-Dichloroethane-d4 (S)	%.				96	75-125	
4-Bromofluorobenzene (S)	%.				99	75-125	
Toluene-d8 (S)	%.				99	75-125	

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QUALITY CONTROL DATA

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

SAMPLE DUPLICATE: 2215950

Parameter	Units	10341927002 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzene	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	94	95	1		
4-Bromofluorobenzene (S)	%.	99	98	1		
Toluene-d8 (S)	%.	97	96	1		

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QUALITY CONTROL DATA

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

QC Batch: MSV/34971 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 10341927015, 10341927016, 10341927021

METHOD BLANK: 2216026 Matrix: Water
Associated Lab Samples: 10341927015, 10341927016, 10341927021

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	0.21	03/24/16 10:58	
Ethylbenzene	ug/L	ND	1.0	0.23	03/24/16 10:58	
Toluene	ug/L	ND	1.0	0.13	03/24/16 10:58	
Xylene (Total)	ug/L	ND	3.0	0.60	03/24/16 10:58	
1,2-Dichloroethane-d4 (S)	%.	94	75-125		03/24/16 10:58	
4-Bromofluorobenzene (S)	%.	98	75-125		03/24/16 10:58	
Toluene-d8 (S)	%.	98	75-125		03/24/16 10:58	

LABORATORY CONTROL SAMPLE: 2216027

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	17.0	85	75-125	
Ethylbenzene	ug/L	20	18.2	91	75-125	
Toluene	ug/L	20	18.5	93	75-125	
Xylene (Total)	ug/L	60	56.7	94	75-125	
1,2-Dichloroethane-d4 (S)	%.			94	75-125	
4-Bromofluorobenzene (S)	%.			99	75-125	
Toluene-d8 (S)	%.			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2216030 2216031

Parameter	Units	10341996003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	ND	20	20	17.5	17.5	88	87	52-147	0	30	
Ethylbenzene	ug/L	ND	20	20	19.1	18.7	95	93	67-149	2	30	
Toluene	ug/L	ND	20	20	19.4	18.7	97	93	69-139	4	30	
Xylene (Total)	ug/L	ND	60	60	57.6	56.1	96	94	70-147	3	30	
1,2-Dichloroethane-d4 (S)	%.						96	96	75-125			
4-Bromofluorobenzene (S)	%.						96	98	75-125			
Toluene-d8 (S)	%.						97	99	75-125			

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QUALITY CONTROL DATA

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

QC Batch: OEXT/32851 — Analysis Method: Diesel Range Organics
QC Batch Method: Diesel Range Organics — Analysis Description: WIDRO Extended GCS
Associated Lab Samples: 10341927001, 10341927002, 10341927003, 10341927004, 10341927005, 10341927006, 10341927007, 10341927008, 10341927009, 10341927010, 10341927011, 10341927012, 10341927013, 10341927014, 10341927015, 10341927016, 10341927017, 10341927018, 10341927019, 10341927020

METHOD BLANK: 2214072 — Matrix: Water
Associated Lab Samples: 10341927001, 10341927002, 10341927003, 10341927004, 10341927005, 10341927006, 10341927007, 10341927008, 10341927009, 10341927010, 10341927011, 10341927012, 10341927013, 10341927014, 10341927015, 10341927016, 10341927017, 10341927018, 10341927019, 10341927020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO, Extended C10-C32	mg/L	ND	0.10	0.10	03/23/16 08:45	
n-Triacontane (S)	%.	109	50-150		03/23/16 08:45	

LABORATORY CONTROL SAMPLE & LCSD: 2214073 2214074

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
n-Triacontane (S)	%.				90	95	50-150			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

QC Batch: OEXT/32852 | Analysis Method: Diesel Range Organics
QC Batch Method: Diesel Range Organics | Analysis Description: WIDRO Extended GCS
Associated Lab Samples: 10341927021, 10341927022

METHOD BLANK: 2214080 | Matrix: Water
Associated Lab Samples: 10341927021, 10341927022

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO, Extended C10-C32	mg/L	ND	0.10	0.10	03/23/16 07:56	
n-Triacontane (S)	%.	95	50-150		03/23/16 07:56	

LABORATORY CONTROL SAMPLE & LCSD: 2214081 2214082

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
n-Triacontane (S)	%.				93	94	50-150			

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QUALITY CONTROL DATA

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

QC Batch: WETA/26658 — Analysis Method: SM 4500-NO3 H
QC Batch Method: SM 4500-NO3 H — Analysis Description: SM4500NO3-H, NO2 + NO3 pres.
Associated Lab Samples: 10341927001, 10341927002, 10341927003, 10341927004, 10341927005, 10341927006, 10341927007, 10341927008, 10341927009, 10341927010, 10341927011, 10341927012, 10341927013, 10341927014, 10341927015

METHOD BLANK: 2214417 — Matrix: Water
Associated Lab Samples: 10341927001, 10341927002, 10341927003, 10341927004, 10341927005, 10341927006, 10341927007, 10341927008, 10341927009, 10341927010, 10341927011, 10341927012, 10341927013, 10341927014, 10341927015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.050	03/22/16 11:41	

LABORATORY CONTROL SAMPLE: 2214418

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.4	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2214419 — 2214420

Parameter	Units	10341382002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.23	2.5	2.5	2.6	2.8	95	101	80-120	5	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2214421 — 2214422

Parameter	Units	10340979001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.70	2.5	2.5	0.97	1.0	11	13	80-120	4	30	M1

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QUALITY CONTROL DATA

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

QC Batch: WETA/26659 — Analysis Method: SM 4500-NO3 H
QC Batch Method: SM 4500-NO3 H — Analysis Description: SM4500NO3-H, NO2 + NO3 pres.
Associated Lab Samples: 10341927016, 10341927017, 10341927018, 10341927019, 10341927020, 10341927021, 10341927022

METHOD BLANK: 2214424 — Matrix: Water
Associated Lab Samples: 10341927016, 10341927017, 10341927018, 10341927019, 10341927020, 10341927021, 10341927022

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.050	03/22/16 11:41	

LABORATORY CONTROL SAMPLE: 2214425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2214426 — 2214427

Parameter	Units	10341927016 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	1.6	1.6	61	60	80-120	1	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2214428 — 2214429

Parameter	Units	10341927017 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	2.1	2.2	81	86	80-120	6	30	

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QUALITY CONTROL DATA

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

QC Batch: WETA/26678 — Analysis Method: ASTM D516
QC Batch Method: ASTM D516 — Analysis Description: ASTM D516 Sulfate Water
Associated Lab Samples: 10341927001, 10341927002, 10341927003

METHOD BLANK: 2215382 — Matrix: Water
Associated Lab Samples: 10341927001, 10341927002, 10341927003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	2.5	1.2	03/23/16 09:33	

LABORATORY CONTROL SAMPLE & LCSD: 2215383 2215384

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Sulfate	mg/L	7.5	7.3	7.3	97	97	80-120	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2215385 2215386

Parameter	Units	10341603001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	ND	20	20	23.3	23.7	107	108	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2215387 2215388

Parameter	Units	10341603010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	5.3	20	20	26.0	26.5	104	106	80-120	2	30	

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QUALITY CONTROL DATA

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

QC Batch: WETA/26679 — Analysis Method: ASTM D516
QC Batch Method: ASTM D516 — Analysis Description: ASTM D516 Sulfate Water
Associated Lab Samples: 10341927004, 10341927005, 10341927006, 10341927007, 10341927008, 10341927009, 10341927010, 10341927011, 10341927012, 10341927013, 10341927014, 10341927015, 10341927016, 10341927017, 10341927018, 10341927019, 10341927020, 10341927021, 10341927022

METHOD BLANK: 2215391 — Matrix: Water
Associated Lab Samples: 10341927004, 10341927005, 10341927006, 10341927007, 10341927008, 10341927009, 10341927010, 10341927011, 10341927012, 10341927013, 10341927014, 10341927015, 10341927016, 10341927017, 10341927018, 10341927019, 10341927020, 10341927021, 10341927022

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	2.5	1.2	03/23/16 10:00	

LABORATORY CONTROL SAMPLE & LCSD: 2215392 2215393

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Sulfate	mg/L	7.5	7.0	7.2	93	96	80-120	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2215394 2215395

Parameter	Units	10341927004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	6.5	20	20	27.2	26.5	104	100	80-120	3	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2215396 2215397

Parameter	Units	10341927013 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	4.2	20	20	23.9	23.2	99	95	80-120	3	30	

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QUALIFIERS

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

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BATCH QUALIFIERS

Batch: MSV/34968

[M5]	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10341927001	**MW-1**	RSK 175	AIR/25475		
10341927002	**MW-4**	RSK 175	AIR/25475		
10341927003	**MW-6**	RSK 175	AIR/25475		
10341927004	**MW-7**	RSK 175	AIR/25475		
10341927005	**MW-8**	RSK 175	AIR/25475		
10341927006	**MW-9**	RSK 175	AIR/25475		
10341927007	**MW-10**	RSK 175	AIR/25475		
10341927008	**DUP**	RSK 175	AIR/25475		
10341927009	**MW-16A**	RSK 175	AIR/25475		
10341927010	**MW-16B**	RSK 175	AIR/25480		
10341927011	**MW-17**	RSK 175	AIR/25480		
10341927012	**MW-18**	RSK 175	AIR/25480		
10341927013	**MW-19**	RSK 175	AIR/25480		
10341927014	**MW-20**	RSK 175	AIR/25480		
10341927015	**MW-21**	RSK 175	AIR/25480		
10341927016	**MW-22**	RSK 175	AIR/25480		
10341927017	**USGS-1A**	RSK 175	AIR/25498		
10341927018	**USGS-2A**	RSK 175	AIR/25498		
10341927019	**USGS-3A**	RSK 175	AIR/25505		
10341927020	**USGS-4A**	RSK 175	AIR/25505		
10341927021	**SCL DW**	RSK 175	AIR/25480		
10341927022	**Field Blank**	RSK 175	AIR/25480		
10341927001	**MW-1**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927002	**MW-4**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927003	**MW-6**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927004	**MW-7**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927005	**MW-8**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927006	**MW-9**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927007	**MW-10**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927008	**DUP**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927009	**MW-16A**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927010	**MW-16B**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927011	**MW-17**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927012	**MW-18**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927013	**MW-19**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927014	**MW-20**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927015	**MW-21**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927016	**MW-22**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927017	**USGS-1A**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927018	**USGS-2A**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927019	**USGS-3A**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927020	**USGS-4A**	Diesel Range Organics	OEXT/32851	Diesel Range Organics	GCSV/18132
10341927021	**SCL DW**	Diesel Range Organics	OEXT/32852	Diesel Range Organics	GCSV/18130
10341927022	**Field Blank**	Diesel Range Organics	OEXT/32852	Diesel Range Organics	GCSV/18130
10341927001	**MW-1**	EPA 8260B	MSV/34968		

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Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10341927002	**MW-4**	EPA 8260B	MSV/34968		
10341927003	**MW-6**	EPA 8260B	MSV/34968		
10341927004	**MW-7**	EPA 8260B	MSV/34968		
10341927005	**MW-8**	EPA 8260B	MSV/34968		
10341927006	**MW-9**	EPA 8260B	MSV/34968		
10341927007	**MW-10**	EPA 8260B	MSV/34968		
10341927008	**DUP**	EPA 8260B	MSV/34968		
10341927009	**MW-16A**	EPA 8260B	MSV/34968		
10341927010	**MW-16B**	EPA 8260B	MSV/34968		
10341927011	**MW-17**	EPA 8260B	MSV/34968		
10341927012	**MW-18**	EPA 8260B	MSV/34968		
10341927013	**MW-19**	EPA 8260B	MSV/34968		
10341927014	**MW-20**	EPA 8260B	MSV/34968		
10341927015	**MW-21**	EPA 8260B	MSV/34971		
10341927016	**MW-22**	EPA 8260B	MSV/34971		
10341927017	**USGS-1A**	EPA 8260B	MSV/34968		
10341927018	**USGS-2A**	EPA 8260B	MSV/34968		
10341927019	**USGS-3A**	EPA 8260B	MSV/34968		
10341927020	**USGS-4A**	EPA 8260B	MSV/34968		
10341927021	**SCL DW**	EPA 8260B	MSV/34971		
10341927022	**Field Blank**	EPA 8260B	MSV/34968		
10341927023	**Trip Blank**	EPA 8260B	MSV/34968		
10341927001	**MW-1**	SM 4500-NO3 H	WETA/26658		
10341927002	**MW-4**	SM 4500-NO3 H	WETA/26658		
10341927003	**MW-6**	SM 4500-NO3 H	WETA/26658		
10341927004	**MW-7**	SM 4500-NO3 H	WETA/26658		
10341927005	**MW-8**	SM 4500-NO3 H	WETA/26658		
10341927006	**MW-9**	SM 4500-NO3 H	WETA/26658		
10341927007	**MW-10**	SM 4500-NO3 H	WETA/26658		
10341927008	**DUP**	SM 4500-NO3 H	WETA/26658		
10341927009	**MW-16A**	SM 4500-NO3 H	WETA/26658		
10341927010	**MW-16B**	SM 4500-NO3 H	WETA/26658		
10341927011	**MW-17**	SM 4500-NO3 H	WETA/26658		
10341927012	**MW-18**	SM 4500-NO3 H	WETA/26658		
10341927013	**MW-19**	SM 4500-NO3 H	WETA/26658		
10341927014	**MW-20**	SM 4500-NO3 H	WETA/26658		
10341927015	**MW-21**	SM 4500-NO3 H	WETA/26658		
10341927016	**MW-22**	SM 4500-NO3 H	WETA/26659		
10341927017	**USGS-1A**	SM 4500-NO3 H	WETA/26659		
10341927018	**USGS-2A**	SM 4500-NO3 H	WETA/26659		
10341927019	**USGS-3A**	SM 4500-NO3 H	WETA/26659		
10341927020	**USGS-4A**	SM 4500-NO3 H	WETA/26659		
10341927021	**SCL DW**	SM 4500-NO3 H	WETA/26659		
10341927022	**Field Blank**	SM 4500-NO3 H	WETA/26659		
10341927001	**MW-1**	ASTM D516	WETA/26678		

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Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60341413 South Cass Lake
Pace Project No.: 10341927

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10341927002	**MW-4**	ASTM D516	WETA/26678		
10341927003	**MW-6**	ASTM D516	WETA/26678		
10341927004	**MW-7**	ASTM D516	WETA/26679		
10341927005	**MW-8**	ASTM D516	WETA/26679		
10341927006	**MW-9**	ASTM D516	WETA/26679		
10341927007	**MW-10**	ASTM D516	WETA/26679		
10341927008	**DUP**	ASTM D516	WETA/26679		
10341927009	**MW-16A**	ASTM D516	WETA/26679		
10341927010	**MW-16B**	ASTM D516	WETA/26679		
10341927011	**MW-17**	ASTM D516	WETA/26679		
10341927012	**MW-18**	ASTM D516	WETA/26679		
10341927013	**MW-19**	ASTM D516	WETA/26679		
10341927014	**MW-20**	ASTM D516	WETA/26679		
10341927015	**MW-21**	ASTM D516	WETA/26679		
10341927016	**MW-22**	ASTM D516	WETA/26679		
10341927017	**USGS-1A**	ASTM D516	WETA/26679		
10341927018	**USGS-2A**	ASTM D516	WETA/26679		
10341927019	**USGS-3A**	ASTM D516	WETA/26679		
10341927020	**USGS-4A**	ASTM D516	WETA/26679		
10341927021	**SCL DW**	ASTM D516	WETA/26679		
10341927022	**Field Blank**	ASTM D516	WETA/26679		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

L0341922

Page: of

Section A Required Client Information:

Company:	AECOM
Address:	11 East Superior Street, Suite 260
	Duluth, MN 55802
Email To:	darin.albrecht@aecom.com
Phone: (218) 625-8768	Fax: (218) 625-2201
Requested Due Date/TAT:	5 Day Enbridge Standard

Section B Required Project Information:

Report To:	Darin Albrecht
Copy To:	
Purchase Order No.:	
Project Name:	South Cass Lake
Project Number:	60341413

Section C Invoice Information:

Attention:	Karl Beaster
Company Name:	Enbridge Energy
Address:	1100 Louisiana St. Ste 3000
Pace Quote Reference:	Houston, TX 77002
Pace Project Manager:	Carol Davy
Pace Profile #:	32482

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER
UST | RCRA | OTHER _____

Site Location STATE: MN

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/Grab DATE	COLLECTED Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	BTEX	Extended Range DRO	Sulfate	Nitrate + Nitrite	Methane	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
										Preservatives									N	N	N	N	N		
1	MW-1	WT	G			3/16	1014		10	4	1		5						3	2	1	1	3		001
2	MW-4	WT	G			3/16	1115		10	4	1		5						3	2	1	1	3		002
3	MW-6	WT	G			3/16	1517		10	4	1		5						3	2	1	1	3		003
4	MW-7	WT	G			3/16	1608		10	4	1		5						3	2	1	1	3		004
5	MW-8	WT	G			3/16	1550		10	4	1		5						3	2	1	1	3		005
6	MW-9	WT	G			3/16	1500		10	4	1		5						3	2	1	1	3		006
7	MW-10	WT	G			3/16	1250		10	4	1		5						3	2	1	1	3		007
8	DUP	WT	G			3/16	—		10	4	1		5						3	2	1	1	3		008
9	MW-16A	WT	G			3/16	1217		10	4	1		5						3	2	1	1	3		009
10	MW-16B	WT	G			3/16	1300		10	4	1		5						3	2	1	1	3		010
11	MW-17	WT	G			3/16	1156		10	4	1		5						3	2	1	1	3		011
12	MW-18	WT	G			3/16	1335		10	4	1		5						3	2	1	1	3		012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Please send Chroms with GRO or DRO hits	AECOM	3/17/16	1250	Kristina Polson	3/17/16	1250				
	Kristina Polson	3/17/16	1445		3/17/16	1445				
				Pace	3/17/16	1800	04.2 05.2	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ashley Lawson

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY): 3-17-16

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

W341927

Page: of

Section A Required Client Information:

Company:	AECOM
Address:	11 East Superior Street, Suite 260
	Duluth, MN 55802
Email To:	darin.albrecht@aecom.com
Phone: (218) 625-8768	Fax: (218) 625-2201
Requested Due Date/TAT:	5 Day Enbridge Standard

Section B Required Project Information:

Report To:	Darin Albrecht
Copy To:	
Purchase Order No.:	
Project Name:	South Cass lake
Project Number:	60341413

Section C Invoice Information:

Attention:	Karl Beater
Company Name:	Enbridge Energy
Address:	1100 Lousiana St Sutie 3000
Pace Quote Reference:	Houston, TX 77002
Pace Project Manager:	Carol Davy
Pace Profile #:	32482

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER
UST | RCRA | OTHER _____

Site Location STATE: MN

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/Grab DATE	COLLECTED Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	BTEX	Extended Range DRO	Sulfate	Nitrate + Nitrite	Methane	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																			N	N	N	N	N		
1	MW-19	WT	G			3/16	1005		10	4	1		5						3	2	1	1	3		013
2	MW-20	WT	G			3/16	1057		10	4	1		5						3	2	1	1	3		014
3	MW-21	WT	G			3/16	1025		10	4	1		5						3	2	1	1	3		015
4	MW-22	WT	G			3/16	9360		10	4	1		5						3	2	1	1	3		016
5	USGS-1A	WT	G			3/17	1000		10	4	1		5						3	2	1	1	3		017
6	USGS-2A	WT	G			3/17	915		10	4	1		5						3	2	1	1	3		018
7	USGS-3A	WT	G			3/17	915		10	4	1		5						3	2	1	1	3		019
8	USGS-4A	WT	G			3/17	945		10	4	1		5						3	2	1	1	3		020
9	SCL DW	DW	G			3/16	1325		10	4	1		5						3	2	1	1	3		021
10	Field Blank	WT	G			3/16	1345		10	4	1		5						3	2	1	1	3		022
11	Trip Blank	OT	-			3/16	—		4				4						3	2	1	1	3		023
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Please send Chroms with GRO or DRO hits	AECOM	3/17/16	1250	Kristina Polson	3/17/16	1250
	Kristina Polson	3/17/16	1445		3/17/16	1445
				PACE	3/17/16	1900

SAMPLE CONDITIONS	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	1.4, 2.2, 1.0 1.7, 0.5, 2.3, 1.2	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ashley Lawrence

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY): 3-17-16

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 05Jan2016 Page 1 of 1
	Document No.: **F-MN-L-213-rev.15**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: AECOM

Project #: WO#: 10341927

10341927

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace ☐ SpeeDee ☐ Other:

Tracking Number:

Custody Seal on Cooler/Box Present? ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☑ Yes ☐ No

Thermometer Used: ☐ 151401163 ☑ B88A912167504 ☐ 151401164 ☐ B88A0143310098

Type of Ice: ☑ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Read (°C): See back **Cooler Temp Corrected (°C):** See back **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** +0.1 **Date and Initials of Person Examining Contents:** CMB 3/17/16

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☑ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No	☐ N/A	6.
Rush Turn Around Time Requested?	☑ Yes	☐ No	☐ N/A	7. 5-Day
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: Water	☑ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13. ☐ HNO_3 ☑ H_2SO_4 ☐ NaOH ☐ HCl Sample # 1-22 22/22
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	☑ Yes	☐ No	☐ N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☑ No	☐ N/A	14.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	15. 12 TB's rec'd
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased): 010416-3BZA				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: CMB **Date:** 3/18/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

SCUR Exceptions: **Workorder #:**

Issue	Sample ID	Container Type/#
Cooler #1	1.3 , 1.4	
2	2.1 , 2.2	
3	0.9 , 1.0	
4	1.6 , 1.7	
5	0.4 , 0.5	
6	2.2 , 2.3	
7	1.1 , 1.2	

pH Adjustment Log for Preserved Samples

Sample #	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials

Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000022.D

Date : 23-MAR-2016 09:55

Client ID: MW-1

Instrument: 10gcs9.i

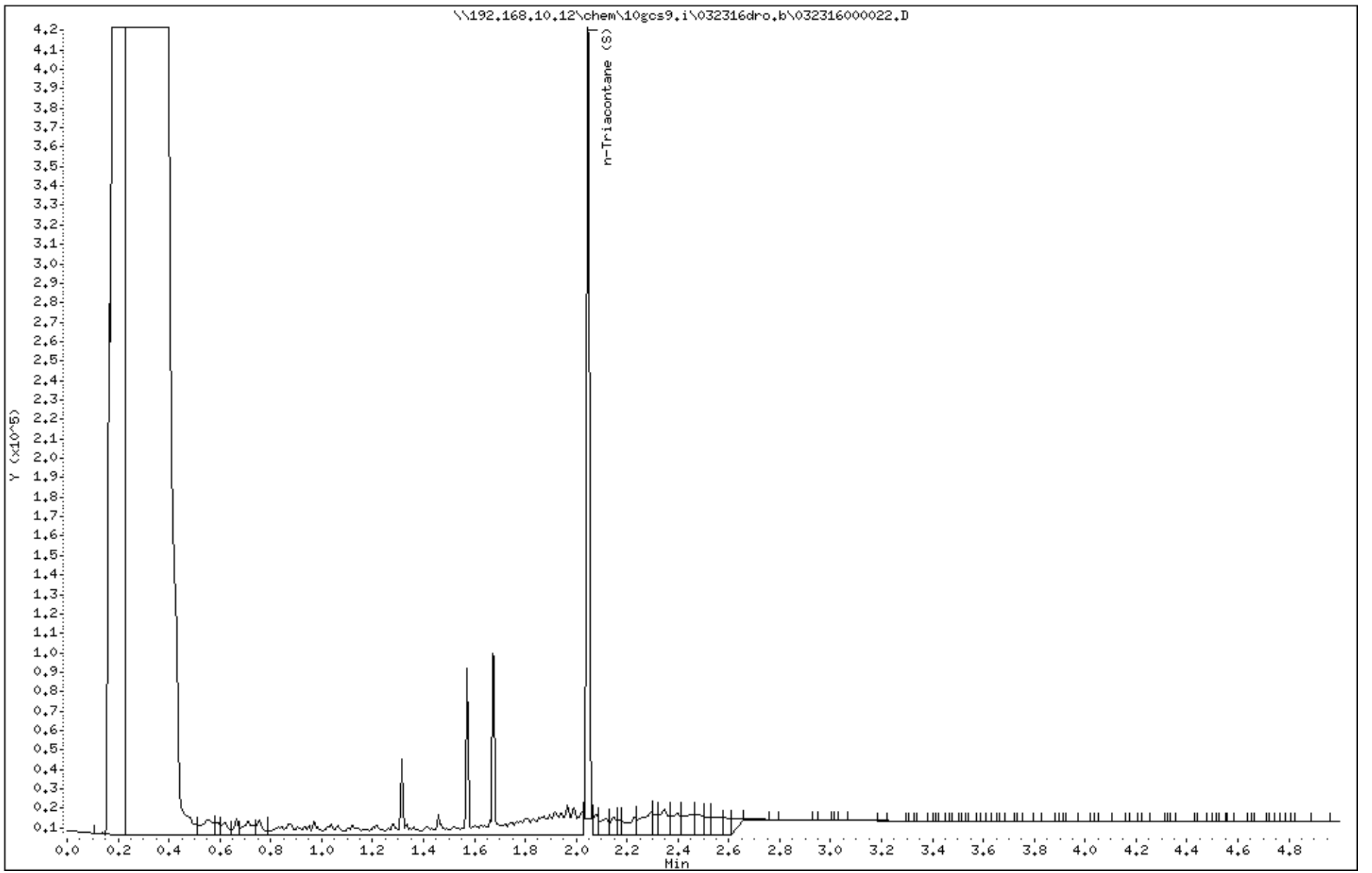
Sample Info: 10341927001

Volume Injected (uL): 1.0

Operator: MT

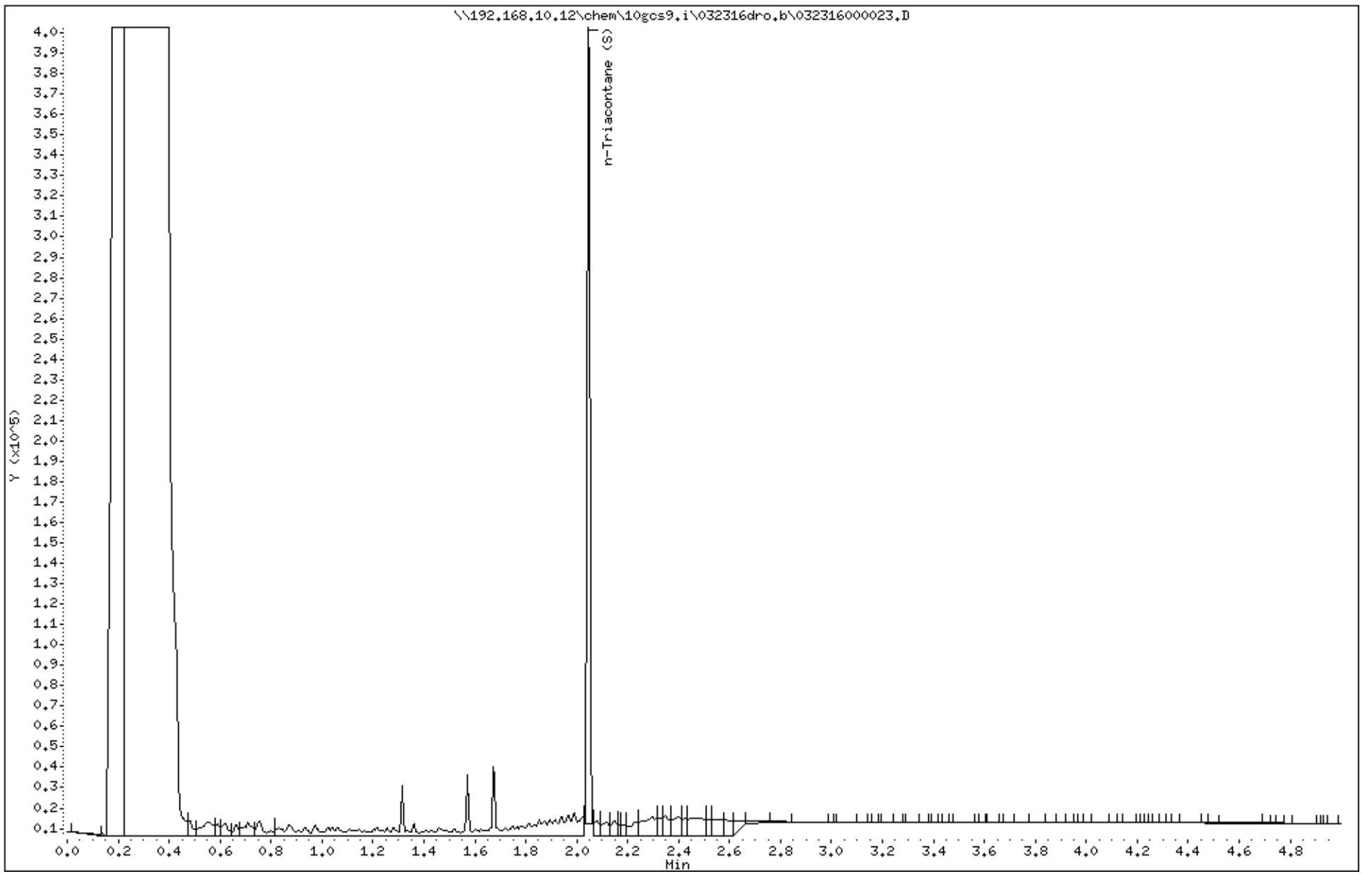
Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000023.D
Date : 23-MAR-2016 10:02
Client ID: MW-4
Sample Info: 10341927002
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs9.i
Operator: MT
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000024.D

Date : 23-MAR-2016 10:09

Client ID: MW-6

Instrument: 10gcs9.i

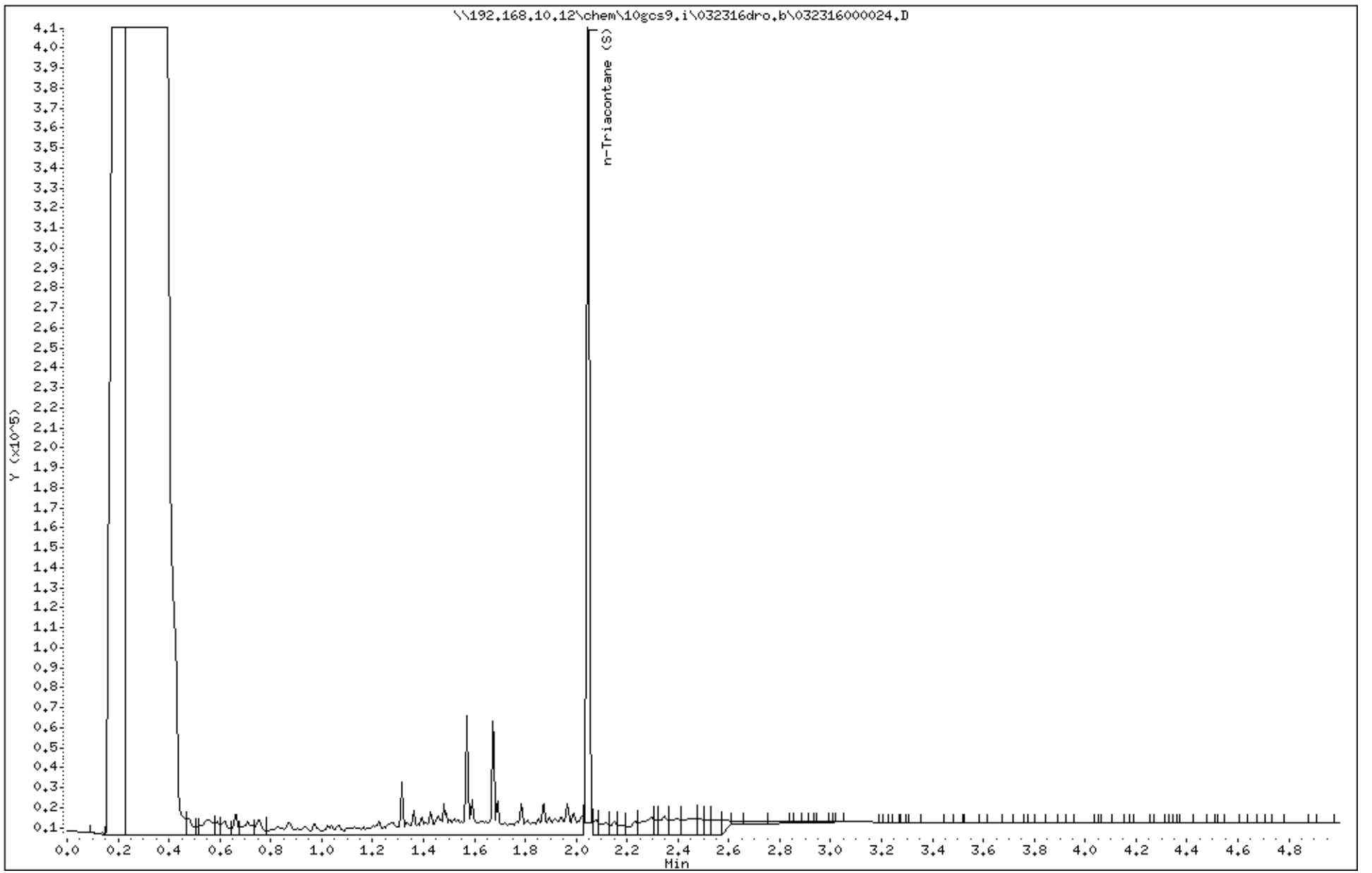
Sample Info: 10341927003

Volume Injected (uL): 1.0

Operator: MT

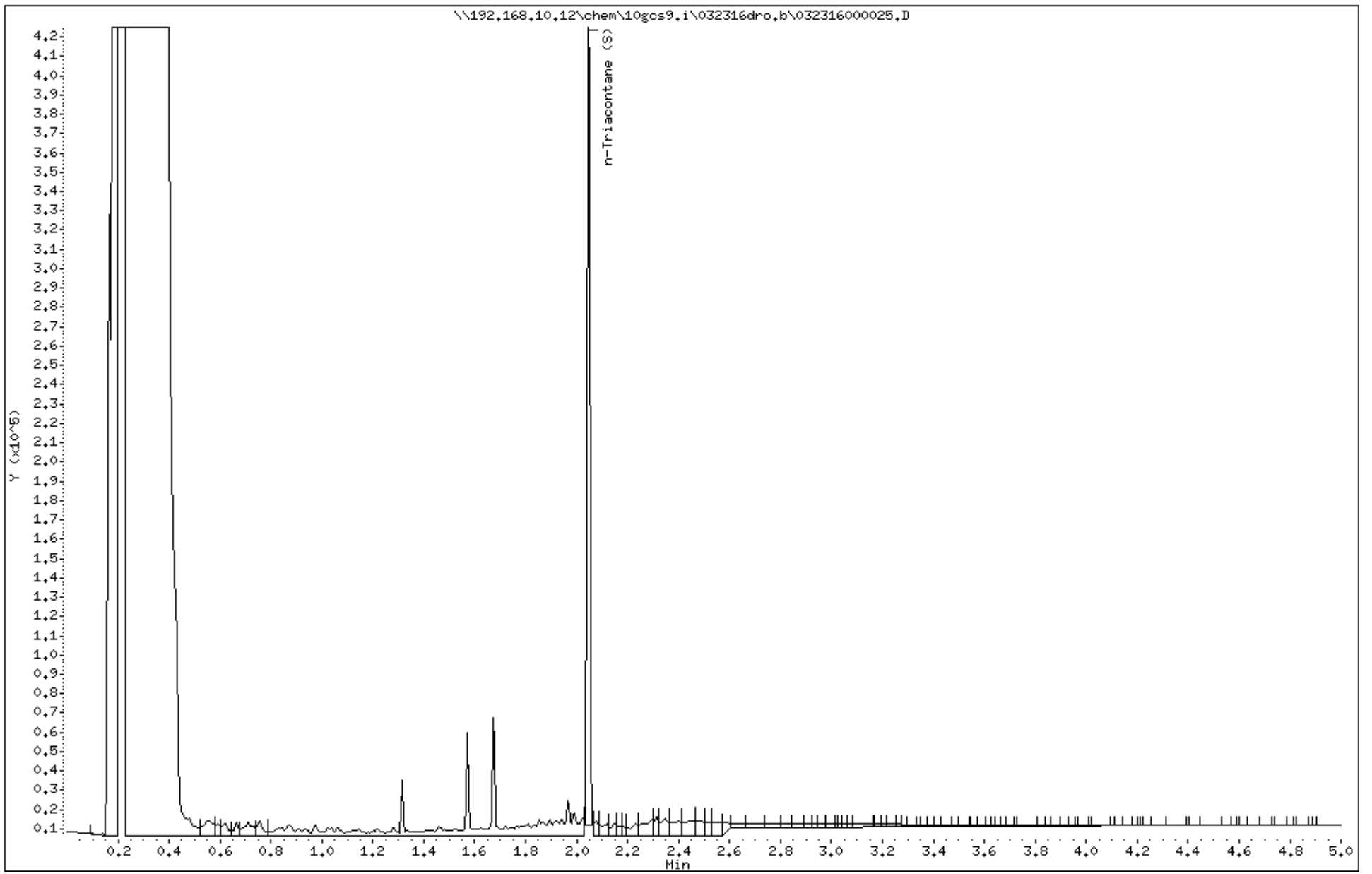
Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000025.D
Date : 23-MAR-2016 10:16
Client ID: MW-7
Sample Info: 10341927004
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs9.i
Operator: MT
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000026.D

Date : 23-MAR-2016 10:23

Client ID: MW-8

Instrument: 10gcs9.i

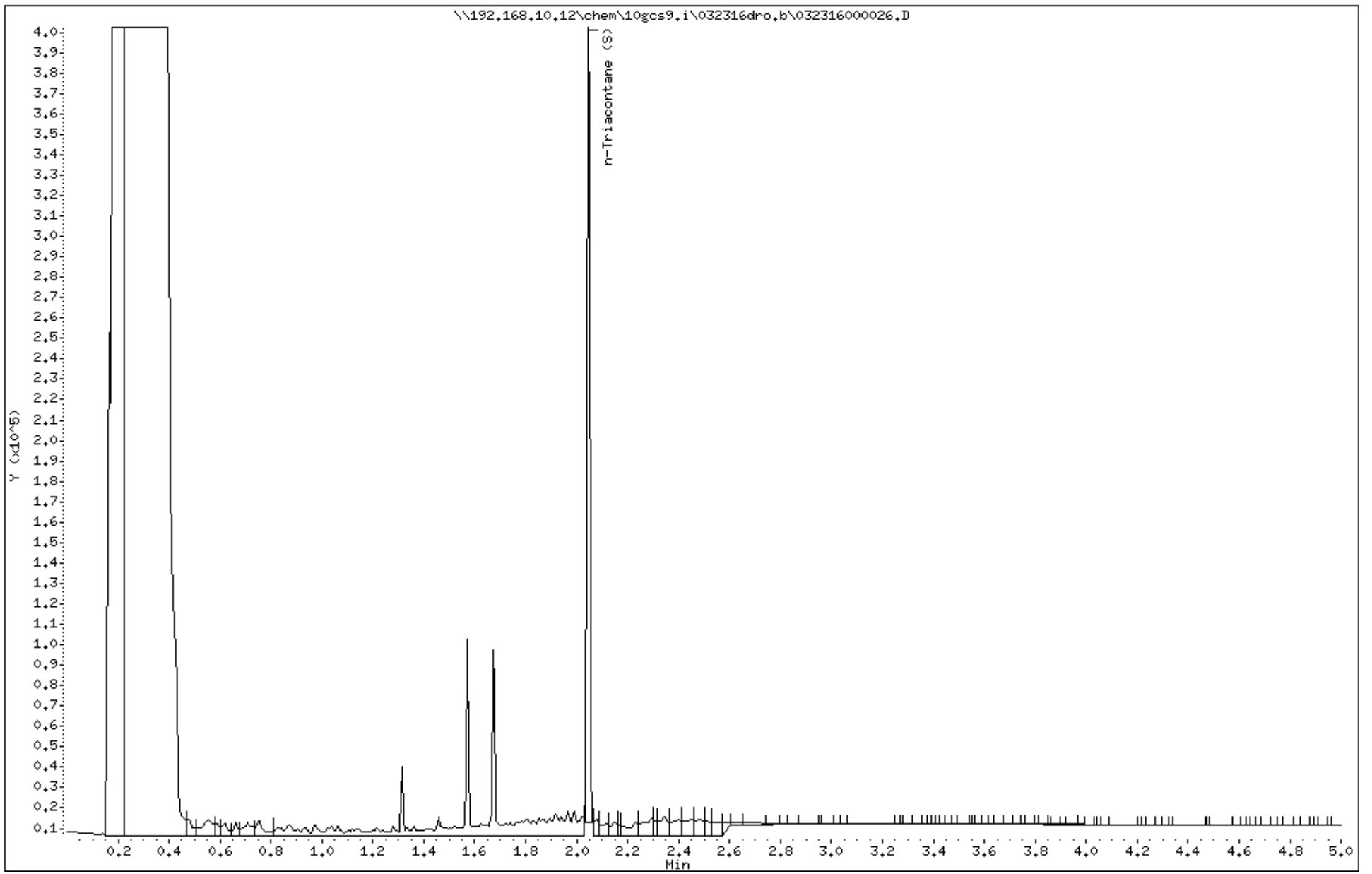
Sample Info: 10341927005

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000019.D

Date : 23-MAR-2016 09:34

Client ID: MW-9

Instrument: 10gcs9.i

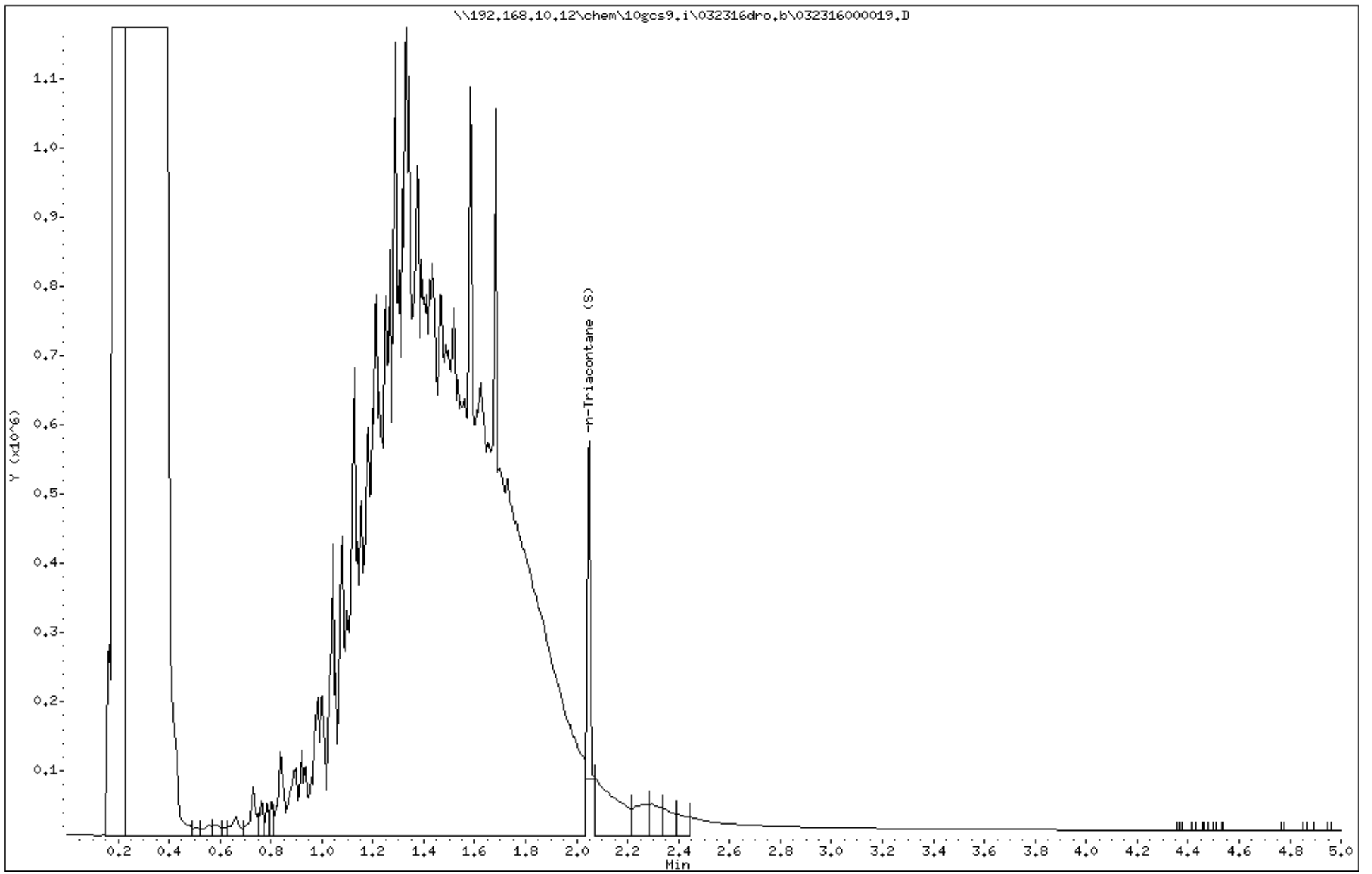
Sample Info: 10341927006

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000038.D

Date : 23-MAR-2016 11:47

Client ID: MW-10

Instrument: 10gcs9.i

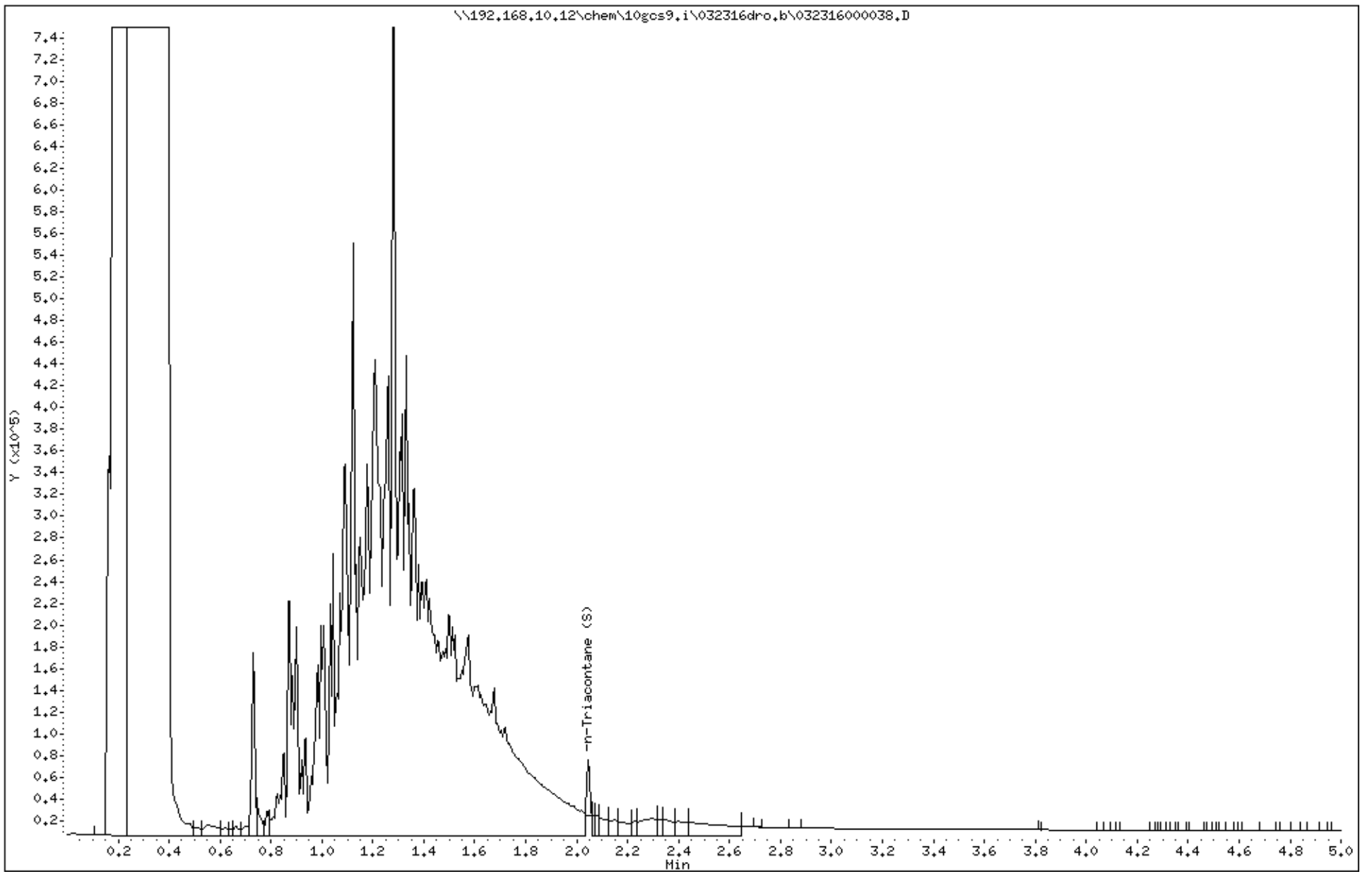
Sample Info: 10341927007X10

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000037.D

Date : 23-MAR-2016 11:40

Client ID: DUP

Instrument: 10gcs9.i

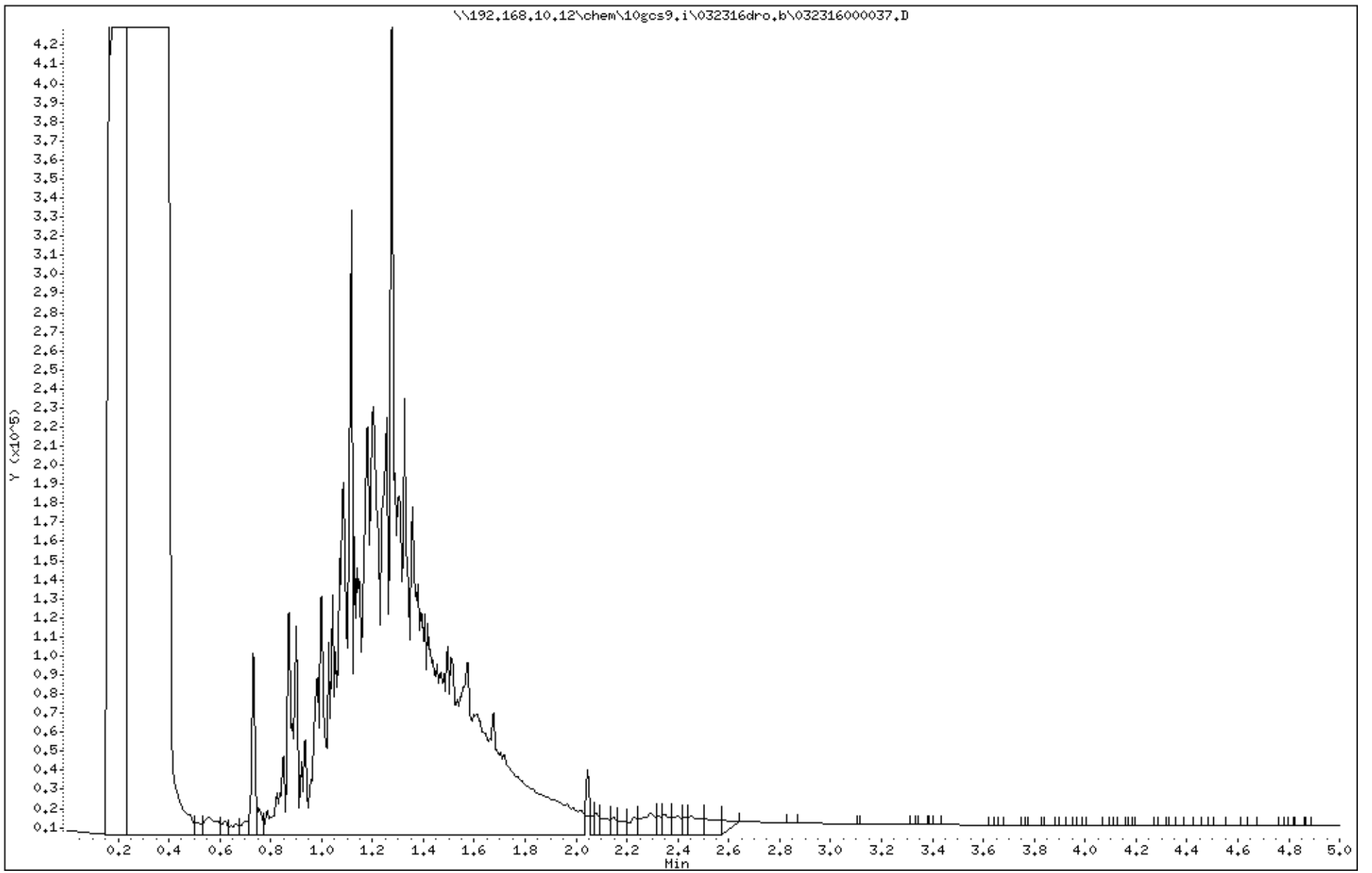
Sample Info: 10341927008X20

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000018.D

Date : 23-MAR-2016 09:27

Client ID: MW-16A

Instrument: 10gcs9.i

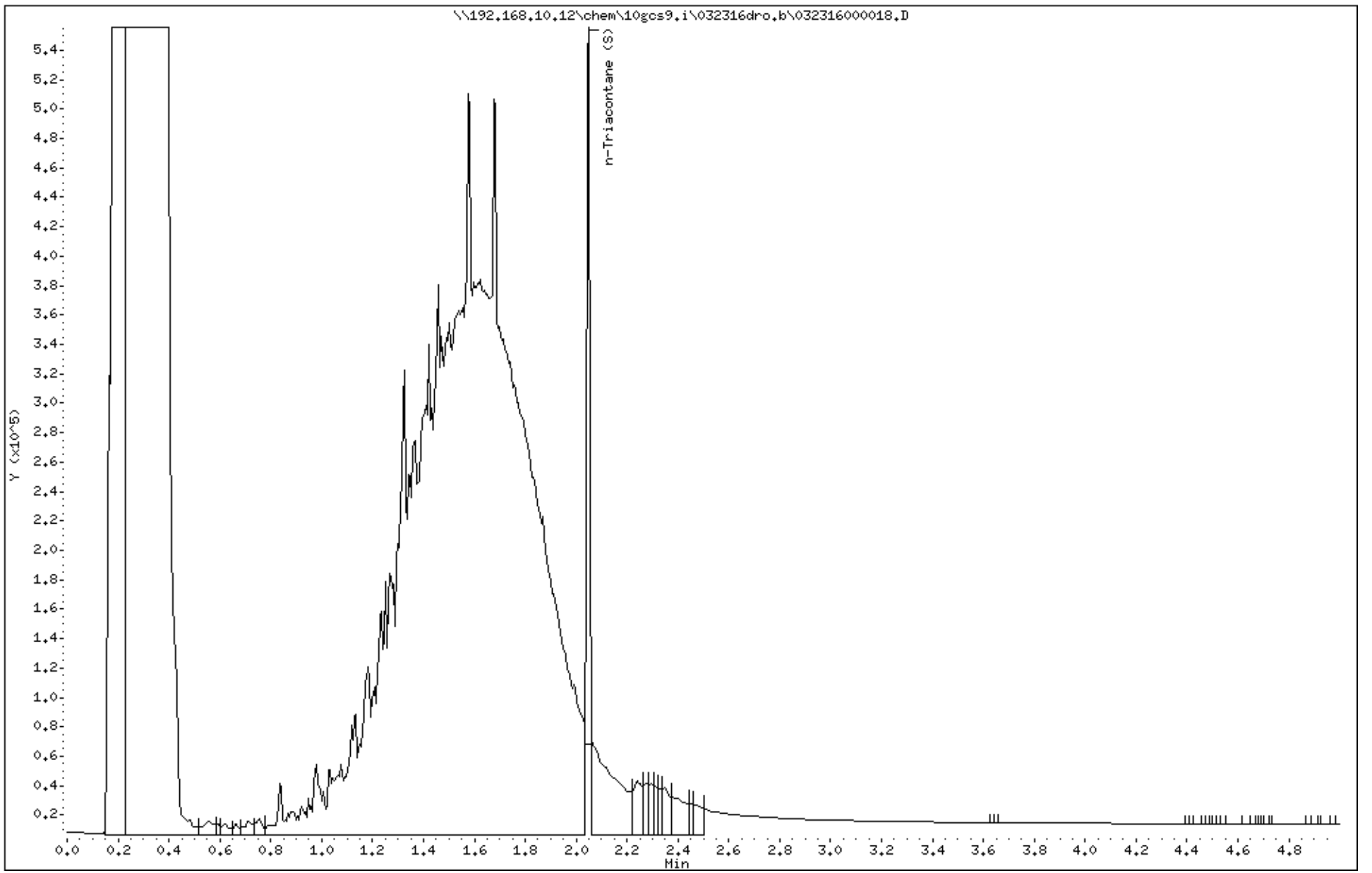
Sample Info: 10341927009

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000027.D

Date : 23-MAR-2016 10:30

Client ID: MW-16B

Instrument: 10gcs9.i

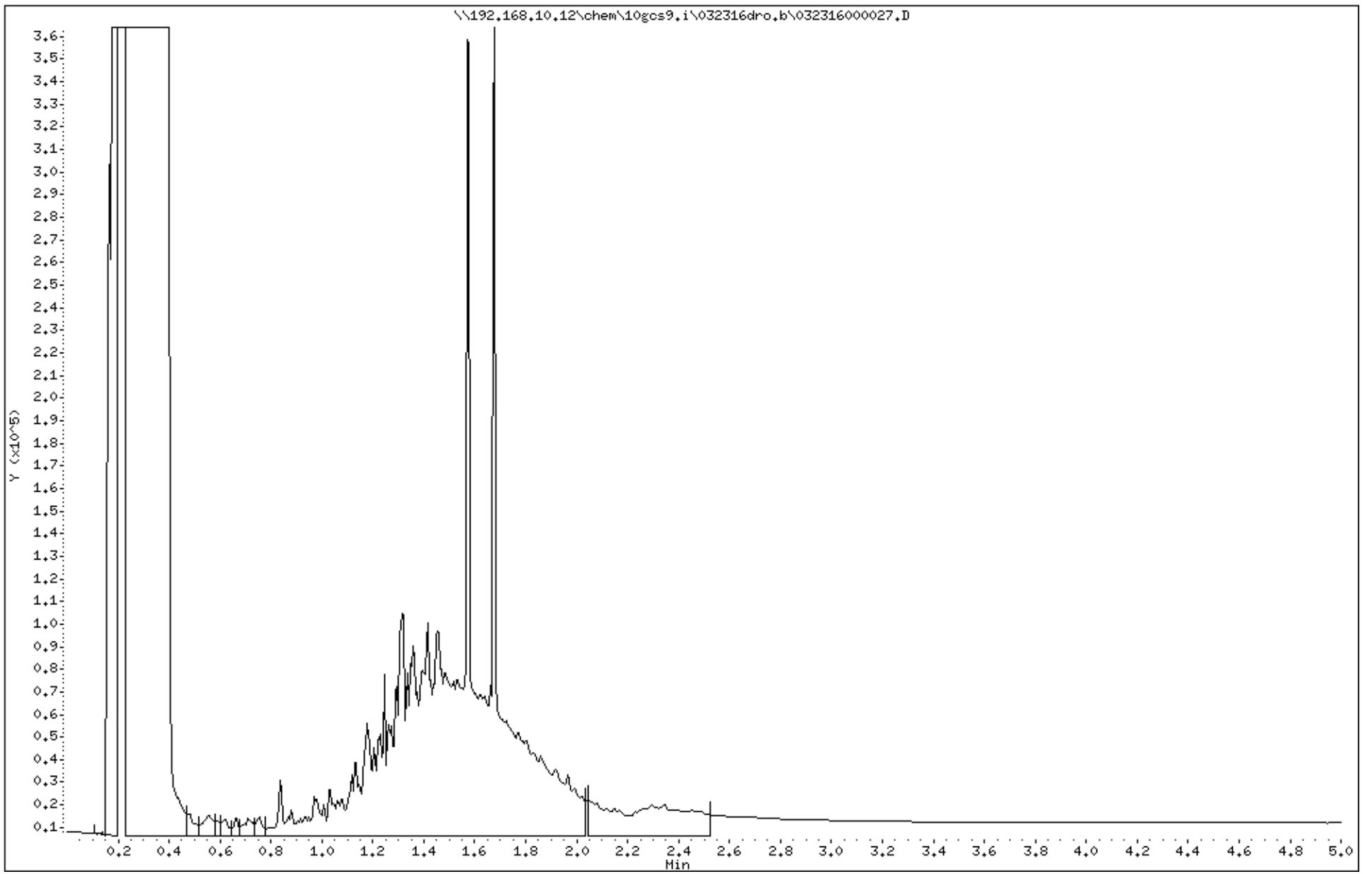
Sample Info: 10341927010

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000028.D

Date : 23-MAR-2016 10:37

Client ID: MW-17

Instrument: 10gcs9.i

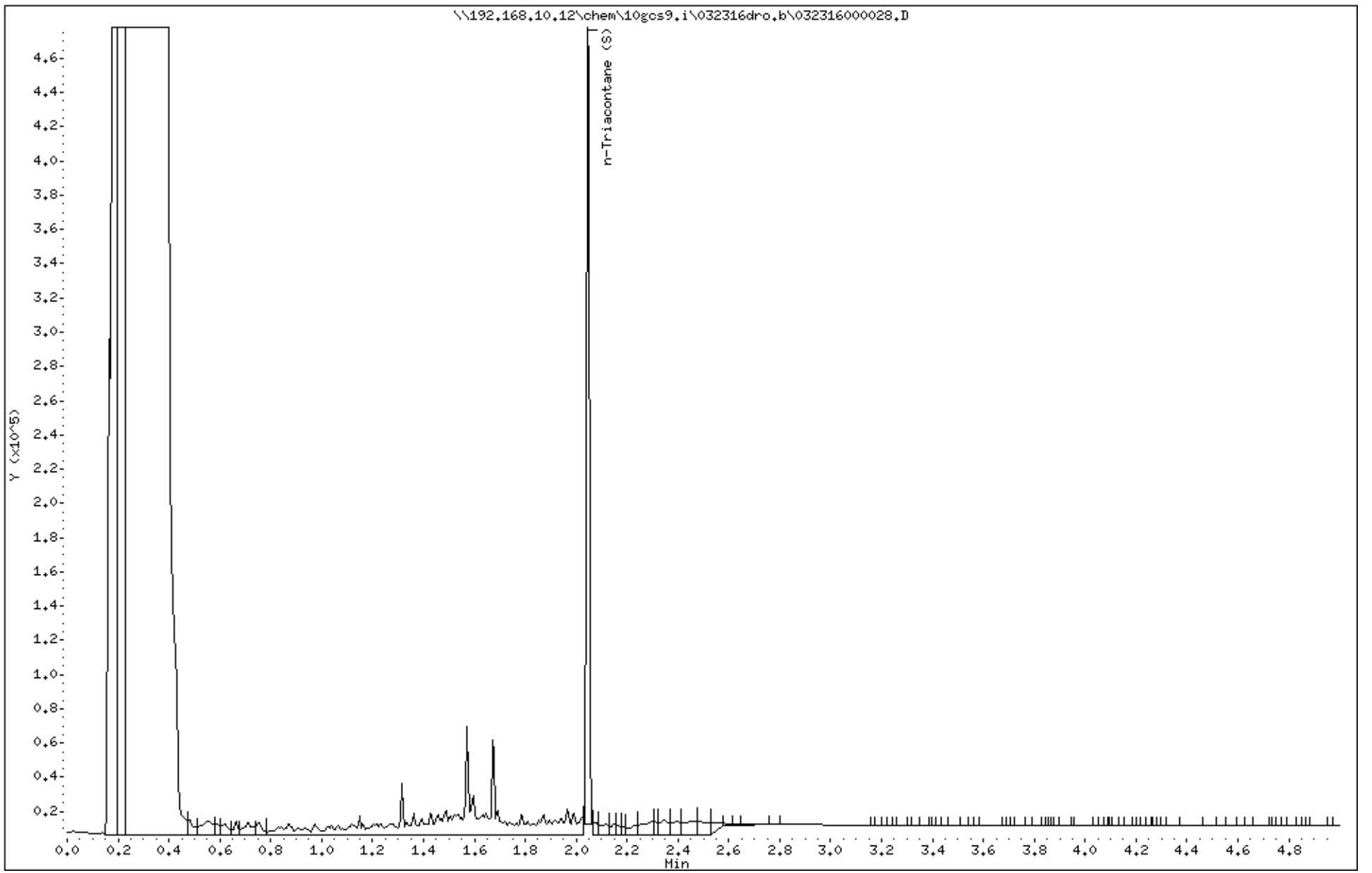
Sample Info: 10341927011

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000029.D

Date : 23-MAR-2016 10:44

Client ID: MW-18

Instrument: 10gcs9.i

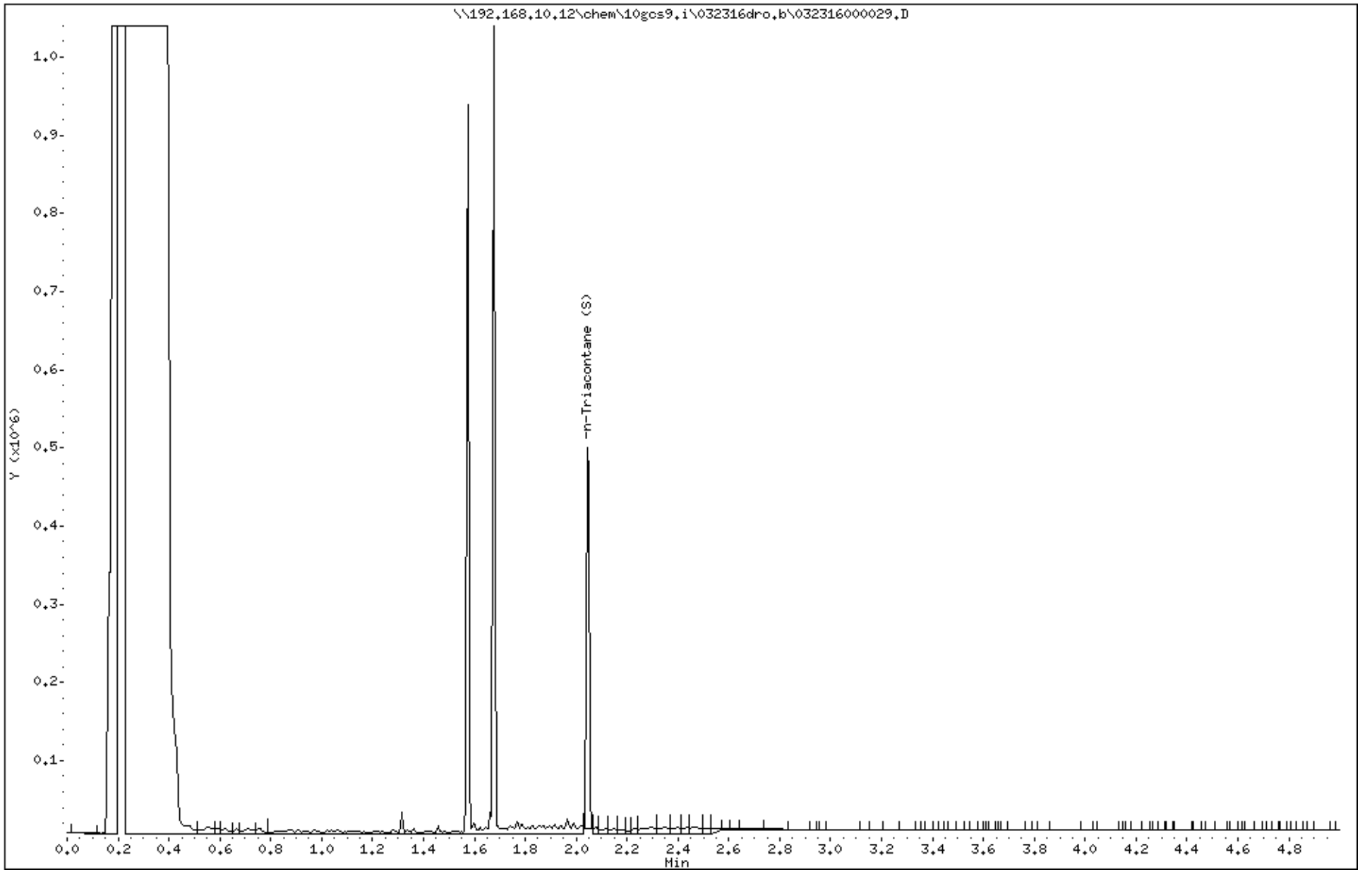
Sample Info: 10341927012

Volume Injected (uL): 1.0

Operator: MT

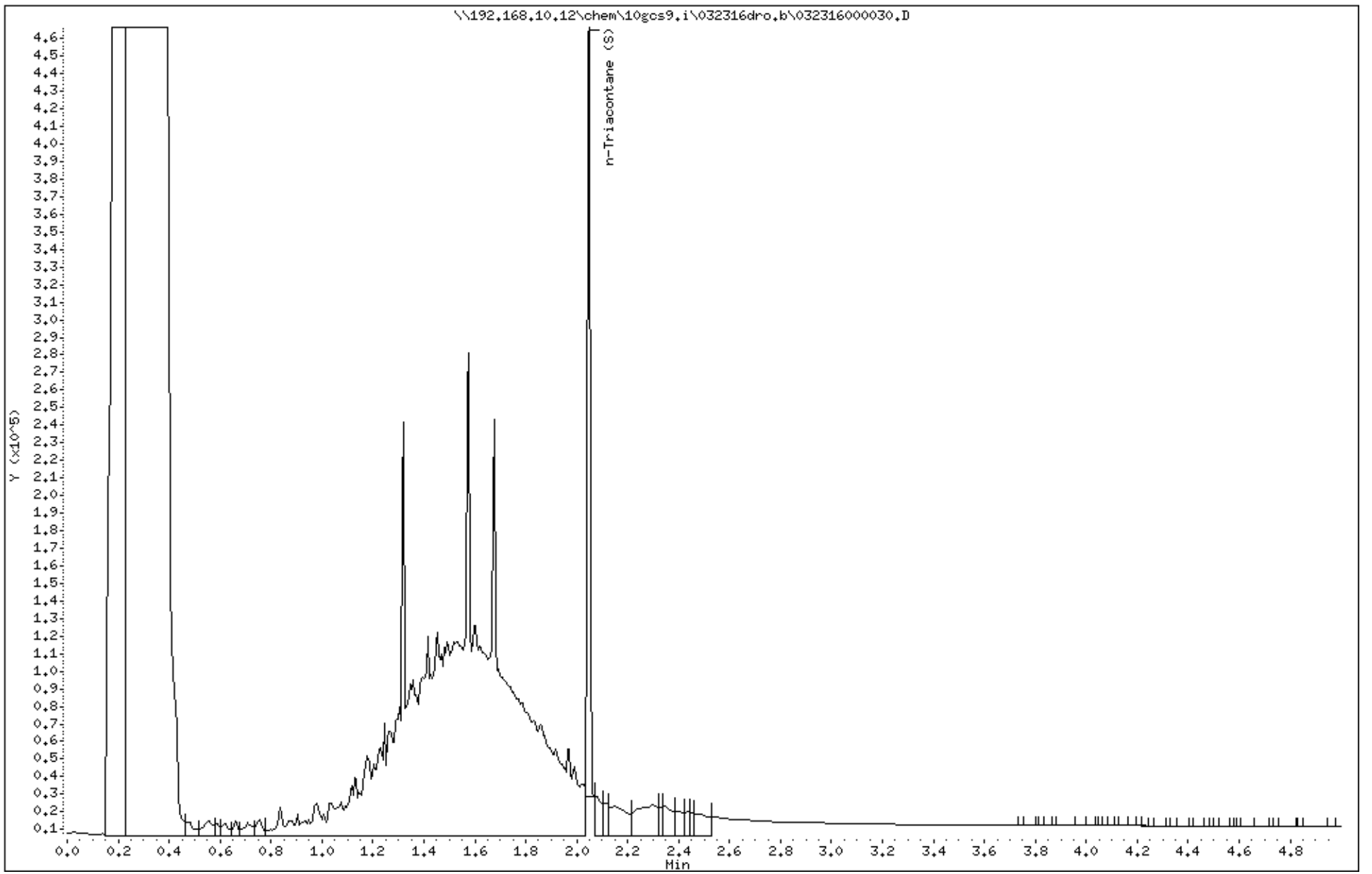
Column phase: DB-5MS

Column diameter: 0.32



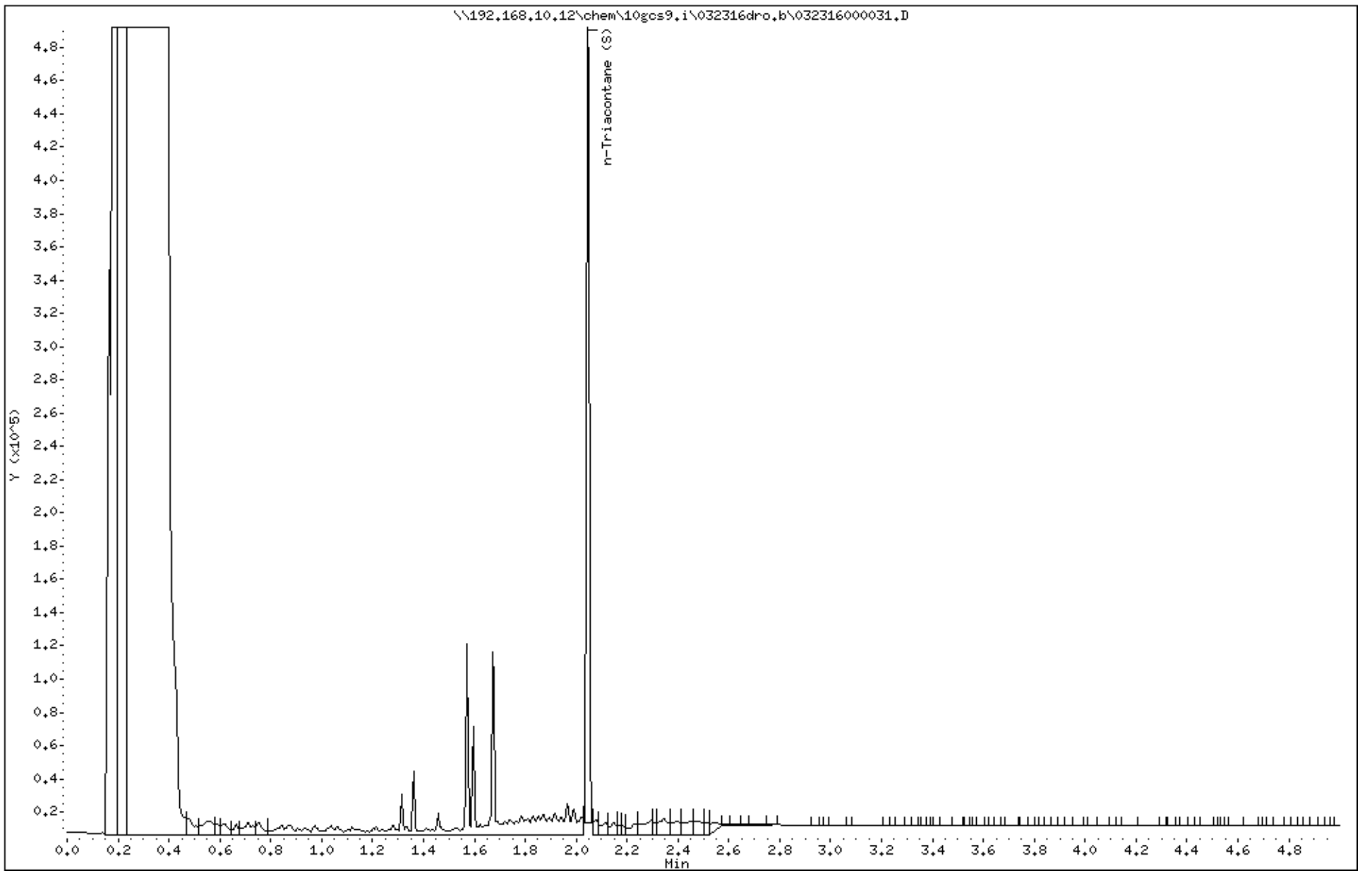
Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000030.D
Date : 23-MAR-2016 10:51
Client ID: MW-19
Sample Info: 10341927013
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs9.i
Operator: MT
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000031.D
Date : 23-MAR-2016 10:58
Client ID: MW-20
Sample Info: 10341927014
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs9.i
Operator: MT
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000032.D

Date : 23-MAR-2016 11:05

Client ID: MW-21

Instrument: 10gcs9.i

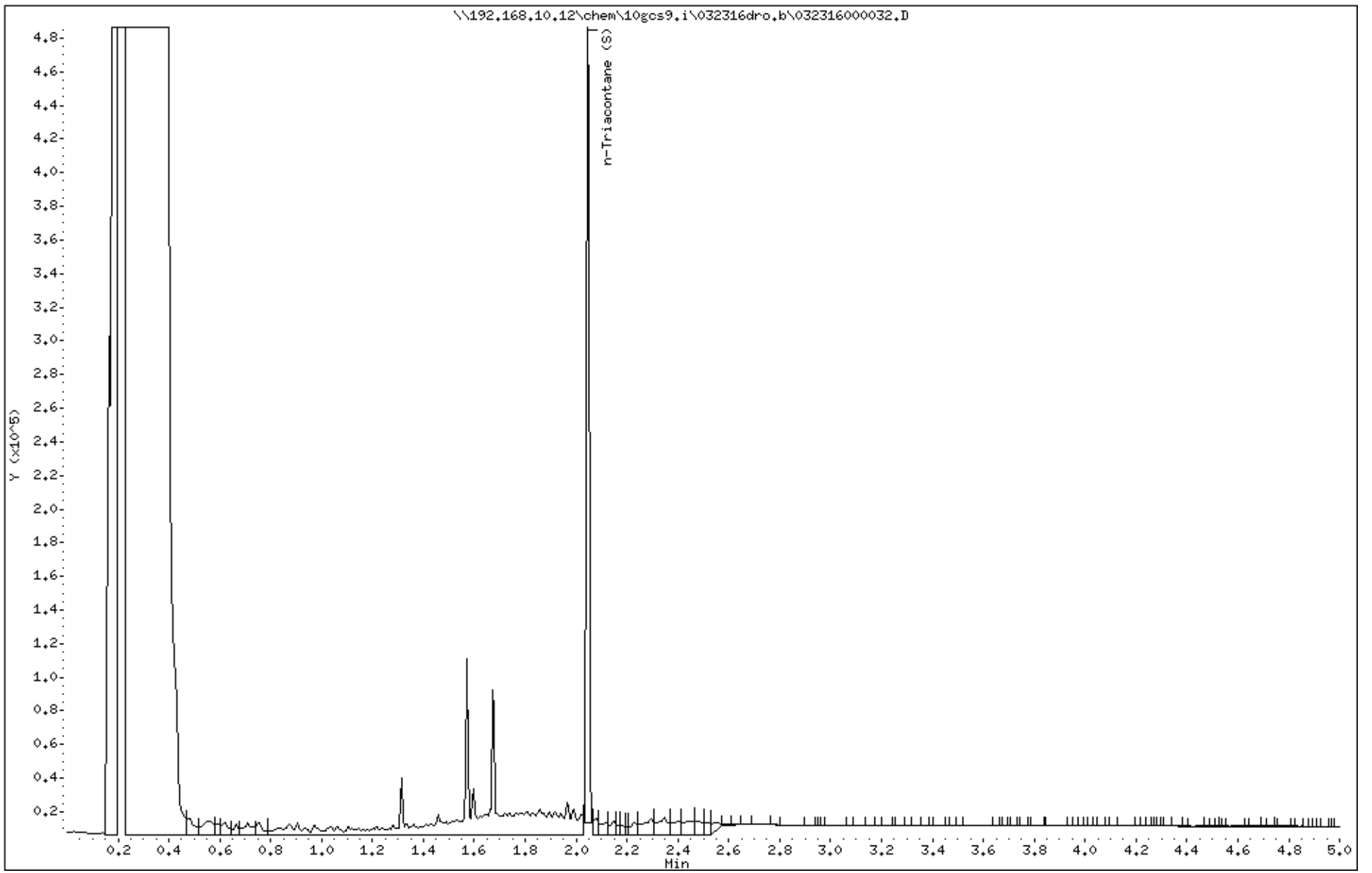
Sample Info: 10341927015

Volume Injected (uL): 1.0

Operator: MT

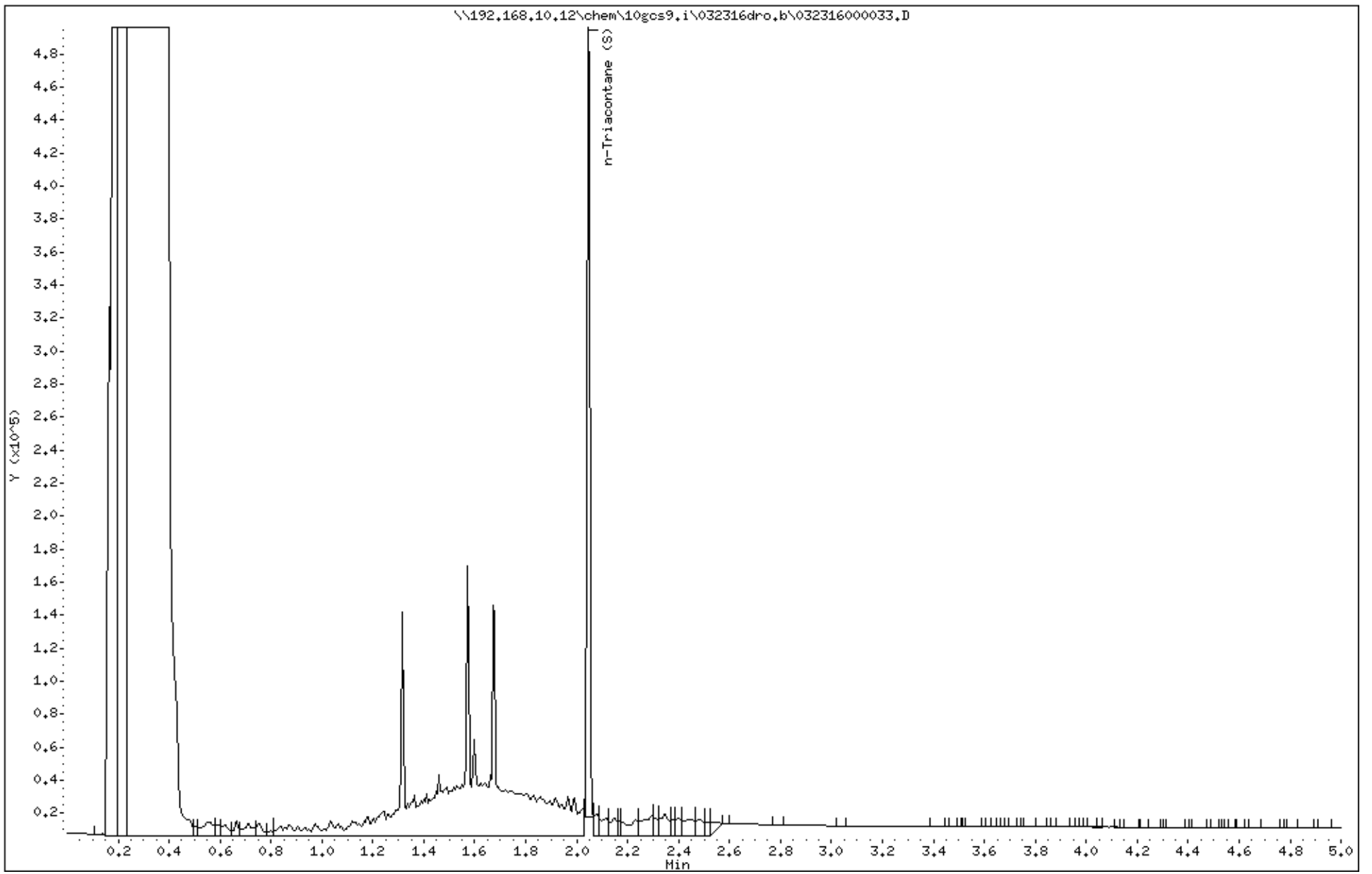
Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000033.D
Date : 23-MAR-2016 11:12
Client ID: MW-22
Sample Info: 10341927016
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs9.i
Operator: MT
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000039.D

Date : 23-MAR-2016 11:55

Client ID: USGS-1A

Instrument: 10gcs9.i

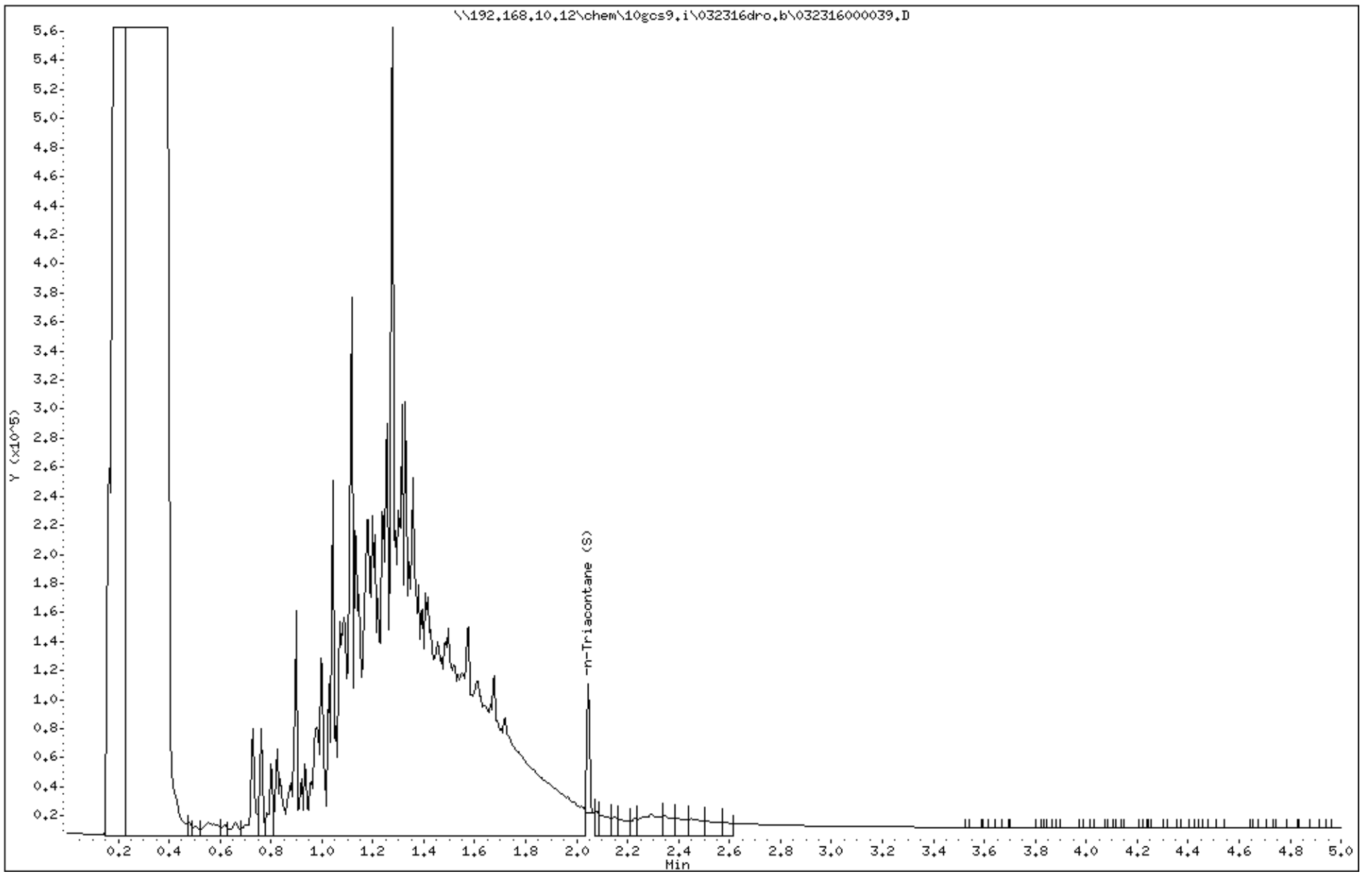
Sample Info: 10341927017X5

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000040.D

Date : 23-MAR-2016 12:02

Client ID: USGS-2A

Instrument: 10gcs9.i

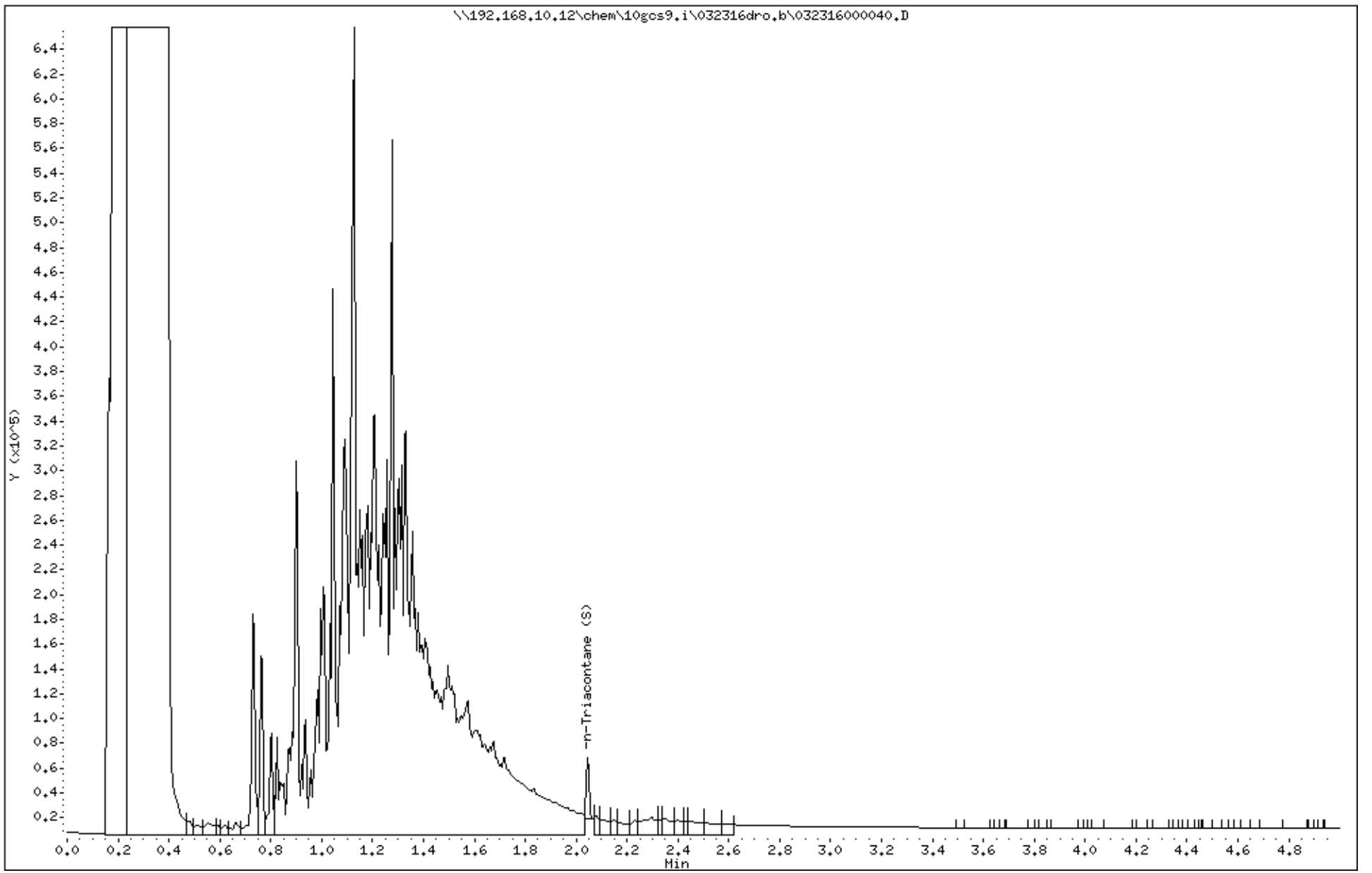
Sample Info: 10341927018X10

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000020.D

Date : 23-MAR-2016 09:41

Client ID: USGS-3A

Instrument: 10gcs9.i

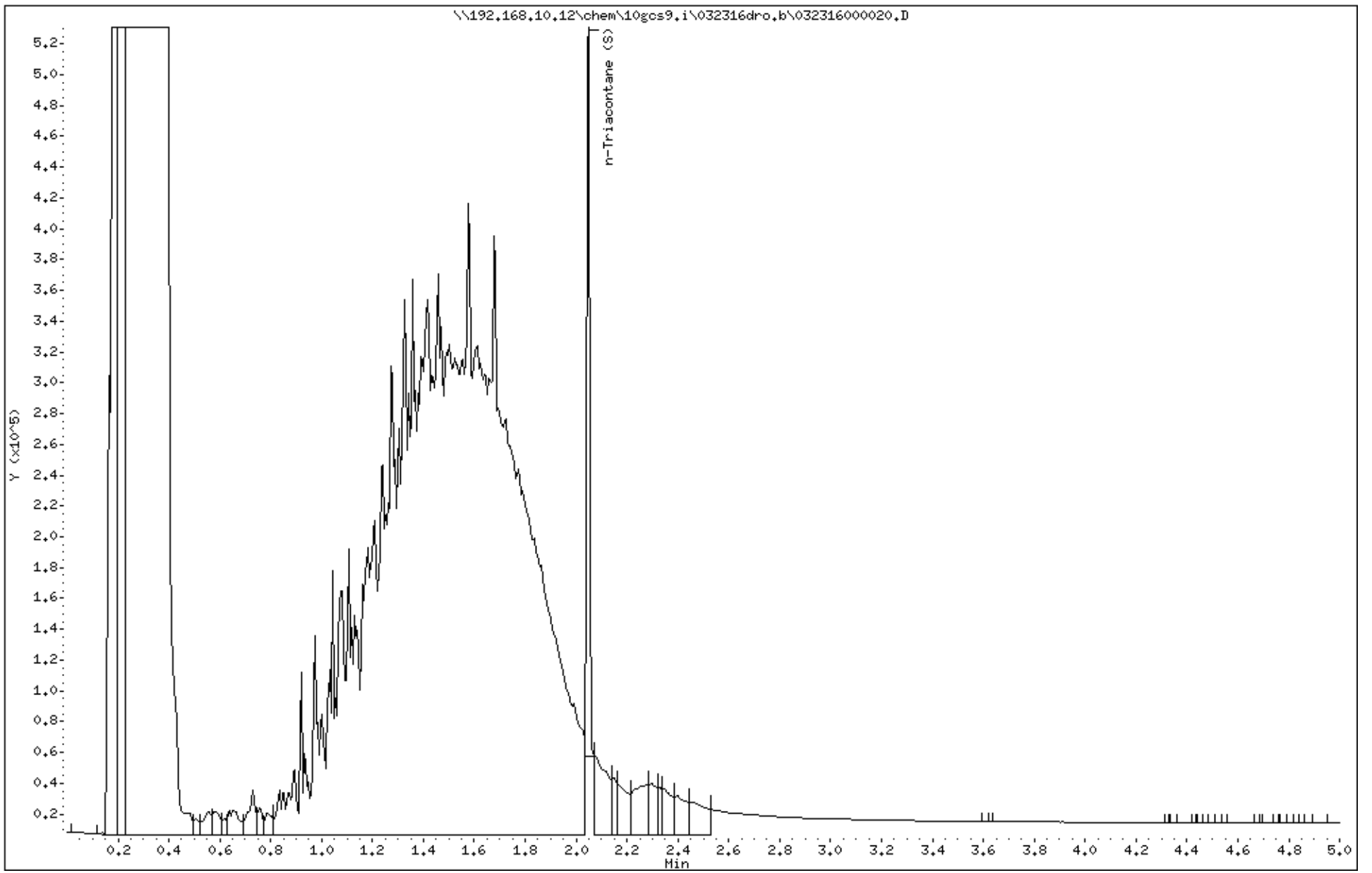
Sample Info: 10341927019

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000021.D

Date : 23-MAR-2016 09:48

Client ID: USGS-4A

Instrument: 10gcs9.i

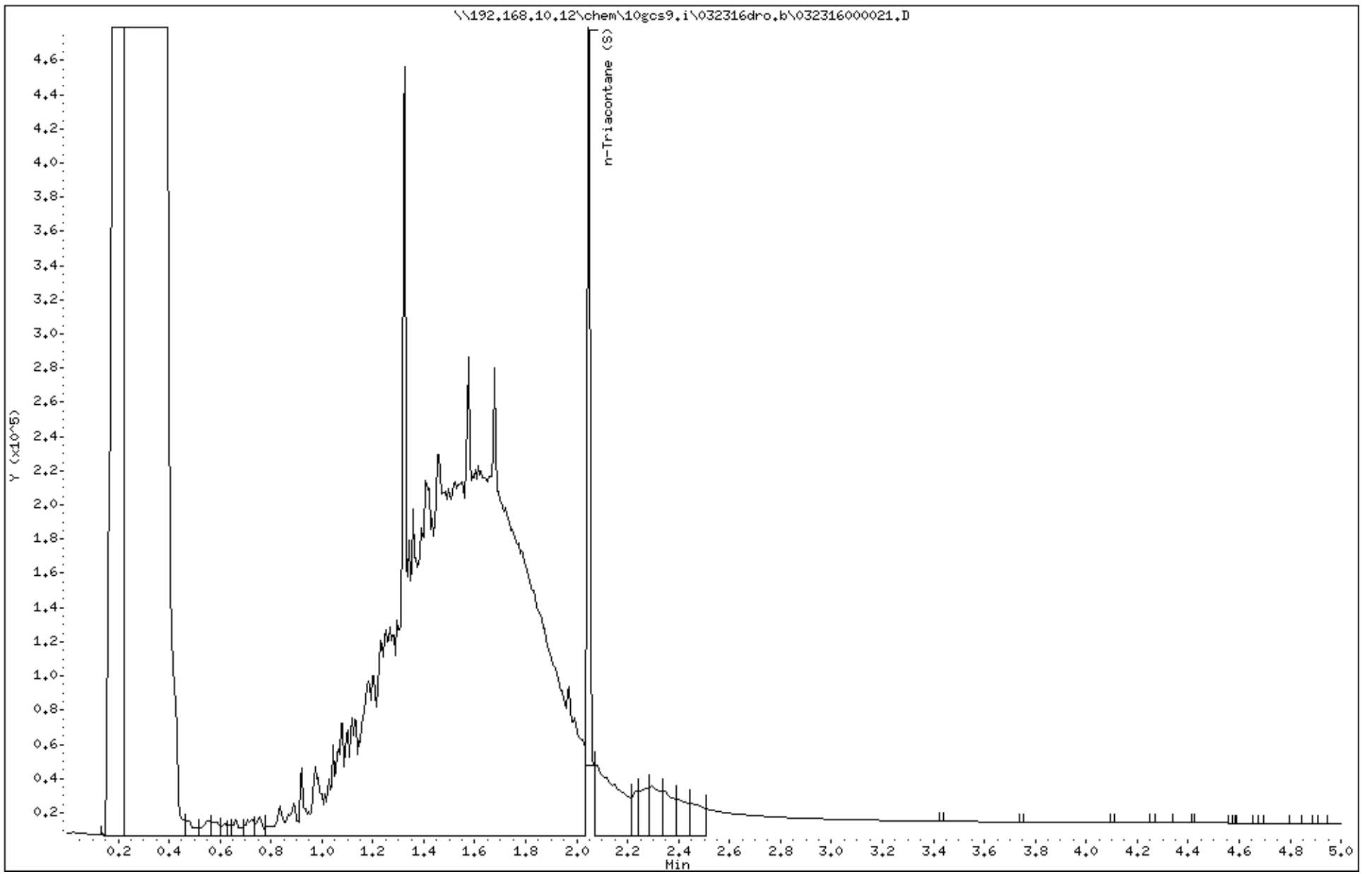
Sample Info: 10341927020

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000008.D

Date : 23-MAR-2016 08:17

Client ID: SCL DW

Instrument: 10gcs9.i

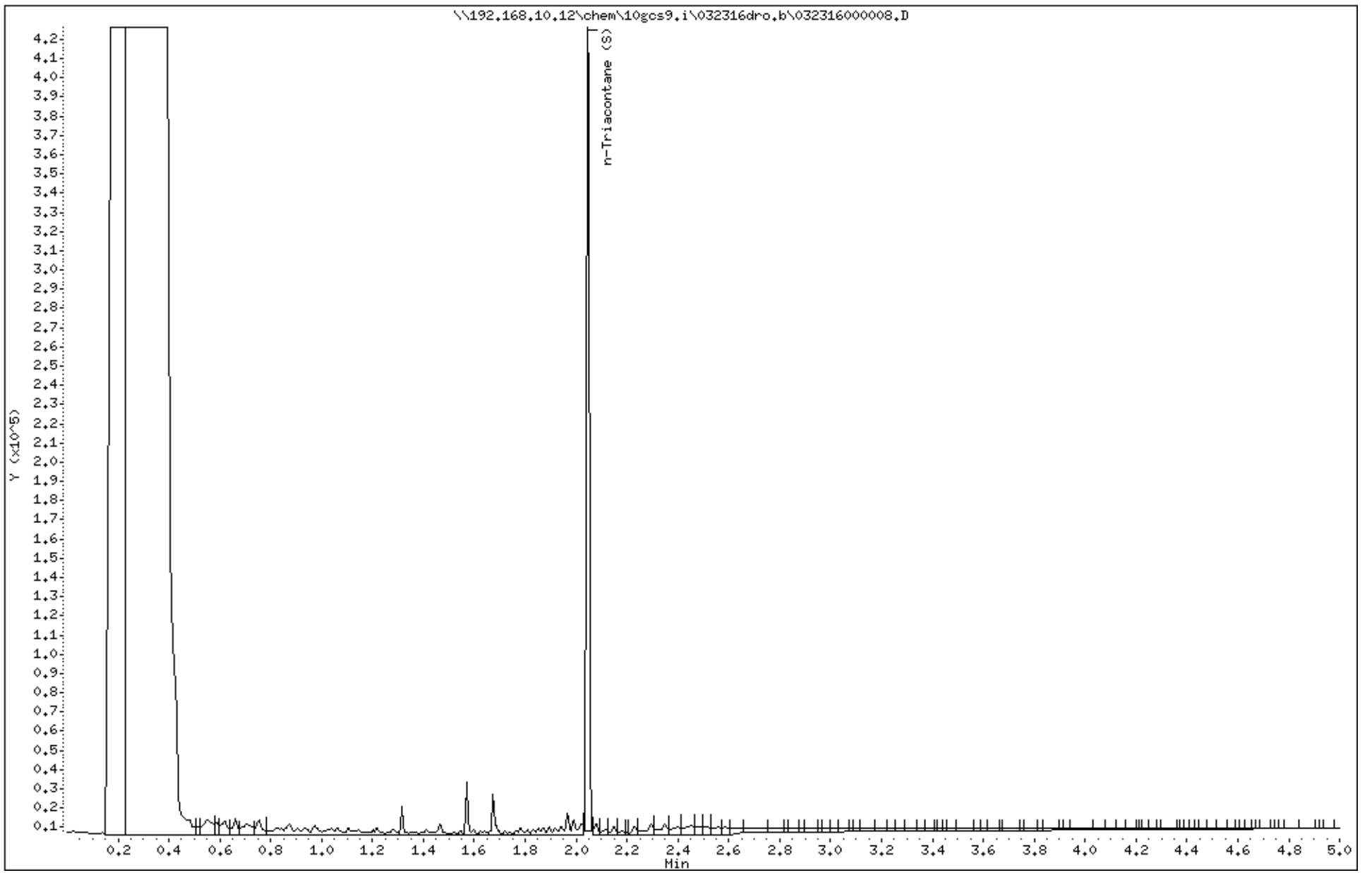
Sample Info: 10341927021

Volume Injected (uL): 1.0

Operator: MT

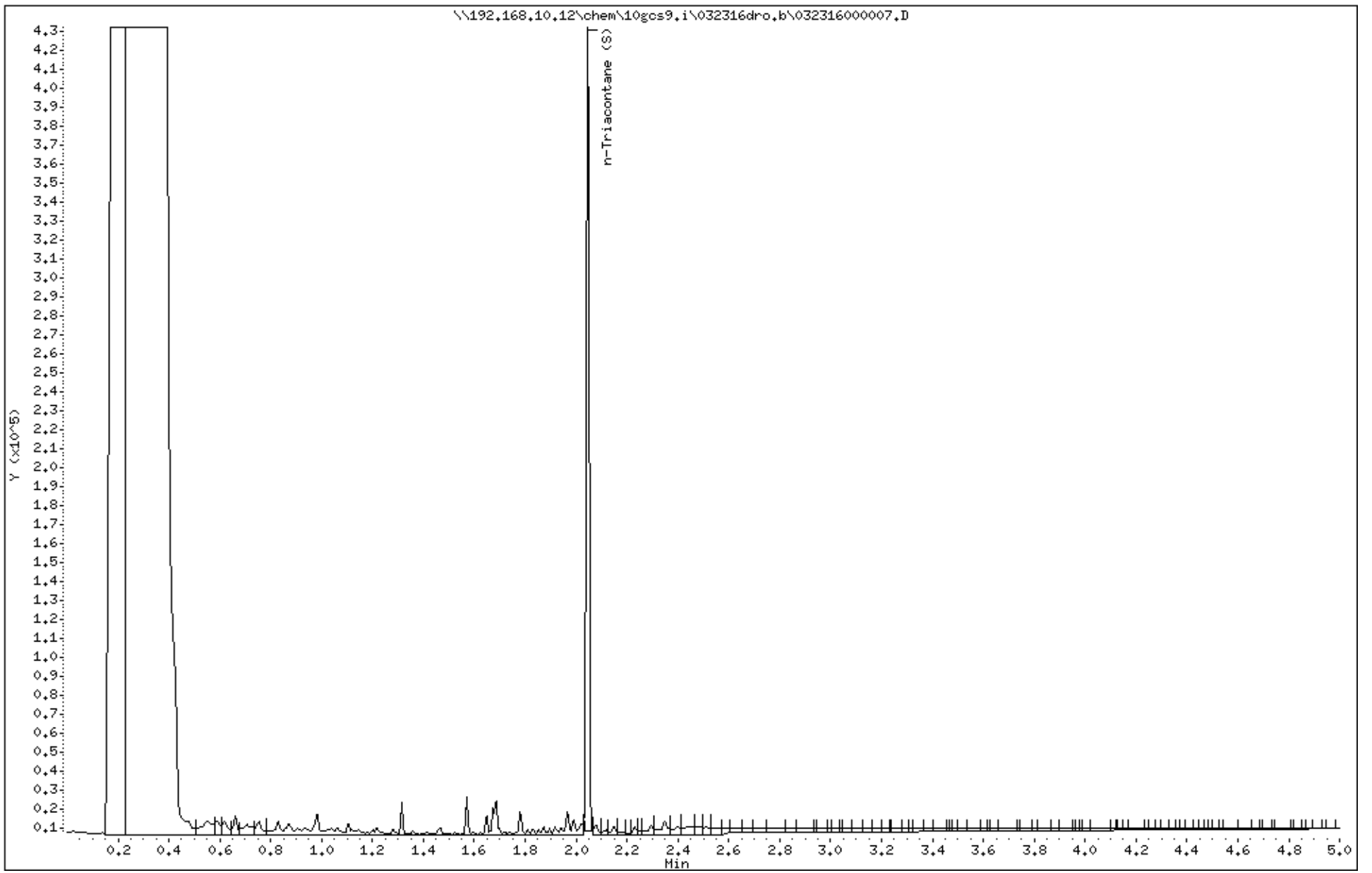
Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\032316dro.b\032316000007.D
Date : 23-MAR-2016 08:10
Client ID: Field Blank
Sample Info: 10341927022
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs9.i
Operator: MT
Column diameter: 0.32



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
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(612)607-1700

June 30, 2016

Darin Albrecht
AECOM
Duluth Technology Village
11 E Superior St, Suite 260
Duluth, MN 55802

RE: Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Dear Darin Albrecht:
Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised to correct units from mg/kg to mg/L and correct the corresponding results. The data affected is WIDRO data for samples 006, 007, 009, 010, 013, 016, 017, 018, 019, and 020.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carol Davy
carol.davy@pacelabs.com
Project Manager

Enclosures

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CERTIFICATIONS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10352597001	**MW-1**	Water	06/16/16 10:07	06/17/16 17:30
10352597002	**MW-4**	Water	06/16/16 11:02	06/17/16 17:30
10352597003	**MW-6**	Water	06/16/16 15:20	06/17/16 17:30
10352597004	**MW-7**	Water	06/16/16 16:55	06/17/16 17:30
10352597005	**MW-8**	Water	06/17/16 09:38	06/17/16 17:30
10352597006	**MW-9**	Water	06/16/16 16:13	06/17/16 17:30
10352597007	**MW-10**	Water	06/17/16 11:47	06/17/16 17:30
10352597008	**DUP**	Water	06/17/16 00:00	06/17/16 17:30
10352597009	**MW-16A**	Water	06/16/16 15:23	06/17/16 17:30
10352597010	**MW-16B**	Water	06/16/16 16:50	06/17/16 17:30
10352597011	**MW-17**	Water	06/16/16 14:40	06/17/16 17:30
10352597012	**MW-18**	Water	06/16/16 14:28	06/17/16 17:30
10352597013	**MW-19**	Water	06/16/16 10:49	06/17/16 17:30
10352597014	**MW-20**	Water	06/16/16 12:26	06/17/16 17:30
10352597015	**MW-21**	Water	06/16/16 11:35	06/17/16 17:30
10352597016	**MW-22**	Water	06/16/16 10:14	06/17/16 17:30
10352597017	**USGS-1A**	Water	06/17/16 10:02	06/17/16 17:30
10352597018	**USGS-2A**	Water	06/17/16 09:50	06/17/16 17:30
10352597019	**USGS-3A**	Water	06/17/16 09:20	06/17/16 17:30
10352597020	**USGS-4A**	Water	06/17/16 08:57	06/17/16 17:30
10352597021	**SCL DW**	Water	06/16/16 11:30	06/17/16 17:30
10352597022	**Field Blank**	Water	06/17/16 11:30	06/17/16 17:30
10352597023	**Trip Blank**	Water	06/17/16 00:00	06/17/16 17:30

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SAMPLE ANALYTE COUNT

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10352597001	**MW-1**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597002	**MW-4**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597003	**MW-6**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597004	**MW-7**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597005	**MW-8**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597006	**MW-9**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		WI MOD DRO	JRH	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597007	**MW-10**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		WI MOD DRO	JRH	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1

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SAMPLE ANALYTE COUNT

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10352597008	**DUP**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597009	**MW-16A**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		WI MOD DRO	JRH	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597010	**MW-16B**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		WI MOD DRO	JRH	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597011	**MW-17**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597012	**MW-18**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597013	**MW-19**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		WI MOD DRO	JRH	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597014	**MW-20**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1

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SAMPLE ANALYTE COUNT

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		ASTM D516	KEO	1
10352597015	**MW-21**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597016	**MW-22**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		WI MOD DRO	JRH	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597017	**USGS-1A**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		WI MOD DRO	JRH	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597018	**USGS-2A**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		WI MOD DRO	JRH	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597019	**USGS-3A**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		WI MOD DRO	JRH	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597020	**USGS-4A**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		WI MOD DRO	JRH	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597021	**SCL DW**	RSK 175	DR1	1

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SAMPLE ANALYTE COUNT

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10352597022	**Field Blank**	RSK 175	DR1	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		ASTM D516	KEO	1
10352597023	**Trip Blank**	EPA 8260B	PRD	7

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SUMMARY OF DETECTION

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
10352597001	**MW-1**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.28	mg/L	0.10	06/23/16 12:31	
10352597002	**MW-4**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	1.6	mg/L	0.10	06/23/16 12:34	
10352597003	**MW-6**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	2.9	mg/L	0.10	06/23/16 12:34	
ASTM D516	Sulfate	5.8	mg/L	2.5	06/23/16 08:39	
10352597004	**MW-7**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.22	mg/L	0.10	06/23/16 12:35	
ASTM D516	Sulfate	5.6	mg/L	2.5	06/23/16 08:41	
10352597005	**MW-8**					
ASTM D516	Sulfate	7.7	mg/L	2.5	06/23/16 08:41	
10352597006	**MW-9**					
RSK 175	Methane	10.5	ug/L	10.0	06/23/16 14:11	
Diesel Range Organics	WDRO, Extended C10-C32	1.5	mg/L	0.11	06/22/16 11:21	
WI MOD DRO	WDRO, Extended C10-C32	0.64	mg/L	0.11	06/26/16 10:56	
ASTM D516	Sulfate	5.6	mg/L	2.5	06/23/16 08:41	
10352597007	**MW-10**					
RSK 175	Methane	6410	ug/L	10.0	06/23/16 10:54	
Diesel Range Organics	WDRO, Extended C10-C32	17.9	mg/L	1.1	06/22/16 14:30	
WI MOD DRO	WDRO, Extended C10-C32	10.7	mg/L	1.1	06/26/16 10:42	
EPA 8260B	Benzene	14.6	ug/L	1.0	06/24/16 18:45	
EPA 8260B	Ethylbenzene	1.9	ug/L	1.0	06/24/16 18:45	
10352597008	**DUP**					
RSK 175	Methane	6630	ug/L	10.0	06/23/16 11:03	
Diesel Range Organics	WDRO, Extended C10-C32	17.9	mg/L	1.2	06/22/16 14:23	
EPA 8260B	Benzene	14.8	ug/L	1.0	06/24/16 19:01	
EPA 8260B	Ethylbenzene	2.0	ug/L	1.0	06/24/16 19:01	
10352597009	**MW-16A**					
RSK 175	Methane	17.2	ug/L	10.0	06/23/16 14:27	
Diesel Range Organics	WDRO, Extended C10-C32	1.6	mg/L	0.11	06/22/16 11:55	
WI MOD DRO	WDRO, Extended C10-C32	0.53	mg/L	0.11	06/26/16 11:03	
10352597010	**MW-16B**					
Diesel Range Organics	WDRO, Extended C10-C32	0.54	mg/L	0.10	06/22/16 12:15	
WI MOD DRO	WDRO, Extended C10-C32	0.24	mg/L	0.10	06/26/16 11:09	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.33	mg/L	0.10	06/27/16 09:01	
ASTM D516	Sulfate	8.4	mg/L	2.5	06/23/16 08:44	M1
10352597011	**MW-17**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.18	mg/L	0.10	06/27/16 09:01	
ASTM D516	Sulfate	9.6	mg/L	2.5	06/23/16 08:47	

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SUMMARY OF DETECTION

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
10352597012	**MW-18**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	4.9	mg/L	0.10	06/27/16 09:04	
ASTM D516	Sulfate	5.3	mg/L	2.5	06/23/16 08:47	
10352597013	**MW-19**					
RSK 175	Methane	14.8	ug/L	10.0	06/23/16 15:00	
Diesel Range Organics	WDRO, Extended C10-C32	0.88	mg/L	0.11	06/22/16 12:01	
WI MOD DRO	WDRO, Extended C10-C32	0.31	mg/L	0.11	06/26/16 11:16	
ASTM D516	Sulfate	2.5	mg/L	2.5	06/23/16 08:47	
10352597014	**MW-20**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	4.0	mg/L	0.10	06/27/16 09:06	
ASTM D516	Sulfate	8.1	mg/L	2.5	06/23/16 08:49	
10352597015	**MW-21**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.63	mg/L	0.10	06/27/16 09:06	
ASTM D516	Sulfate	7.2	mg/L	2.5	06/23/16 08:49	
10352597016	**MW-22**					
Diesel Range Organics	WDRO, Extended C10-C32	0.18	mg/L	0.11	06/22/16 12:49	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.14	mg/L	0.10	06/27/16 09:09	
ASTM D516	Sulfate	6.7	mg/L	2.5	06/23/16 08:49	
10352597017	**USGS-1A**					
RSK 175	Methane	594	ug/L	10.0	06/23/16 11:11	
Diesel Range Organics	WDRO, Extended C10-C32	2.9	mg/L	0.11	06/22/16 11:41	
WI MOD DRO	WDRO, Extended C10-C32	1.3	mg/L	0.11	06/26/16 10:49	
EPA 8260B	Benzene	1.7	ug/L	1.0	06/24/16 21:30	
ASTM D516	Sulfate	3.2	mg/L	2.5	06/23/16 08:49	
10352597018	**USGS-2A**					
RSK 175	Methane	3480	ug/L	10.0	06/23/16 11:19	
Diesel Range Organics	WDRO, Extended C10-C32	3.7	mg/L	0.11	06/22/16 11:28	
WI MOD DRO	WDRO, Extended C10-C32	2.1	mg/L	0.11	06/26/16 11:30	
EPA 8260B	Benzene	33.0	ug/L	1.0	06/24/16 21:46	
10352597019	**USGS-3A**					
RSK 175	Methane	1710	ug/L	10.0	06/23/16 11:27	
Diesel Range Organics	WDRO, Extended C10-C32	4.7	mg/L	0.11	06/22/16 11:34	
WI MOD DRO	WDRO, Extended C10-C32	2.5	mg/L	0.11	06/26/16 11:36	
EPA 8260B	Benzene	3.8	ug/L	1.0	06/27/16 14:32	
10352597020	**USGS-4A**					
RSK 175	Methane	387	ug/L	10.0	06/23/16 11:36	
Diesel Range Organics	WDRO, Extended C10-C32	2.2	mg/L	0.11	06/22/16 11:48	
WI MOD DRO	WDRO, Extended C10-C32	1.2	mg/L	0.11	06/26/16 11:43	
10352597021	**SCL DW**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	1.1	mg/L	0.10	06/27/16 09:15	
ASTM D516	Sulfate	2.8	mg/L	2.5	06/23/16 09:05	M1

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Method: **RSK 175**
Description: RSK 175 AIR Headspace
Client: AECOM MN ND
Date: June 30, 2016

General Information:
22 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Method: **Diesel Range Organics**
Description: WIDRO Extended GCS
Client: AECOM MN ND
Date: June 30, 2016

General Information:
22 samples were analyzed for Diesel Range Organics. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

P4: Sample field preservation does not meet EPA or method recommendations for this analysis.
- MW-16A (Lab ID: 10352597009)
- MW-16B (Lab ID: 10352597010)
- USGS-3A (Lab ID: 10352597019)

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with Diesel Range Organics with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Method: **WI MOD DRO**
Description: WIDRO GCS Silica Gel
Client: AECOM MN ND
Date: June 30, 2016

General Information:
10 samples were analyzed for WI MOD DRO. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

P4: Sample field preservation does not meet EPA or method recommendations for this analysis.
- MW-16A (Lab ID: 10352597009)
- MW-16B (Lab ID: 10352597010)
- USGS-3A (Lab ID: 10352597019)

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with WI MOD DRO with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Method: **EPA 8260B**
Description: 8260B MSV UST
Client: AECOM MN ND
Date: June 30, 2016

General Information:
23 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Method: **SM 4500-NO3 H**
Description: SM4500NO3-H, NO2 + NO3 pres.
Client: AECOM MN ND
Date: June 30, 2016

General Information:
21 samples were analyzed for SM 4500-NO3 H. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WETA/27762

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10352287001,10352287002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2293410)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2293411)
  - Nitrogen, NO2 plus NO3

QC Batch: WETA/27781

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10352597006,10352597007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2294565)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2294566)
  - Nitrogen, NO2 plus NO3

Additional Comments:

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Method: **ASTM D516**
Description: ASTM D516 Sulfate Water
Client: AECOM MN ND
Date: June 30, 2016

General Information:
22 samples were analyzed for ASTM D516. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: WETA/27764

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10352597001,10352597010

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2293441)
  - Sulfate
- MSD (Lab ID: 2293442)
  - Sulfate

QC Batch: WETA/27765

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10352359005,10352597021

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2293482)
  - Sulfate
- MS (Lab ID: 2293484)
  - Sulfate
- MSD (Lab ID: 2293483)
  - Sulfate
- MSD (Lab ID: 2293485)
  - Sulfate

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-1 **Lab ID: 10352597001** Collected: 06/16/16 10:07 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		06/21/16 18:53	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11		1	06/21/16 08:28	06/22/16 12:08		
Surrogates									
n-Triacontane (S)	95	%.	50-150		1	06/21/16 08:28	06/22/16 12:08	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/24/16 16:00	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 16:00	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 16:00	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 16:00	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		06/24/16 16:00	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		06/24/16 16:00	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	75-125		1		06/24/16 16:00	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.28**	mg/L	0.10	0.050	1		06/23/16 12:31		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		06/23/16 08:36	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-4 **Lab ID: 10352597002** Collected: 06/16/16 11:02 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		06/22/16 16:09	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11		1	06/21/16 08:28	06/22/16 13:09		
Surrogates									
n-Triacontane (S)	92	%.	50-150		1	06/21/16 08:28	06/22/16 13:09	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/24/16 17:06	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 17:06	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 17:06	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 17:06	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	92	%.	75-125		1		06/24/16 17:06	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		06/24/16 17:06	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	75-125		1		06/24/16 17:06	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**1.6**	mg/L	0.10	0.050	1		06/23/16 12:34		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		06/23/16 08:39	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-6 **Lab ID: 10352597003** Collected: 06/16/16 15:20 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		06/22/16 16:18	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11		1	06/21/16 08:28	06/22/16 13:16		
Surrogates									
n-Triacontane (S)	91	%.	50-150		1	06/21/16 08:28	06/22/16 13:16	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/24/16 17:39	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 17:39	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 17:39	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 17:39	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	94	%.	75-125		1		06/24/16 17:39	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		06/24/16 17:39	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	75-125		1		06/24/16 17:39	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**2.9**	mg/L	0.10	0.050	1		06/23/16 12:34		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**5.8**	mg/L	2.5	1.0	1		06/23/16 08:39	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-7 **Lab ID: 10352597004** Collected: 06/16/16 16:55 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		06/22/16 16:26	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11		1	06/21/16 08:28	06/22/16 12:55		
Surrogates									
n-Triacontane (S)	90	%.	50-150		1	06/21/16 08:28	06/22/16 12:55	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/24/16 17:56	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 17:56	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 17:56	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 17:56	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		06/24/16 17:56	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		06/24/16 17:56	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	75-125		1		06/24/16 17:56	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.22**	mg/L	0.10	0.050	1		06/23/16 12:35		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**5.6**	mg/L	2.5	1.0	1		06/23/16 08:41	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-8 **Lab ID: 10352597005** Collected: 06/17/16 09:38 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		06/23/16 10:46	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11		1	06/21/16 08:28	06/22/16 13:02		
Surrogates									
n-Triacontane (S)	101	%.	50-150		1	06/21/16 08:28	06/22/16 13:02	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/24/16 18:12	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 18:12	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 18:12	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 18:12	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	91	%.	75-125		1		06/24/16 18:12	17060-07-0	
Toluene-d8 (S)	96	%.	75-125		1		06/24/16 18:12	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		06/24/16 18:12	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/23/16 12:35		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**7.7**	mg/L	2.5	1.0	1		06/23/16 08:41	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-9 **Lab ID: 10352597006** Collected: 06/16/16 16:13 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**10.5**	ug/L	10.0	0.49	1		06/23/16 14:11	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**1.5**	mg/L	0.11		1	06/21/16 08:28	06/22/16 11:21		
Surrogates									
n-Triacontane (S)	91	%.	50-150		1	06/21/16 08:28	06/22/16 11:21	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**0.64**	mg/L	0.11	0.11	1	06/21/16 08:28	06/26/16 10:56		
Surrogates									
n-Triacontane (S)	82	%.	62-125		1	06/21/16 08:28	06/26/16 10:56	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/24/16 18:29	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 18:29	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 18:29	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 18:29	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	91	%.	75-125		1		06/24/16 18:29	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		06/24/16 18:29	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	75-125		1		06/24/16 18:29	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/27/16 08:50		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**5.6**	mg/L	2.5	1.0	1		06/23/16 08:41	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-10 **Lab ID: 10352597007** Collected: 06/17/16 11:47 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**6410**	ug/L	10.0	0.49	1		06/23/16 10:54	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**17.9**	mg/L	1.1		10	06/21/16 08:28	06/22/16 14:30		
Surrogates									
n-Triacontane (S)	95	%.	50-150		10	06/21/16 08:28	06/22/16 14:30	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**10.7**	mg/L	1.1	1.1	10	06/21/16 08:28	06/26/16 10:42		
Surrogates									
n-Triacontane (S)	85	%.	62-125		10	06/21/16 08:28	06/26/16 10:42	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**14.6**	ug/L	1.0	0.042	1		06/24/16 18:45	71-43-2	
Ethylbenzene	**1.9**	ug/L	1.0	0.075	1		06/24/16 18:45	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 18:45	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 18:45	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		06/24/16 18:45	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		06/24/16 18:45	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	75-125		1		06/24/16 18:45	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/27/16 08:51		M1
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		06/23/16 08:41	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: DUP **Lab ID: 10352597008** Collected: 06/17/16 00:00 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**6630**	ug/L	10.0	0.49	1		06/23/16 11:03	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**17.9**	mg/L	1.2		10	06/21/16 08:28	06/22/16 14:23		
Surrogates									
n-Triacontane (S)	95	%.	50-150		10	06/21/16 08:28	06/22/16 14:23	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**14.8**	ug/L	1.0	0.042	1		06/24/16 19:01	71-43-2	
Ethylbenzene	**2.0**	ug/L	1.0	0.075	1		06/24/16 19:01	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 19:01	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 19:01	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	90	%.	75-125		1		06/24/16 19:01	17060-07-0	
Toluene-d8 (S)	100	%.	75-125		1		06/24/16 19:01	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	75-125		1		06/24/16 19:01	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/27/16 08:56		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		06/23/16 08:44	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-16A **Lab ID: 10352597009** Collected: 06/16/16 15:23 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**17.2**	ug/L	10.0	0.49	1		06/23/16 14:27	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**1.6**	mg/L	0.11		1	06/21/16 08:28	06/22/16 11:55		
Surrogates									
n-Triacontane (S)	92	%.	50-150		1	06/21/16 08:28	06/22/16 11:55	638-68-6	P4
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**0.53**	mg/L	0.11	0.11	1	06/21/16 08:28	06/26/16 11:03		
Surrogates									
n-Triacontane (S)	83	%.	62-125		1	06/21/16 08:28	06/26/16 11:03	638-68-6	P4
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/24/16 19:18	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 19:18	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 19:18	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 19:18	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	94	%.	75-125		1		06/24/16 19:18	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		06/24/16 19:18	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	75-125		1		06/24/16 19:18	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/27/16 09:00		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		06/23/16 08:44	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-16B **Lab ID: 10352597010** Collected: 06/16/16 16:50 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		06/23/16 14:36	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**0.54**	mg/L	0.10		1	06/21/16 08:28	06/22/16 12:15		
Surrogates									
n-Triacontane (S)	93	%.	50-150		1	06/21/16 08:28	06/22/16 12:15	638-68-6	P4
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**0.24**	mg/L	0.10	0.10	1	06/21/16 08:28	06/26/16 11:09		
Surrogates									
n-Triacontane (S)	92	%.	62-125		1	06/21/16 08:28	06/26/16 11:09	638-68-6	P4
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/24/16 19:34	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 19:34	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 19:34	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 19:34	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		06/24/16 19:34	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		06/24/16 19:34	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		06/24/16 19:34	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.33**	mg/L	0.10	0.050	1		06/27/16 09:01		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**8.4**	mg/L	2.5	1.0	1		06/23/16 08:44	14808-79-8	M1

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-17 **Lab ID: 10352597011** Collected: 06/16/16 14:40 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		06/23/16 14:44	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11		1	06/21/16 08:28	06/22/16 12:22		
Surrogates									
n-Triacontane (S)	90	%.	50-150		1	06/21/16 08:28	06/22/16 12:22	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/24/16 19:50	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 19:50	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 19:50	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 19:50	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	91	%.	75-125		1		06/24/16 19:50	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		06/24/16 19:50	2037-26-5	
4-Bromofluorobenzene (S)	94	%.	75-125		1		06/24/16 19:50	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.18**	mg/L	0.10	0.050	1		06/27/16 09:01		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**9.6**	mg/L	2.5	1.0	1		06/23/16 08:47	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-18 **Lab ID: 10352597012** Collected: 06/16/16 14:28 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		06/23/16 14:52	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11		1	06/21/16 08:28	06/22/16 12:28		
Surrogates									
n-Triacontane (S)	87	%.	50-150		1	06/21/16 08:28	06/22/16 12:28	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/24/16 20:07	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 20:07	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 20:07	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 20:07	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	94	%.	75-125		1		06/24/16 20:07	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		06/24/16 20:07	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125		1		06/24/16 20:07	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**4.9**	mg/L	0.10	0.050	1		06/27/16 09:04		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**5.3**	mg/L	2.5	1.0	1		06/23/16 08:47	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-19 **Lab ID: 10352597013** Collected: 06/16/16 10:49 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**14.8**	ug/L	10.0	0.49	1		06/23/16 15:00	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**0.88**	mg/L	0.11		1	06/21/16 08:28	06/22/16 12:01		
Surrogates									
n-Triacontane (S)	93	%.	50-150		1	06/21/16 08:28	06/22/16 12:01	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**0.31**	mg/L	0.11	0.11	1	06/21/16 08:28	06/26/16 11:16		
Surrogates									
n-Triacontane (S)	85	%.	62-125		1	06/21/16 08:28	06/26/16 11:16	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/24/16 20:23	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 20:23	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 20:23	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 20:23	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	92	%.	75-125		1		06/24/16 20:23	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		06/24/16 20:23	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	75-125		1		06/24/16 20:23	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/27/16 09:05		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**2.5**	mg/L	2.5	1.0	1		06/23/16 08:47	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-20 **Lab ID: 10352597014** Collected: 06/16/16 12:26 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		06/23/16 15:09	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11		1	06/21/16 08:28	06/22/16 12:35		
Surrogates									
n-Triacontane (S)	97	%.	50-150		1	06/21/16 08:28	06/22/16 12:35	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/24/16 20:40	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 20:40	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 20:40	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 20:40	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	92	%.	75-125		1		06/24/16 20:40	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		06/24/16 20:40	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	75-125		1		06/24/16 20:40	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**4.0**	mg/L	0.10	0.050	1		06/27/16 09:06		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**8.1**	mg/L	2.5	1.0	1		06/23/16 08:49	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-21 **Lab ID: 10352597015** Collected: 06/16/16 11:35 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		06/23/16 15:17	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11		1	06/21/16 08:28	06/22/16 12:42		
Surrogates									
n-Triacontane (S)	90	%.	50-150		1	06/21/16 08:28	06/22/16 12:42	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/24/16 20:57	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 20:57	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 20:57	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 20:57	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	92	%.	75-125		1		06/24/16 20:57	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		06/24/16 20:57	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	75-125		1		06/24/16 20:57	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.63**	mg/L	0.10	0.050	1		06/27/16 09:06		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**7.2**	mg/L	2.5	1.0	1		06/23/16 08:49	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: MW-22 **Lab ID: 10352597016** Collected: 06/16/16 10:14 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		06/23/16 15:25	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**0.18**	mg/L	0.11		1	06/21/16 08:28	06/22/16 12:49		
Surrogates									
n-Triacontane (S)	94	%.	50-150		1	06/21/16 08:28	06/22/16 12:49	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	ND	mg/L	0.11	0.11	1	06/21/16 08:28	06/26/16 11:23		
Surrogates									
n-Triacontane (S)	88	%.	62-125		1	06/21/16 08:28	06/26/16 11:23	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/24/16 21:13	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 21:13	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 21:13	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 21:13	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	92	%.	75-125		1		06/24/16 21:13	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		06/24/16 21:13	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	75-125		1		06/24/16 21:13	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.14**	mg/L	0.10	0.050	1		06/27/16 09:09		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**6.7**	mg/L	2.5	1.0	1		06/23/16 08:49	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: USGS-1A **Lab ID: 10352597017** Collected: 06/17/16 10:02 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**594**	ug/L	10.0	0.49	1		06/23/16 11:11	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**2.9**	mg/L	0.11		1	06/21/16 08:28	06/22/16 11:41		
Surrogates									
n-Triacontane (S)	87	%.	50-150		1	06/21/16 08:28	06/22/16 11:41	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**1.3**	mg/L	0.11	0.11	1	06/21/16 08:28	06/26/16 10:49		
Surrogates									
n-Triacontane (S)	82	%.	62-125		1	06/21/16 08:28	06/26/16 10:49	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**1.7**	ug/L	1.0	0.042	1		06/24/16 21:30	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 21:30	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 21:30	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 21:30	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	92	%.	75-125		1		06/24/16 21:30	17060-07-0	
Toluene-d8 (S)	99	%.	75-125		1		06/24/16 21:30	2037-26-5	
4-Bromofluorobenzene (S)	95	%.	75-125		1		06/24/16 21:30	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/27/16 09:09		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**3.2**	mg/L	2.5	1.0	1		06/23/16 08:49	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: USGS-2A **Lab ID: 10352597018** Collected: 06/17/16 09:50 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**3480**	ug/L	10.0	0.49	1		06/23/16 11:19	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**3.7**	mg/L	0.11		1	06/21/16 08:28	06/22/16 11:28		
Surrogates									
n-Triacontane (S)	92	%.	50-150		1	06/21/16 08:28	06/22/16 11:28	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**2.1**	mg/L	0.11	0.11	1	06/21/16 08:28	06/26/16 11:30		
Surrogates									
n-Triacontane (S)	93	%.	62-125		1	06/21/16 08:28	06/26/16 11:30	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**33.0**	ug/L	1.0	0.042	1		06/24/16 21:46	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/24/16 21:46	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/24/16 21:46	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.15	1		06/24/16 21:46	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	95	%.	75-125		1		06/24/16 21:46	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		06/24/16 21:46	2037-26-5	
4-Bromofluorobenzene (S)	95	%.	75-125		1		06/24/16 21:46	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/27/16 09:10		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		06/23/16 08:49	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: USGS-3A **Lab ID: 10352597019** Collected: 06/17/16 09:20 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**1710**	ug/L	10.0	0.49	1		06/23/16 11:27	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**4.7**	mg/L	0.11		1	06/21/16 08:28	06/22/16 11:34		
Surrogates									
n-Triacontane (S)	88	%.	50-150		1	06/21/16 08:28	06/22/16 11:34	638-68-6	P4
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**2.5**	mg/L	0.11	0.11	1	06/21/16 08:28	06/26/16 11:36		
Surrogates									
n-Triacontane (S)	82	%.	62-125		1	06/21/16 08:28	06/26/16 11:36	638-68-6	P4
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**3.8**	ug/L	1.0	0.042	1		06/27/16 14:32	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/27/16 14:32	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/27/16 14:32	108-88-3	
Xylene (Total)	ND	ug/L	2.0	0.15	1		06/27/16 14:32	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	100	%.	75-125		1		06/27/16 14:32	17060-07-0	
Toluene-d8 (S)	95	%.	75-125		1		06/27/16 14:32	2037-26-5	
4-Bromofluorobenzene (S)	92	%.	75-125		1		06/27/16 14:32	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/27/16 09:14		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		06/23/16 08:49	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: USGS-4A **Lab ID: 10352597020** Collected: 06/17/16 08:57 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**387**	ug/L	10.0	0.49	1		06/23/16 11:36	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**2.2**	mg/L	0.11		1	06/21/16 08:28	06/22/16 11:48		
Surrogates									
n-Triacontane (S)	93	%.	50-150		1	06/21/16 08:28	06/22/16 11:48	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**1.2**	mg/L	0.11	0.11	1	06/21/16 08:28	06/26/16 11:43		
Surrogates									
n-Triacontane (S)	90	%.	62-125		1	06/21/16 08:28	06/26/16 11:43	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/27/16 16:07	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/27/16 16:07	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/27/16 16:07	108-88-3	
Xylene (Total)	ND	ug/L	2.0	0.15	1		06/27/16 16:07	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	99	%.	75-125		1		06/27/16 16:07	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		06/27/16 16:07	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		06/27/16 16:07	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		06/27/16 09:15		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		06/23/16 08:51	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: SCL DW **Lab ID: 10352597021** Collected: 06/16/16 11:30 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		06/22/16 11:55	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11		1	06/21/16 13:30	06/22/16 14:10		
Surrogates									
n-Triacontane (S)	91	%.	50-150		1	06/21/16 13:30	06/22/16 14:10	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/27/16 16:54	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/27/16 16:54	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/27/16 16:54	108-88-3	
Xylene (Total)	ND	ug/L	2.0	0.15	1		06/27/16 16:54	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	100	%.	75-125		1		06/27/16 16:54	17060-07-0	
Toluene-d8 (S)	95	%.	75-125		1		06/27/16 16:54	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		06/27/16 16:54	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**1.1**	mg/L	0.10	0.050	1		06/27/16 09:15		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**2.8**	mg/L	2.5	1.0	1		06/23/16 09:05	14808-79-8	M1

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: Field Blank **Lab ID: 10352597022** Collected: 06/17/16 11:30 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		06/23/16 11:44	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11		1	06/21/16 13:30	06/22/16 14:17		
Surrogates									
n-Triacontane (S)	96	%.	50-150		1	06/21/16 13:30	06/22/16 14:17	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/27/16 13:45	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/27/16 13:45	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/27/16 13:45	108-88-3	
Xylene (Total)	ND	ug/L	2.0	0.15	1		06/27/16 13:45	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	98	%.	75-125		1		06/27/16 13:45	17060-07-0	
Toluene-d8 (S)	95	%.	75-125		1		06/27/16 13:45	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		06/27/16 13:45	460-00-4	
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		06/23/16 09:08	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Sample: Trip Blank **Lab ID: 10352597023** Collected: 06/17/16 00:00 Received: 06/17/16 17:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.042	1		06/27/16 12:58	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.075	1		06/27/16 12:58	100-41-4	
Toluene	ND	ug/L	1.0	0.059	1		06/27/16 12:58	108-88-3	
Xylene (Total)	ND	ug/L	2.0	0.15	1		06/27/16 12:58	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	97	%.	75-125		1		06/27/16 12:58	17060-07-0	
Toluene-d8 (S)	93	%.	75-125		1		06/27/16 12:58	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		06/27/16 12:58	460-00-4	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

QC Batch: AIR/26168 | Analysis Method: RSK 175
QC Batch Method: RSK 175 | Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10352597001

METHOD BLANK: 2290712 | Matrix: Water
Associated Lab Samples: 10352597001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ug/L	ND	10.0	0.49	06/21/16 15:49	

LABORATORY CONTROL SAMPLE & LCSD: 2290713 2290714

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ug/L	60.7	60.8	60.8	100	100	85-115	0	20	

SAMPLE DUPLICATE: 2292756

Parameter	Units	60221675002 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	ND	2J		20	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

QC Batch: AIR/26179 Analysis Method: RSK 175
QC Batch Method: RSK 175 Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10352597002, 10352597003, 10352597004

METHOD BLANK: 2292310 Matrix: Water
Associated Lab Samples: 10352597002, 10352597003, 10352597004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ug/L	ND	10.0	0.49	06/22/16 15:04	

LABORATORY CONTROL SAMPLE & LCSD: 2292311 2292312

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ug/L	60.7	55.8	54.7	92	90	85-115	2	20	

SAMPLE DUPLICATE: 2293748

Parameter	Units	60221560012 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	9860	10600	7	20	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

QC Batch: AIR/26180 | Analysis Method: RSK 175
QC Batch Method: RSK 175 | Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10352597021

METHOD BLANK: 2292313 | Matrix: Water
Associated Lab Samples: 10352597021

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ug/L	ND	10.0	0.49	06/22/16 11:47	

LABORATORY CONTROL SAMPLE & LCSD: 2292314 2292315

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ug/L	60.7	57.2	55.8	94	92	85-115	2	20	

SAMPLE DUPLICATE: 2293686

Parameter	Units	10352597021 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	ND	1.6J		20	

SAMPLE DUPLICATE: 2293687

Parameter	Units	92301760008 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	1620	1430	13	20	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

QC Batch: AIR/26186 | Analysis Method: RSK 175
QC Batch Method: RSK 175 | Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10352597005, 10352597007, 10352597008, 10352597017, 10352597018, 10352597019, 10352597020, 10352597022

METHOD BLANK: 2292827 | Matrix: Water
Associated Lab Samples: 10352597005, 10352597007, 10352597008, 10352597017, 10352597018, 10352597019, 10352597020, 10352597022

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ug/L	ND	10.0	0.49	06/23/16 08:44	

LABORATORY CONTROL SAMPLE & LCSD: 2292828 2292829

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ug/L	60.7	54.4	54.1	90	89	85-115	0	20	

SAMPLE DUPLICATE: 2295045

Parameter	Units	60221593007 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	400	414	3	20	

SAMPLE DUPLICATE: 2295046

Parameter	Units	1268736008 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	1500	1510	1	20	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

QC Batch: AIR/26187 — Analysis Method: RSK 175
QC Batch Method: RSK 175 — Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10352597006, 10352597009, 10352597010, 10352597011, 10352597012, 10352597013, 10352597014, 10352597015, 10352597016

METHOD BLANK: 2293676 — Matrix: Water
Associated Lab Samples: 10352597006, 10352597009, 10352597010, 10352597011, 10352597012, 10352597013, 10352597014, 10352597015, 10352597016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ug/L	ND	10.0	0.49	06/23/16 14:03	

LABORATORY CONTROL SAMPLE & LCSD: 2293677 2293678

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ug/L	60.7	54.1	54.9	89	91	85-115	1	20	

SAMPLE DUPLICATE: 2295055

Parameter	Units	10352597006 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	10.5	12.3	16	20	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

QC Batch: MSV/36060 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 10352597001, 10352597002, 10352597003, 10352597004, 10352597005, 10352597006, 10352597007, 10352597008, 10352597009, 10352597010, 10352597011, 10352597012, 10352597013, 10352597014, 10352597015, 10352597016, 10352597017, 10352597018

METHOD BLANK: 2294835 Matrix: Water
Associated Lab Samples: 10352597001, 10352597002, 10352597003, 10352597004, 10352597005, 10352597006, 10352597007, 10352597008, 10352597009, 10352597010, 10352597011, 10352597012, 10352597013, 10352597014, 10352597015, 10352597016, 10352597017, 10352597018

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	0.042	06/24/16 14:56	
Ethylbenzene	ug/L	ND	1.0	0.075	06/24/16 14:56	
Toluene	ug/L	ND	1.0	0.059	06/24/16 14:56	
Xylene (Total)	ug/L	ND	3.0	0.15	06/24/16 14:56	
1,2-Dichloroethane-d4 (S)	%.	92	75-125		06/24/16 14:56	
4-Bromofluorobenzene (S)	%.	98	75-125		06/24/16 14:56	
Toluene-d8 (S)	%.	96	75-125		06/24/16 14:56	

LABORATORY CONTROL SAMPLE & LCSD: 2294836 2295761

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/L	20	18.6	17.2	93	86	75-125	8	20	
Ethylbenzene	ug/L	20	19.4	18.3	97	91	75-125	6	20	
Toluene	ug/L	20	22.5	20.9	113	104	75-125	8	20	
Xylene (Total)	ug/L	60	58.6	56.0	98	93	75-125	5	20	
1,2-Dichloroethane-d4 (S)	%.				96	94	75-125			
4-Bromofluorobenzene (S)	%.				95	98	75-125			
Toluene-d8 (S)	%.				101	99	75-125			

MATRIX SPIKE SAMPLE: 2295762

Parameter	Units	10352597001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	ND	20	19.5	97	52-147	
Ethylbenzene	ug/L	ND	20	20.3	101	67-149	
Toluene	ug/L	ND	20	20.8	101	69-139	
Xylene (Total)	ug/L	ND	60	62.5	104	70-147	
1,2-Dichloroethane-d4 (S)	%.				94	75-125	
4-Bromofluorobenzene (S)	%.				97	75-125	
Toluene-d8 (S)	%.				99	75-125	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

SAMPLE DUPLICATE: 2295763

Parameter	Units	10352597002 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzene	ug/L	ND	.11J		30	
Ethylbenzene	ug/L	ND	ND		30	
Toluene	ug/L	ND	.28J		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	92	90	2		
4-Bromofluorobenzene (S)	%.	96	97	1		
Toluene-d8 (S)	%.	97	97	0		

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

QC Batch: MSV/36080 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 10352597019, 10352597020, 10352597021, 10352597022, 10352597023

METHOD BLANK: 2296521 Matrix: Water
Associated Lab Samples: 10352597019, 10352597020, 10352597021, 10352597022, 10352597023

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	0.042	06/27/16 10:53	
Ethylbenzene	ug/L	ND	1.0	0.075	06/27/16 10:53	
Toluene	ug/L	ND	1.0	0.059	06/27/16 10:53	
Xylene (Total)	ug/L	ND	2.0	0.15	06/27/16 10:53	
1,2-Dichloroethane-d4 (S)	%.	98	75-125		06/27/16 10:53	
4-Bromofluorobenzene (S)	%.	98	75-125		06/27/16 10:53	
Toluene-d8 (S)	%.	95	75-125		06/27/16 10:53	

LABORATORY CONTROL SAMPLE & LCSD: 2296522 2296523

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/L	20	17.0	16.6	85	83	75-125	2	20	
Ethylbenzene	ug/L	20	21.1	20.8	106	104	75-125	2	20	
Toluene	ug/L	20	20.1	20.1	101	100	75-125	0	20	
Xylene (Total)	ug/L	60	66.2	64.6	110	108	75-125	2	20	
1,2-Dichloroethane-d4 (S)	%.				93	93	75-125			
4-Bromofluorobenzene (S)	%.				96	93	75-125			
Toluene-d8 (S)	%.				98	99	75-125			

MATRIX SPIKE SAMPLE: 2297643

Parameter	Units	10352597019 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	3.8	20	20.9	86	52-147	
Ethylbenzene	ug/L	ND	20	21.6	108	67-149	
Toluene	ug/L	ND	20	21.1	105	69-139	
Xylene (Total)	ug/L	ND	60	66.4	111	70-147	
1,2-Dichloroethane-d4 (S)	%.				95	75-125	
4-Bromofluorobenzene (S)	%.				92	75-125	
Toluene-d8 (S)	%.				100	75-125	

SAMPLE DUPLICATE: 2297644

Parameter	Units	10352597020 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzene	ug/L	ND	.22J		30	
Ethylbenzene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

SAMPLE DUPLICATE: 2297644

Parameter	Units	10352597020 Result	Dup Result	RPD	Max RPD	Qualifiers
1,2-Dichloroethane-d4 (S)	%.	99	101	2		
4-Bromofluorobenzene (S)	%.	99	97	3		
Toluene-d8 (S)	%.	97	96	1		

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

QC Batch: OEXT/33955 Analysis Method: Diesel Range Organics
QC Batch Method: Diesel Range Organics Analysis Description: WIDRO Extended GCS
Associated Lab Samples: 10352597001, 10352597002, 10352597003, 10352597004, 10352597005, 10352597006, 10352597007, 10352597008, 10352597009, 10352597010, 10352597011, 10352597012, 10352597013, 10352597014, 10352597015, 10352597016, 10352597017, 10352597018, 10352597019, 10352597020

METHOD BLANK: 2291307 Matrix: Water
Associated Lab Samples: 10352597001, 10352597002, 10352597003, 10352597004, 10352597005, 10352597006, 10352597007, 10352597008, 10352597009, 10352597010, 10352597011, 10352597012, 10352597013, 10352597014, 10352597015, 10352597016, 10352597017, 10352597018, 10352597019, 10352597020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO, Extended C10-C32	mg/L	ND	0.10		06/22/16 10:54	
n-Triacontane (S)	%.	76	50-150		06/22/16 10:54	

LABORATORY CONTROL SAMPLE & LCSD: 2291308 2291309

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
n-Triacontane (S)	%.				95	96	50-150			

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

QC Batch: OEXT/33963 | Analysis Method: Diesel Range Organics
QC Batch Method: Diesel Range Organics | Analysis Description: WIDRO Extended GCS
Associated Lab Samples: 10352597021, 10352597022

METHOD BLANK: 2291665 | Matrix: Water
Associated Lab Samples: 10352597021, 10352597022

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO, Extended C10-C32	mg/L	ND	0.10		06/22/16 13:36	
n-Triacontane (S)	%.	90	50-150		06/22/16 13:36	

LABORATORY CONTROL SAMPLE & LCSD: 2291666 2291667

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
n-Triacontane (S)	%.				101	90	50-150			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

QC Batch: OEXT/34022 Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS w/Cleanup
Associated Lab Samples: 10352597006, 10352597007, 10352597009, 10352597010, 10352597013, 10352597016, 10352597017, 10352597018, 10352597019, 10352597020

METHOD BLANK: 2295742 Matrix: Water
Associated Lab Samples: 10352597006, 10352597007, 10352597009, 10352597010, 10352597013, 10352597016, 10352597017, 10352597018, 10352597019, 10352597020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO, Extended C10-C32	mg/L	ND	0.10	0.10	06/26/16 10:29	
n-Triacontane (S)	%.	67	62-125		06/26/16 10:29	

LABORATORY CONTROL SAMPLE & LCSD: 2295743 2295744

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
n-Triacontane (S)	%.				100	95	62-125			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

QC Batch: WETA/27762 Analysis Method: SM 4500-NO3 H
QC Batch Method: SM 4500-NO3 H Analysis Description: SM4500NO3-H, NO2 + NO3 pres.
Associated Lab Samples: 10352597001, 10352597002, 10352597003, 10352597004, 10352597005

METHOD BLANK: 2293406 Matrix: Water
Associated Lab Samples: 10352597001, 10352597002, 10352597003, 10352597004, 10352597005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.050	06/23/16 12:02	

LABORATORY CONTROL SAMPLE: 2293407

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2293408 2293409

Parameter	Units	10352287001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	2.0	2.1	81	82	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2293410 2293411

Parameter	Units	10352287002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	1.9	2.5	2.5	2.8	3.0	39	45	80-120	5	30	M1

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

QC Batch: WETA/27781 — Analysis Method: SM 4500-NO3 H
QC Batch Method: SM 4500-NO3 H — Analysis Description: SM4500NO3-H, NO2 + NO3 pres.
Associated Lab Samples: 10352597006, 10352597007, 10352597008, 10352597009, 10352597010, 10352597011, 10352597012, 10352597013, 10352597014, 10352597015, 10352597016, 10352597017, 10352597018, 10352597019, 10352597020, 10352597021

METHOD BLANK: 2294561 — Matrix: Water
Associated Lab Samples: 10352597006, 10352597007, 10352597008, 10352597009, 10352597010, 10352597011, 10352597012, 10352597013, 10352597014, 10352597015, 10352597016, 10352597017, 10352597018, 10352597019, 10352597020, 10352597021

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.050	06/27/16 08:46	

LABORATORY CONTROL SAMPLE: 2294562

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2294563 — 2294564

Parameter	Units	10352597006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	2.3	2.2	89	87	80-120	2	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2294565 — 2294566

Parameter	Units	10352597007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	1.8	1.9	71	74	80-120	3	30	M1

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

QC Batch: WETA/27764 — Analysis Method: ASTM D516
QC Batch Method: ASTM D516 — Analysis Description: ASTM D516 Sulfate Water
Associated Lab Samples: 10352597001, 10352597002, 10352597003, 10352597004, 10352597005, 10352597006, 10352597007, 10352597008, 10352597009, 10352597010, 10352597011, 10352597012, 10352597013, 10352597014, 10352597015, 10352597016, 10352597017, 10352597018, 10352597019, 10352597020

METHOD BLANK: 2293436 — Matrix: Water
Associated Lab Samples: 10352597001, 10352597002, 10352597003, 10352597004, 10352597005, 10352597006, 10352597007, 10352597008, 10352597009, 10352597010, 10352597011, 10352597012, 10352597013, 10352597014, 10352597015, 10352597016, 10352597017, 10352597018, 10352597019, 10352597020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	2.5	1.0	06/23/16 08:36	

LABORATORY CONTROL SAMPLE & LCSD: 2293437 2293438

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Sulfate	mg/L	7.5	8.2	8.1	110	108	80-120	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2293439 2293440

Parameter	Units	10352597001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	ND	20	20	17.0	17.1	85	85	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2293441 2293442

Parameter	Units	10352597010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	8.4	20	20	19.3	18.9	55	52	80-120	2	30	M1

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

QC Batch: WETA/27765 | Analysis Method: ASTM D516
QC Batch Method: ASTM D516 | Analysis Description: ASTM D516 Sulfate Water
Associated Lab Samples: 10352597021, 10352597022

METHOD BLANK: 2293479 | Matrix: Water
Associated Lab Samples: 10352597021, 10352597022

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	2.5	1.0	06/23/16 09:05	FS

LABORATORY CONTROL SAMPLE & LCSD: 2293480 2293481

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Sulfate	mg/L	7.5	8.7	8.9	116	118	80-120	2	20	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2293482 2293483

Parameter	Units	10352597021 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	2.8	20	20	17.1	17.0	72	71	80-120	1	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2293484 2293485

Parameter	Units	10352359005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	25.8	20	20	39.2	29.1	67	17	80-120	30	30	M1

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QUALIFIERS

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

FS	The sample was filtered in the laboratory prior to analysis.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
P4	Sample field preservation does not meet EPA or method recommendations for this analysis.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10352597001	**MW-1**	RSK 175	AIR/26168		
10352597002	**MW-4**	RSK 175	AIR/26179		
10352597003	**MW-6**	RSK 175	AIR/26179		
10352597004	**MW-7**	RSK 175	AIR/26179		
10352597005	**MW-8**	RSK 175	AIR/26186		
10352597006	**MW-9**	RSK 175	AIR/26187		
10352597007	**MW-10**	RSK 175	AIR/26186		
10352597008	**DUP**	RSK 175	AIR/26186		
10352597009	**MW-16A**	RSK 175	AIR/26187		
10352597010	**MW-16B**	RSK 175	AIR/26187		
10352597011	**MW-17**	RSK 175	AIR/26187		
10352597012	**MW-18**	RSK 175	AIR/26187		
10352597013	**MW-19**	RSK 175	AIR/26187		
10352597014	**MW-20**	RSK 175	AIR/26187		
10352597015	**MW-21**	RSK 175	AIR/26187		
10352597016	**MW-22**	RSK 175	AIR/26187		
10352597017	**USGS-1A**	RSK 175	AIR/26186		
10352597018	**USGS-2A**	RSK 175	AIR/26186		
10352597019	**USGS-3A**	RSK 175	AIR/26186		
10352597020	**USGS-4A**	RSK 175	AIR/26186		
10352597021	**SCL DW**	RSK 175	AIR/26180		
10352597022	**Field Blank**	RSK 175	AIR/26186		
10352597001	**MW-1**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597002	**MW-4**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597003	**MW-6**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597004	**MW-7**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597005	**MW-8**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597006	**MW-9**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597007	**MW-10**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597008	**DUP**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597009	**MW-16A**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597010	**MW-16B**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597011	**MW-17**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597012	**MW-18**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597013	**MW-19**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597014	**MW-20**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597015	**MW-21**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597016	**MW-22**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597017	**USGS-1A**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597018	**USGS-2A**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597019	**USGS-3A**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597020	**USGS-4A**	Diesel Range Organics	OEXT/33955	Diesel Range Organics	GCSV/18913
10352597021	**SCL DW**	Diesel Range Organics	OEXT/33963	Diesel Range Organics	GCSV/18914
10352597022	**Field Blank**	Diesel Range Organics	OEXT/33963	Diesel Range Organics	GCSV/18914

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10352597006	**MW-9**	WI MOD DRO	OEXT/34022	WI MOD DRO	GCSV/18943
10352597007	**MW-10**	WI MOD DRO	OEXT/34022	WI MOD DRO	GCSV/18943
10352597009	**MW-16A**	WI MOD DRO	OEXT/34022	WI MOD DRO	GCSV/18943
10352597010	**MW-16B**	WI MOD DRO	OEXT/34022	WI MOD DRO	GCSV/18943
10352597013	**MW-19**	WI MOD DRO	OEXT/34022	WI MOD DRO	GCSV/18943
10352597016	**MW-22**	WI MOD DRO	OEXT/34022	WI MOD DRO	GCSV/18943
10352597017	**USGS-1A**	WI MOD DRO	OEXT/34022	WI MOD DRO	GCSV/18943
10352597018	**USGS-2A**	WI MOD DRO	OEXT/34022	WI MOD DRO	GCSV/18943
10352597019	**USGS-3A**	WI MOD DRO	OEXT/34022	WI MOD DRO	GCSV/18943
10352597020	**USGS-4A**	WI MOD DRO	OEXT/34022	WI MOD DRO	GCSV/18943
10352597001	**MW-1**	EPA 8260B	MSV/36060		
10352597002	**MW-4**	EPA 8260B	MSV/36060		
10352597003	**MW-6**	EPA 8260B	MSV/36060		
10352597004	**MW-7**	EPA 8260B	MSV/36060		
10352597005	**MW-8**	EPA 8260B	MSV/36060		
10352597006	**MW-9**	EPA 8260B	MSV/36060		
10352597007	**MW-10**	EPA 8260B	MSV/36060		
10352597008	**DUP**	EPA 8260B	MSV/36060		
10352597009	**MW-16A**	EPA 8260B	MSV/36060		
10352597010	**MW-16B**	EPA 8260B	MSV/36060		
10352597011	**MW-17**	EPA 8260B	MSV/36060		
10352597012	**MW-18**	EPA 8260B	MSV/36060		
10352597013	**MW-19**	EPA 8260B	MSV/36060		
10352597014	**MW-20**	EPA 8260B	MSV/36060		
10352597015	**MW-21**	EPA 8260B	MSV/36060		
10352597016	**MW-22**	EPA 8260B	MSV/36060		
10352597017	**USGS-1A**	EPA 8260B	MSV/36060		
10352597018	**USGS-2A**	EPA 8260B	MSV/36060		
10352597019	**USGS-3A**	EPA 8260B	MSV/36080		
10352597020	**USGS-4A**	EPA 8260B	MSV/36080		
10352597021	**SCL DW**	EPA 8260B	MSV/36080		
10352597022	**Field Blank**	EPA 8260B	MSV/36080		
10352597023	**Trip Blank**	EPA 8260B	MSV/36080		
10352597001	**MW-1**	SM 4500-NO3 H	WETA/27762		
10352597002	**MW-4**	SM 4500-NO3 H	WETA/27762		
10352597003	**MW-6**	SM 4500-NO3 H	WETA/27762		
10352597004	**MW-7**	SM 4500-NO3 H	WETA/27762		
10352597005	**MW-8**	SM 4500-NO3 H	WETA/27762		
10352597006	**MW-9**	SM 4500-NO3 H	WETA/27781		
10352597007	**MW-10**	SM 4500-NO3 H	WETA/27781		
10352597008	**DUP**	SM 4500-NO3 H	WETA/27781		
10352597009	**MW-16A**	SM 4500-NO3 H	WETA/27781		
10352597010	**MW-16B**	SM 4500-NO3 H	WETA/27781		
10352597011	**MW-17**	SM 4500-NO3 H	WETA/27781		
10352597012	**MW-18**	SM 4500-NO3 H	WETA/27781		
10352597013	**MW-19**	SM 4500-NO3 H	WETA/27781		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60503816 South Cass Lake REV
Pace Project No.: 10352597

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10352597014	**MW-20**	SM 4500-NO3 H	WETA/27781		
10352597015	**MW-21**	SM 4500-NO3 H	WETA/27781		
10352597016	**MW-22**	SM 4500-NO3 H	WETA/27781		
10352597017	**USGS-1A**	SM 4500-NO3 H	WETA/27781		
10352597018	**USGS-2A**	SM 4500-NO3 H	WETA/27781		
10352597019	**USGS-3A**	SM 4500-NO3 H	WETA/27781		
10352597020	**USGS-4A**	SM 4500-NO3 H	WETA/27781		
10352597021	**SCL DW**	SM 4500-NO3 H	WETA/27781		
10352597001	**MW-1**	ASTM D516	WETA/27764		
10352597002	**MW-4**	ASTM D516	WETA/27764		
10352597003	**MW-6**	ASTM D516	WETA/27764		
10352597004	**MW-7**	ASTM D516	WETA/27764		
10352597005	**MW-8**	ASTM D516	WETA/27764		
10352597006	**MW-9**	ASTM D516	WETA/27764		
10352597007	**MW-10**	ASTM D516	WETA/27764		
10352597008	**DUP**	ASTM D516	WETA/27764		
10352597009	**MW-16A**	ASTM D516	WETA/27764		
10352597010	**MW-16B**	ASTM D516	WETA/27764		
10352597011	**MW-17**	ASTM D516	WETA/27764		
10352597012	**MW-18**	ASTM D516	WETA/27764		
10352597013	**MW-19**	ASTM D516	WETA/27764		
10352597014	**MW-20**	ASTM D516	WETA/27764		
10352597015	**MW-21**	ASTM D516	WETA/27764		
10352597016	**MW-22**	ASTM D516	WETA/27764		
10352597017	**USGS-1A**	ASTM D516	WETA/27764		
10352597018	**USGS-2A**	ASTM D516	WETA/27764		
10352597019	**USGS-3A**	ASTM D516	WETA/27764		
10352597020	**USGS-4A**	ASTM D516	WETA/27764		
10352597021	**SCL DW**	ASTM D516	WETA/27765		
10352597022	**Field Blank**	ASTM D516	WETA/27765		

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CHAIN-OF-CUSTODY / Analytical Request Document

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L0352597

Section A Required Client Information:

Company:	AECOM
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	Duluth, MN 55802
Email To:	darin.albrecht@aecom.com
Phone: (218) 625-8768	Fax: (218) 625-2201
Requested Due Date/TAT:	5 Day Enbridge Standard

Section B Required Project Information:

Report To:	Darin Albrecht
Copy To:	
Purchase Order No.:	
Project Name:	South Cass Lake
Project Number:	60503816

Section C Invoice Information:

Attention:	Karl Beaster
Company Name:	Enbridge Energy
Address:	1100 Louisiana St. Ste 3000
	Houston, TX 77002
Pace Quote Reference:	
Pace Project Manager:	Carol Davy
Pace Profile #:	32482

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER
UST | RCRA | OTHER _____

Site Location STATE: MN

Section D Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/GRAB DATE	COLLECTED Composite End/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	BTEX	Extended Range DRO	Sulfate	Nitrate + Nitrite	Methane	ERDRO - Silica Gel Cleanup	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
	Analysis Test (Y/N)																	N	N	N	N	N			
1	MW-1	WT	G			6-16-16	1007		10	4	1		5					3	2	1	1	3			001
2	MW-4	WT	G			6-16-16	1102		10	4	1		5					3	2	1	1	3			002
3	MW-6	WT	G			6-16-16	1520		10	4	1		5					3	2	1	1	3			003
4	MW-7	WT	G			6-16-16	1655		10	4	1		5					3	2	1	1	3			004
5	MW-8	WT	G			6-17-16	0938		10	4	1		5					3	2	1	1	3			005
6	MW-9	WT	G			6-16-16	1613		10	4	1		5					3	2	1	1	3	2		006
7	MW-10	WT	G			6-17-16	1147		10	4	1		5					3	2	1	1	3	2		007
8	DUP	WT	G			6-17-16	—		10	4	1		5					3	2	1	1	3			008
9	MW-16A	WT	G			6-16	1523		10	4	1		5					3	2	1	1	3	2		009
10	MW-16B	WT	G			6-16-16	1650		10	4	1		5					3	2	1	1	3	2		010
11	MW-17	WT	G			6-16-16	1440		10	4	1		5					3	2	1	1	3			011
12	MW-18	WT	G			6-16-16	1428		10	4	1		5					3	2	1	1	3			012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Please send Chroms with DRO hits	[signature]	6/17	1730	[signature] Pace	6/17	1730	—	Y	N	N

SAMPLER NAME AND SIGNATURE			
PRINT Name of SAMPLER:			
SIGNATURE of SAMPLER:	DATE Signed (MM/DD/YY):		

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

W0352597

Section A Required Client Information:

Company:	AECOM
Address:	11 East Superior Street, Suite 260
	Duluth, MN 55802
Email To:	darin.albrecht@aecom.com
Phone: (218) 625-8768	Fax: (218) 625-2201
Requested Due Date/TAT:	5 Day Enbridge Standard

Section B Required Project Information:

Report To:	Darin Albrecht
Copy To:	
Purchase Order No.:	
Project Name:	South Cass lake
Project Number:	60503816

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Attention:	Karl Beater
Company Name:	Enbridge Energy
Address:	1100 Lousiana St Sutie 3000
Pace Quote Reference:	Houston, TX 77002
Pace Project Manager:	Carol Davy
Pace Profile #:	32482

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER
UST | RCRA | OTHER

Site Location STATE: MN

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SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/GRAB DATE	COLLECTED Composite End/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	BTEX	Extended Range DRO	Sulfate	Nitrate + Nitrite	Methane	ERDRO - Silica Gel Clean-up							Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																			N	N	N	N	N									
1	MW-19	WT	G			6-16-16	1049		10	4	1		5						3	2	1	1	3	2								013
2	MW-20	WT	G			6-16	1226		10	4	1		5						3	2	1	1	3									014
3	MW-21	WT	G			6-16	1135		10	4	1		5						3	2	1	1	3									015
4	MW-22	WT	G			6-16-16	1014		10	4	1		5						3	2	1	1	3	2								016
5	USGS-1A	WT	G			6-17-16	1002		10	4	1		5						3	2	1	1	3	2								017
6	USGS-2A	WT	G			6-17	0950		10	4	1		5						3	2	1	1	3	2								018
7	USGS-3A	WT	G			6-17	0920		10	4	1		5						3	2	1	1	3	2								019
8	USGS-4A	WT	G			6-17-16	0857		10	4	1		5						3	2	1	1	3	2								020
9	SCL DW	DW	G			6-16	1130		10	4	1		5						3	2	1	1	3									021
10	Field Blank	WT	G			6-17	1130		9	4			5						3	2	1		3									022
11	Trip Blank	OT	-						4				4						3	2	1	1	3									023
12																																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Please send Chroms with DRO hits	[signature]	6/17	1730	[signature] Pace	6/17	1730	Y Y

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:					
SIGNATURE of SAMPLER:	DATE Signed (MM/DD/YY):				

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-Feb-2007

Pace Analytical®	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 04Apr2016 Page 1 of 1
	Document No.: **F-MN-L-213-rev.16**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Aecom

Project #: WO#: 10352597

10352597

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

Tracking Number:

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No **Seals Intact?** ☐ Yes ☒ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☒ Other: PB **Temp Blank?** ☒ Yes ☐ No

Thermometer Used: ☐ 151401163 ☒ B88A912167504 ☐ 151401164 ☐ B88A0143310098 **Type of Ice:** ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Read (°C): See exception **Cooler Temp Corrected (°C):** See exception **Biological Tissue Frozen?** ☐ Yes ☐ No ☒ N/A

Temp should be above freezing to 6°C **Correction Factor:** +0.1 **Date and Initials of Person Examining Contents:** DW 6/17/16

USDA Regulated Soil (☒ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☒ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☒ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☒ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☐ Yes	☒ No	☐ N/A	4.
Samples Arrived within Hold Time?	☒ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☒ No	☐ N/A	6.
Rush Turn Around Time Requested?	☒ Yes	☐ No	☐ N/A	7. 5 day
Sufficient Volume?	☒ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☒ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☒ Yes	☐ No	☐ N/A	
Containers Intact?	☒ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☒ Yes	☐ No	☐ N/A	12.
-Includes Date/Time/ID/Analysis Matrix: WT				
All containers needing acid/base preservation have been checked?	☒ Yes	☐ No	☐ N/A	13. ☐ HNO_3 ☒ H_2SO_4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☒ Yes	☐ No	☐ N/A	Sample # 1-21
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	☒ Yes	☐ No	☐ N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☒ No	☐ N/A	14.
Trip Blank Present?	☒ Yes	☐ No	☐ N/A	15.
Trip Blank Custody Seals Present?	☒ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased): 052216-3B2A				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Kaber Xiong **Date:** 6/20/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

SCUR Exceptions: Correction (°C) **Workorder #:** Corrected Temp. (°C)

~~Issue~~ Temp. (°C)	~~Sample ID~~	~~Container Type/#~~
4.3	+0.1	4.4
4.2	"	4.3
0.3	"	0.4
4.0	"	4.1
5.7	"	5.8
2.1	"	2.2
3.8	"	3.9
	"	

pH Adjustment Log for Preserved Samples

Sample #	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials

Data File: \\192.168.10.12\chem\10gcs9.i\062216dro.b\062216000016.D

Date : 22-JUN-2016 12:08

Client ID: MW-1

Instrument: 10gcs9.i

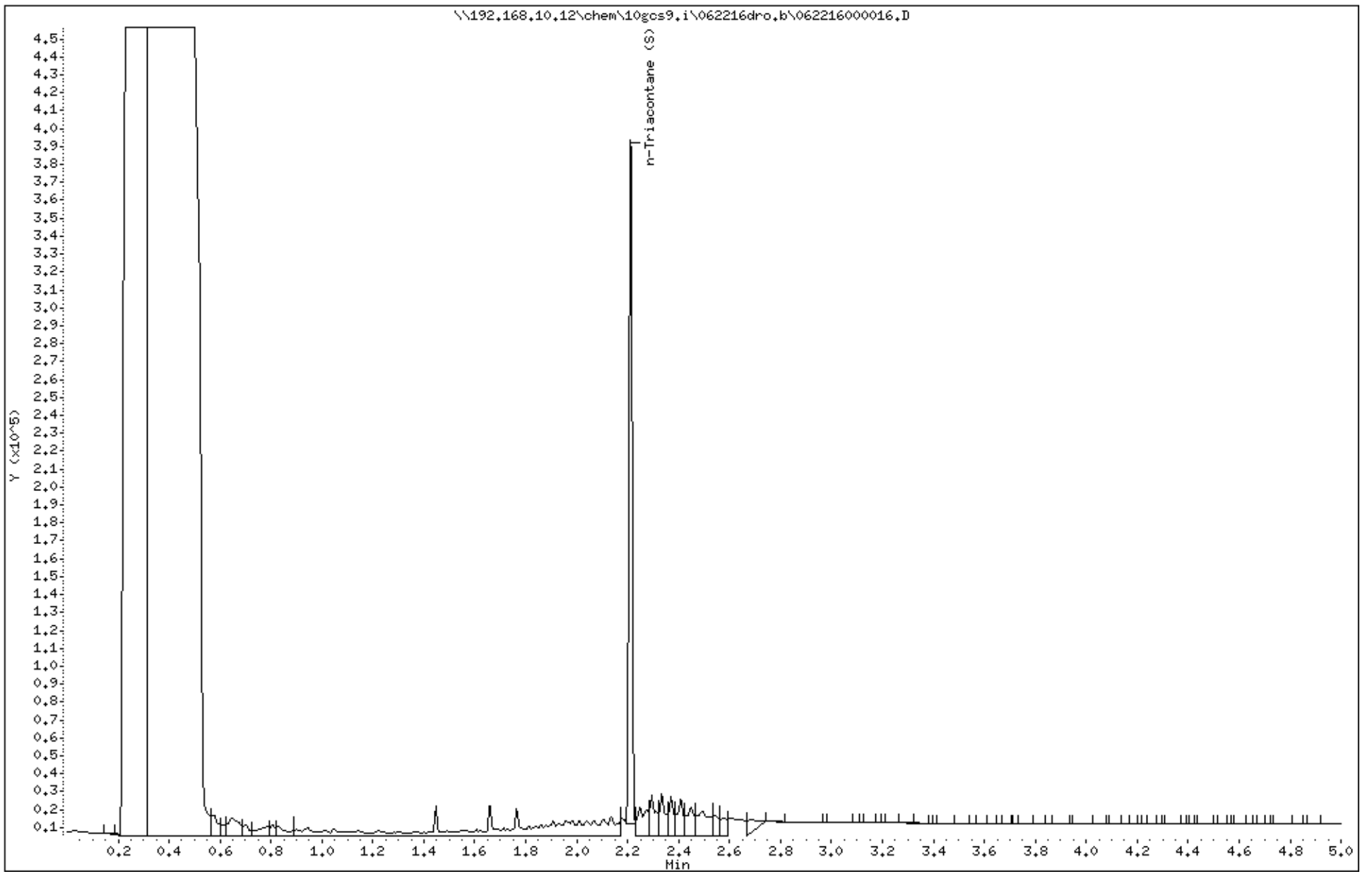
Sample Info: 10352597001

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



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Date : 22-JUN-2016 13:09

Client ID: MW-4

Instrument: 10gcs9.i

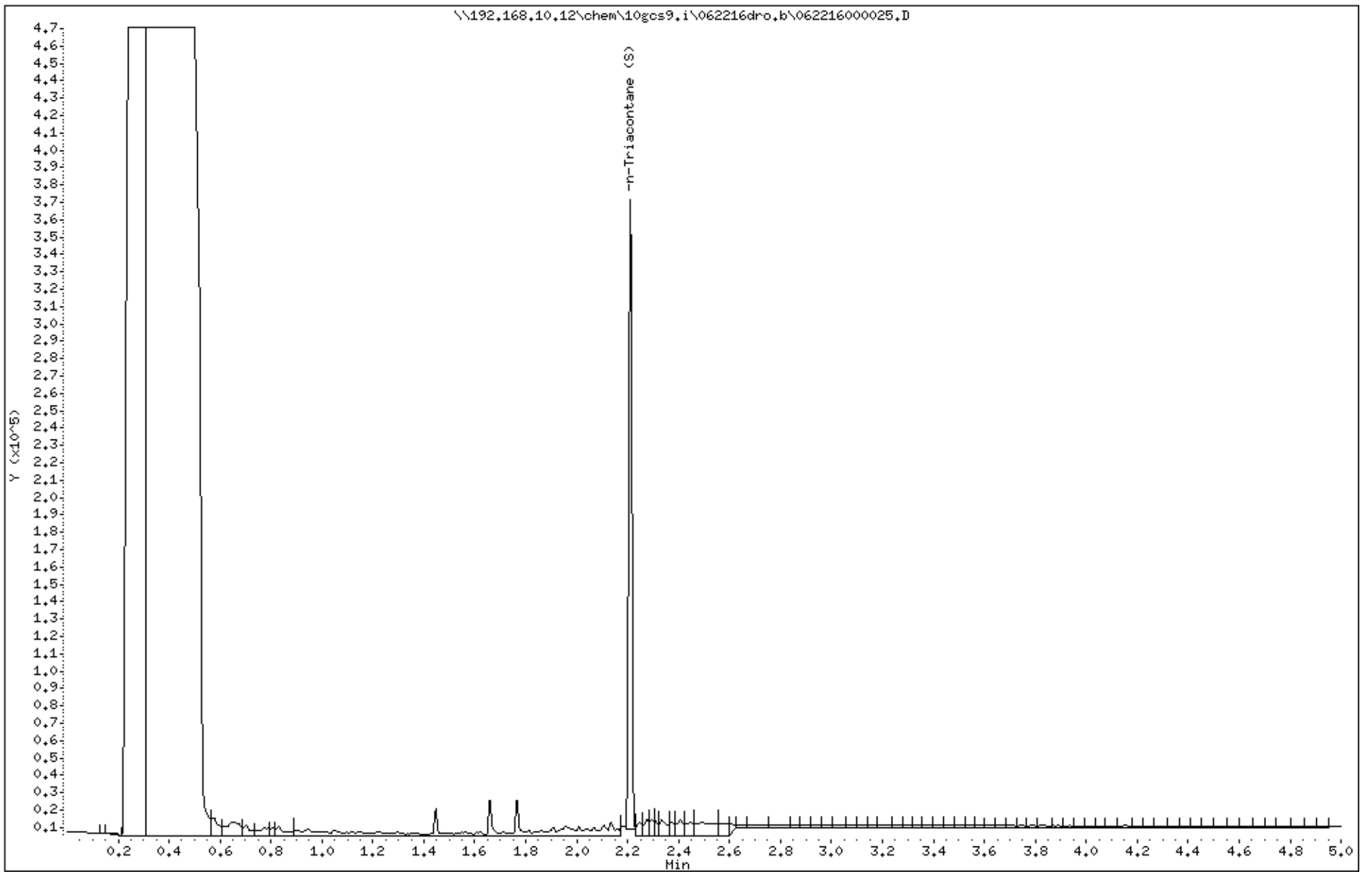
Sample Info: 10352597002

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



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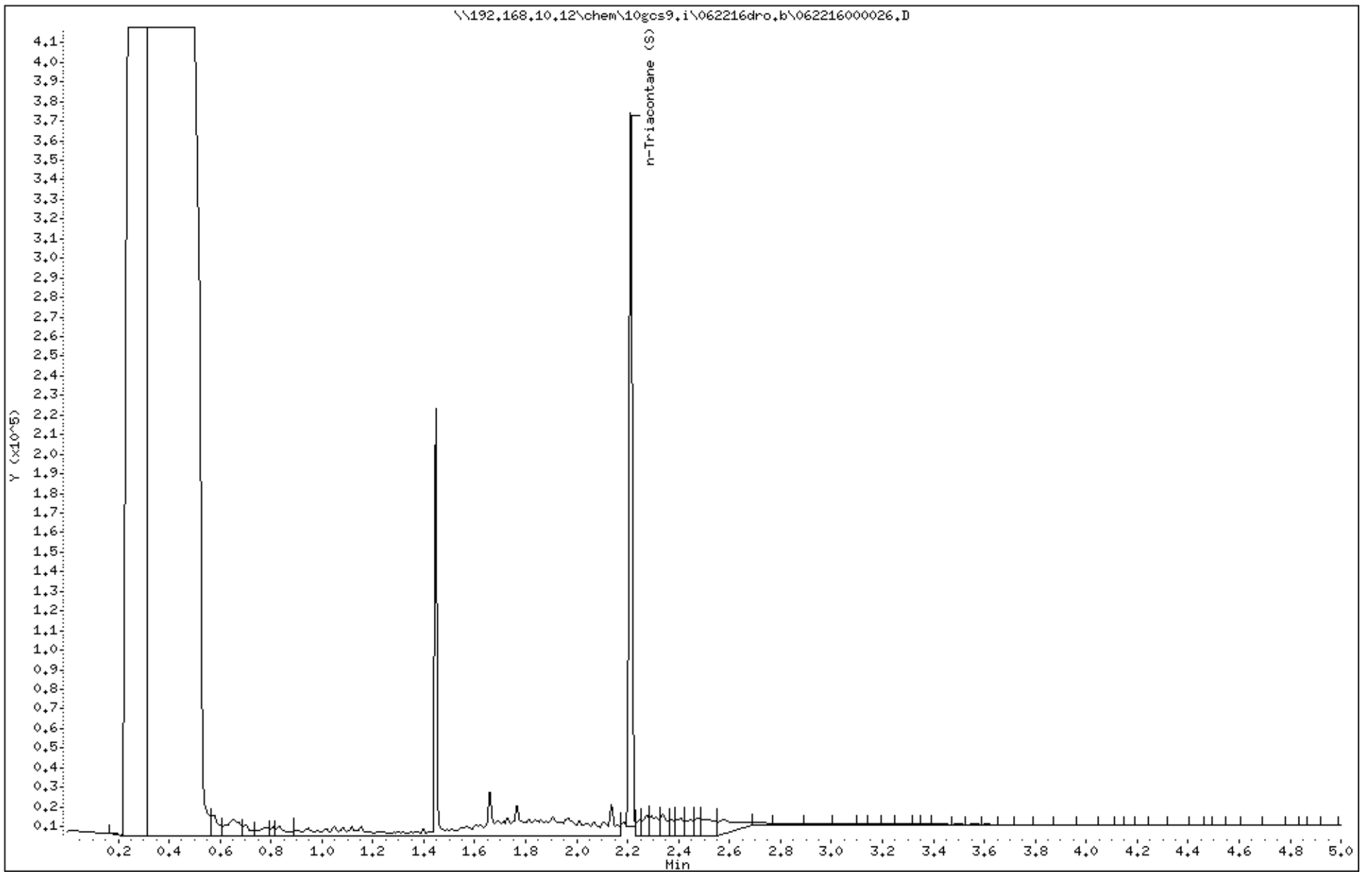
Date : 22-JUN-2016 13:16
Client ID: MW-6
Sample Info: 10352597003
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs9.i
Operator: MT
Column diameter: 0.32



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Date : 22-JUN-2016 12:55

Client ID: MW-7

Instrument: 10gcs9.i

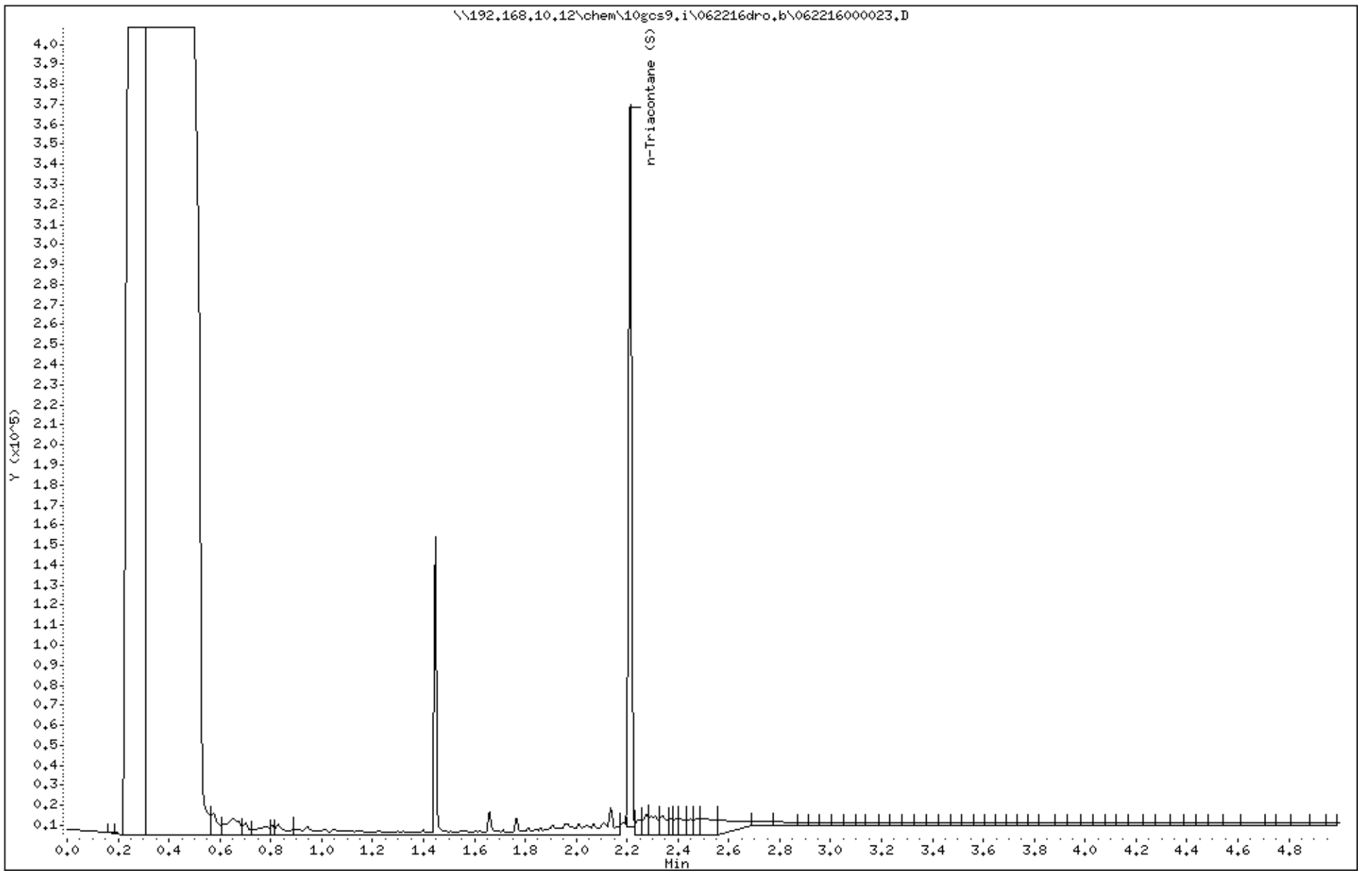
Sample Info: 10352597004

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



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Date : 22-JUN-2016 13:02

Client ID: MW-8

Instrument: 10gcs9.i

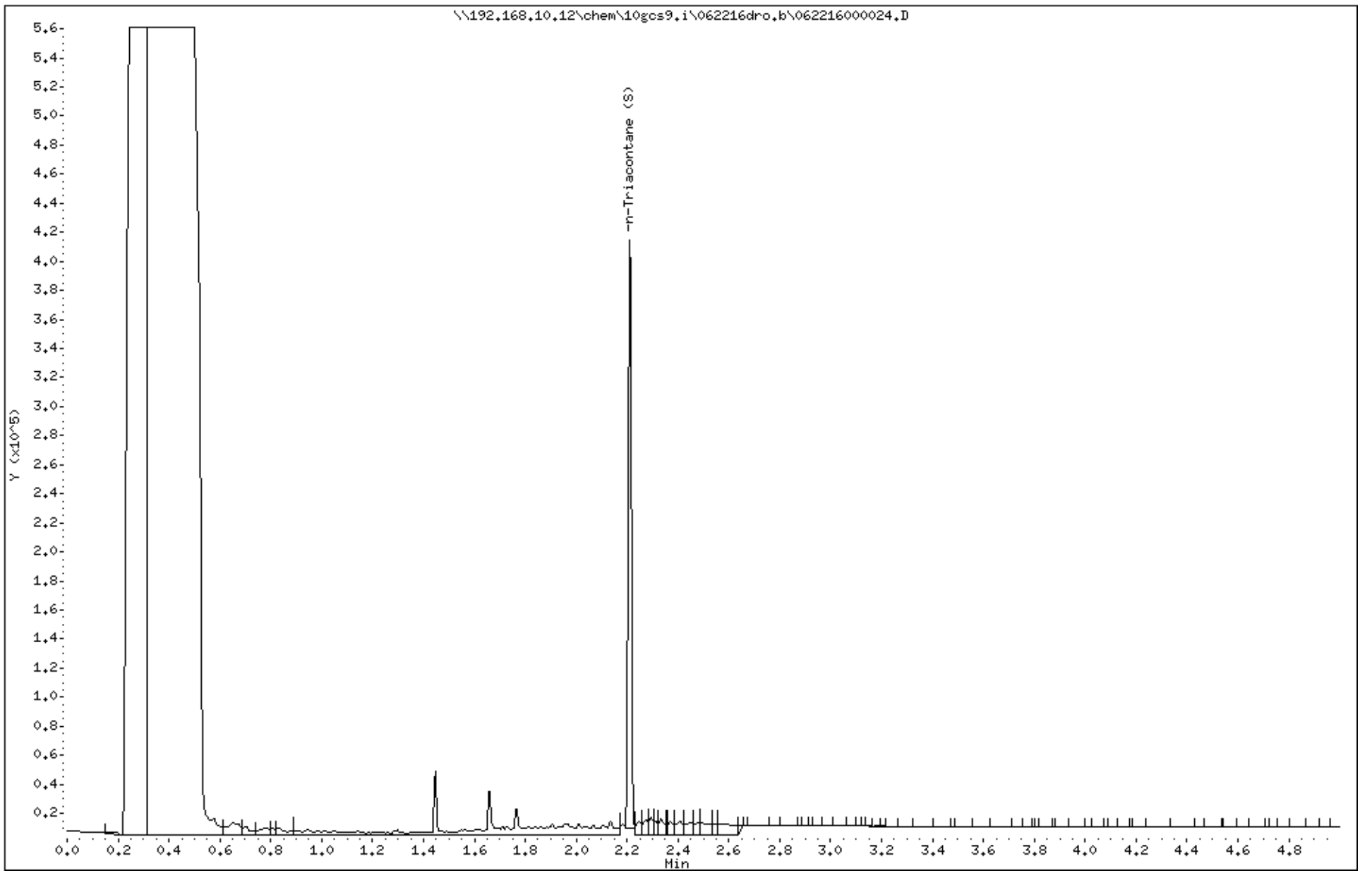
Sample Info: 10352597005

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



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Date : 22-JUN-2016 11:21

Client ID: MW-9

Instrument: 10gcs9.i

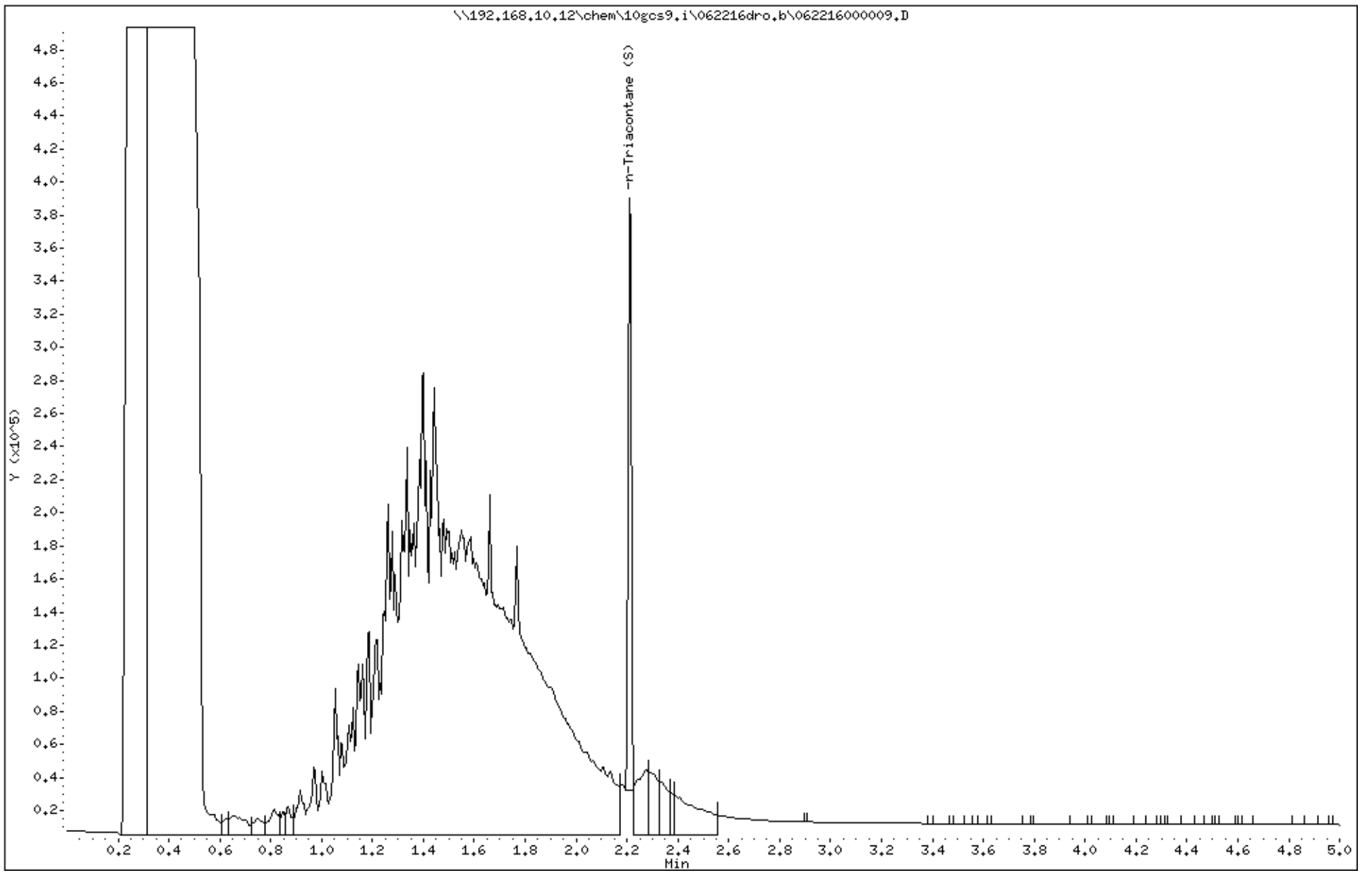
Sample Info: 10352597006

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



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Date : 22-JUN-2016 14:30

Client ID: MW-10

Instrument: 10gcs9.i

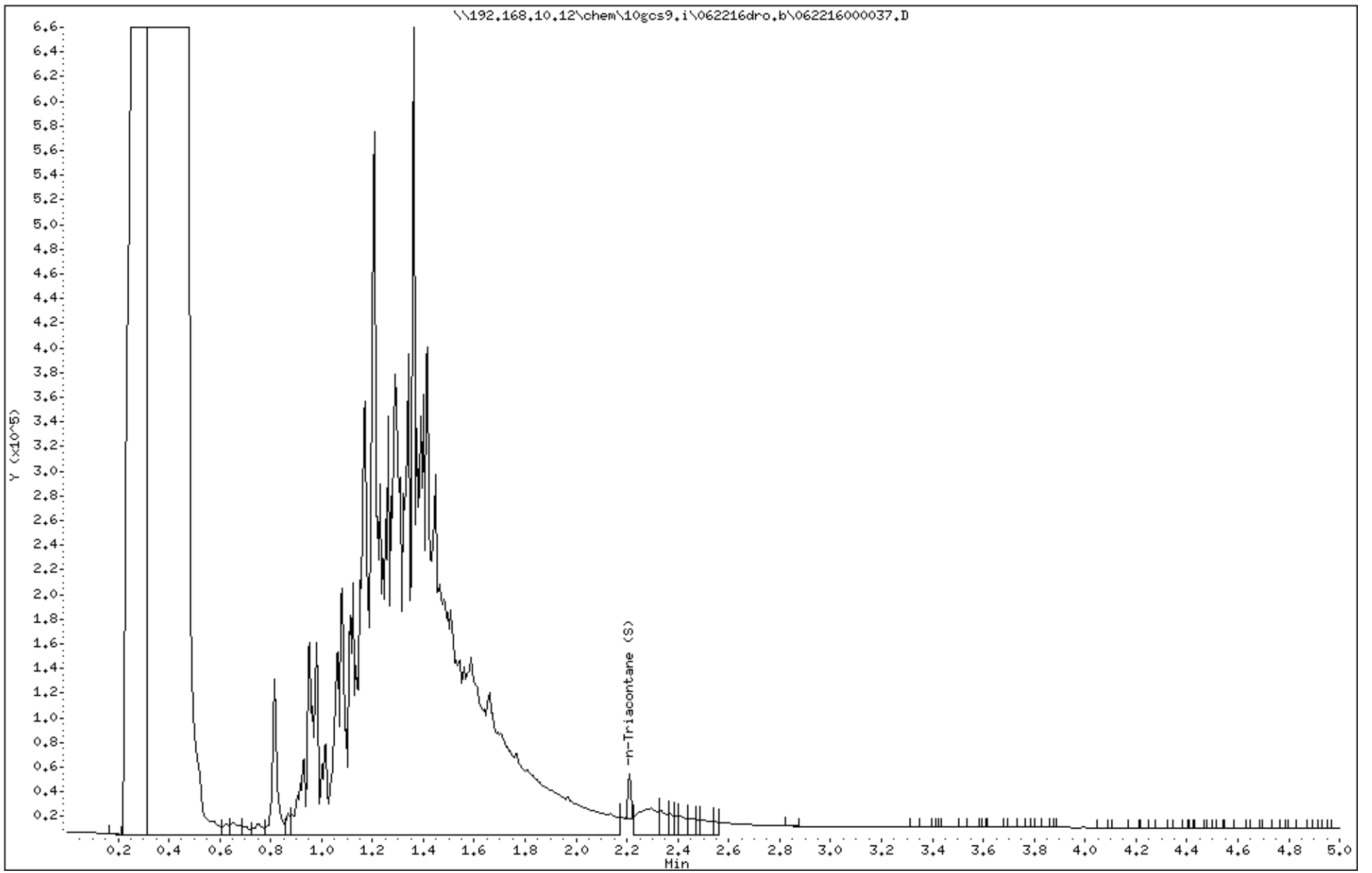
Sample Info: 10352597007X10

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



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Date : 22-JUN-2016 14:23

Client ID: DUP

Instrument: 10gcs9.i

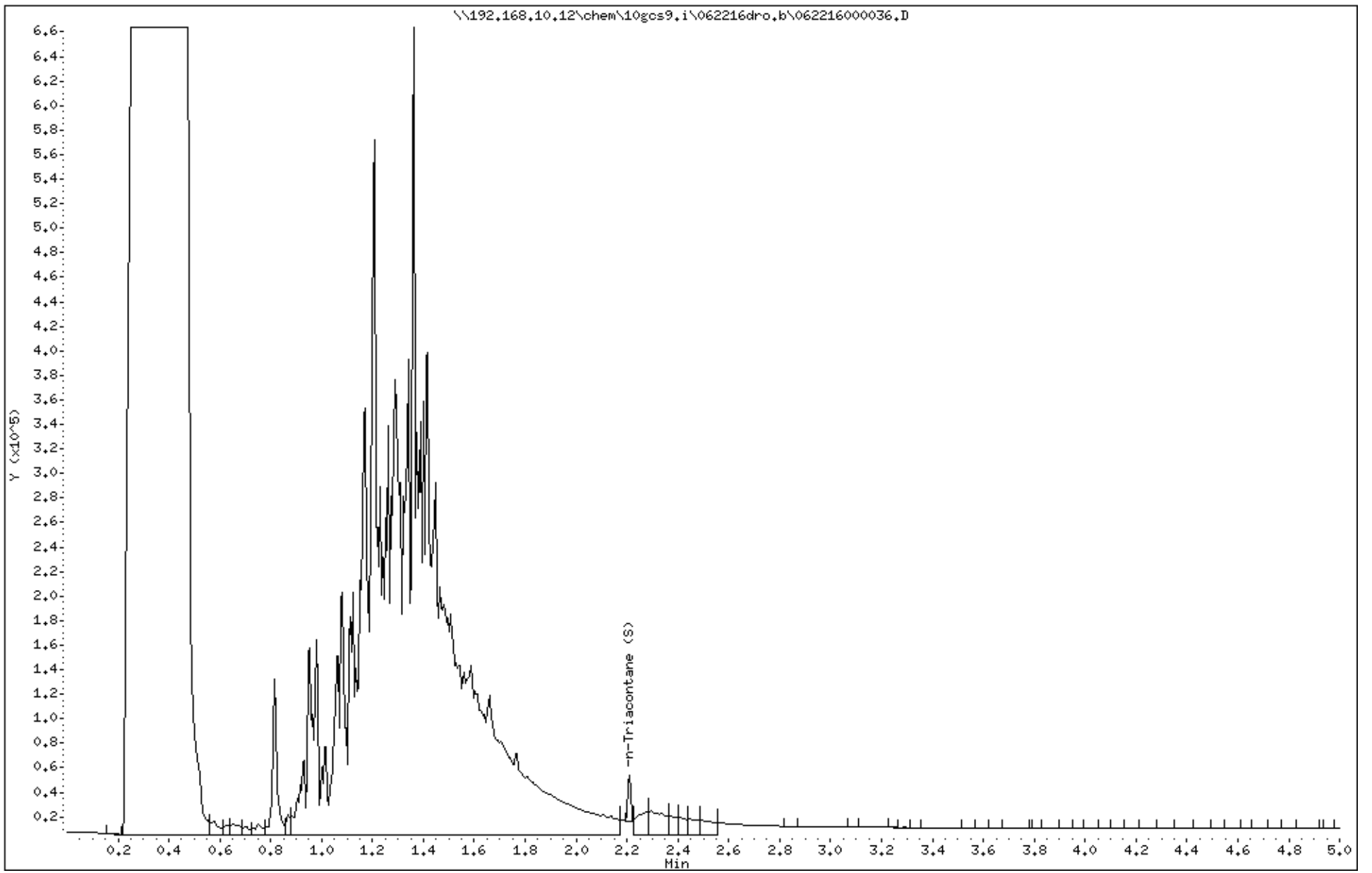
Sample Info: 10352597008X10

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062216dro.b\062216000014.D

Date : 22-JUN-2016 11:55

Client ID: MW-16A

Instrument: 10gcs9.i

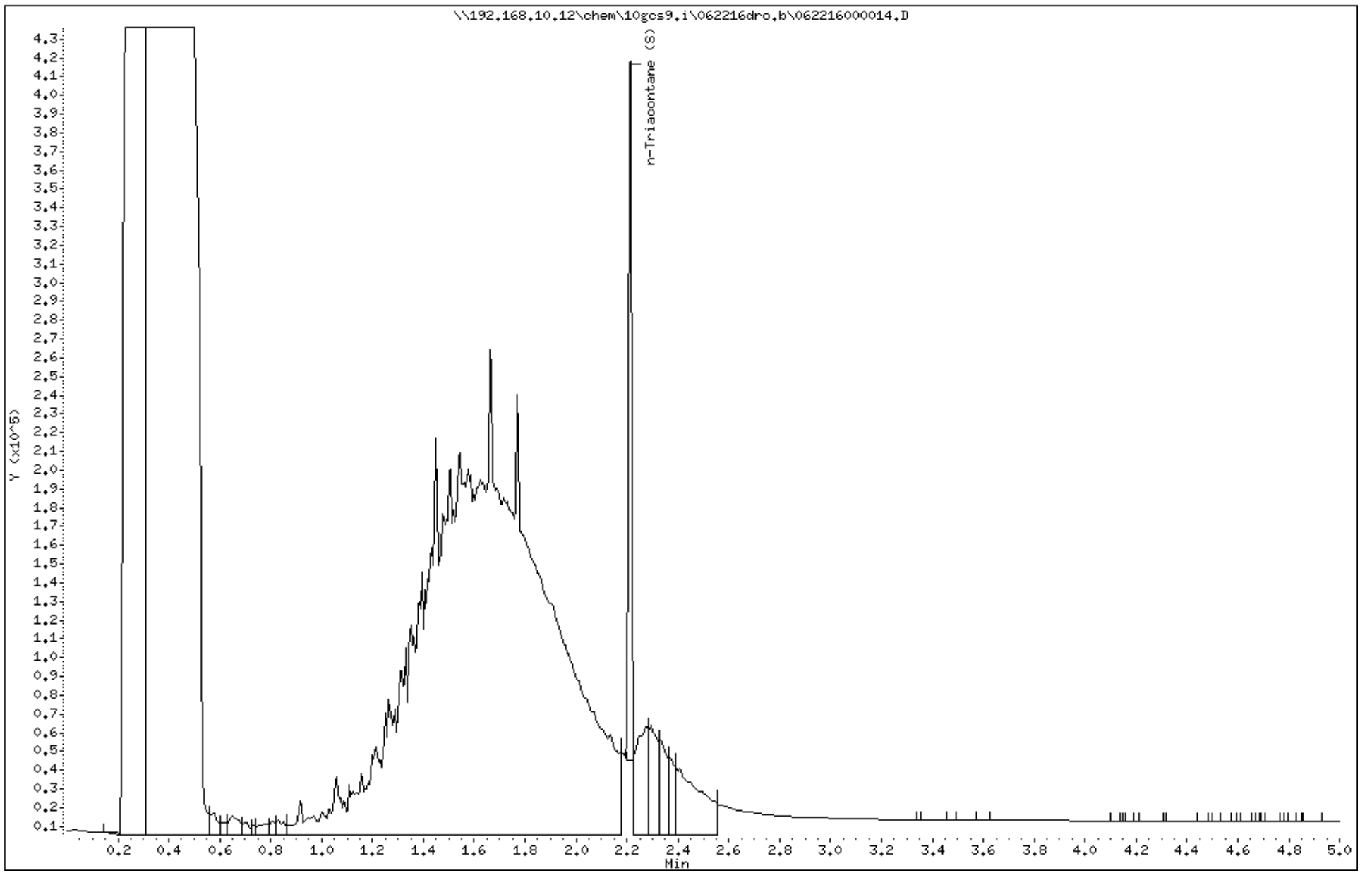
Sample Info: 10352597009

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062216dro.b\062216000017.D

Date : 22-JUN-2016 12:15

Client ID: MW-16B

Instrument: 10gcs9.i

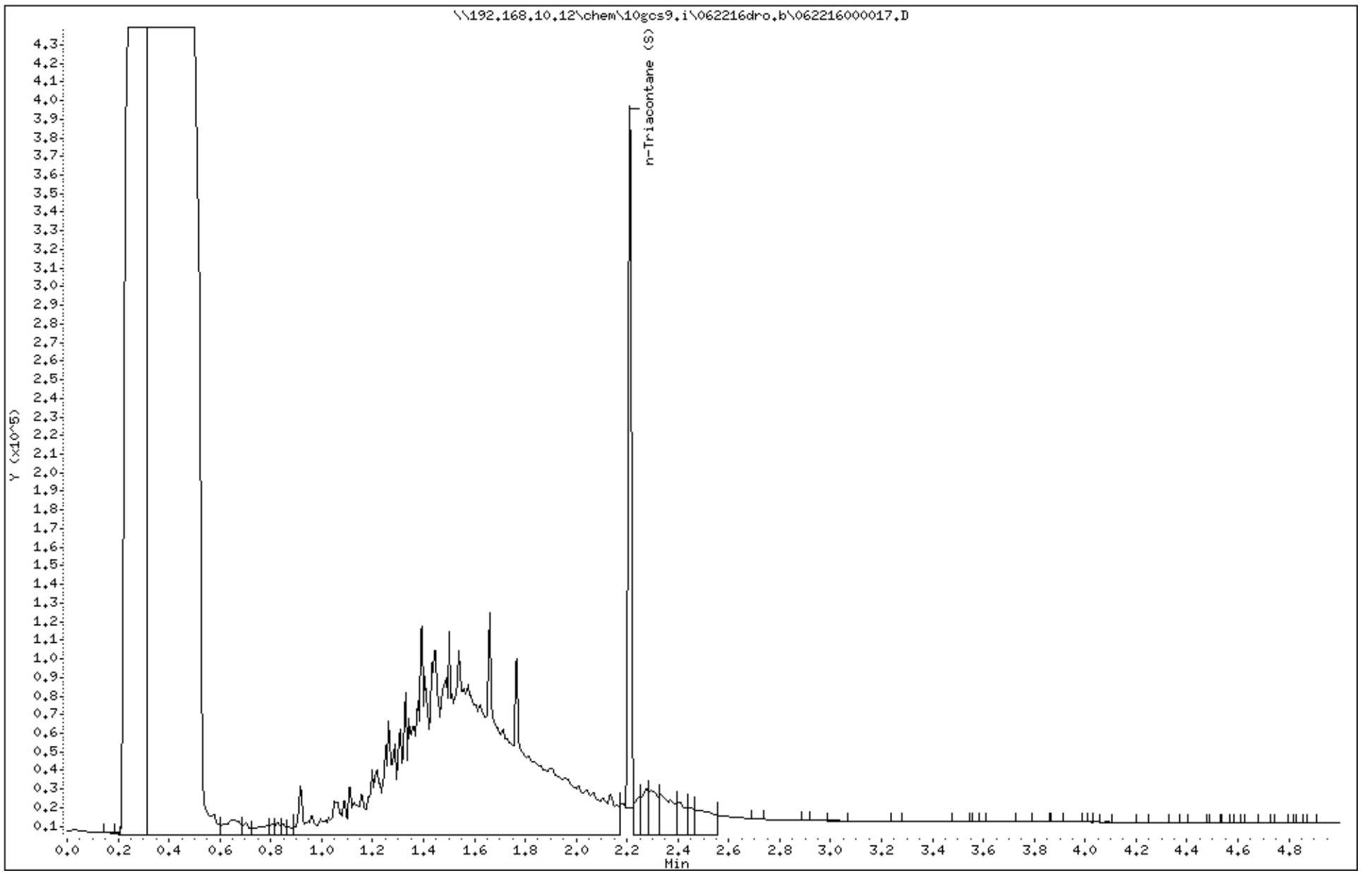
Sample Info: 10352597010

Volume Injected (uL): 1.0

Operator: MT

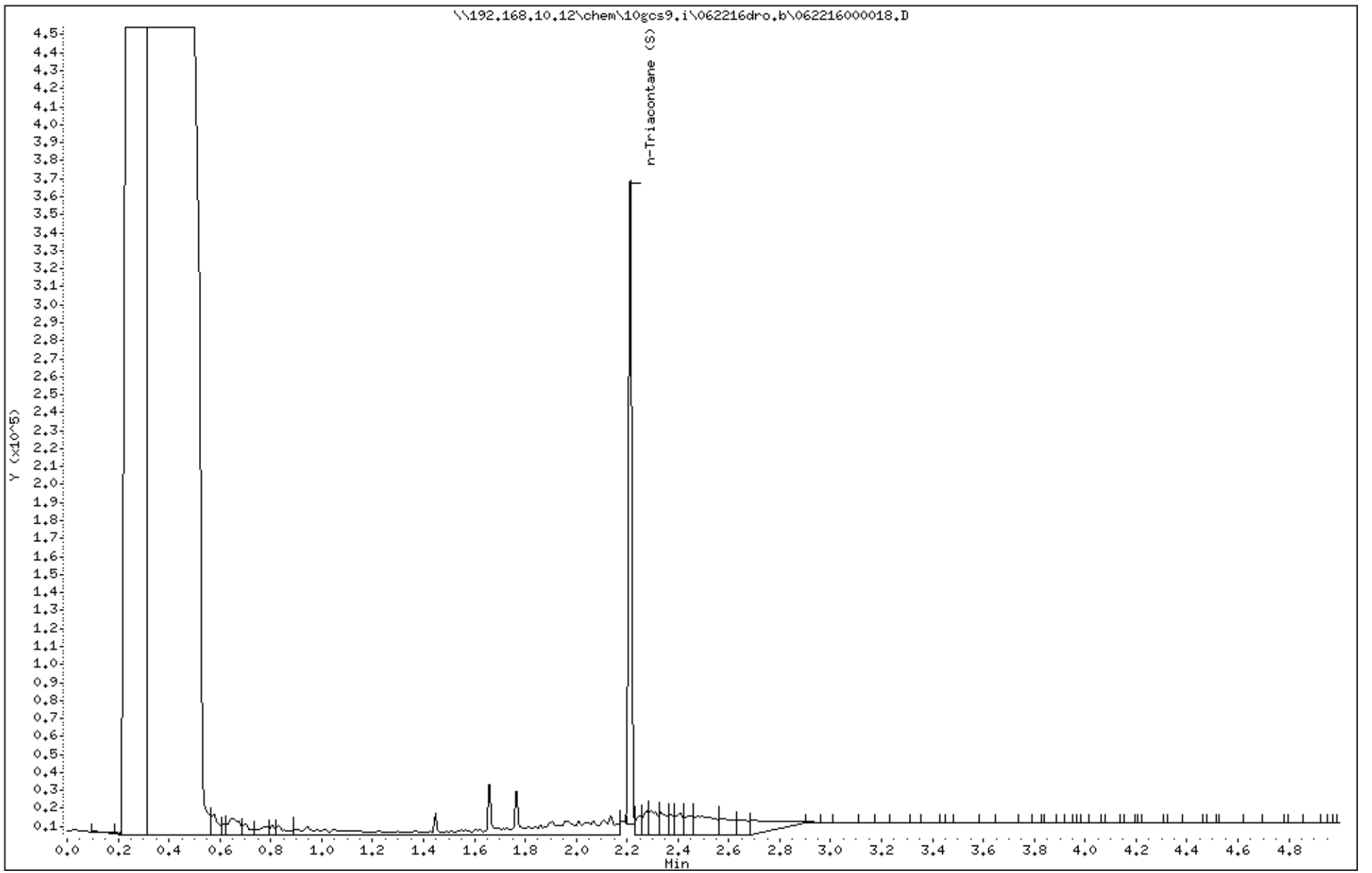
Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062216dro.b\062216000018.D
Date : 22-JUN-2016 12:22
Client ID: MW-17
Sample Info: 10352597011
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs9.i
Operator: MT
Column diameter: 0.32



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Date : 22-JUN-2016 12:28

Client ID: MW-18

Instrument: 10gcs9.i

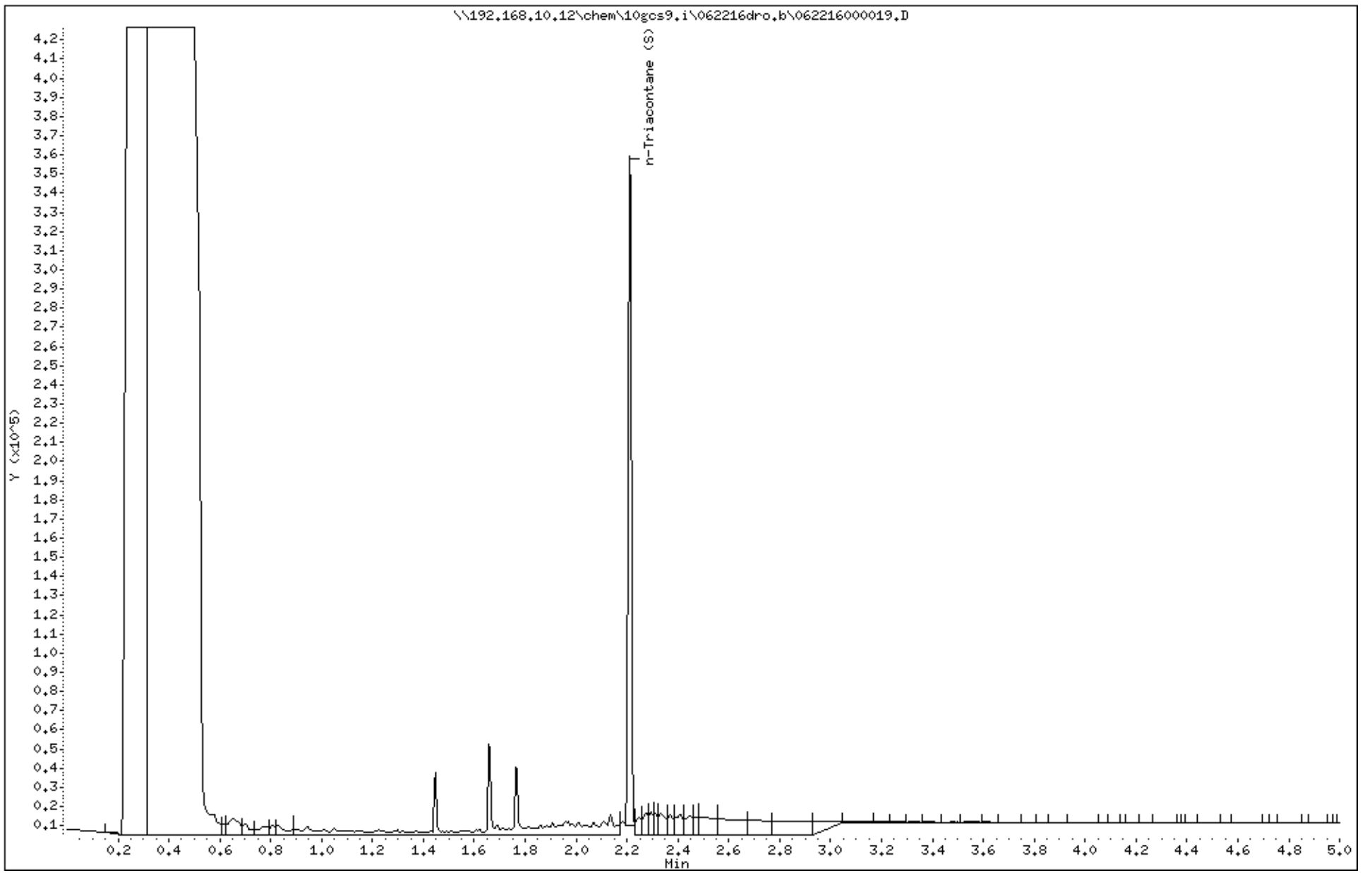
Sample Info: 10352597012

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062216dro.b\062216000015.D

Date : 22-JUN-2016 12:01

Client ID: MW-19

Instrument: 10gcs9.i

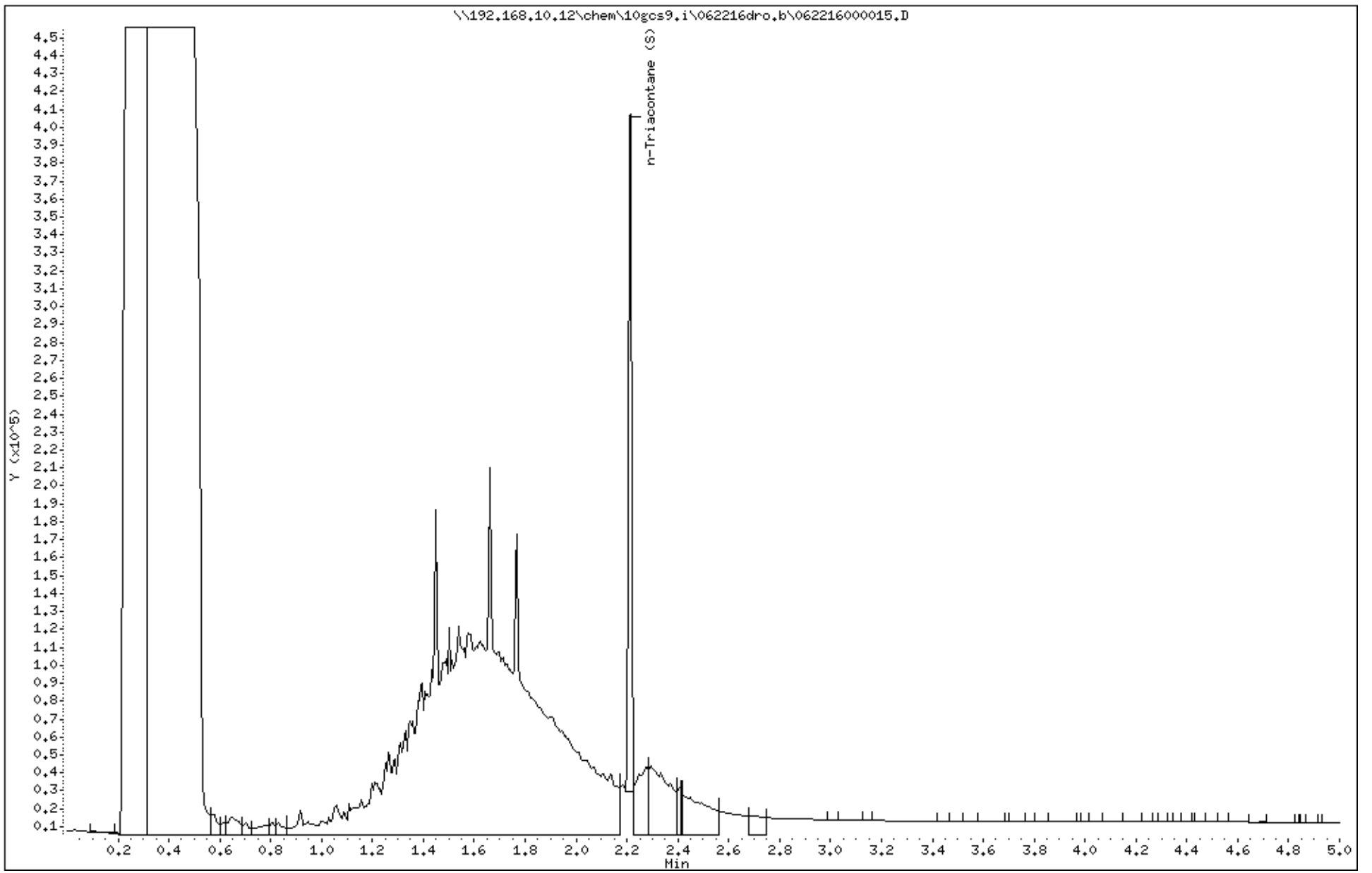
Sample Info: 10352597013

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



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Date : 22-JUN-2016 12:35

Client ID: MW-20

Instrument: 10gcs9.i

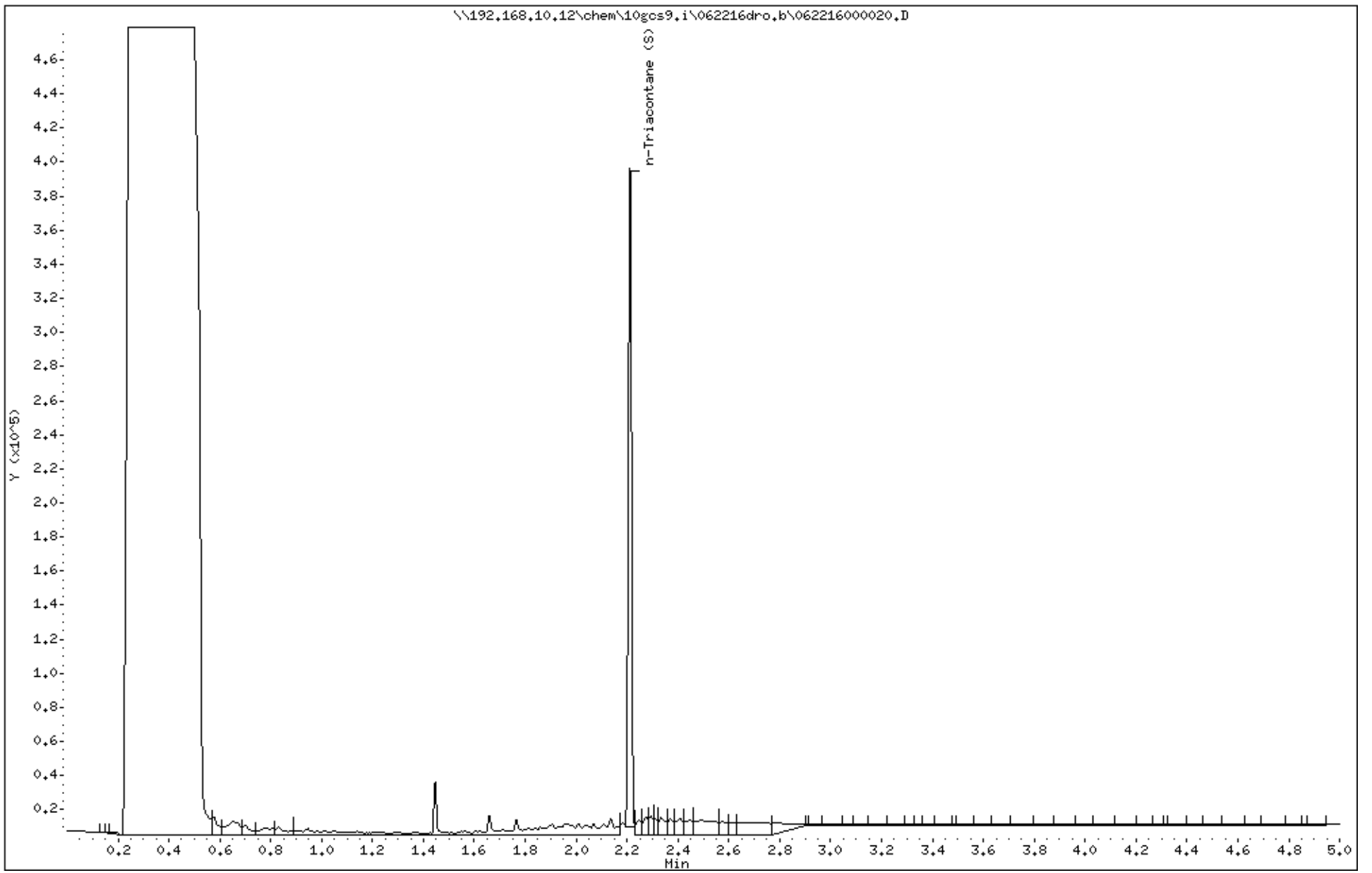
Sample Info: 10352597014

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



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Date : 22-JUN-2016 12:42

Client ID: MW-21

Instrument: 10gcs9.i

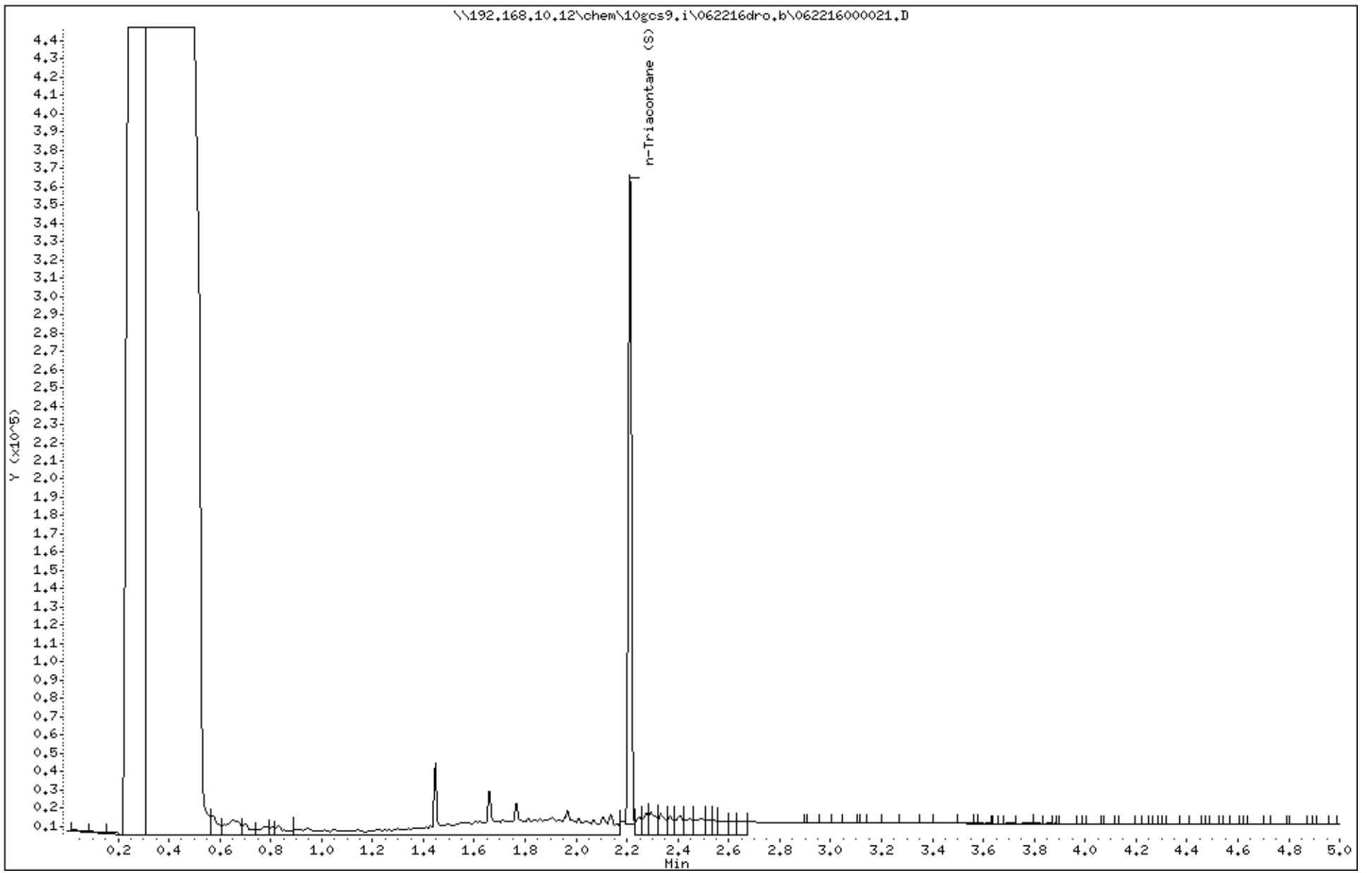
Sample Info: 10352597015

Volume Injected (uL): 1.0

Operator: MT

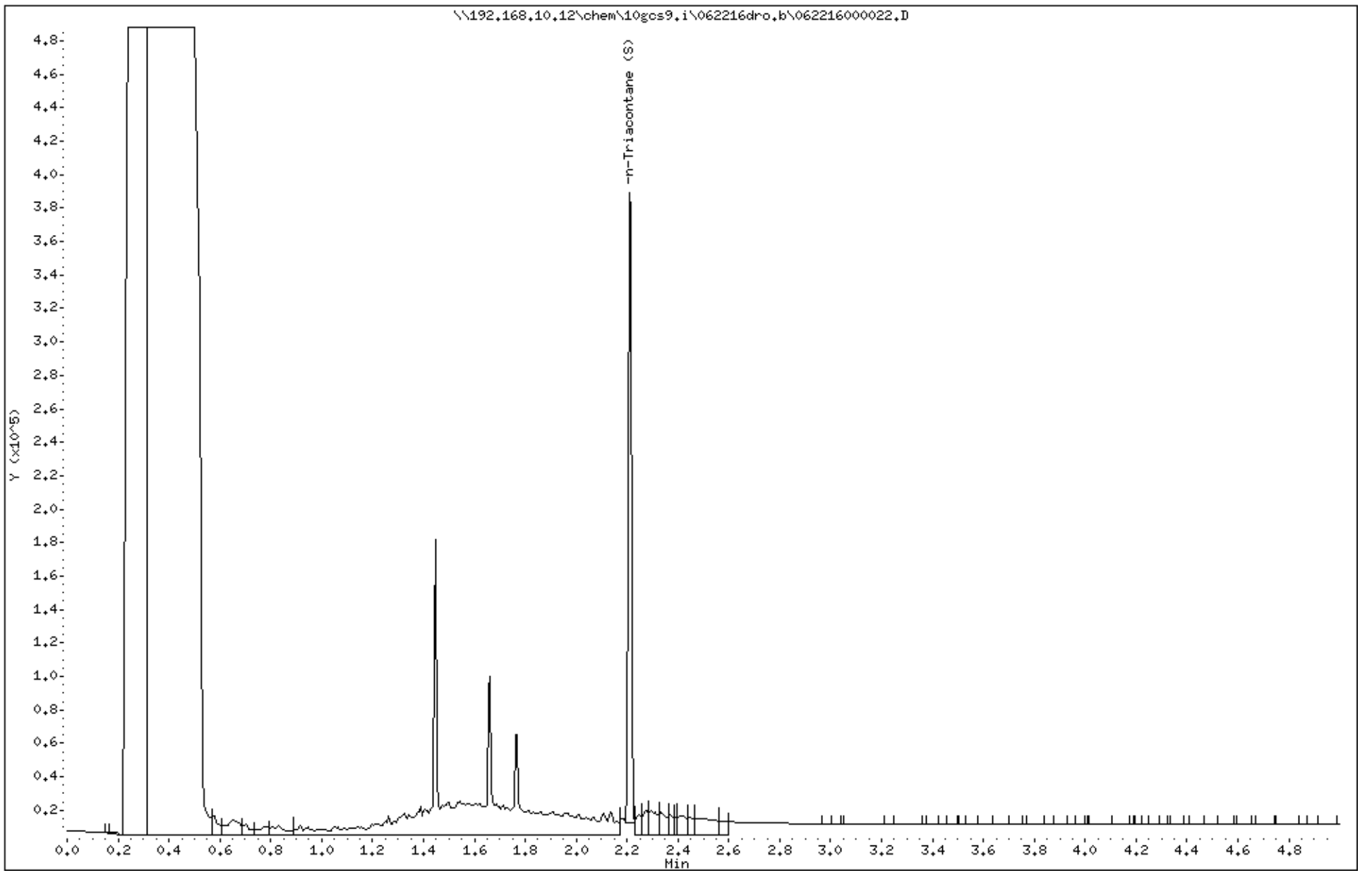
Column phase: DB-5MS

Column diameter: 0.32



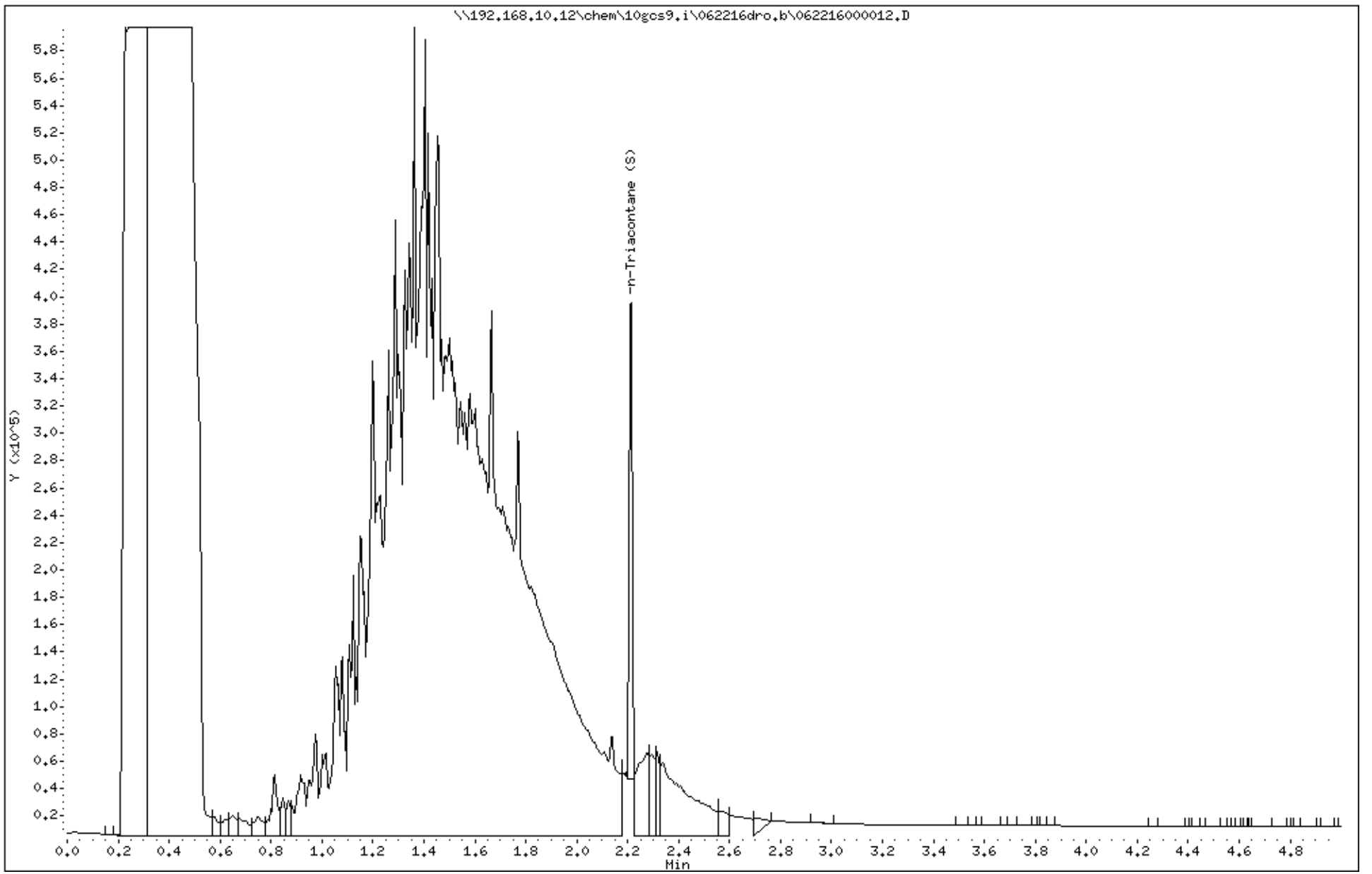
Data File: \\192.168.10.12\chem\10gcs9.i\062216dro.b\062216000022.D
Date : 22-JUN-2016 12:49
Client ID: MW-22
Sample Info: 10352597016
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs9.i
Operator: MT
Column diameter: 0.32



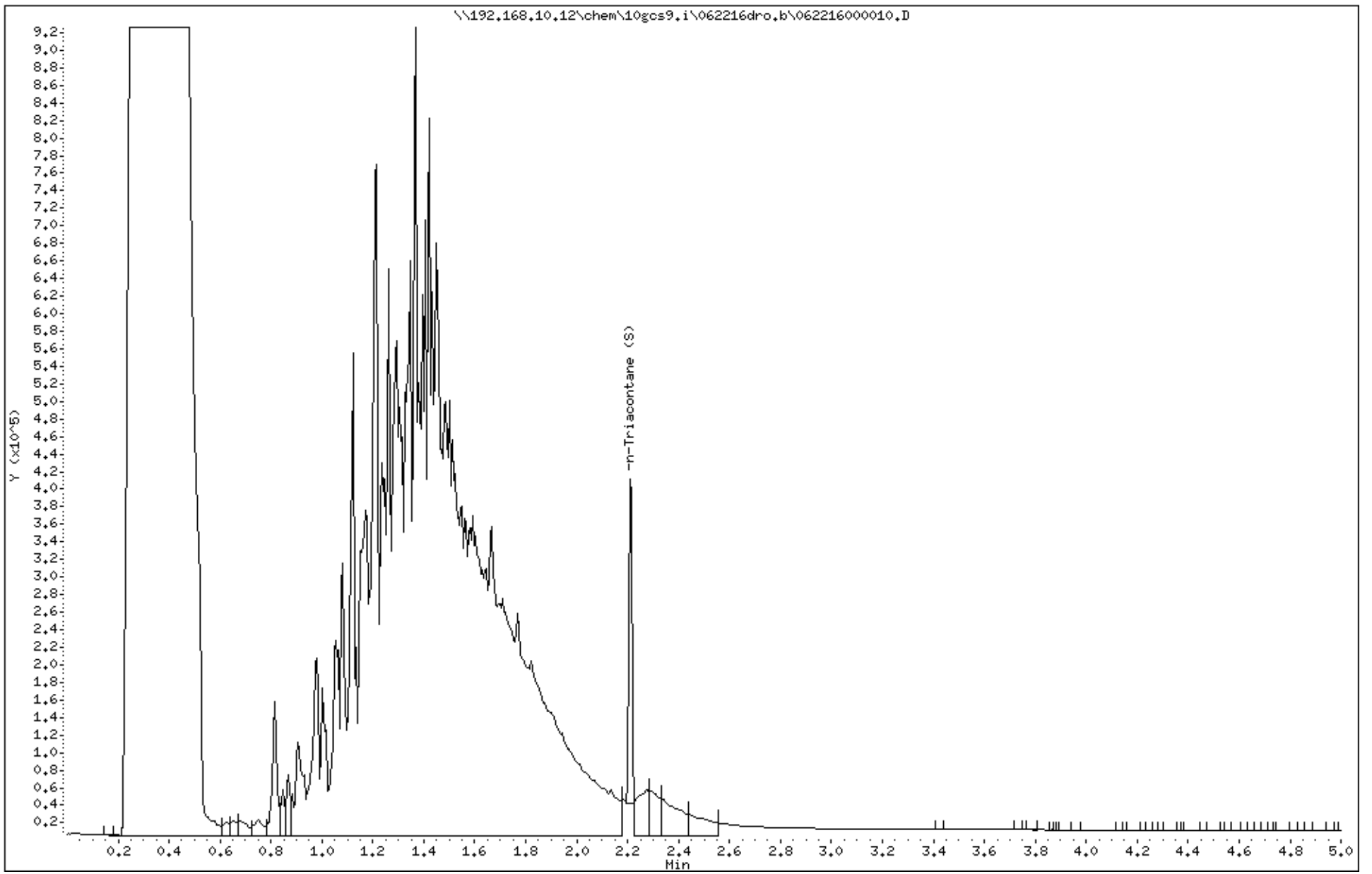
Data File: \\192.168.10.12\chem\10gcs9.i\062216dro.b\062216000012.D
Date : 22-JUN-2016 11:41
Client ID: USGS-1A
Sample Info: 10352597017
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs9.i
Operator: MT
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062216dro.b\062216000010.D
Date : 22-JUN-2016 11:28
Client ID: USGS-2A
Sample Info: 10352597018
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs9.i
Operator: MT
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062216dro.b\062216000011.D

Date : 22-JUN-2016 11:34

Client ID: USGS-3A

Instrument: 10gcs9.i

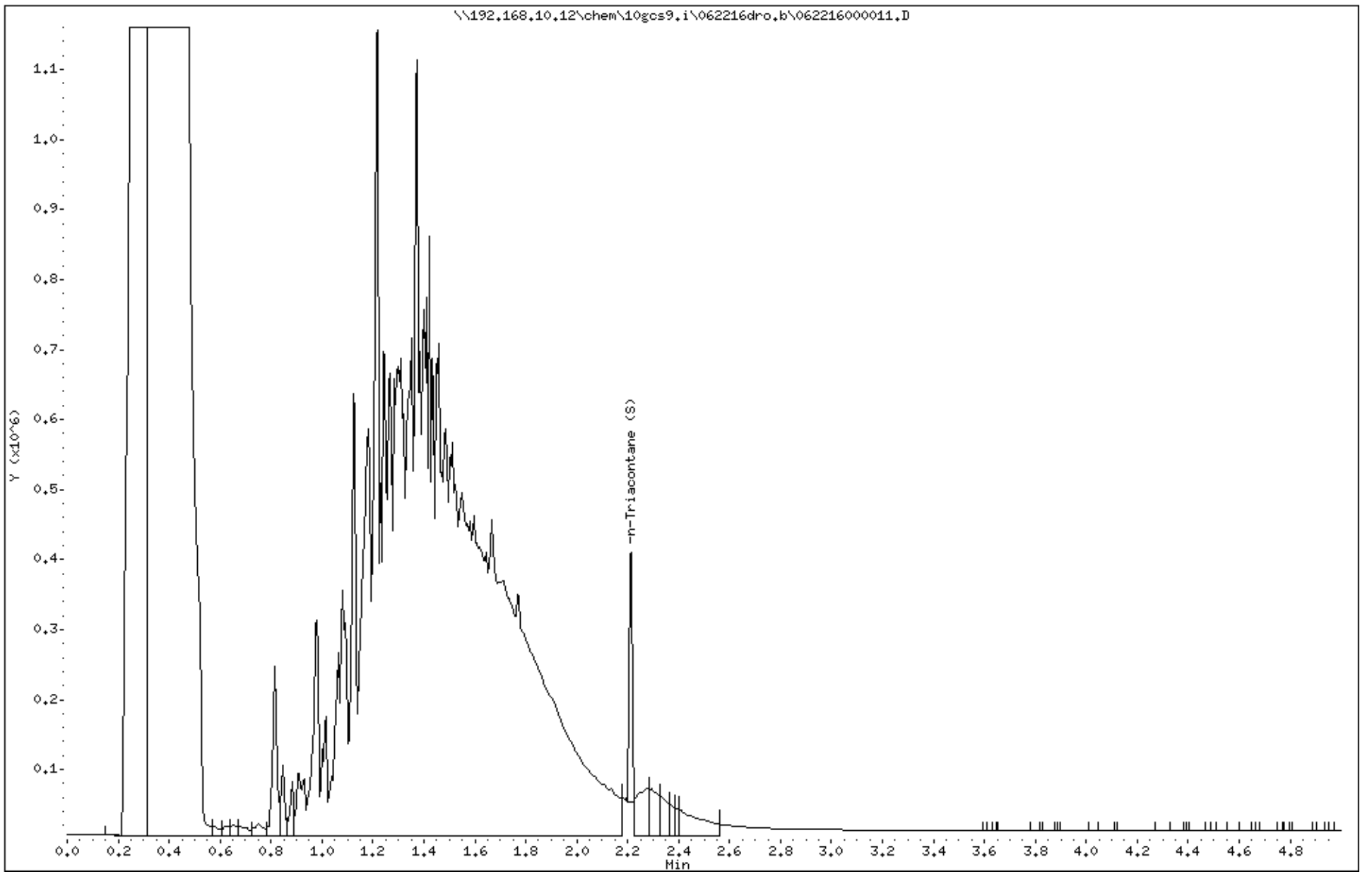
Sample Info: 10352597019

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062216dro.b\062216000013.D

Date : 22-JUN-2016 11:48

Client ID: USGS-4A

Instrument: 10gcs9.i

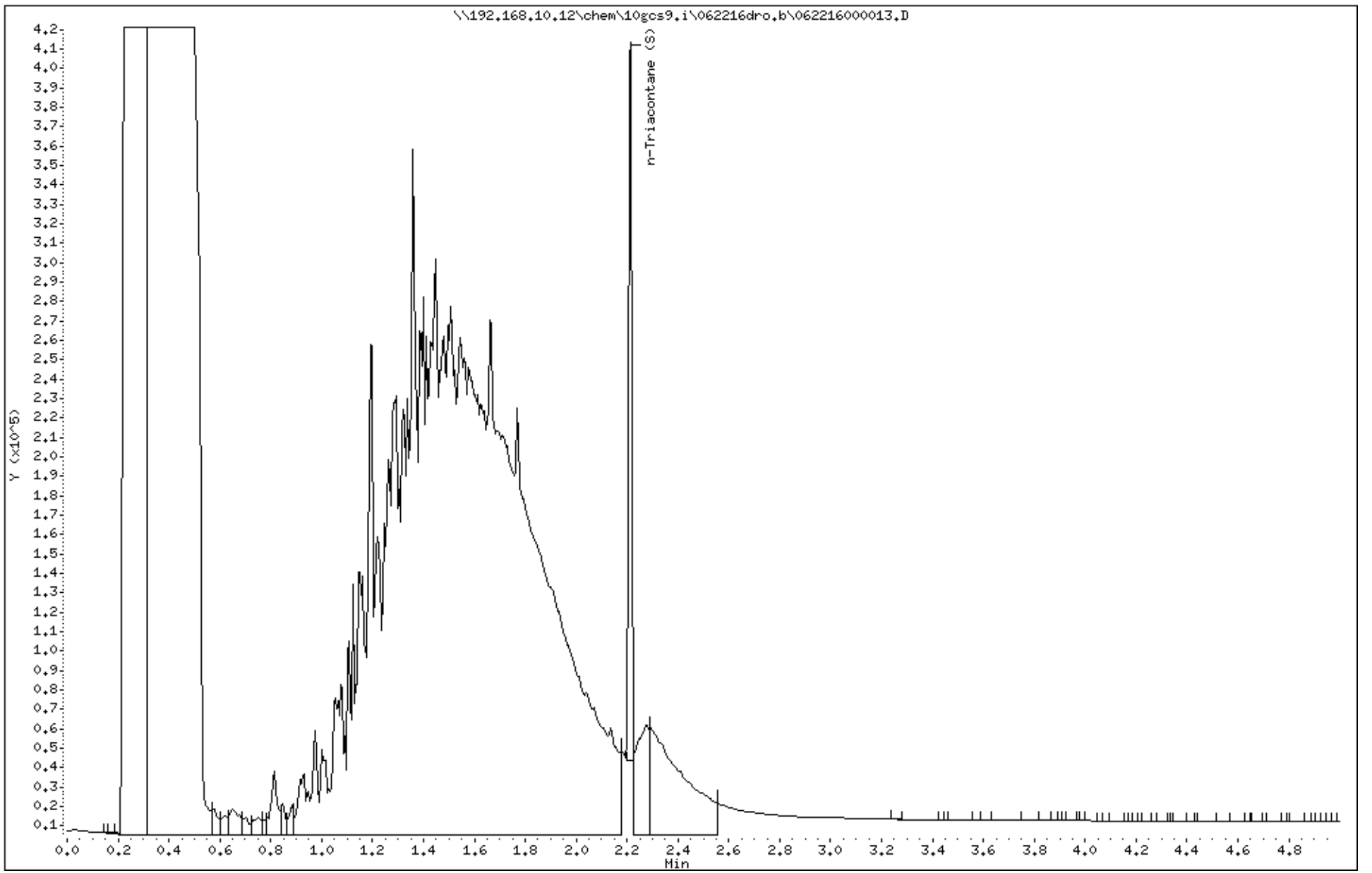
Sample Info: 10352597020

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062216dro.b\062216000034.D

Date : 22-JUN-2016 14:10

Client ID: SCL DW

Instrument: 10gcs9.i

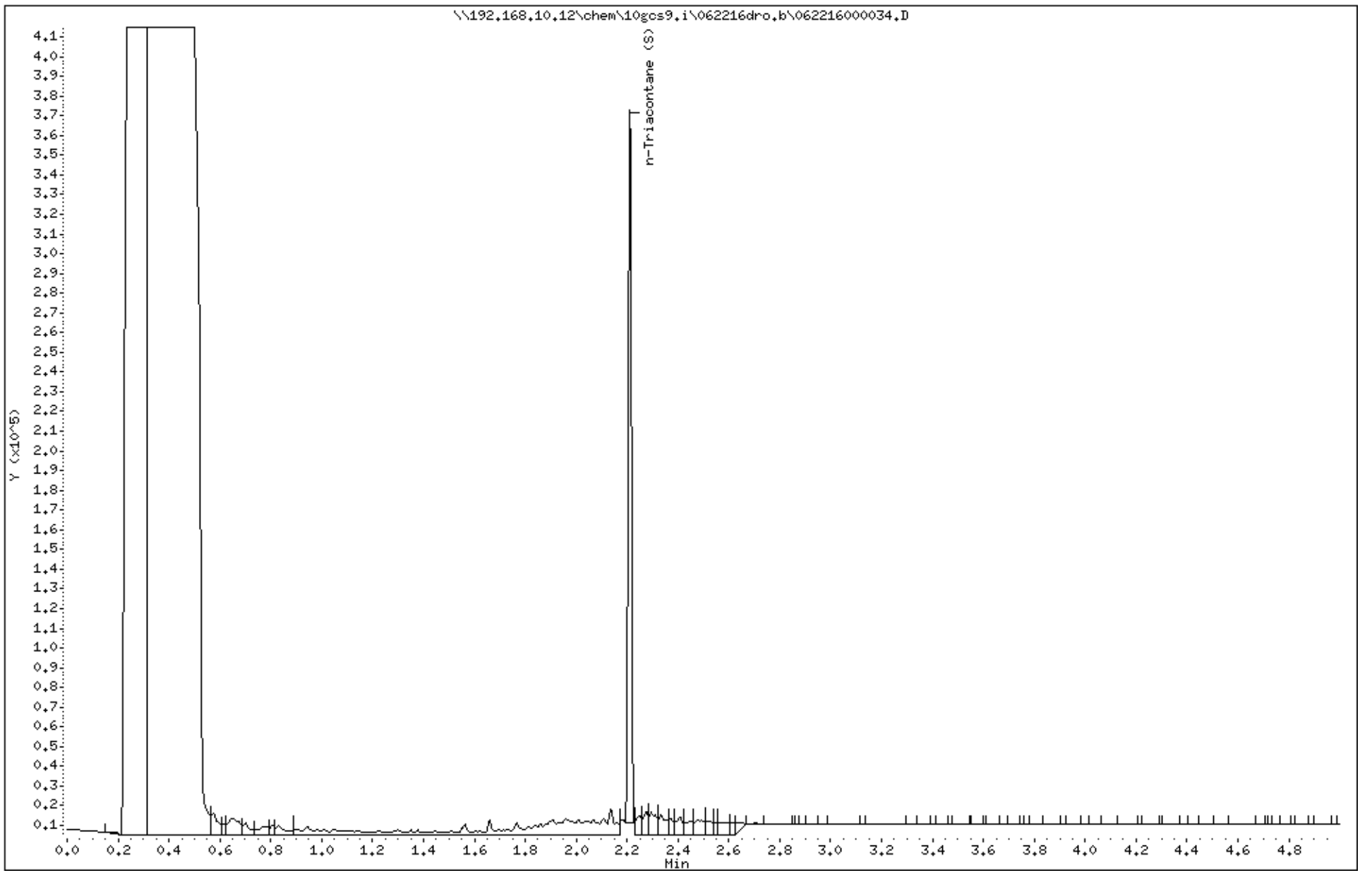
Sample Info: 10352597021

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062216dro.b\062216000035.D

Date : 22-JUN-2016 14:17

Client ID: Field Blank

Instrument: 10gcs9.i

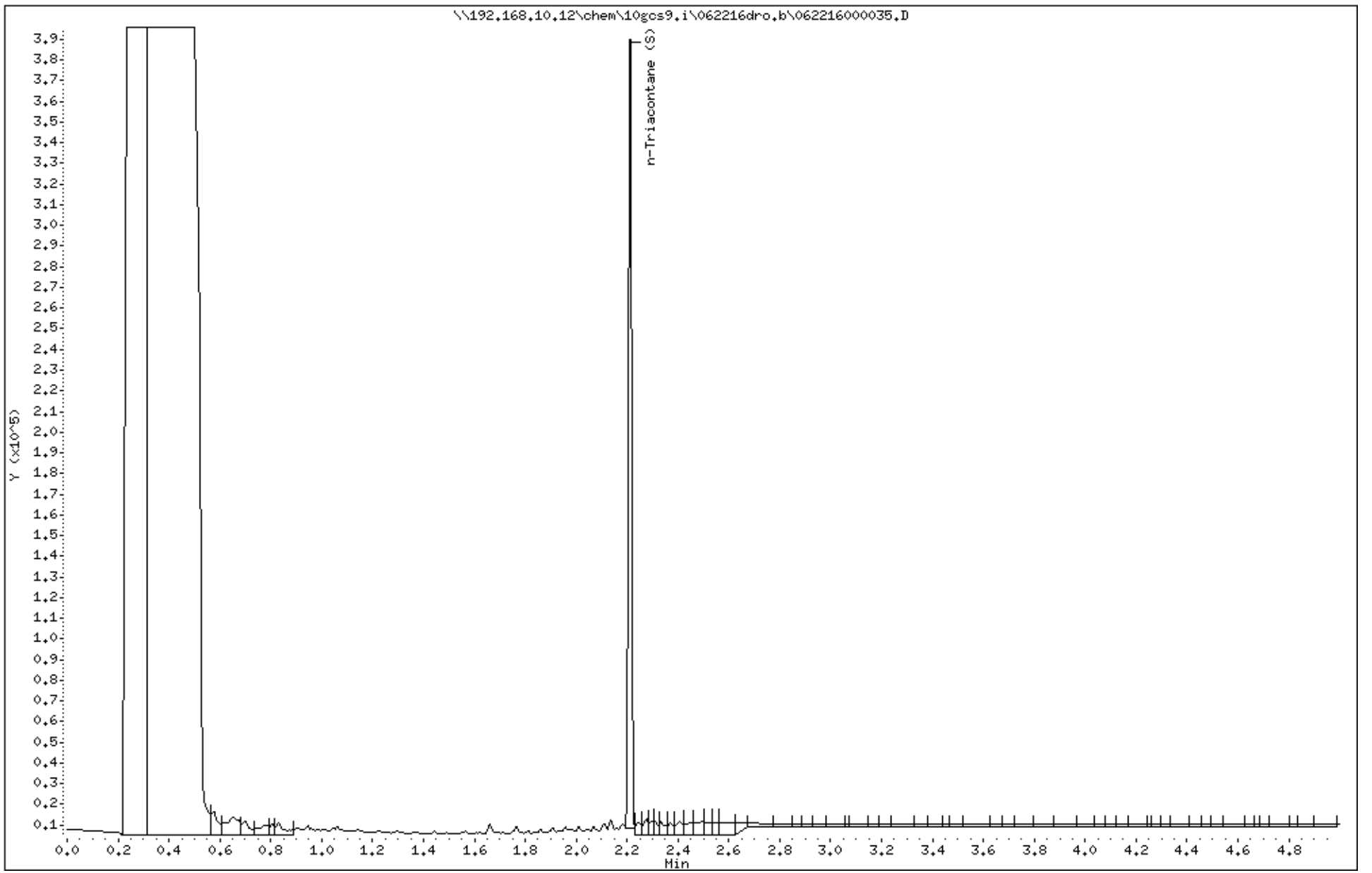
Sample Info: 10352597022

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062616dro.b\062616000011.D

Date : 26-JUN-2016 10:56

Client ID: MW-9

Instrument: 10gcs9.i

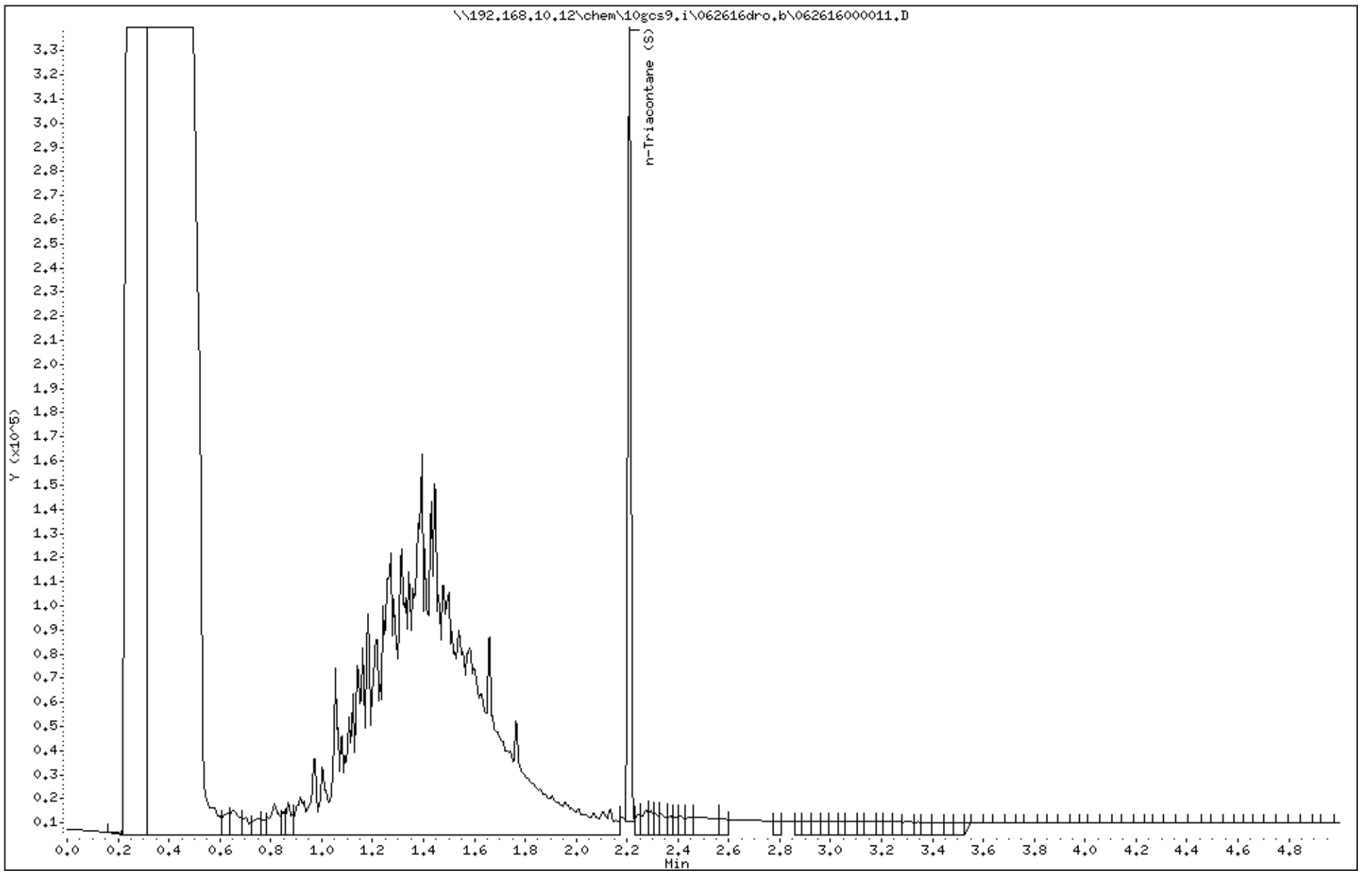
Sample Info: 10352597006

Volume Injected (uL): 1.0

Operator: JRH

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062616dro.b\062616000009.D

Date : 26-JUN-2016 10:42

Client ID: MW-10

Instrument: 10gcs9.i

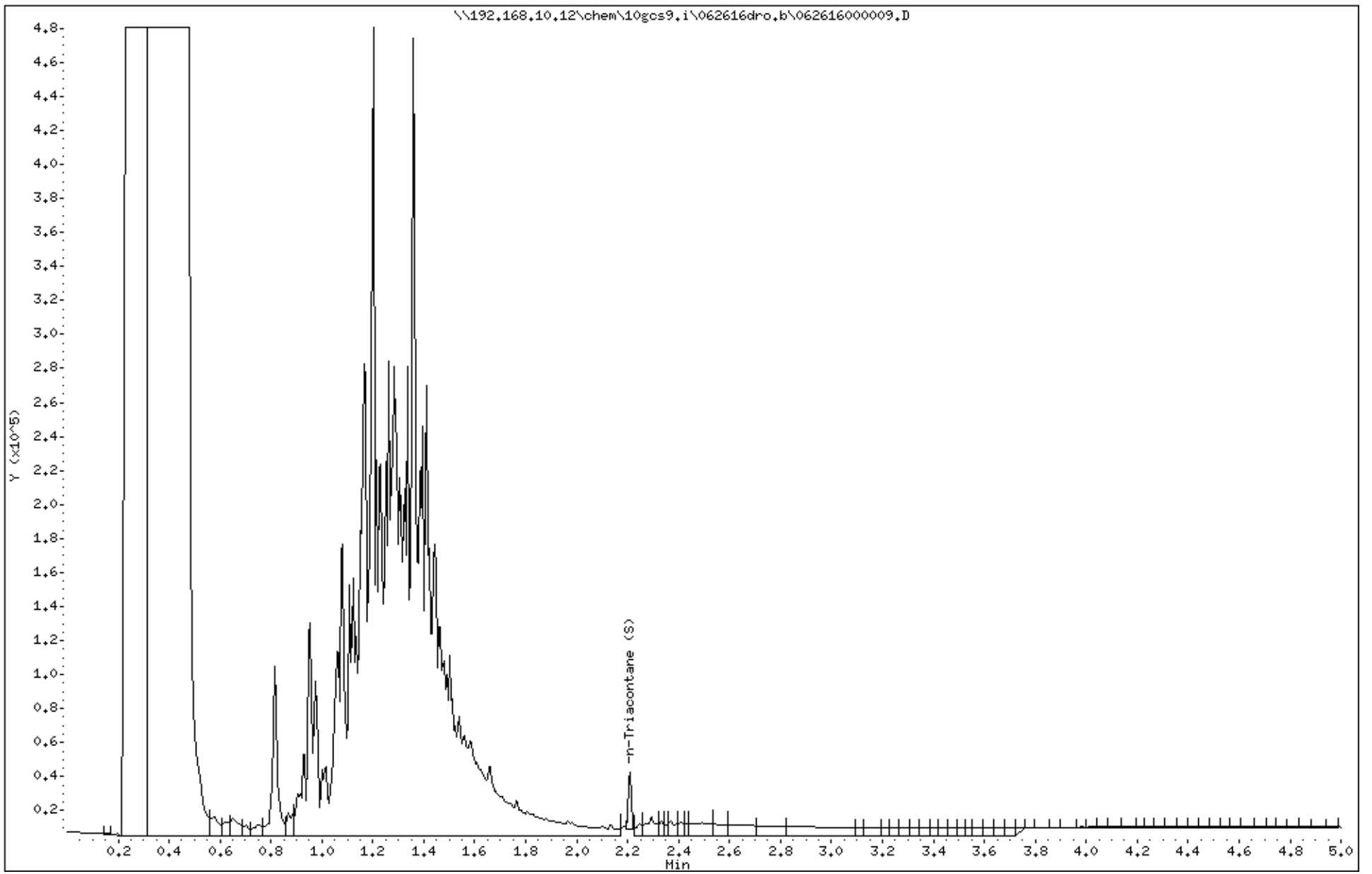
Sample Info: 10352597007X10

Volume Injected (uL): 1.0

Operator: JRH

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062616dro.b\062616000012.D

Date : 26-JUN-2016 11:03

Client ID: MW-16A

Instrument: 10gcs9.i

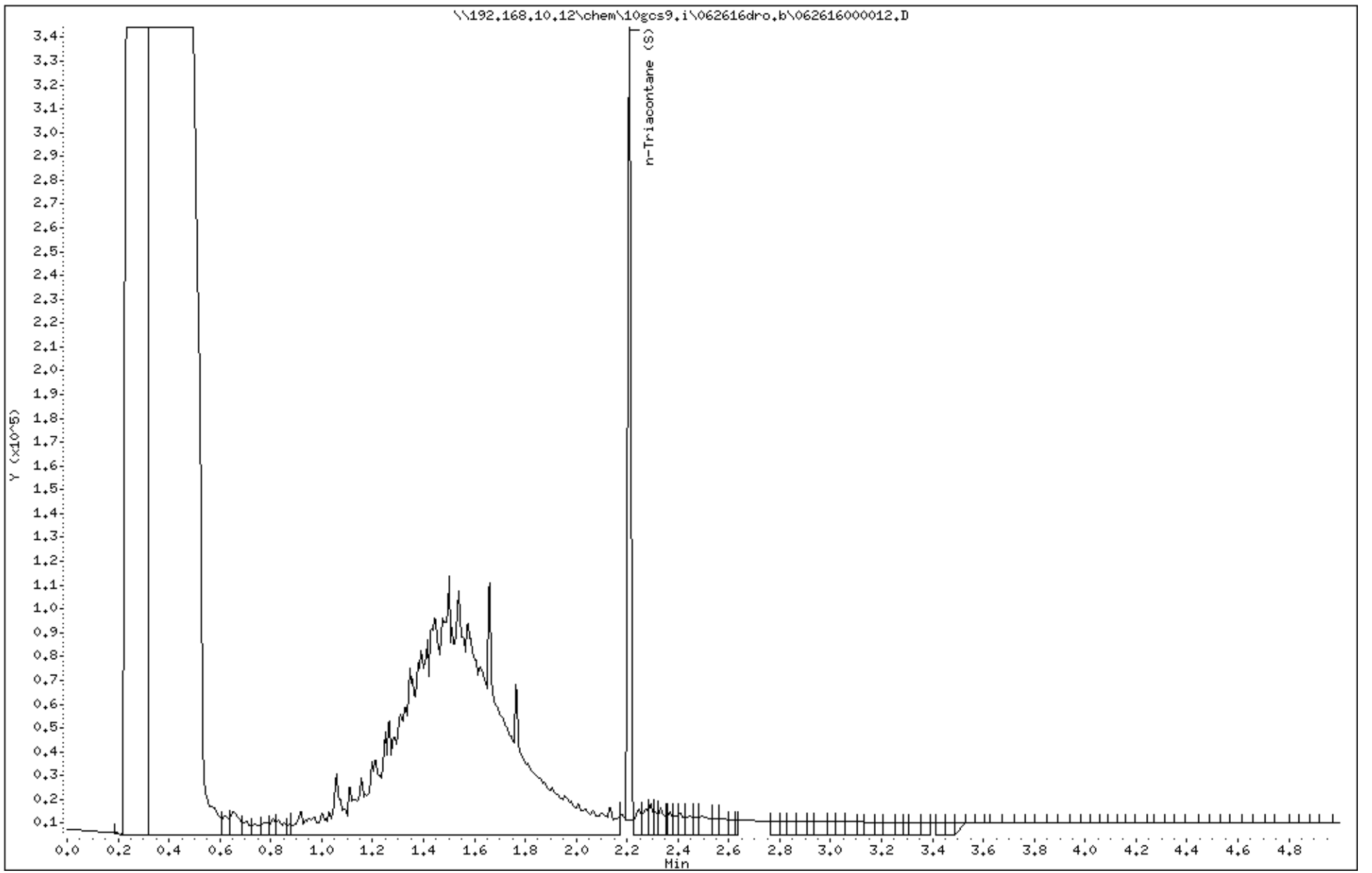
Sample Info: 10352597009

Volume Injected (uL): 1.0

Operator: JRH

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062616dro.b\062616000013.D

Date : 26-JUN-2016 11:09

Client ID: MW-16B

Instrument: 10gcs9.i

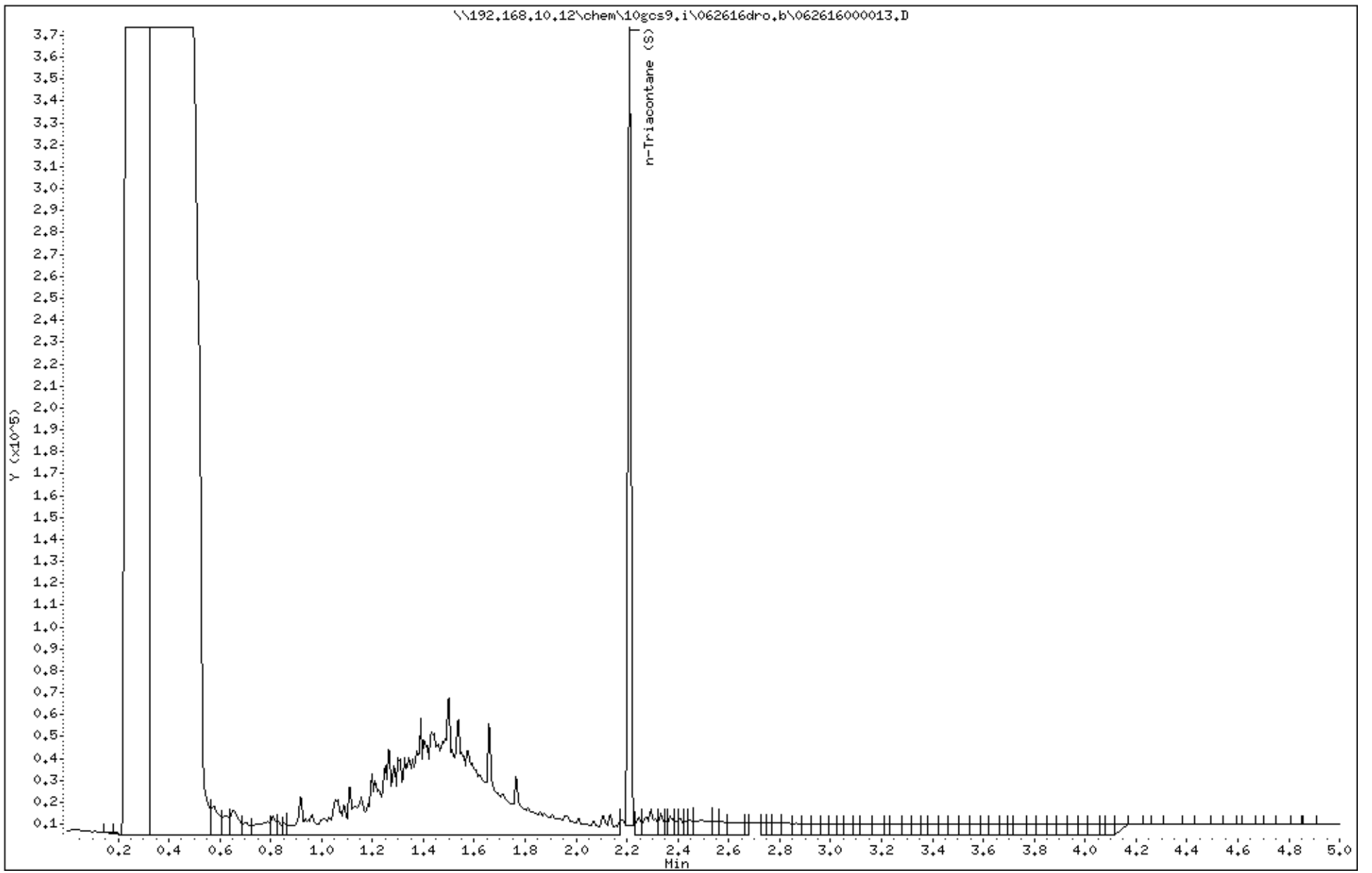
Sample Info: 10352597010

Volume Injected (uL): 1.0

Operator: JRH

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062616dro.b\062616000014.D

Date : 26-JUN-2016 11:16

Client ID: MW-19

Instrument: 10gcs9.i

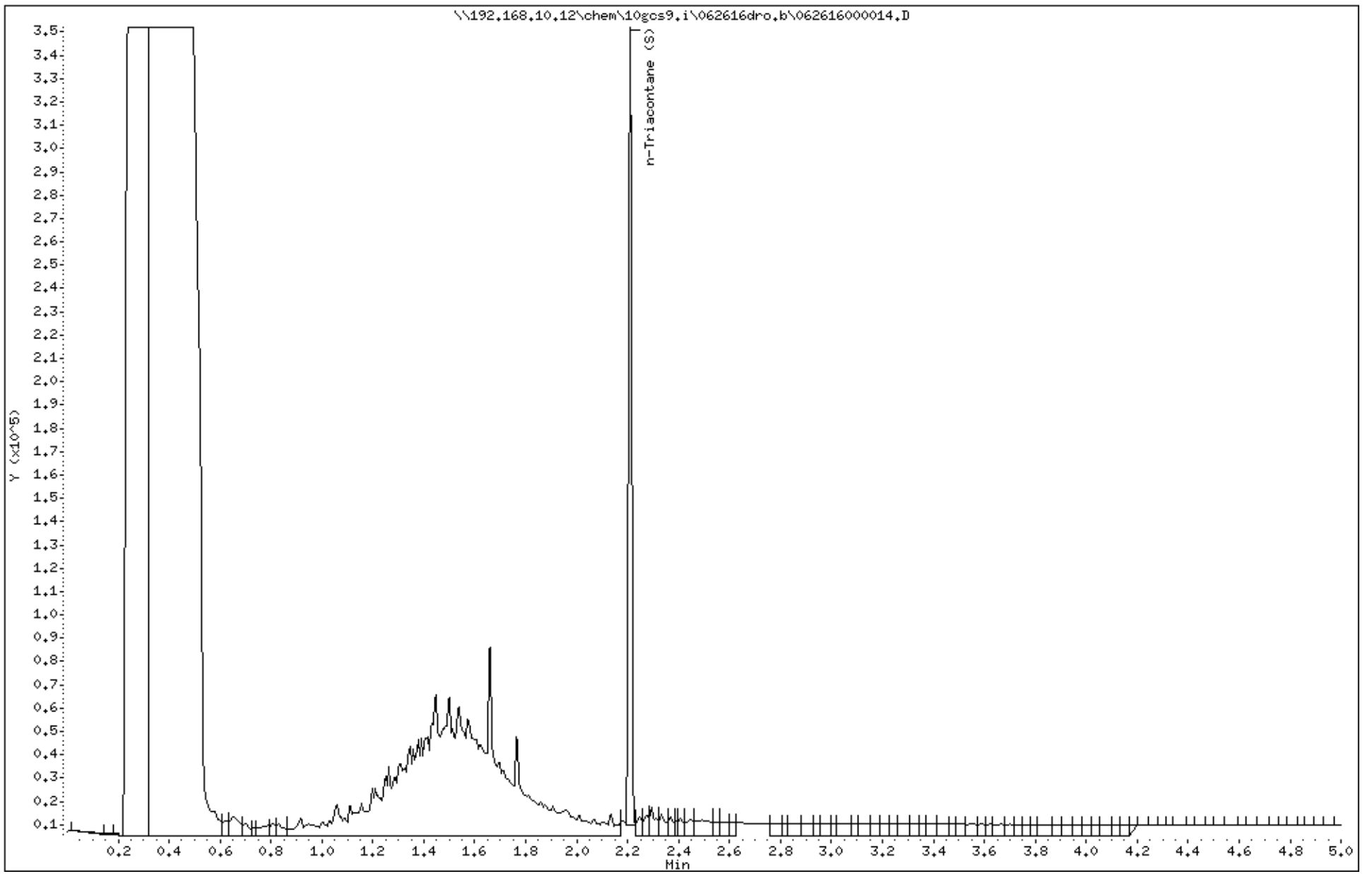
Sample Info: 10352597013

Volume Injected (uL): 1.0

Operator: JRH

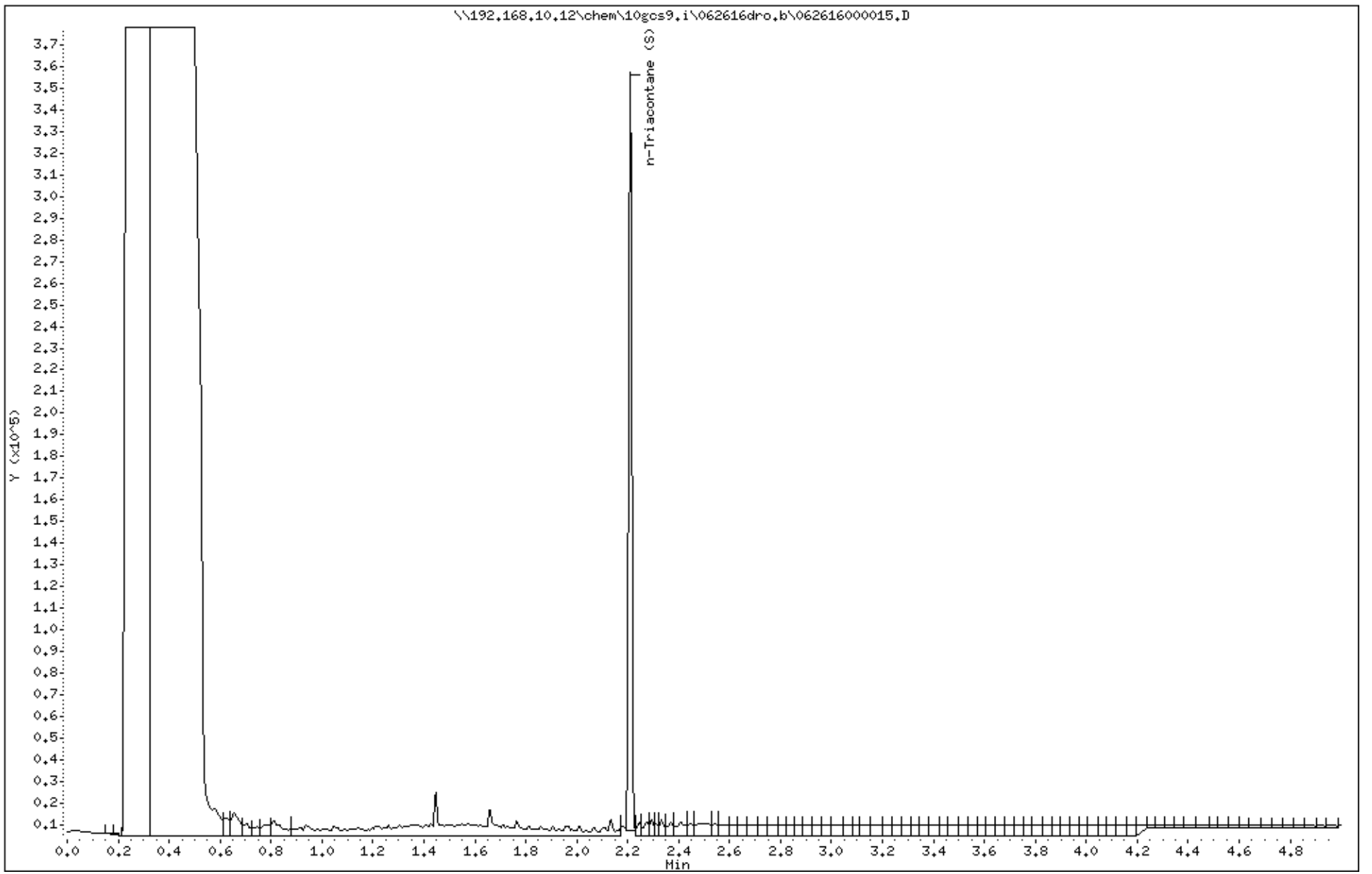
Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062616dro.b\062616000015.D
Date : 26-JUN-2016 11:23
Client ID: MW-22
Sample Info: 10352597016
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs9.i
Operator: JRH
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062616dro.b\062616000010.D

Date : 26-JUN-2016 10:49

Client ID: USGS-1A

Instrument: 10gcs9.i

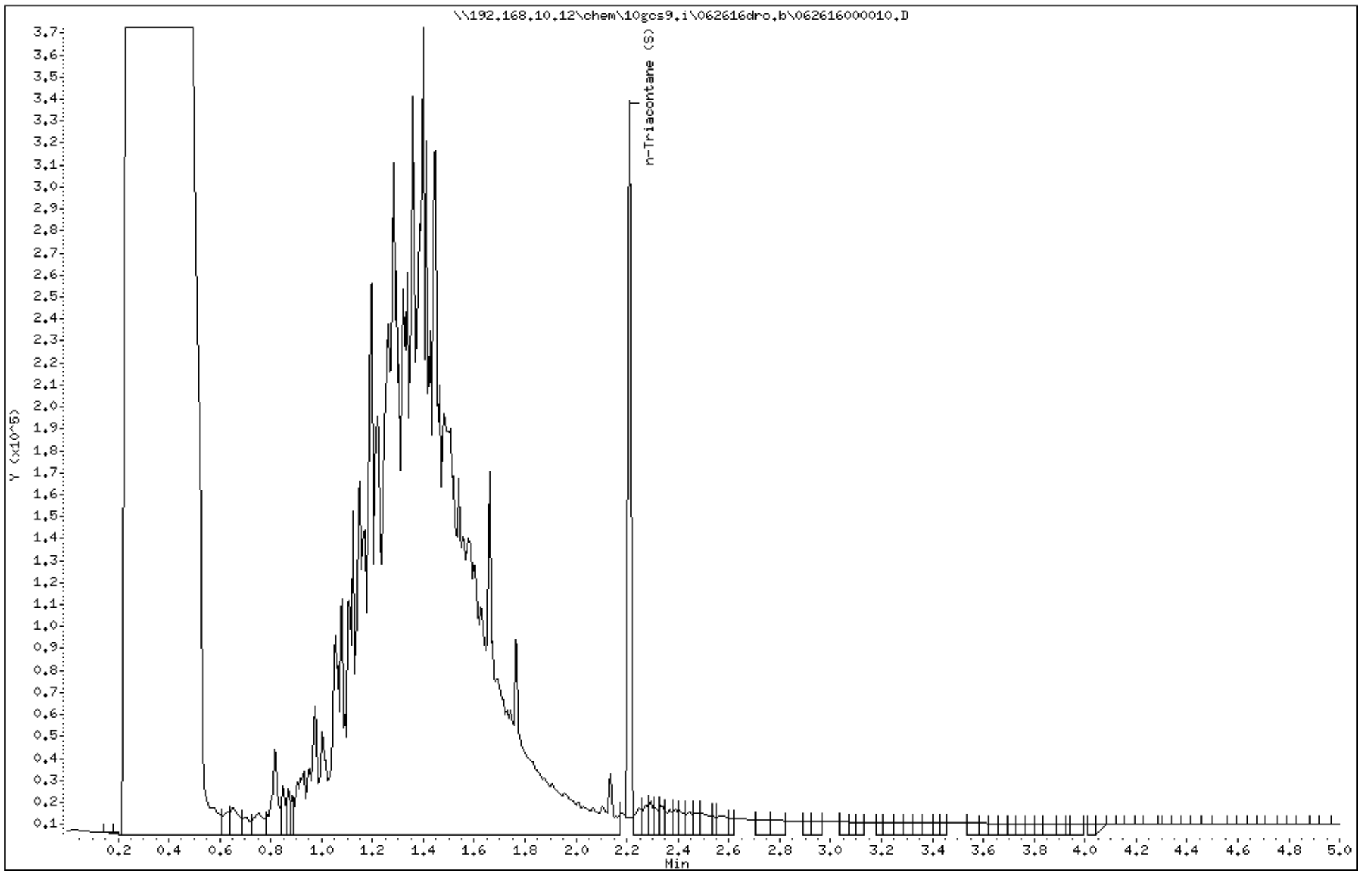
Sample Info: 10352597017

Volume Injected (uL): 1.0

Operator: JRH

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062616dro.b\062616000016.D

Date : 26-JUN-2016 11:30

Client ID: USGS-2A

Instrument: 10gcs9.i

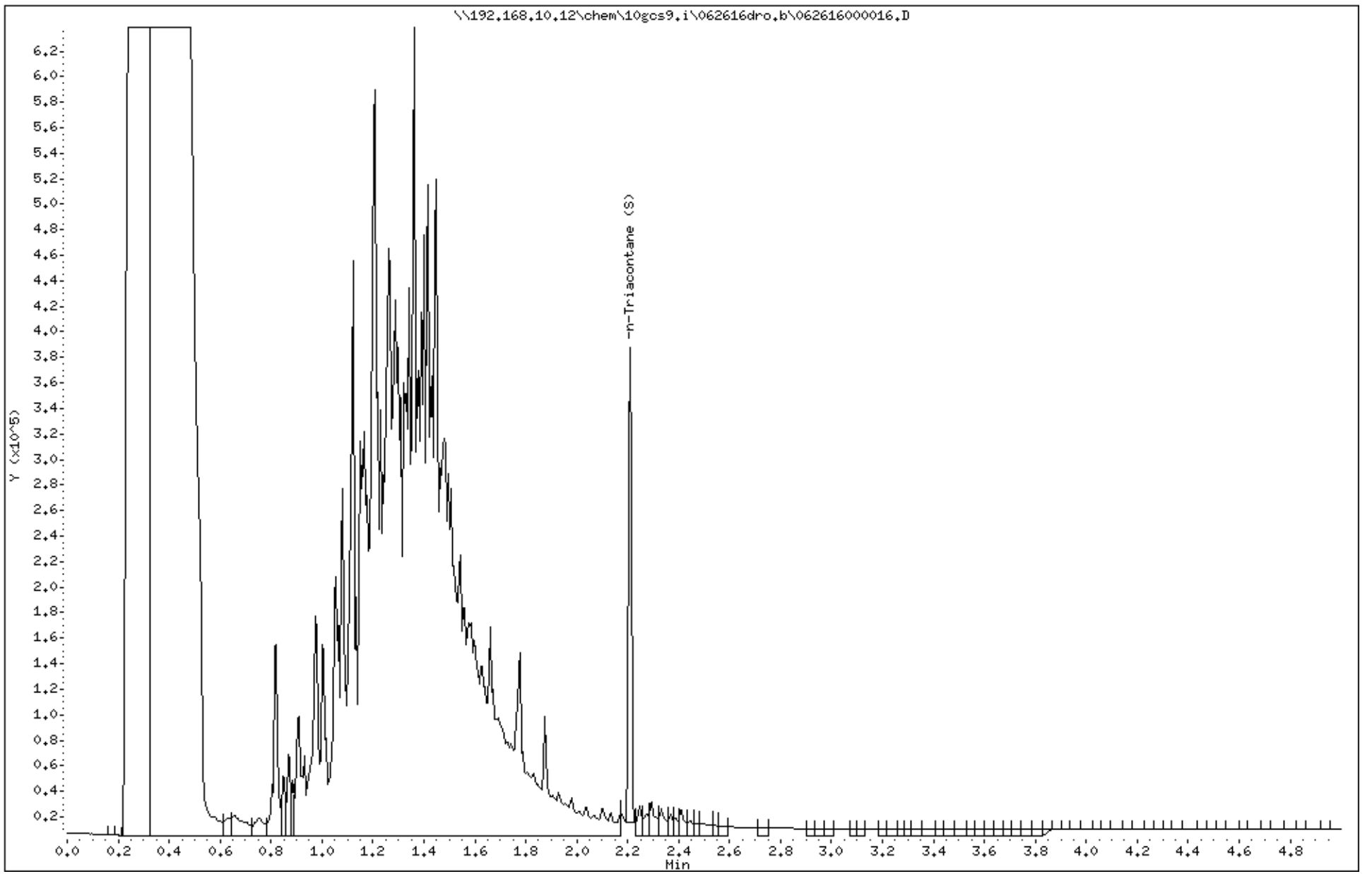
Sample Info: 10352597018

Volume Injected (uL): 1.0

Operator: JRH

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062616dro.b\062616000017.D

Date : 26-JUN-2016 11:36

Client ID: USGS-3A

Instrument: 10gcs9.i

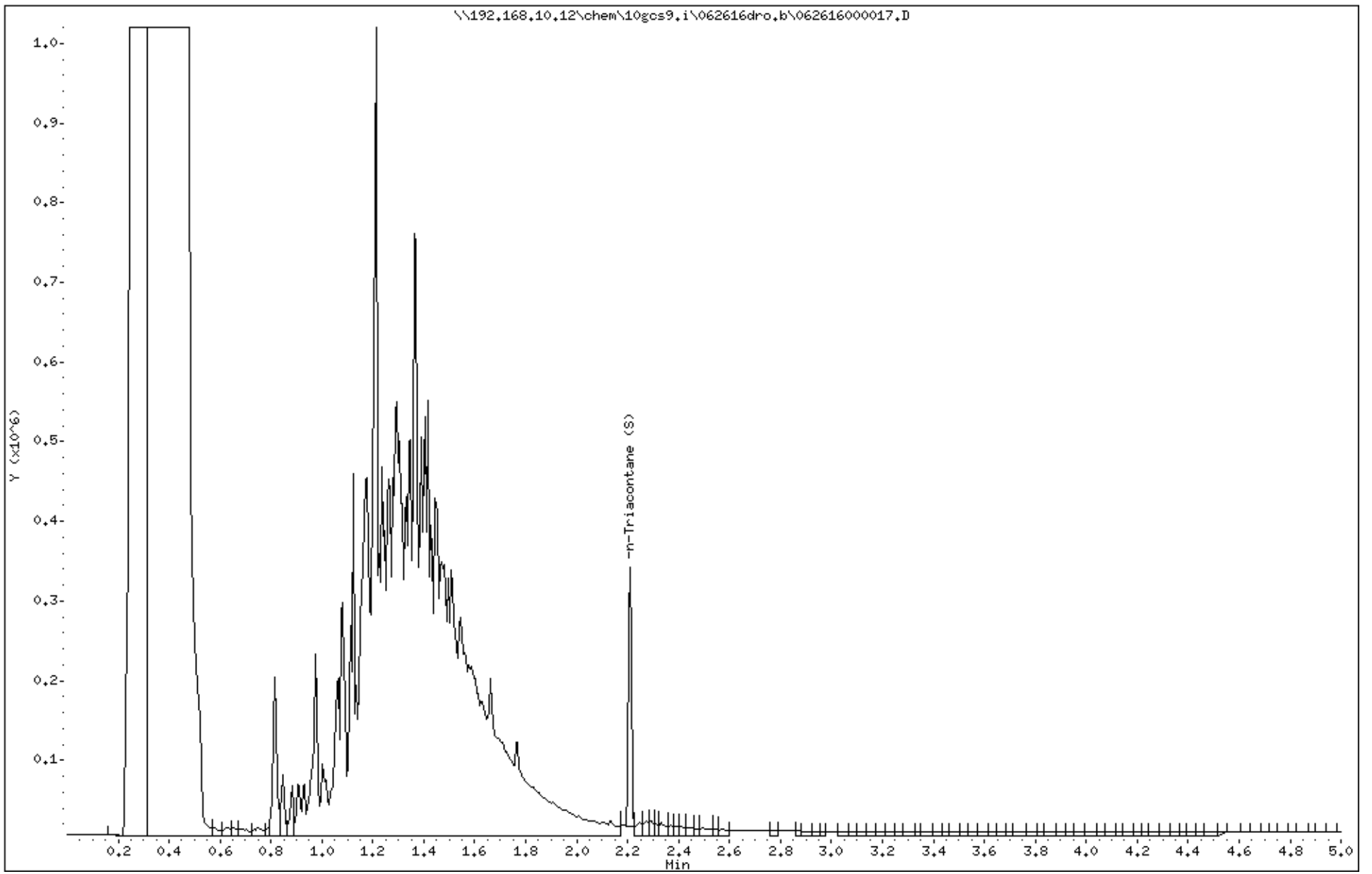
Sample Info: 10352597019

Volume Injected (uL): 1.0

Operator: JRH

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\062616dro.b\062616000018.D

Date : 26-JUN-2016 11:43

Client ID: USGS-4A

Instrument: 10gcs9.i

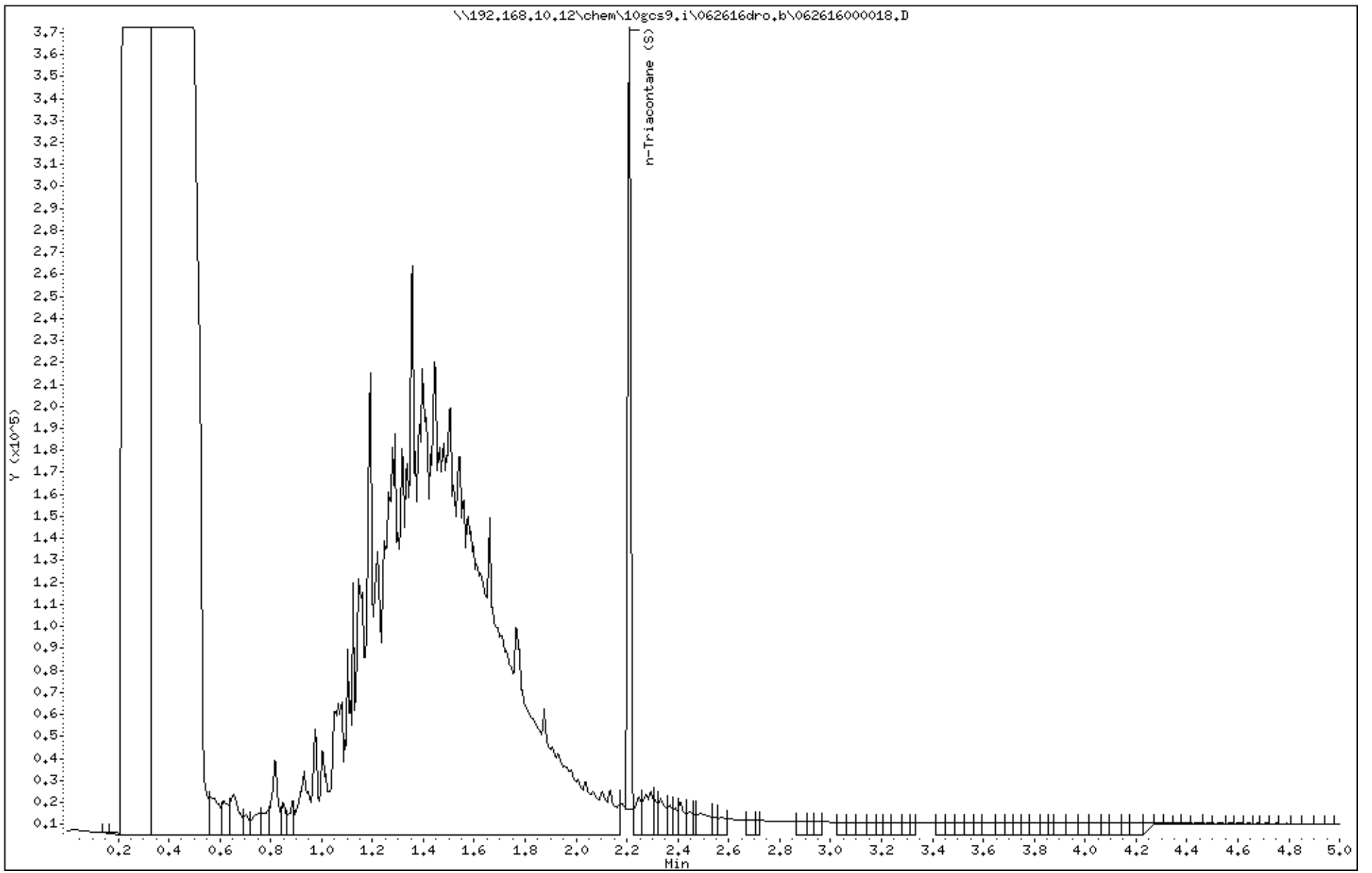
Sample Info: 10352597020

Volume Injected (uL): 1.0

Operator: JRH

Column phase: DB-5MS

Column diameter: 0.32



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
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(612)607-1700

September 22, 2016

Darin Albrecht
AECOM
Duluth Technology Village
11 E Superior St, Suite 260
Duluth, MN 55802

RE: Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Dear Darin Albrecht:

Enclosed are the analytical results for sample(s) received by the laboratory on September 14, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carol Davy
carol.davy@pacelabs.com
Project Manager

Enclosures

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CERTIFICATIONS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10362320001	**MW-8**	Water	09/13/16 10:45	09/14/16 09:40
10362320002	**MW-9**	Water	09/13/16 10:55	09/14/16 09:40
10362320003	**MW-10**	Water	09/13/16 16:30	09/14/16 09:40
10362320004	**MW-16A**	Water	09/13/16 09:50	09/14/16 09:40
10362320005	**MW-16B**	Water	09/13/16 09:20	09/14/16 09:40
10362320006	**MW-19**	Water	09/13/16 10:00	09/14/16 09:40
10362320007	**MW-21**	Water	09/13/16 09:24	09/14/16 09:40
10362320008	**MW-22**	Water	09/13/16 08:48	09/14/16 09:40
10362320009	**MW-23**	Water	09/12/16 16:37	09/14/16 09:40
10362320010	**Field Blank**	Water	09/12/16 16:20	09/14/16 09:40
10362320011	**Dup**	Water	09/12/16 00:00	09/14/16 09:40
10362320012	**SCDW**	Water	09/12/16 17:45	09/14/16 09:40
10362320013	**USGS-1A**	Water	09/13/16 11:50	09/14/16 09:40
10362320014	**USGS-2A**	Water	09/13/16 11:17	09/14/16 09:40
10362320015	**USGS-3A**	Water	09/13/16 11:46	09/14/16 09:40
10362320016	**USGS-4A**	Water	09/13/16 12:25	09/14/16 09:40
10362320017	**Trip Blank**	Water	09/13/16 00:00	09/14/16 09:40

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SAMPLE ANALYTE COUNT

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10362320001	**MW-8**	RSK 175	AEJ	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320002	**MW-9**	RSK 175	AEJ	1
		Diesel Range Organics	MT	2
		WI MOD DRO	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320003	**MW-10**	RSK 175	AEJ	1
		Diesel Range Organics	MT	2
		WI MOD DRO	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320004	**MW-16A**	RSK 175	AEJ	1
		Diesel Range Organics	MT	2
		WI MOD DRO	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320005	**MW-16B**	RSK 175	AEJ	1
		Diesel Range Organics	MT	2
		WI MOD DRO	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320006	**MW-19**	RSK 175	AEJ	1
		Diesel Range Organics	MT	2
		WI MOD DRO	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320007	**MW-21**	RSK 175	MJL	1
		Diesel Range Organics	MT	2

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SAMPLE ANALYTE COUNT

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320008	**MW-22**	RSK 175	MJL	1
		Diesel Range Organics	MT	2
		WI MOD DRO	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320009	**MW-23**	RSK 175	AEJ	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320010	**Field Blank**	RSK 175	AEJ	1
		Diesel Range Organics	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320011	**Dup**	RSK 175	AEJ	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320012	**SCDW**	RSK 175	AEJ	1
		Diesel Range Organics	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320013	**USGS-1A**	RSK 175	MJL	1
		Diesel Range Organics	MT	2
		WI MOD DRO	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320014	**USGS-2A**	RSK 175	MJL	1
		Diesel Range Organics	MT	2

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SAMPLE ANALYTE COUNT

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		WI MOD DRO	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320015	**USGS-3A**	RSK 175	AEJ	1
		Diesel Range Organics	MT	2
		WI MOD DRO	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320016	**USGS-4A**	RSK 175	AEJ	1
		Diesel Range Organics	MT	2
		WI MOD DRO	MT	2
		EPA 8260B	PRD	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10362320017	**Trip Blank**	EPA 8260B	PRD	7

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SUMMARY OF DETECTION

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
10362320001	**MW-8**					
Diesel Range Organics	WDRO, Extended C10-C32	0.15	mg/L	0.11	09/19/16 09:47	
ASTM D516	Sulfate	5.9	mg/L	2.5	09/16/16 11:07	
10362320002	**MW-9**					
RSK 175	Methane	11200	ug/L	10.0	09/19/16 13:05	
Diesel Range Organics	WDRO, Extended C10-C32	33.8	mg/L	2.2	09/19/16 10:43	
WI MOD DRO	WDRO, Extended C10-C32	18.2	mg/L	2.2	09/20/16 12:29	
EPA 8260B	Benzene	248	ug/L	1.0	09/14/16 23:48	
EPA 8260B	Ethylbenzene	4.3	ug/L	1.0	09/14/16 23:48	
EPA 8260B	Xylene (Total)	3.6	ug/L	3.0	09/14/16 23:48	
ASTM D516	Sulfate	5.1	mg/L	2.5	09/16/16 11:10	
10362320003	**MW-10**					
RSK 175	Methane	5260	ug/L	10.0	09/19/16 13:14	
Diesel Range Organics	WDRO, Extended C10-C32	7.7	mg/L	0.56	09/19/16 10:36	
WI MOD DRO	WDRO, Extended C10-C32	3.2	mg/L	0.56	09/20/16 12:08	
EPA 8260B	Benzene	10.7	ug/L	1.0	09/15/16 00:04	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	1.3	mg/L	0.10	09/20/16 12:53	
ASTM D516	Sulfate	4.7	mg/L	2.5	09/16/16 11:10	
10362320004	**MW-16A**					
Diesel Range Organics	WDRO, Extended C10-C32	2.6	mg/L	0.11	09/19/16 09:04	
WI MOD DRO	WDRO, Extended C10-C32	0.79	mg/L	0.11	09/20/16 12:43	
EPA 8260B	Benzene	2.6	ug/L	1.0	09/18/16 17:19	
10362320005	**MW-16B**					
Diesel Range Organics	WDRO, Extended C10-C32	1.0	mg/L	0.10	09/19/16 09:11	
WI MOD DRO	WDRO, Extended C10-C32	0.24	mg/L	0.10	09/20/16 12:50	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.32	mg/L	0.10	09/20/16 12:54	
ASTM D516	Sulfate	7.6	mg/L	2.5	09/16/16 11:13	
10362320006	**MW-19**					
Diesel Range Organics	WDRO, Extended C10-C32	0.68	mg/L	0.11	09/19/16 09:25	
WI MOD DRO	WDRO, Extended C10-C32	0.19	mg/L	0.11	09/20/16 12:57	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.14	mg/L	0.10	09/20/16 12:57	
ASTM D516	Sulfate	15.0	mg/L	2.5	09/16/16 11:13	
10362320007	**MW-21**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	1.7	mg/L	0.10	09/20/16 12:57	
ASTM D516	Sulfate	8.3	mg/L	2.5	09/16/16 11:13	
10362320008	**MW-22**					
Diesel Range Organics	WDRO, Extended C10-C32	0.49	mg/L	0.10	09/19/16 09:18	
WI MOD DRO	WDRO, Extended C10-C32	0.12	mg/L	0.10	09/20/16 13:04	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.16	mg/L	0.10	09/20/16 12:58	
ASTM D516	Sulfate	6.8	mg/L	2.5	09/16/16 11:15	
10362320009	**MW-23**					
RSK 175	Methane	7310	ug/L	10.0	09/19/16 10:18	
Diesel Range Organics	WDRO, Extended C10-C32	38.0	mg/L	2.3	09/19/16 10:29	

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SUMMARY OF DETECTION

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
10362320009	**MW-23**					
EPA 8260B	Benzene	278	ug/L	2.0	09/20/16 19:57	
EPA 8260B	Ethylbenzene	48.0	ug/L	1.0	09/18/16 18:37	
EPA 8260B	Xylene (Total)	43.7	ug/L	3.0	09/18/16 18:37	
ASTM D516	Sulfate	5.9	mg/L	2.5	09/16/16 11:15	
10362320011	**Dup**					
RSK 175	Methane	5220	ug/L	10.0	09/19/16 10:35	
Diesel Range Organics	WDRO, Extended C10-C32	5.2	mg/L	0.11	09/19/16 08:36	
EPA 8260B	Benzene	8.7	ug/L	1.0	09/18/16 18:52	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	1.4	mg/L	0.10	09/20/16 13:02	
10362320012	**SCDW**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.79	mg/L	0.10	09/20/16 13:03	
ASTM D516	Sulfate	3.7	mg/L	2.5	09/16/16 11:18	
10362320013	**USGS-1A**					
Diesel Range Organics	WDRO, Extended C10-C32	20.9	mg/L	2.2	09/19/16 10:50	
WI MOD DRO	WDRO, Extended C10-C32	9.0	mg/L	2.2	09/20/16 12:36	
EPA 8260B	Benzene	37.8	ug/L	1.0	09/18/16 15:09	
EPA 8260B	Ethylbenzene	1.8	ug/L	1.0	09/18/16 15:09	
10362320014	**USGS-2A**					
RSK 175	Methane	4370	ug/L	10.0	09/19/16 14:28	
Diesel Range Organics	WDRO, Extended C10-C32	9.0	mg/L	0.56	09/19/16 10:57	
WI MOD DRO	WDRO, Extended C10-C32	3.1	mg/L	0.56	09/20/16 12:15	
EPA 8260B	Benzene	3.1	ug/L	1.0	09/18/16 15:24	
10362320015	**USGS-3A**					
RSK 175	Methane	1830	ug/L	10.0	09/19/16 12:41	
Diesel Range Organics	WDRO, Extended C10-C32	7.9	mg/L	0.54	09/19/16 11:04	
WI MOD DRO	WDRO, Extended C10-C32	2.7	mg/L	0.54	09/20/16 12:22	
EPA 8260B	Benzene	2.5	ug/L	1.0	09/18/16 16:33	
10362320016	**USGS-4A**					
RSK 175	Methane	75.1	ug/L	10.0	09/19/16 12:49	
Diesel Range Organics	WDRO, Extended C10-C32	5.1	mg/L	0.11	09/19/16 08:57	
WI MOD DRO	WDRO, Extended C10-C32	2.0	mg/L	0.11	09/20/16 13:11	
EPA 8260B	Benzene	5.0	ug/L	1.0	09/18/16 19:23	

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Method: **RSK 175**
Description: RSK 175 AIR Headspace
Client: AECOM MN ND
Date: September 22, 2016

General Information:
16 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

QC Batch: 435871

R1: RPD value was outside control limits.

- DUP (Lab ID: 2371232)
  - Methane

Additional Comments:

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Method: **Diesel Range Organics**
Description: WIDRO Extended GCS
Client: AECOM MN ND
Date: September 22, 2016

General Information:
16 samples were analyzed for Diesel Range Organics. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with Diesel Range Organics with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 435986

S4: Surrogate recovery not evaluated against control limits due to sample dilution.

- MW-23 (Lab ID: 10362320009)
  - n-Triacontane (S)
- MW-9 (Lab ID: 10362320002)
  - n-Triacontane (S)
- USGS-1A (Lab ID: 10362320013)
  - n-Triacontane (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Method: **WI MOD DRO**
Description: WIDRO GCS Silica Gel
Client: AECOM MN ND
Date: September 22, 2016

General Information:
10 samples were analyzed for WI MOD DRO. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with WI MOD DRO with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 436370

S4: Surrogate recovery not evaluated against control limits due to sample dilution.

- MW-9 (Lab ID: 10362320002)
  - n-Triacontane (S)
- USGS-1A (Lab ID: 10362320013)
  - n-Triacontane (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Method: **EPA 8260B**
Description: 8260B MSV UST
Client: AECOM MN ND
Date: September 22, 2016

General Information:
17 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Method: **SM 4500-NO3 H**
Description: SM4500NO3-H, NO2 + NO3 pres.
Client: AECOM MN ND
Date: September 22, 2016

General Information:
16 samples were analyzed for SM 4500-NO3 H. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 436462

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10361481001,10362320001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2371789)
  - Nitrogen, NO2 plus NO3
- MS (Lab ID: 2371791)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2371790)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2371792)
  - Nitrogen, NO2 plus NO3

Additional Comments:

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Method: **ASTM D516**
Description: ASTM D516 Sulfate Water
Client: AECOM MN ND
Date: September 22, 2016

General Information:
16 samples were analyzed for ASTM D516. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 436013

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10361997001,10362320001

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MSD (Lab ID: 2369396)
  - Sulfate

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: MW-8 **Lab ID: 10362320001** Collected: 09/13/16 10:45 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		09/19/16 12:57	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**0.15**	mg/L	0.11	0.11	1	09/16/16 13:18	09/19/16 09:47		
Surrogates									
n-Triacontane (S)	84	%.	50-150		1	09/16/16 13:18	09/19/16 09:47	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.16	1		09/14/16 23:31	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.15	1		09/14/16 23:31	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/14/16 23:31	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/14/16 23:31	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	95	%.	75-125		1		09/14/16 23:31	17060-07-0	
Toluene-d8 (S)	104	%.	75-125		1		09/14/16 23:31	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125		1		09/14/16 23:31	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		09/20/16 12:44		M1
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**5.9**	mg/L	2.5	1.0	1		09/16/16 11:07	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: MW-9 **Lab ID: 10362320002** Collected: 09/13/16 10:55 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**11200**	ug/L	10.0	0.49	1		09/19/16 13:05	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**33.8**	mg/L	2.2	2.2	20	09/16/16 13:18	09/19/16 10:43		
Surrogates									
n-Triacontane (S)	0	%.	50-150		20	09/16/16 13:18	09/19/16 10:43	638-68-6	S4
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**18.2**	mg/L	2.2	2.2	20	09/16/16 13:18	09/20/16 12:29		
Surrogates									
n-Triacontane (S)	0	%.	62-125		20	09/16/16 13:18	09/20/16 12:29	638-68-6	S4
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**248**	ug/L	1.0	0.16	1		09/14/16 23:48	71-43-2	
Ethylbenzene	**4.3**	ug/L	1.0	0.15	1		09/14/16 23:48	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/14/16 23:48	108-88-3	
Xylene (Total)	**3.6**	ug/L	3.0	0.32	1		09/14/16 23:48	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	96	%.	75-125		1		09/14/16 23:48	17060-07-0	
Toluene-d8 (S)	104	%.	75-125		1		09/14/16 23:48	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125		1		09/14/16 23:48	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		09/20/16 12:49		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**5.1**	mg/L	2.5	1.0	1		09/16/16 11:10	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: MW-10 **Lab ID: 10362320003** Collected: 09/13/16 16:30 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**5260**	ug/L	10.0	0.49	1		09/19/16 13:14	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**7.7**	mg/L	0.56	0.56	5	09/16/16 13:18	09/19/16 10:36		
Surrogates									
n-Triacontane (S)	103	%.	50-150		5	09/16/16 13:18	09/19/16 10:36	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**3.2**	mg/L	0.56	0.56	5	09/16/16 13:18	09/20/16 12:08		
Surrogates									
n-Triacontane (S)	70	%.	62-125		5	09/16/16 13:18	09/20/16 12:08	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**10.7**	ug/L	1.0	0.16	1		09/15/16 00:04	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.15	1		09/15/16 00:04	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/15/16 00:04	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/15/16 00:04	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		09/15/16 00:04	17060-07-0	
Toluene-d8 (S)	104	%.	75-125		1		09/15/16 00:04	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125		1		09/15/16 00:04	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**1.3**	mg/L	0.10	0.050	1		09/20/16 12:53		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**4.7**	mg/L	2.5	1.0	1		09/16/16 11:10	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: MW-16A **Lab ID: 10362320004** Collected: 09/13/16 09:50 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		09/19/16 13:22	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**2.6**	mg/L	0.11	0.11	1	09/16/16 13:18	09/19/16 09:04		
Surrogates									
n-Triacontane (S)	120	%.	50-150		1	09/16/16 13:18	09/19/16 09:04	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**0.79**	mg/L	0.11	0.11	1	09/16/16 13:18	09/20/16 12:43		
Surrogates									
n-Triacontane (S)	90	%.	62-125		1	09/16/16 13:18	09/20/16 12:43	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**2.6**	ug/L	1.0	0.16	1		09/18/16 17:19	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.15	1		09/18/16 17:19	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/18/16 17:19	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/18/16 17:19	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	101	%.	75-125		1		09/18/16 17:19	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		09/18/16 17:19	2037-26-5	
4-Bromofluorobenzene (S)	103	%.	75-125		1		09/18/16 17:19	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		09/20/16 12:54		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		09/16/16 11:12	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: MW-16B **Lab ID: 10362320005** Collected: 09/13/16 09:20 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		09/19/16 13:38	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**1.0**	mg/L	0.10	0.10	1	09/16/16 13:18	09/19/16 09:11		
Surrogates									
n-Triacontane (S)	104	%.	50-150		1	09/16/16 13:18	09/19/16 09:11	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**0.24**	mg/L	0.10	0.10	1	09/16/16 13:18	09/20/16 12:50		
Surrogates									
n-Triacontane (S)	79	%.	62-125		1	09/16/16 13:18	09/20/16 12:50	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.16	1		09/18/16 17:35	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.15	1		09/18/16 17:35	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/18/16 17:35	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/18/16 17:35	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	100	%.	75-125		1		09/18/16 17:35	17060-07-0	
Toluene-d8 (S)	96	%.	75-125		1		09/18/16 17:35	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125		1		09/18/16 17:35	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.32**	mg/L	0.10	0.050	1		09/20/16 12:54		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**7.6**	mg/L	2.5	1.0	1		09/16/16 11:13	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: MW-19 **Lab ID: 10362320006** Collected: 09/13/16 10:00 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		09/19/16 13:30	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**0.68**	mg/L	0.11	0.11	1	09/16/16 13:18	09/19/16 09:25		
Surrogates									
n-Triacontane (S)	108	%.	50-150		1	09/16/16 13:18	09/19/16 09:25	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**0.19**	mg/L	0.11	0.11	1	09/16/16 13:18	09/20/16 12:57		
Surrogates									
n-Triacontane (S)	84	%.	62-125		1	09/16/16 13:18	09/20/16 12:57	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.16	1		09/18/16 17:50	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.15	1		09/18/16 17:50	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/18/16 17:50	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/18/16 17:50	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	100	%.	75-125		1		09/18/16 17:50	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		09/18/16 17:50	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	75-125		1		09/18/16 17:50	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.14**	mg/L	0.10	0.050	1		09/20/16 12:57		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**15.0**	mg/L	2.5	1.0	1		09/16/16 11:13	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: MW-21 **Lab ID: 10362320007** Collected: 09/13/16 09:24 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		09/19/16 14:03	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11	0.11	1	09/16/16 13:18	09/19/16 09:54		
Surrogates									
n-Triacontane (S)	96	%.	50-150		1	09/16/16 13:18	09/19/16 09:54	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.16	1		09/18/16 18:06	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.15	1		09/18/16 18:06	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/18/16 18:06	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/18/16 18:06	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	100	%.	75-125		1		09/18/16 18:06	17060-07-0	
Toluene-d8 (S)	96	%.	75-125		1		09/18/16 18:06	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125		1		09/18/16 18:06	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**1.7**	mg/L	0.10	0.050	1		09/20/16 12:57		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**8.3**	mg/L	2.5	1.0	1		09/16/16 11:13	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: MW-22 **Lab ID: 10362320008** Collected: 09/13/16 08:48 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		09/19/16 14:11	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**0.49**	mg/L	0.10	0.10	1	09/16/16 13:18	09/19/16 09:18		
Surrogates									
n-Triacontane (S)	104	%.	50-150		1	09/16/16 13:18	09/19/16 09:18	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**0.12**	mg/L	0.10	0.10	1	09/16/16 13:18	09/20/16 13:04		
Surrogates									
n-Triacontane (S)	84	%.	62-125		1	09/16/16 13:18	09/20/16 13:04	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.16	1		09/18/16 18:21	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.15	1		09/18/16 18:21	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/18/16 18:21	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/18/16 18:21	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	100	%.	75-125		1		09/18/16 18:21	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		09/18/16 18:21	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125		1		09/18/16 18:21	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.16**	mg/L	0.10	0.050	1		09/20/16 12:58		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**6.8**	mg/L	2.5	1.0	1		09/16/16 11:15	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: MW-23 **Lab ID: 10362320009** Collected: 09/12/16 16:37 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**7310**	ug/L	10.0	0.49	1		09/19/16 10:18	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**38.0**	mg/L	2.3	2.3	20	09/16/16 13:18	09/19/16 10:29		
Surrogates									
n-Triacontane (S)	0	%.	50-150		20	09/16/16 13:18	09/19/16 10:29	638-68-6	S4
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**278**	ug/L	2.0	0.31	2		09/20/16 19:57	71-43-2	
Ethylbenzene	**48.0**	ug/L	1.0	0.15	1		09/18/16 18:37	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/18/16 18:37	108-88-3	
Xylene (Total)	**43.7**	ug/L	3.0	0.32	1		09/18/16 18:37	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	96	%.	75-125		1		09/18/16 18:37	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		09/18/16 18:37	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125		1		09/18/16 18:37	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		09/20/16 12:59		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**5.9**	mg/L	2.5	1.0	1		09/16/16 11:15	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: Field Blank **Lab ID: 10362320010** Collected: 09/12/16 16:20 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		09/19/16 10:27	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.10	0.10	1	09/16/16 13:18	09/19/16 09:33		
Surrogates									
n-Triacontane (S)	95	%.	50-150		1	09/16/16 13:18	09/19/16 09:33	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.16	1		09/15/16 13:27	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.15	1		09/15/16 13:27	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/15/16 13:27	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/15/16 13:27	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	93	%.	75-125		1		09/15/16 13:27	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		09/15/16 13:27	2037-26-5	
4-Bromofluorobenzene (S)	105	%.	75-125		1		09/15/16 13:27	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		09/20/16 13:02		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		09/16/16 11:15	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: Dup **Lab ID: 10362320011** Collected: 09/12/16 00:00 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**5220**	ug/L	10.0	0.49	1		09/19/16 10:35	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**5.2**	mg/L	0.11	0.11	1	09/16/16 13:18	09/19/16 08:36		
Surrogates									
n-Triacontane (S)	120	%.	50-150		1	09/16/16 13:18	09/19/16 08:36	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**8.7**	ug/L	1.0	0.16	1		09/18/16 18:52	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.15	1		09/18/16 18:52	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/18/16 18:52	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/18/16 18:52	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	99	%.	75-125		1		09/18/16 18:52	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		09/18/16 18:52	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		09/18/16 18:52	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**1.4**	mg/L	0.10	0.050	1		09/20/16 13:02		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		09/16/16 11:15	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: SCDW **Lab ID: 10362320012** Collected: 09/12/16 17:45 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		09/19/16 10:43	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	ND	mg/L	0.11	0.11	1	09/16/16 13:18	09/19/16 09:40		
Surrogates									
n-Triacontane (S)	94	%.	50-150		1	09/16/16 13:18	09/19/16 09:40	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.16	1		09/18/16 19:07	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.15	1		09/18/16 19:07	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/18/16 19:07	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/18/16 19:07	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	99	%.	75-125		1		09/18/16 19:07	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		09/18/16 19:07	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125		1		09/18/16 19:07	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.79**	mg/L	0.10	0.050	1		09/20/16 13:03		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**3.7**	mg/L	2.5	1.0	1		09/16/16 11:18	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: USGS-1A **Lab ID: 10362320013** Collected: 09/13/16 11:50 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		09/19/16 14:19	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**20.9**	mg/L	2.2	2.2	20	09/16/16 13:18	09/19/16 10:50		
Surrogates									
n-Triacontane (S)	0	%.	50-150		20	09/16/16 13:18	09/19/16 10:50	638-68-6	S4
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**9.0**	mg/L	2.2	2.2	20	09/16/16 13:18	09/20/16 12:36		
Surrogates									
n-Triacontane (S)	0	%.	62-125		20	09/16/16 13:18	09/20/16 12:36	638-68-6	S4
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**37.8**	ug/L	1.0	0.16	1		09/18/16 15:09	71-43-2	
Ethylbenzene	**1.8**	ug/L	1.0	0.15	1		09/18/16 15:09	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/18/16 15:09	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/18/16 15:09	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	98	%.	75-125		1		09/18/16 15:09	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		09/18/16 15:09	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	75-125		1		09/18/16 15:09	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		09/20/16 13:07		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		09/16/16 11:18	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: USGS-2A **Lab ID: 10362320014** Collected: 09/13/16 11:17 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**4370**	ug/L	10.0	0.49	1		09/19/16 14:28	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**9.0**	mg/L	0.56	0.56	5	09/16/16 13:18	09/19/16 10:57		
Surrogates									
n-Triacontane (S)	135	%.	50-150		5	09/16/16 13:18	09/19/16 10:57	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**3.1**	mg/L	0.56	0.56	5	09/16/16 13:18	09/20/16 12:15		
Surrogates									
n-Triacontane (S)	71	%.	62-125		5	09/16/16 13:18	09/20/16 12:15	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**3.1**	ug/L	1.0	0.16	1		09/18/16 15:24	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.15	1		09/18/16 15:24	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/18/16 15:24	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/18/16 15:24	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	98	%.	75-125		1		09/18/16 15:24	17060-07-0	
Toluene-d8 (S)	100	%.	75-125		1		09/18/16 15:24	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125		1		09/18/16 15:24	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		09/20/16 13:08		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		09/16/16 11:18	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: USGS-3A **Lab ID: 10362320015** Collected: 09/13/16 11:46 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**1830**	ug/L	10.0	0.49	1		09/19/16 12:41	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**7.9**	mg/L	0.54	0.54	5	09/16/16 13:18	09/19/16 11:04		
Surrogates									
n-Triacontane (S)	129	%.	50-150		5	09/16/16 13:18	09/19/16 11:04	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**2.7**	mg/L	0.54	0.54	5	09/16/16 13:18	09/20/16 12:22		
Surrogates									
n-Triacontane (S)	73	%.	62-125		5	09/16/16 13:18	09/20/16 12:22	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**2.5**	ug/L	1.0	0.16	1		09/18/16 16:33	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.15	1		09/18/16 16:33	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/18/16 16:33	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/18/16 16:33	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	99	%.	75-125		1		09/18/16 16:33	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		09/18/16 16:33	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125		1		09/18/16 16:33	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		09/20/16 13:08		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		09/16/16 11:18	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: USGS-4A **Lab ID: 10362320016** Collected: 09/13/16 12:25 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**75.1**	ug/L	10.0	0.49	1		09/19/16 12:49	74-82-8	
WIDRO Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO, Extended C10-C32	**5.1**	mg/L	0.11	0.11	1	09/16/16 13:18	09/19/16 08:57		
Surrogates									
n-Triacontane (S)	110	%.	50-150		1	09/16/16 13:18	09/19/16 08:57	638-68-6	
WIDRO GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO, Extended C10-C32	**2.0**	mg/L	0.11	0.11	1	09/16/16 13:18	09/20/16 13:11		
Surrogates									
n-Triacontane (S)	75	%.	62-125		1	09/16/16 13:18	09/20/16 13:11	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**5.0**	ug/L	1.0	0.16	1		09/18/16 19:23	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.15	1		09/18/16 19:23	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/18/16 19:23	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/18/16 19:23	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	100	%.	75-125		1		09/18/16 19:23	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		09/18/16 19:23	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	75-125		1		09/18/16 19:23	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		09/20/16 13:12		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		09/16/16 11:20	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Sample: Trip Blank **Lab ID: 10362320017** Collected: 09/13/16 00:00 Received: 09/14/16 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.16	1		09/18/16 13:37	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.15	1		09/18/16 13:37	100-41-4	
Toluene	ND	ug/L	1.0	0.14	1		09/18/16 13:37	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.32	1		09/18/16 13:37	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	101	%.	75-125		1		09/18/16 13:37	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		09/18/16 13:37	2037-26-5	
4-Bromofluorobenzene (S)	103	%.	75-125		1		09/18/16 13:37	460-00-4	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

QC Batch: 435871 | Analysis Method: RSK 175
QC Batch Method: RSK 175 | Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10362320001, 10362320002, 10362320003, 10362320004, 10362320005, 10362320006, 10362320009, 10362320010, 10362320011, 10362320012, 10362320015, 10362320016

METHOD BLANK: 2368847 | Matrix: Water
Associated Lab Samples: 10362320001, 10362320002, 10362320003, 10362320004, 10362320005, 10362320006, 10362320009, 10362320010, 10362320011, 10362320012, 10362320015, 10362320016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ug/L	ND	10.0	0.49	09/19/16 09:45	

LABORATORY CONTROL SAMPLE & LCSD: 2368848 2368849

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ug/L	60.7	63.1	55.4	104	91	85-115	13	20	

SAMPLE DUPLICATE: 2371232

Parameter	Units	10362389001 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	6560	2000	107	20	R1

SAMPLE DUPLICATE: 2371233

Parameter	Units	10361804024 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	ND	2.1J		20	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

QC Batch: 436321 | Analysis Method: RSK 175
QC Batch Method: RSK 175 | Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10362320007, 10362320008, 10362320013, 10362320014

METHOD BLANK: 2371236 | Matrix: Water
Associated Lab Samples: 10362320007, 10362320008, 10362320013, 10362320014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ug/L	ND	10.0	0.49	09/19/16 13:55	

LABORATORY CONTROL SAMPLE & LCSD: 2371237 2371238

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ug/L	60.7	55.4	55.8	91	92	85-115	1	20	

SAMPLE DUPLICATE: 2373621

Parameter	Units	92312274001 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	33.9	28.7	16	20	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

QC Batch: 435666 | Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B | Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 10362320001, 10362320002, 10362320003

METHOD BLANK: 2367661 | Matrix: Water
Associated Lab Samples: 10362320001, 10362320002, 10362320003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	0.16	09/14/16 19:59	
Ethylbenzene	ug/L	ND	1.0	0.15	09/14/16 19:59	
Toluene	ug/L	ND	1.0	0.14	09/14/16 19:59	
Xylene (Total)	ug/L	ND	3.0	0.32	09/14/16 19:59	
1,2-Dichloroethane-d4 (S)	%.	97	75-125		09/14/16 19:59	
4-Bromofluorobenzene (S)	%.	97	75-125		09/14/16 19:59	
Toluene-d8 (S)	%.	98	75-125		09/14/16 19:59	

LABORATORY CONTROL SAMPLE: 2367662

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	17.2	86	75-125	
Ethylbenzene	ug/L	20	17.1	86	75-125	
Toluene	ug/L	20	18.0	90	75-125	
Xylene (Total)	ug/L	60	52.2	87	75-125	
1,2-Dichloroethane-d4 (S)	%.			98	75-125	
4-Bromofluorobenzene (S)	%.			97	75-125	
Toluene-d8 (S)	%.			102	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2368986 2368987

Parameter	Units	10361882001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	14.1	20	20	34.0	35.5	99	107	52-147	4	30	
Ethylbenzene	ug/L	<1.0	20	20	19.7	20.5	98	103	67-149	4	30	
Toluene	ug/L	<1.0	20	20	21.6	22.3	108	111	69-139	3	30	
Xylene (Total)	ug/L	<3.0	60	60	60.1	60.7	100	101	70-147	1	30	
1,2-Dichloroethane-d4 (S)	%.						99	97	75-125			
4-Bromofluorobenzene (S)	%.						97	101	75-125			
Toluene-d8 (S)	%.						101	103	75-125			

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

QC Batch: 435813 | Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B | Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 10362320010

METHOD BLANK: 2368504 | Matrix: Water
Associated Lab Samples: 10362320010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	0.16	09/15/16 11:09	
Ethylbenzene	ug/L	ND	1.0	0.15	09/15/16 11:09	
Toluene	ug/L	ND	1.0	0.14	09/15/16 11:09	
Xylene (Total)	ug/L	ND	3.0	0.32	09/15/16 11:09	
1,2-Dichloroethane-d4 (S)	%.	93	75-125		09/15/16 11:09	
4-Bromofluorobenzene (S)	%.	103	75-125		09/15/16 11:09	
Toluene-d8 (S)	%.	98	75-125		09/15/16 11:09	

LABORATORY CONTROL SAMPLE: 2368505

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	23.1	116	75-125	
Ethylbenzene	ug/L	20	22.4	112	75-125	
Toluene	ug/L	20	22.3	111	75-125	
Xylene (Total)	ug/L	60	68.9	115	75-125	
1,2-Dichloroethane-d4 (S)	%.			90	75-125	
4-Bromofluorobenzene (S)	%.			102	75-125	
Toluene-d8 (S)	%.			98	75-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2371101 2371102

Parameter	Units	10362835001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	16000	4000	4000	21000	19900	125	98	52-147	5	30	
Ethylbenzene	ug/L	1070	4000	4000	5630	5400	114	108	67-149	4	30	
Toluene	ug/L	10300	4000	4000	15600	14600	132	107	69-139	6	30	
Xylene (Total)	ug/L	6920	12000	12000	21800	20600	124	114	70-147	6	30	
1,2-Dichloroethane-d4 (S)	%.						93	94	75-125			
4-Bromofluorobenzene (S)	%.						101	103	75-125			
Toluene-d8 (S)	%.						99	99	75-125			

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

QC Batch: 435901 | Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B | Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 10362320004, 10362320005, 10362320006, 10362320007, 10362320008, 10362320009, 10362320011, 10362320012, 10362320013, 10362320014, 10362320015, 10362320016, 10362320017

METHOD BLANK: 2368994 | Matrix: Water
Associated Lab Samples: 10362320004, 10362320005, 10362320006, 10362320007, 10362320008, 10362320009, 10362320011, 10362320012, 10362320013, 10362320014, 10362320015, 10362320016, 10362320017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	0.16	09/18/16 13:06	
Ethylbenzene	ug/L	ND	1.0	0.15	09/18/16 13:06	
Toluene	ug/L	ND	1.0	0.14	09/18/16 13:06	
Xylene (Total)	ug/L	ND	3.0	0.32	09/18/16 13:06	
1,2-Dichloroethane-d4 (S)	%.	98	75-125		09/18/16 13:06	
4-Bromofluorobenzene (S)	%.	101	75-125		09/18/16 13:06	
Toluene-d8 (S)	%.	98	75-125		09/18/16 13:06	

LABORATORY CONTROL SAMPLE & LCSD: 2368995 2370012

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/L	50	50.5	48.6	101	97	75-125	4	20	
Ethylbenzene	ug/L	50	53.4	52.1	107	104	75-125	2	20	
Toluene	ug/L	50	50.3	48.8	101	98	75-125	3	20	
Xylene (Total)	ug/L	150	156	156	104	104	75-125	0	20	
1,2-Dichloroethane-d4 (S)	%.				92	92	75-125			
4-Bromofluorobenzene (S)	%.				98	102	75-125			
Toluene-d8 (S)	%.				99	100	75-125			

MATRIX SPIKE SAMPLE: 2370013

Parameter	Units	10362320014 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	3.1	20	24.4	106	52-147	
Ethylbenzene	ug/L	ND	20	23.0	115	67-149	
Toluene	ug/L	ND	20	21.2	106	69-139	
Xylene (Total)	ug/L	ND	60	66.3	111	70-147	
1,2-Dichloroethane-d4 (S)	%.				97	75-125	
4-Bromofluorobenzene (S)	%.				102	75-125	
Toluene-d8 (S)	%.				98	75-125	

SAMPLE DUPLICATE: 2370014

Parameter	Units	10362320015 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzene	ug/L	2.5	2.5	3	30	
Ethylbenzene	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

SAMPLE DUPLICATE: 2370014

Parameter	Units	10362320015 Result	Dup Result	RPD	Max RPD	Qualifiers
Toluene	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	99	100	1		
4-Bromofluorobenzene (S)	%.	101	100	0		
Toluene-d8 (S)	%.	97	98	0		

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

QC Batch: 435986 | Analysis Method: Diesel Range Organics
QC Batch Method: Diesel Range Organics | Analysis Description: WIDRO Extended GCS
Associated Lab Samples: 10362320001, 10362320002, 10362320003, 10362320004, 10362320005, 10362320006, 10362320007, 10362320008, 10362320009, 10362320010, 10362320011, 10362320012, 10362320013, 10362320014, 10362320015, 10362320016

METHOD BLANK: 2369325 | Matrix: Water
Associated Lab Samples: 10362320001, 10362320002, 10362320003, 10362320004, 10362320005, 10362320006, 10362320007, 10362320008, 10362320009, 10362320010, 10362320011, 10362320012, 10362320013, 10362320014, 10362320015, 10362320016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO, Extended C10-C32	mg/L	ND	0.10	0.10	09/19/16 07:54	
n-Triacontane (S)	%.	78	50-150		09/19/16 07:54	

LABORATORY CONTROL SAMPLE & LCSD: 2369326 2369327

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
n-Triacontane (S)	%.				100	103	50-150			

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

QC Batch: 436370 Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS w/Cleanup
Associated Lab Samples: 10362320002, 10362320003, 10362320004, 10362320005, 10362320006, 10362320008, 10362320013, 10362320014, 10362320015, 10362320016

METHOD BLANK: 2371491 Matrix: Water
Associated Lab Samples: 10362320002, 10362320003, 10362320004, 10362320005, 10362320006, 10362320008, 10362320013, 10362320014, 10362320015, 10362320016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO, Extended C10-C32	mg/L	ND	0.10	0.10	09/20/16 11:54	
n-Triacontane (S)	%.	72	62-125		09/20/16 11:54	

LABORATORY CONTROL SAMPLE & LCSD: 2371492 2371493

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO, Extended C10-C32	mg/L	2	1.5	1.5	76	77		2	20	
n-Triacontane (S)	%.				96	94	62-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

QC Batch: 436462 | Analysis Method: SM 4500-NO3 H
QC Batch Method: SM 4500-NO3 H | Analysis Description: SM4500NO3-H, NO2 + NO3 pres.
Associated Lab Samples: 10362320001, 10362320002, 10362320003, 10362320004, 10362320005, 10362320006, 10362320007, 10362320008, 10362320009, 10362320010, 10362320011, 10362320012, 10362320013, 10362320014, 10362320015, 10362320016

METHOD BLANK: 2371787 | Matrix: Water
Associated Lab Samples: 10362320001, 10362320002, 10362320003, 10362320004, 10362320005, 10362320006, 10362320007, 10362320008, 10362320009, 10362320010, 10362320011, 10362320012, 10362320013, 10362320014, 10362320015, 10362320016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.050	09/20/16 12:39	

LABORATORY CONTROL SAMPLE: 2371788

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.4	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2371789 2371790

Parameter	Units	10361481001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.57	2.5	2.5	1.8	1.5	49	38	80-120	16	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2371791 2371792

Parameter	Units	10362320001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	1.8	2.0	70	77	80-120	10	30	M1

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

QC Batch: 436013 | Analysis Method: ASTM D516
QC Batch Method: ASTM D516 | Analysis Description: ASTM D516 Sulfate Water
Associated Lab Samples: 10362320001, 10362320002, 10362320003, 10362320004, 10362320005, 10362320006, 10362320007, 10362320008, 10362320009, 10362320010, 10362320011, 10362320012, 10362320013, 10362320014, 10362320015, 10362320016

METHOD BLANK: 2369390 | Matrix: Water
Associated Lab Samples: 10362320001, 10362320002, 10362320003, 10362320004, 10362320005, 10362320006, 10362320007, 10362320008, 10362320009, 10362320010, 10362320011, 10362320012, 10362320013, 10362320014, 10362320015, 10362320016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	2.5	1.0	09/16/16 11:07	

LABORATORY CONTROL SAMPLE & LCSD: 2369391 2369392

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Sulfate	mg/L	7.5	7.7	7.9	103	105	80-120	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2369393 2369394

Parameter	Units	10362320001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	5.9	20	20	26.2	26.4	101	102	80-120	1	30	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2369395 2369396

Parameter	Units	10361997001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	184	20	20	202	198	90	72	80-120	2	30	M6

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QUALIFIERS

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R1	RPD value was outside control limits.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10362320001	**MW-8**	RSK 175	435871		
10362320002	**MW-9**	RSK 175	435871		
10362320003	**MW-10**	RSK 175	435871		
10362320004	**MW-16A**	RSK 175	435871		
10362320005	**MW-16B**	RSK 175	435871		
10362320006	**MW-19**	RSK 175	435871		
10362320007	**MW-21**	RSK 175	436321		
10362320008	**MW-22**	RSK 175	436321		
10362320009	**MW-23**	RSK 175	435871		
10362320010	**Field Blank**	RSK 175	435871		
10362320011	**Dup**	RSK 175	435871		
10362320012	**SCDW**	RSK 175	435871		
10362320013	**USGS-1A**	RSK 175	436321		
10362320014	**USGS-2A**	RSK 175	436321		
10362320015	**USGS-3A**	RSK 175	435871		
10362320016	**USGS-4A**	RSK 175	435871		
10362320001	**MW-8**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320002	**MW-9**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320003	**MW-10**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320004	**MW-16A**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320005	**MW-16B**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320006	**MW-19**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320007	**MW-21**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320008	**MW-22**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320009	**MW-23**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320010	**Field Blank**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320011	**Dup**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320012	**SCDW**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320013	**USGS-1A**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320014	**USGS-2A**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320015	**USGS-3A**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320016	**USGS-4A**	Diesel Range Organics	435986	Diesel Range Organics	436258
10362320002	**MW-9**	WI MOD DRO	436370	WI MOD DRO	436592
10362320003	**MW-10**	WI MOD DRO	436370	WI MOD DRO	436592
10362320004	**MW-16A**	WI MOD DRO	436370	WI MOD DRO	436592
10362320005	**MW-16B**	WI MOD DRO	436370	WI MOD DRO	436592
10362320006	**MW-19**	WI MOD DRO	436370	WI MOD DRO	436592
10362320008	**MW-22**	WI MOD DRO	436370	WI MOD DRO	436592
10362320013	**USGS-1A**	WI MOD DRO	436370	WI MOD DRO	436592
10362320014	**USGS-2A**	WI MOD DRO	436370	WI MOD DRO	436592
10362320015	**USGS-3A**	WI MOD DRO	436370	WI MOD DRO	436592
10362320016	**USGS-4A**	WI MOD DRO	436370	WI MOD DRO	436592
10362320001	**MW-8**	EPA 8260B	435666		
10362320002	**MW-9**	EPA 8260B	435666		
10362320003	**MW-10**	EPA 8260B	435666		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60503816 South Cass Lake
Pace Project No.: 10362320

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10362320004	**MW-16A**	EPA 8260B	435901		
10362320005	**MW-16B**	EPA 8260B	435901		
10362320006	**MW-19**	EPA 8260B	435901		
10362320007	**MW-21**	EPA 8260B	435901		
10362320008	**MW-22**	EPA 8260B	435901		
10362320009	**MW-23**	EPA 8260B	435901		
10362320010	**Field Blank**	EPA 8260B	435813		
10362320011	**Dup**	EPA 8260B	435901		
10362320012	**SCDW**	EPA 8260B	435901		
10362320013	**USGS-1A**	EPA 8260B	435901		
10362320014	**USGS-2A**	EPA 8260B	435901		
10362320015	**USGS-3A**	EPA 8260B	435901		
10362320016	**USGS-4A**	EPA 8260B	435901		
10362320017	**Trip Blank**	EPA 8260B	435901		
10362320001	**MW-8**	SM 4500-NO3 H	436462		
10362320002	**MW-9**	SM 4500-NO3 H	436462		
10362320003	**MW-10**	SM 4500-NO3 H	436462		
10362320004	**MW-16A**	SM 4500-NO3 H	436462		
10362320005	**MW-16B**	SM 4500-NO3 H	436462		
10362320006	**MW-19**	SM 4500-NO3 H	436462		
10362320007	**MW-21**	SM 4500-NO3 H	436462		
10362320008	**MW-22**	SM 4500-NO3 H	436462		
10362320009	**MW-23**	SM 4500-NO3 H	436462		
10362320010	**Field Blank**	SM 4500-NO3 H	436462		
10362320011	**Dup**	SM 4500-NO3 H	436462		
10362320012	**SCDW**	SM 4500-NO3 H	436462		
10362320013	**USGS-1A**	SM 4500-NO3 H	436462		
10362320014	**USGS-2A**	SM 4500-NO3 H	436462		
10362320015	**USGS-3A**	SM 4500-NO3 H	436462		
10362320016	**USGS-4A**	SM 4500-NO3 H	436462		
10362320001	**MW-8**	ASTM D516	436013		
10362320002	**MW-9**	ASTM D516	436013		
10362320003	**MW-10**	ASTM D516	436013		
10362320004	**MW-16A**	ASTM D516	436013		
10362320005	**MW-16B**	ASTM D516	436013		
10362320006	**MW-19**	ASTM D516	436013		
10362320007	**MW-21**	ASTM D516	436013		
10362320008	**MW-22**	ASTM D516	436013		
10362320009	**MW-23**	ASTM D516	436013		
10362320010	**Field Blank**	ASTM D516	436013		
10362320011	**Dup**	ASTM D516	436013		
10362320012	**SCDW**	ASTM D516	436013		
10362320013	**USGS-1A**	ASTM D516	436013		
10362320014	**USGS-2A**	ASTM D516	436013		
10362320015	**USGS-3A**	ASTM D516	436013		
10362320016	**USGS-4A**	ASTM D516	436013		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10362320

Page: 1 of 2

Section A Required Client Information:

Company:	AECOM
Address:	11 East Superior Street, Suite 260
	Duluth, MN 55802
Email To:	darin.albrecht@aecom.com
Phone: (218) 625-8768	Fax: (218) 625-2201
Requested Due Date/TAT:	5 Day Enbridge Standard

Section B Required Project Information:

Report To:	Darin Albrecht
Copy To:	
Purchase Order No.:	
Project Name:	South Cass Lake
Project Number:	60503816

Section C Invoice Information:

Attention:	Karl Beaster
Company Name:	Enbridge Energy
Address:	1100 Louisiana St. Ste 3000
Pace Quote Reference:	Houston, TX 77002
Pace Project Manager:	Carol Davy
Pace Profile #:	32482

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER _____

Site Location STATE: MN

Section D Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start Date	Composite Start Time	Composite End/Grab Date	Composite End/Grab Time	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	BTEX	Extended Range DRO	Sulfate	Nitrate + Nitrite	Methane	ERDRO - Silica Gel Cleanup	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
	Analysis Test (Y/N)									Preservatives								N	N	N	N	N	N		
1	MW-8	WT	G	9/13/16	1045				10	4	1		5					3	2	1	1	3			001
2	MW-9	WT	G	9/13/16	1055				10	4	1		5					3	2	1	1	3	2		002
3	MW-10	WT	G	9/12/16	1630				10	4	1		5					3	2	1	1	3	2		003
4	MW-16A	WT	G	9/13/16	0950				10	4	1		5					3	2	1	1	3	2		004
5	MW-16B	WT	G	9/13/16	0920				10	4	1		5					3	2	1	1	3	2		005
6	MW-19	WT	G	9/13/16	1000				10	4	1		5					3	2	1	1	3	2		006
7	MW-21	WT	G	9/13/16	0924				10	4	1		5					3	2	1	1	3			007
8	MW-22	WT	G	9/13/16	0840				10	4	1		5					3	2	1	1	3	2		008
9	MW-23	WT	G	9/12/16	1637				10	4	1		5					3	2	1	1	3			009
10	Field Blank	WT	G	9/12/16	1620				10	4	1		5					3	2	1	1	3			010
11	DUP	WT	G	9/12/16					10	4	1		5					3	2	1	1	3			011
12	SCDW	WT	G	9/12/16	1745				10	4	1		5					3	2	1	1	3			012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Please send Chroms with DRO hits	AECOM	9/13/16	1800	PACE	9-14-16	940	2.5	Y	N	Y
							1.3			
							1.2			
							5.5			
							4.9			
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Joseph Pearson

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 9/13/16

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-Feb-2007

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CHAIN-OF-CUSTODY / Analytical Request Document

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Section A Required Client Information:

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Phone: (218) 625-8768	Fax: (218) 625-2201
Requested Due Date/TAT:	5 Day Enbridge Standard

Section B Required Project Information:

Report To:	Darin Albrecht
Copy To:	
Purchase Order No.:	
Project Name:	South Cass lake
Project Number:	60503816

Section C Invoice Information:

Attention:	Karl Beater
Company Name:	Enbridge Energy
Address:	1100 Lousiana St Sutie 3000
Pace Quote Reference:	Houston, TX 77002
Pace Project Manager:	Carol Davy
Pace Profile #:	32482

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER
UST | RCRA | OTHER _____

Site Location STATE: MN

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/GRAB DATE	COLLECTED Composite End/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	BTEX	Extended Range DRO	Sulfate	Nitrate + Nitrite	Methane	ERDRO - Silica Gel Clean-up						Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N								
1	USGS-1A	WT	G	9/13/16	1150				10	4	1		5						3	2	1	1	3	2							013
2	USGS-2A	WT	G	9/13/16	1117				10	4	1		5						3	2	1	1	3	2							014
3	USGS-3A	WT	G	9/13/16	1146				10	4	1		5						3	2	1	1	3	2							015
4	USGS-4A	WT	G	9/13/16	1225				10	4	1		5						3	2	1	1	3	2							016
5																															
6																															
7																															
8																															
9																															
10																															
11																															
12																															

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Please send Chroms with DRO hits	AECOM	9/13/16	1800		9-14-16	940	2.5	Y	N	Y
							1.3 1.2			
							5.5			
							4.9			
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Joseph Pearson

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY): 9/13/16

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical®	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 02Aug2016 Page 1 of 2
	Document No.: **F-MN-L-213-rev.17**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: AECOM

Project #: WO#: 10362320

10362320

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

Tracking Number: see exceptions

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☑ Yes ☐ No

Thermometer Used: ☑ 151401163 ☐ 151401164 ☐ B88A912167504 ☐ B88A0143310098 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Read (°C): see exceptions **Cooler Temp Corrected (°C):** see exceptions **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** -0.1 **Date and Initials of Person Examining Contents:** 9-14-16 AA

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA. MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☑ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No	☐ N/A	6.
Rush Turn Around Time Requested?	☑ Yes	☐ No	☐ N/A	7.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13. ☐ HNO_3 ☐ H_2SO_4 ☐ NaOH ☐ HCl Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	☑ Yes	☐ No	☐ N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☑ No	☐ N/A	14.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	15.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased): 95981				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Carol Doug **Date:** 9/14/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

SCUR Exceptions: **Workorder #:**

Issue	Sample ID	Container Type/#
Tracking Number	Read Temp (correction) °C	Corrected Temp °C
7840 7929 3373	2.6 -0.1	2.5
7840 7930 5852	1.4 -0.1	1.3
7840 7929 9496	1.3 -0.1	1.2
7840 7926 4252	5.6 -0.1	5.5
7840 7927 2136	5.0 -0.1	4.9

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials

Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000021.D

Date : 19-SEP-2016 09:47

Client ID: MW-8

Instrument: 10gcs9.i

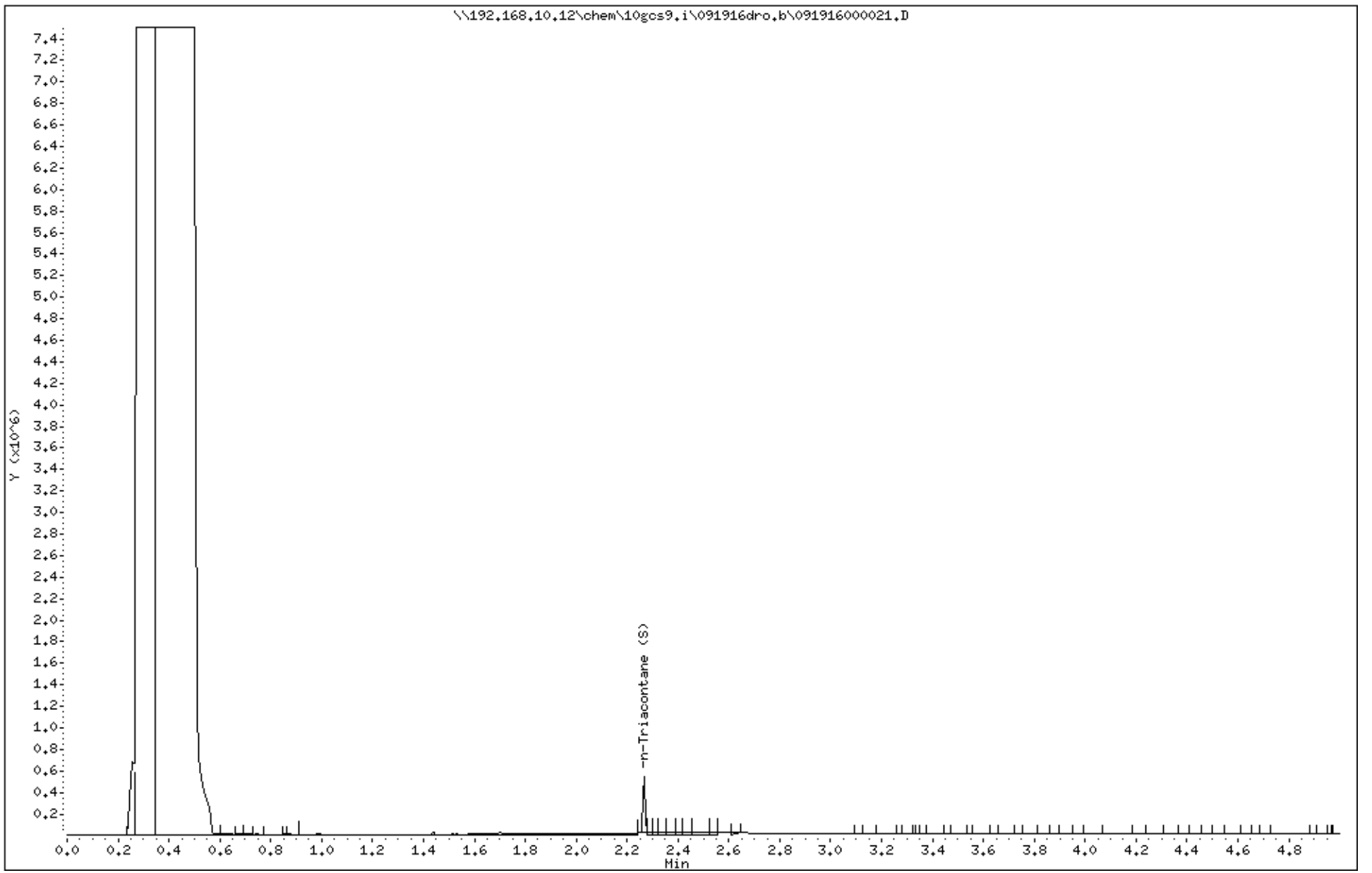
Sample Info: 10362320001

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000028.D

Date : 19-SEP-2016 10:43

Client ID: MW-9

Instrument: 10gcs9.i

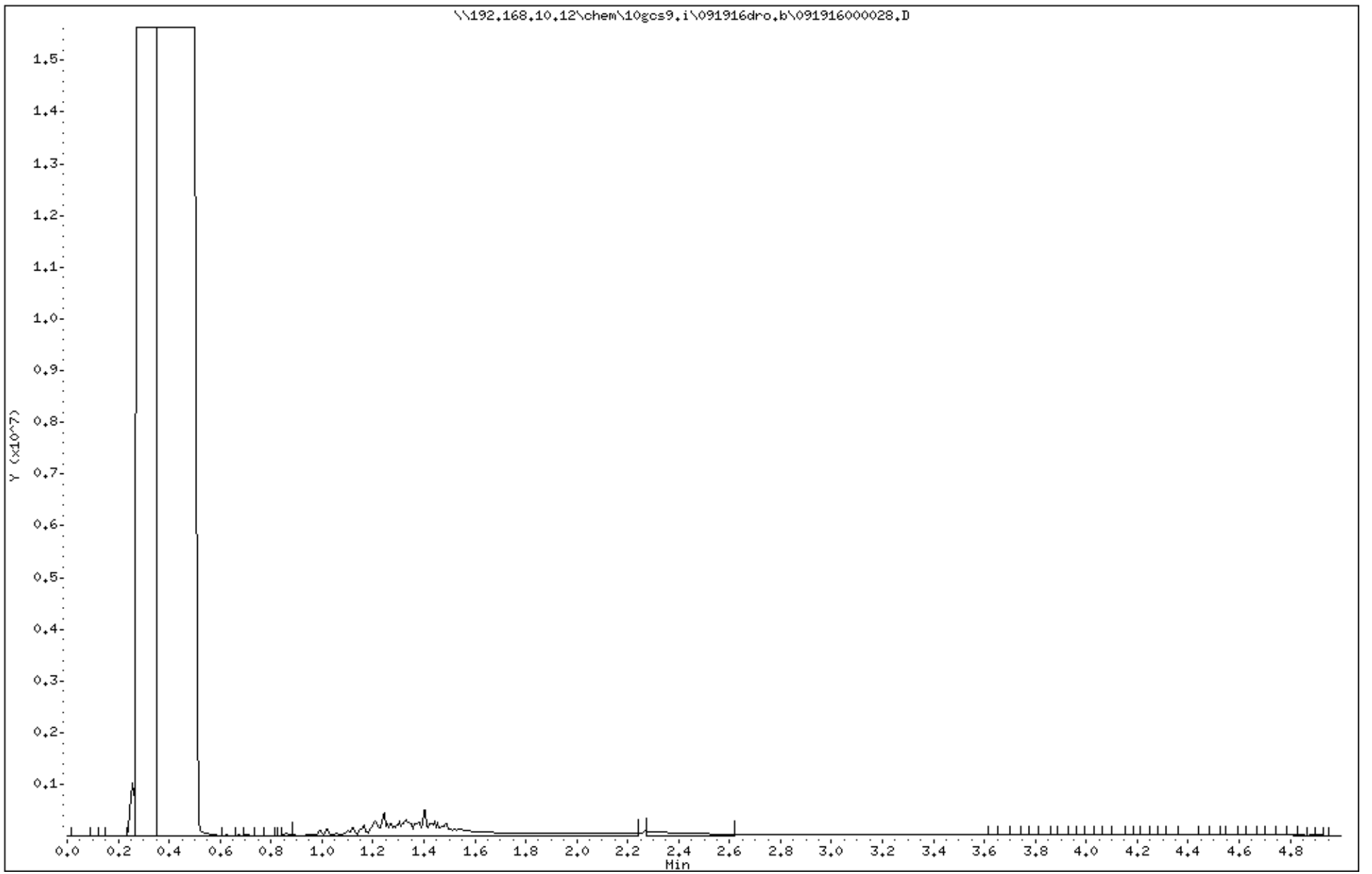
Sample Info: 10362320002X20

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000027.D

Date : 19-SEP-2016 10:36

Client ID: MW-10

Instrument: 10gcs9.i

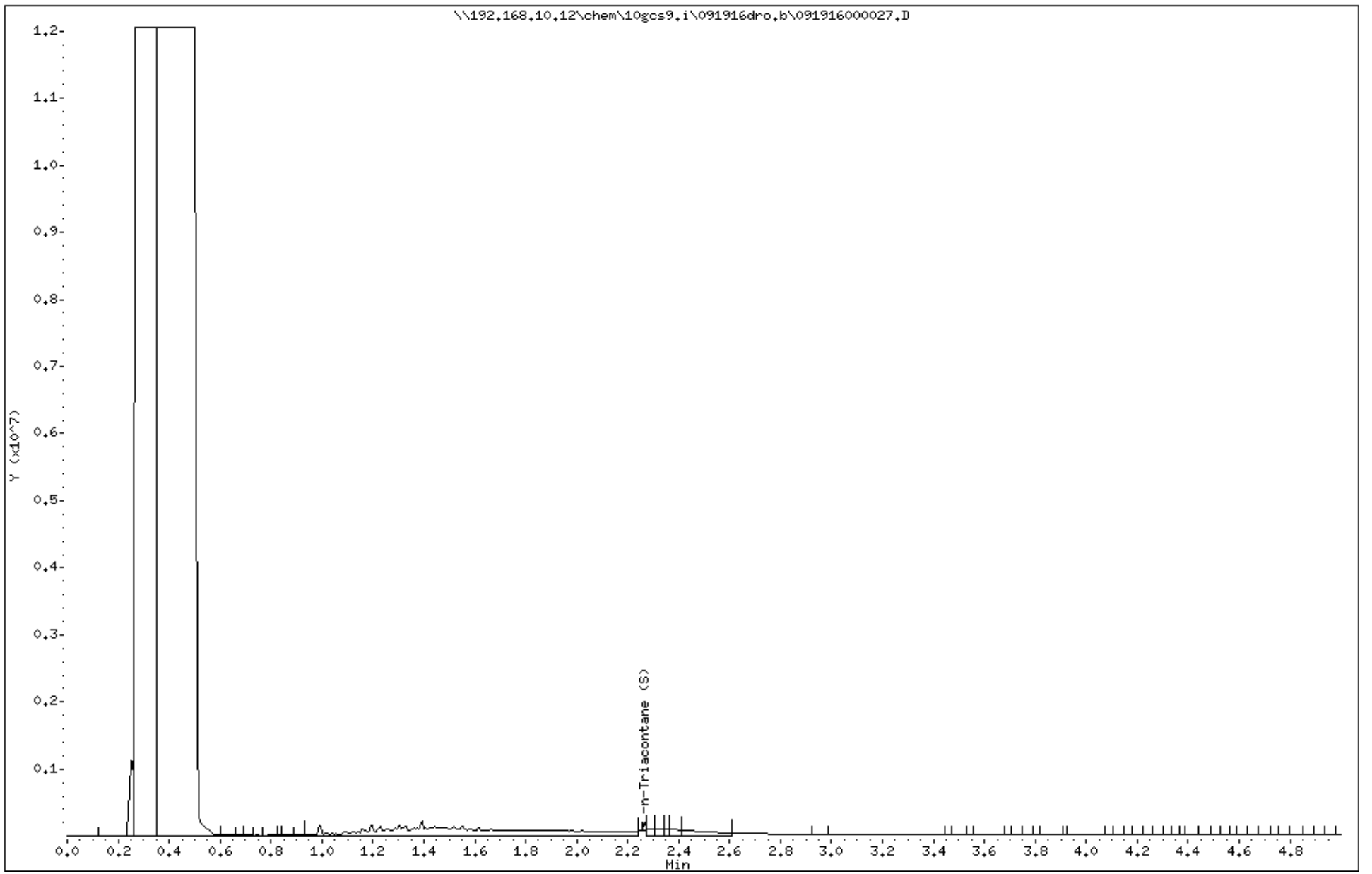
Sample Info: 10362320003X5

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000015.D

Date : 19-SEP-2016 09:04

Client ID: MW-16A

Instrument: 10gcs9.i

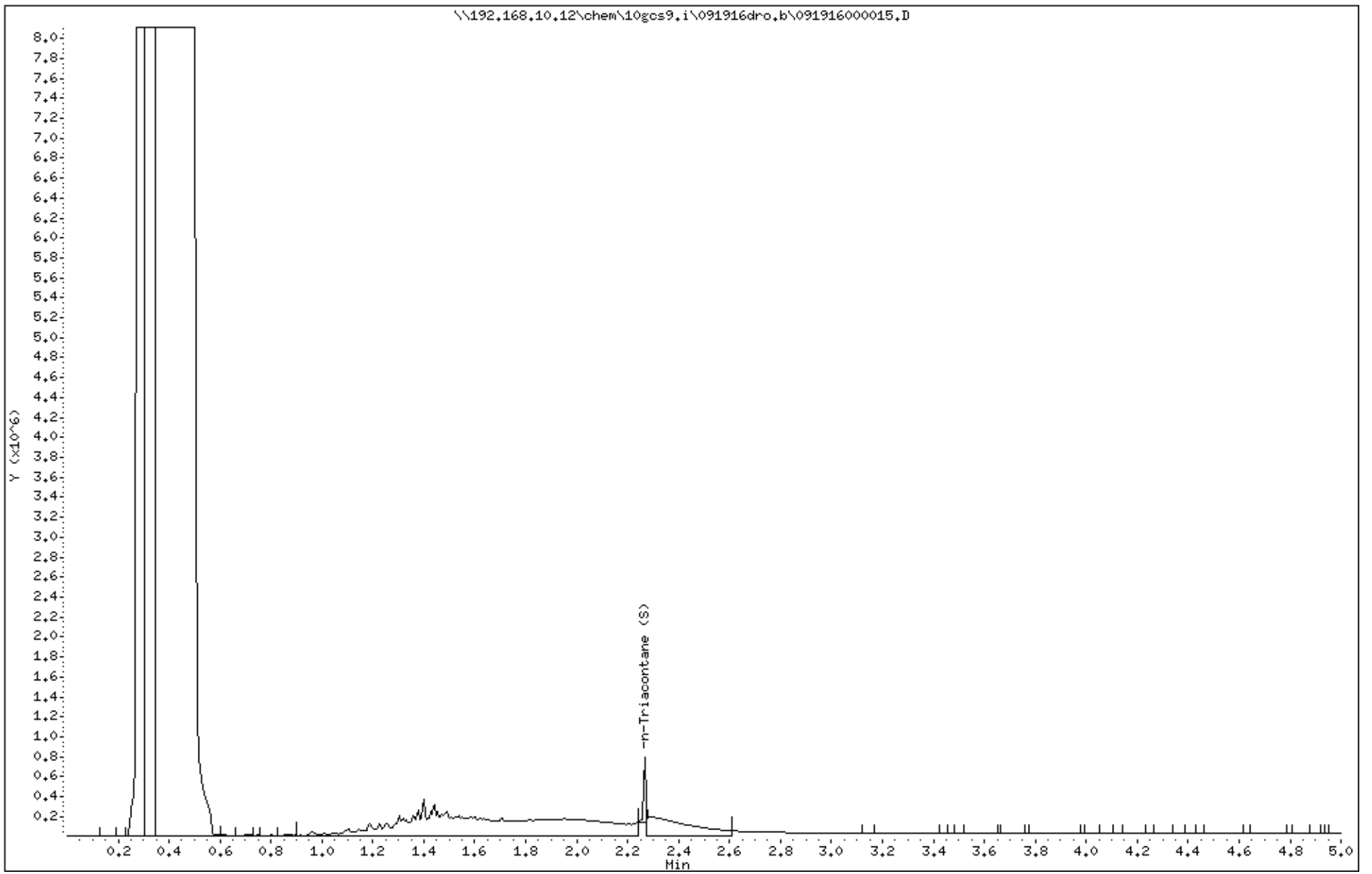
Sample Info: 10362320004

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000016.D

Date : 19-SEP-2016 09:11

Client ID: MW-16B

Instrument: 10gcs9.i

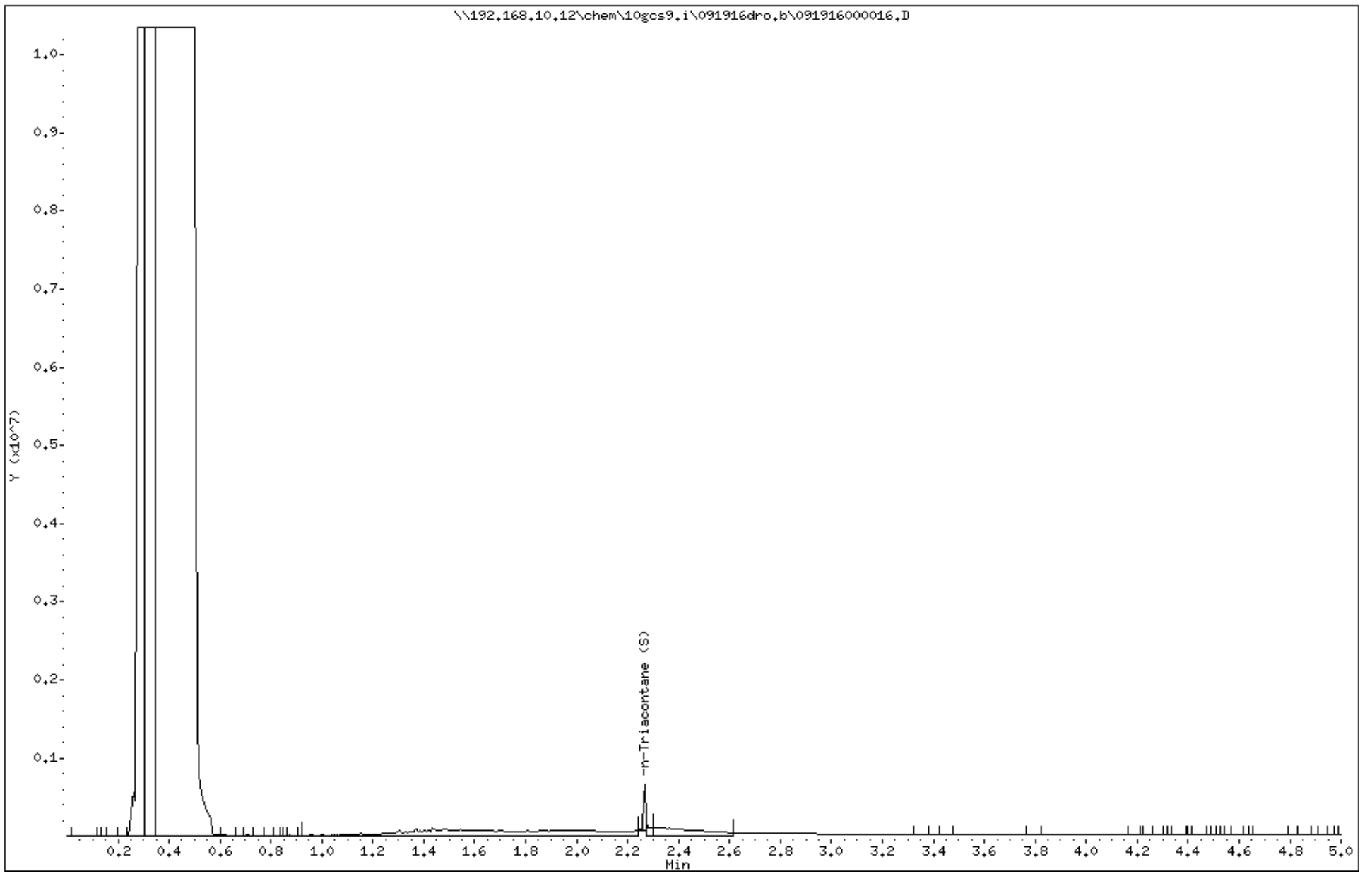
Sample Info: 10362320005

Volume Injected (uL): 1.0

Operator: MT

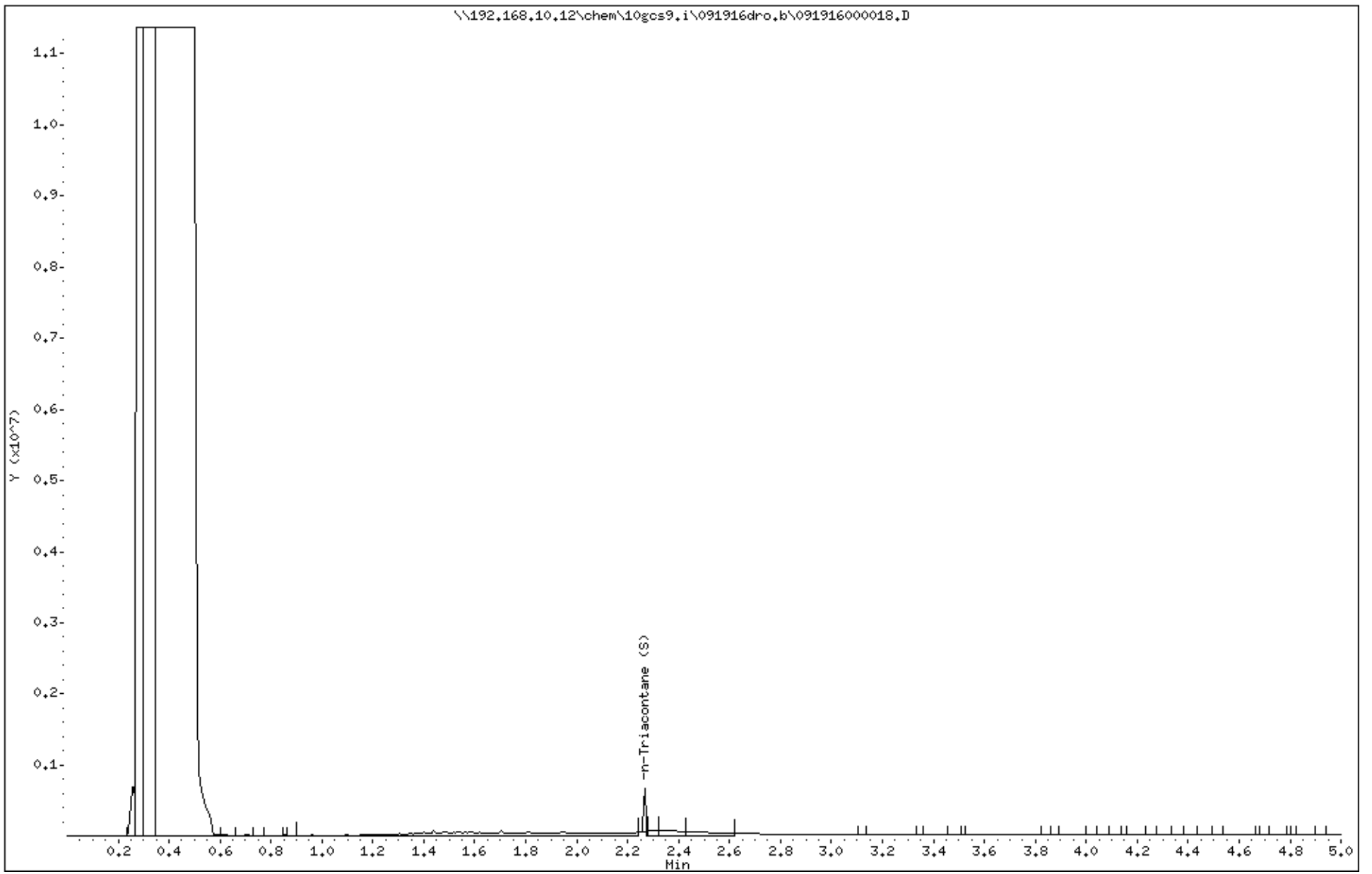
Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000018.D
Date : 19-SEP-2016 09:25
Client ID: MW-19
Sample Info: 10362320006
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs9.i
Operator: MT
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000022.D

Date : 19-SEP-2016 09:54

Client ID: MW-21

Instrument: 10gcs9.i

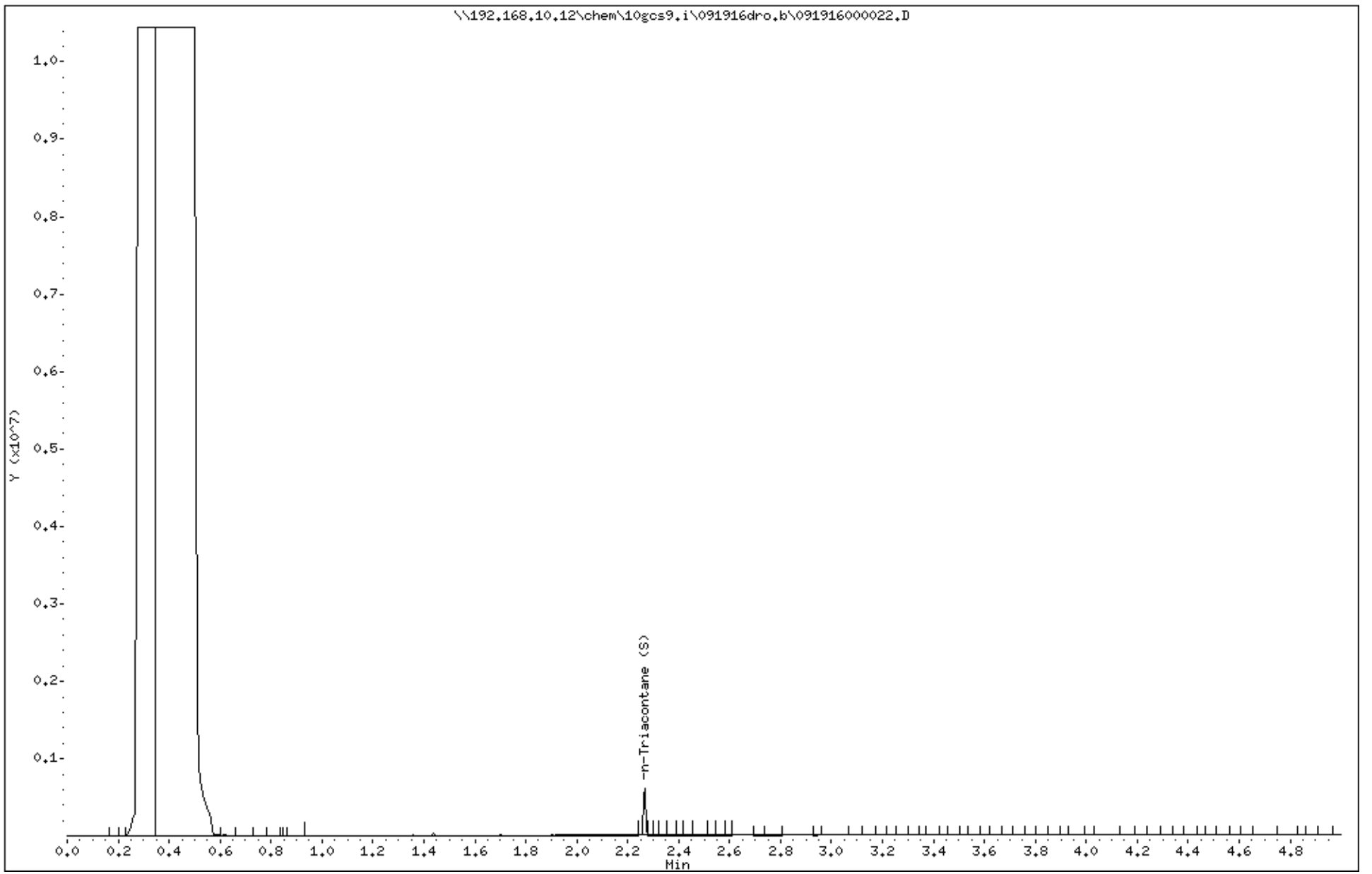
Sample Info: 10362320007

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000017.D

Date : 19-SEP-2016 09:18

Client ID: MW-22

Instrument: 10gcs9.i

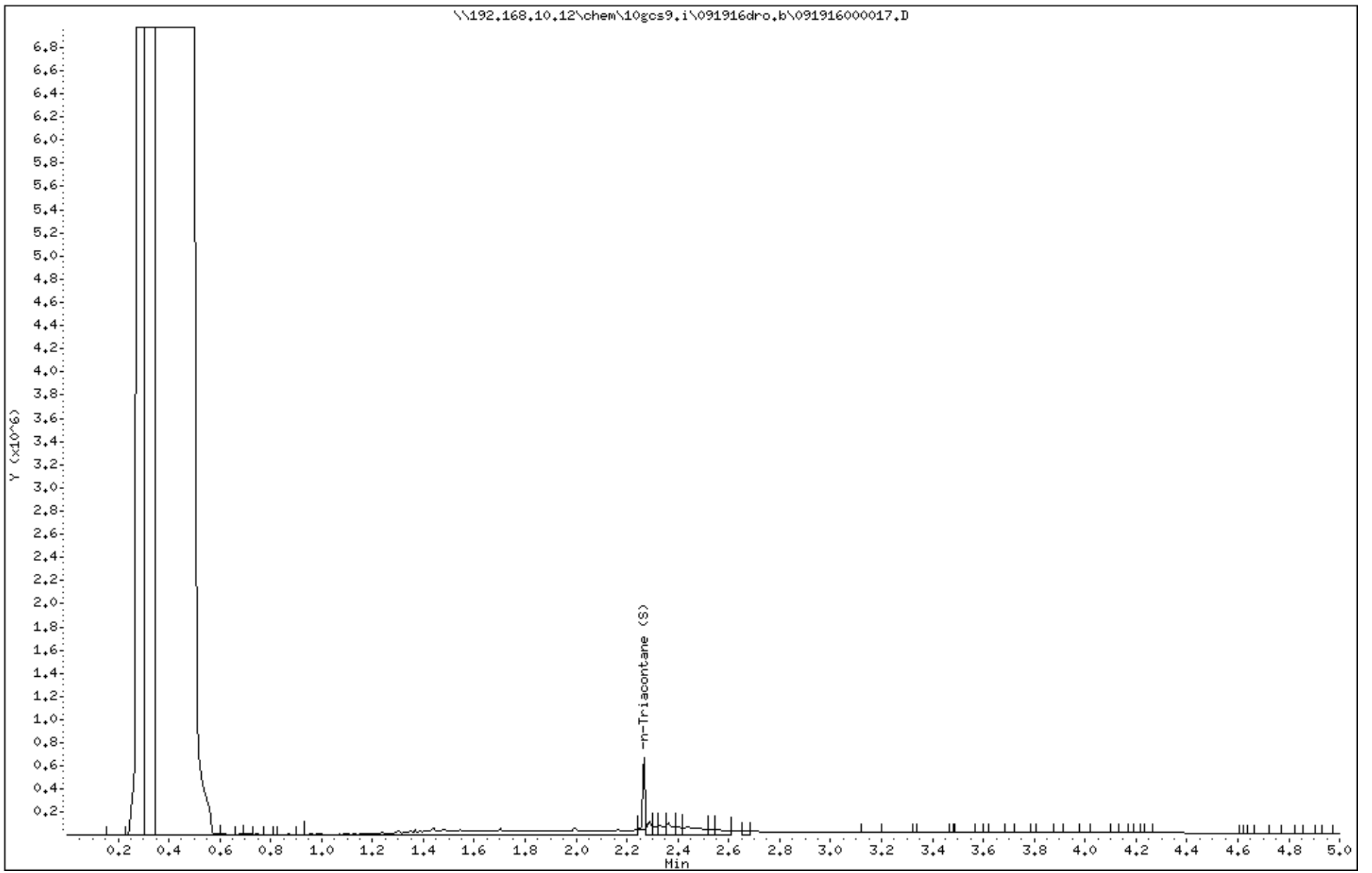
Sample Info: 10362320008

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000026.D

Date : 19-SEP-2016 10:29

Client ID: MW-23

Instrument: 10gcs9.i

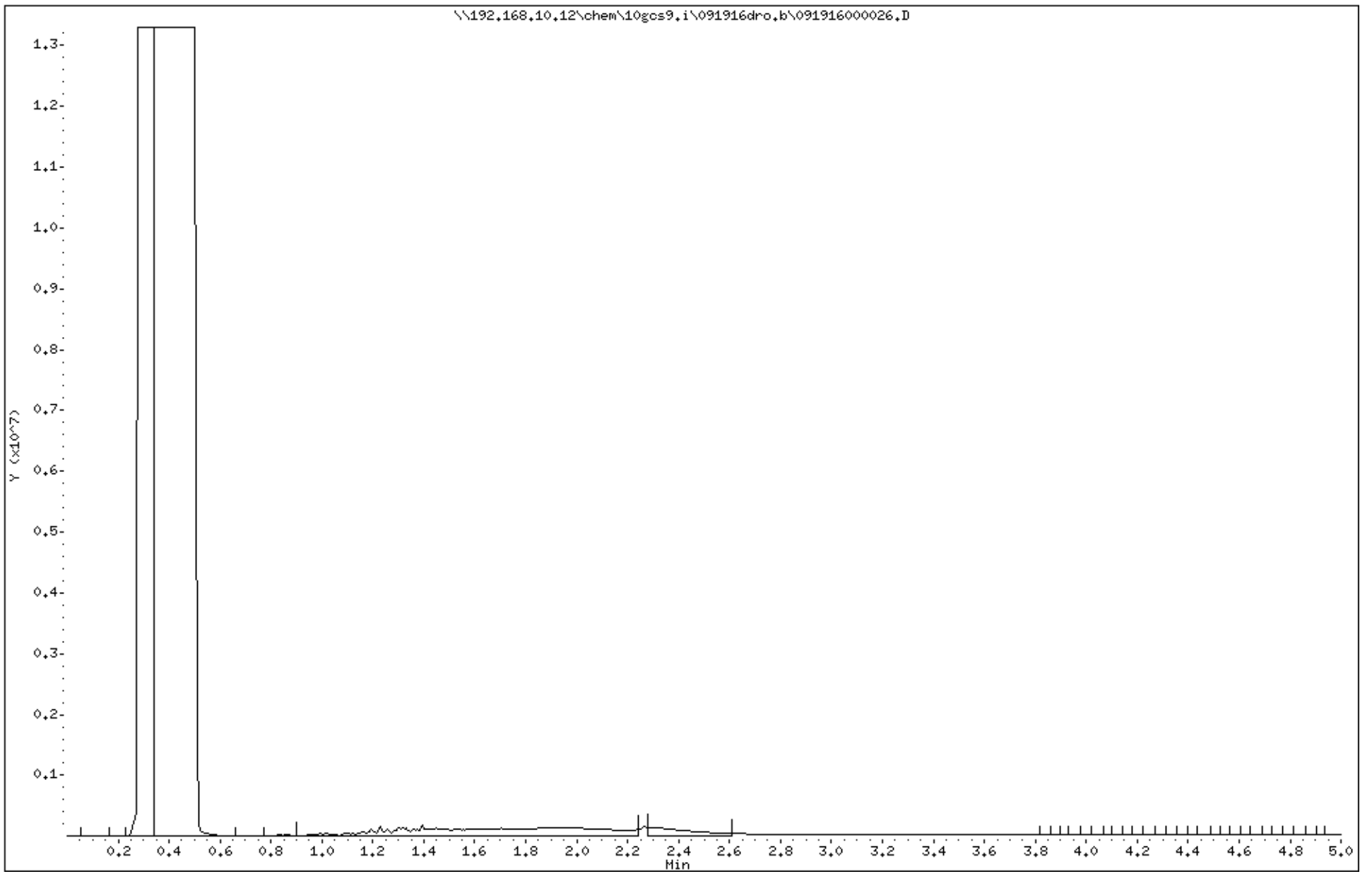
Sample Info: 10362320009X20

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000019.D

Date : 19-SEP-2016 09:33

Client ID: Field Blank

Instrument: 10gcs9.i

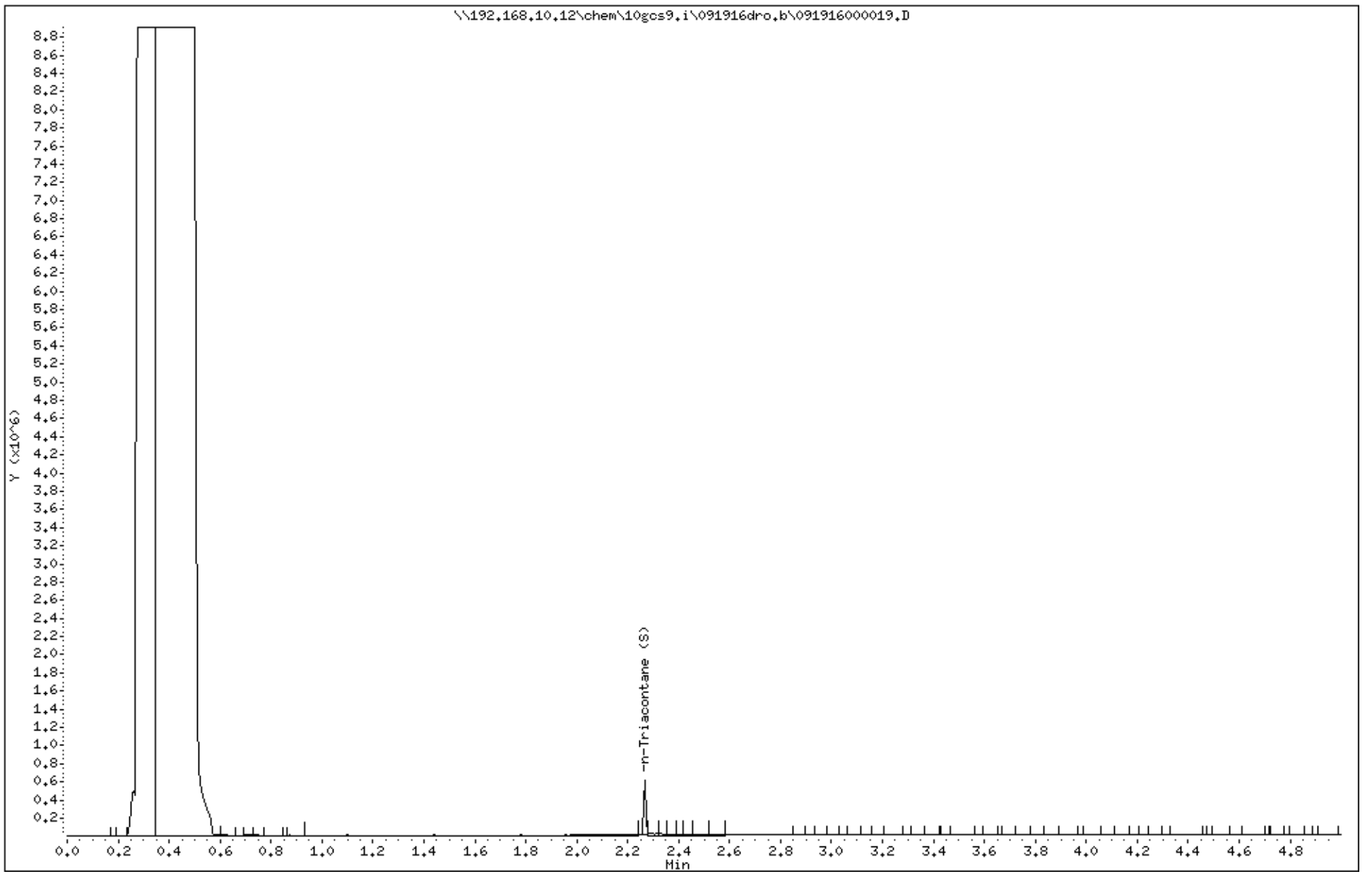
Sample Info: 10362320010

Volume Injected (uL): 1.0

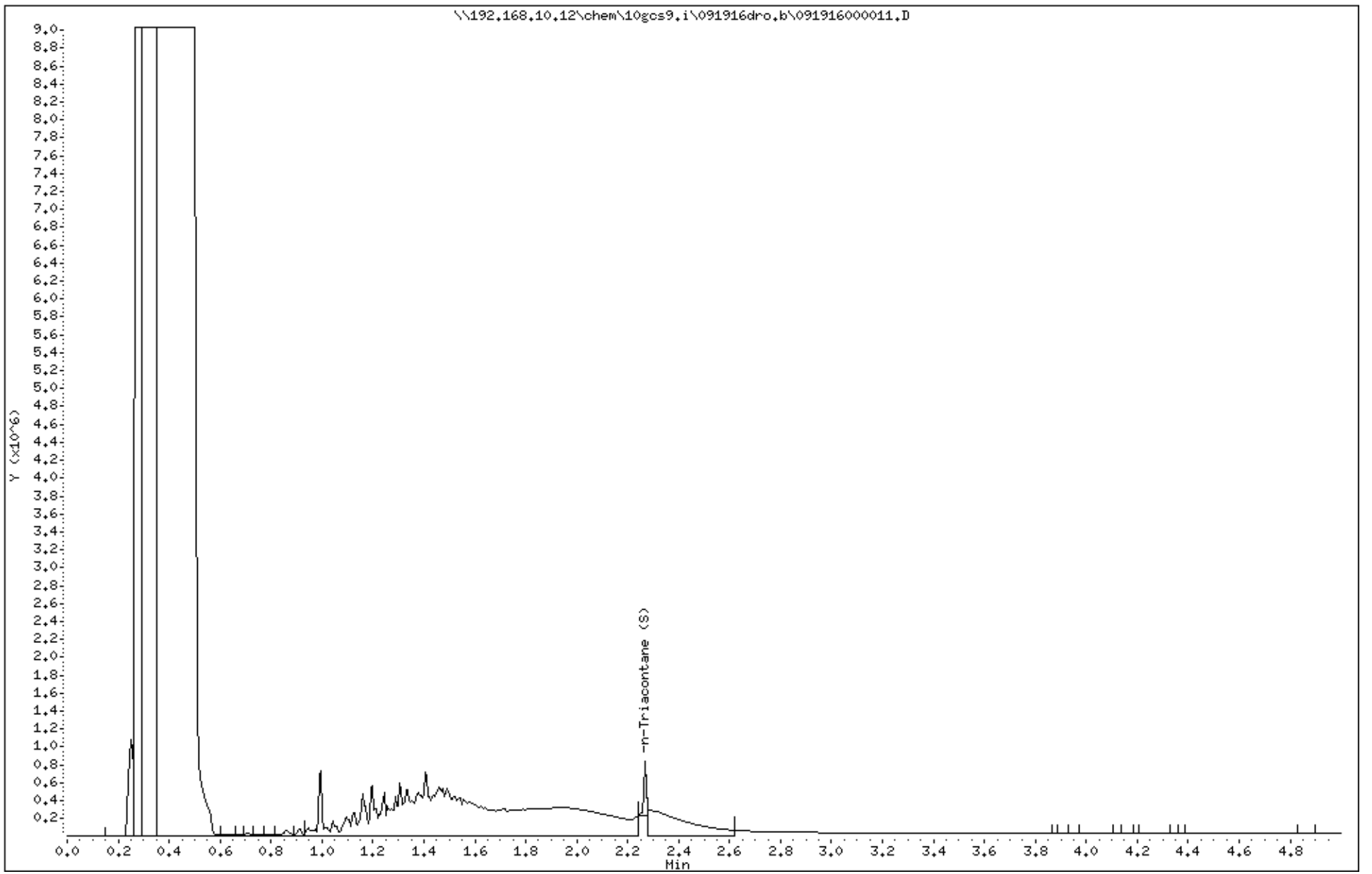
Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000011.D
Date : 19-SEP-2016 08:36
Client ID: Dup
Instrument: 10gcs9.i
Sample Info: 10362320011
Volume Injected (uL): 1.0
Operator: MT
Column phase: DB-5MS
Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000020.D

Date : 19-SEP-2016 09:40

Client ID: SCDW

Instrument: 10gcs9.i

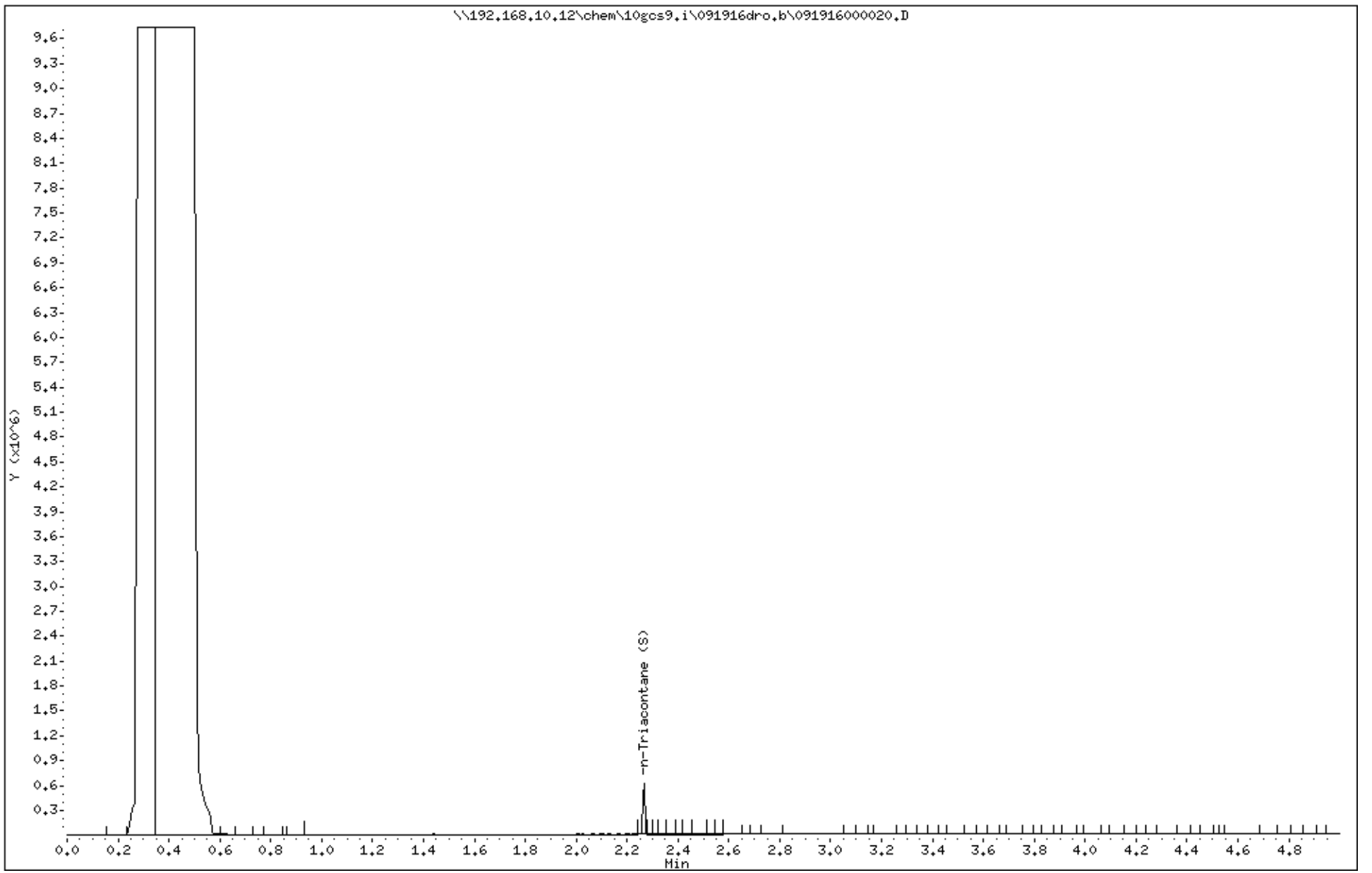
Sample Info: 10362320012

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000029.D

Date : 19-SEP-2016 10:50

Client ID: USGS-1A

Instrument: 10gcs9.i

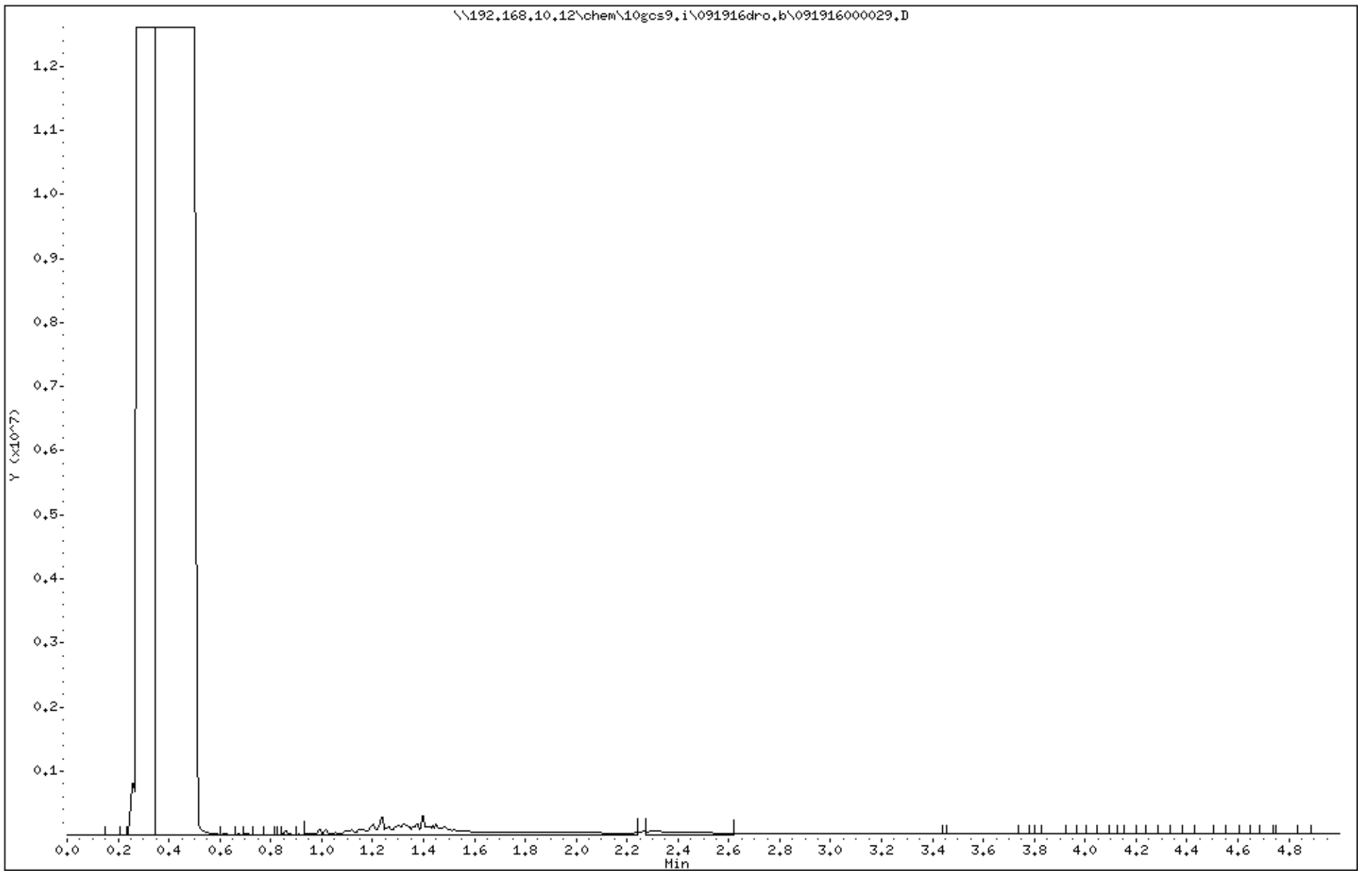
Sample Info: 10362320013X20

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000030.D

Date : 19-SEP-2016 10:57

Client ID: USGS-2A

Instrument: 10gcs9.i

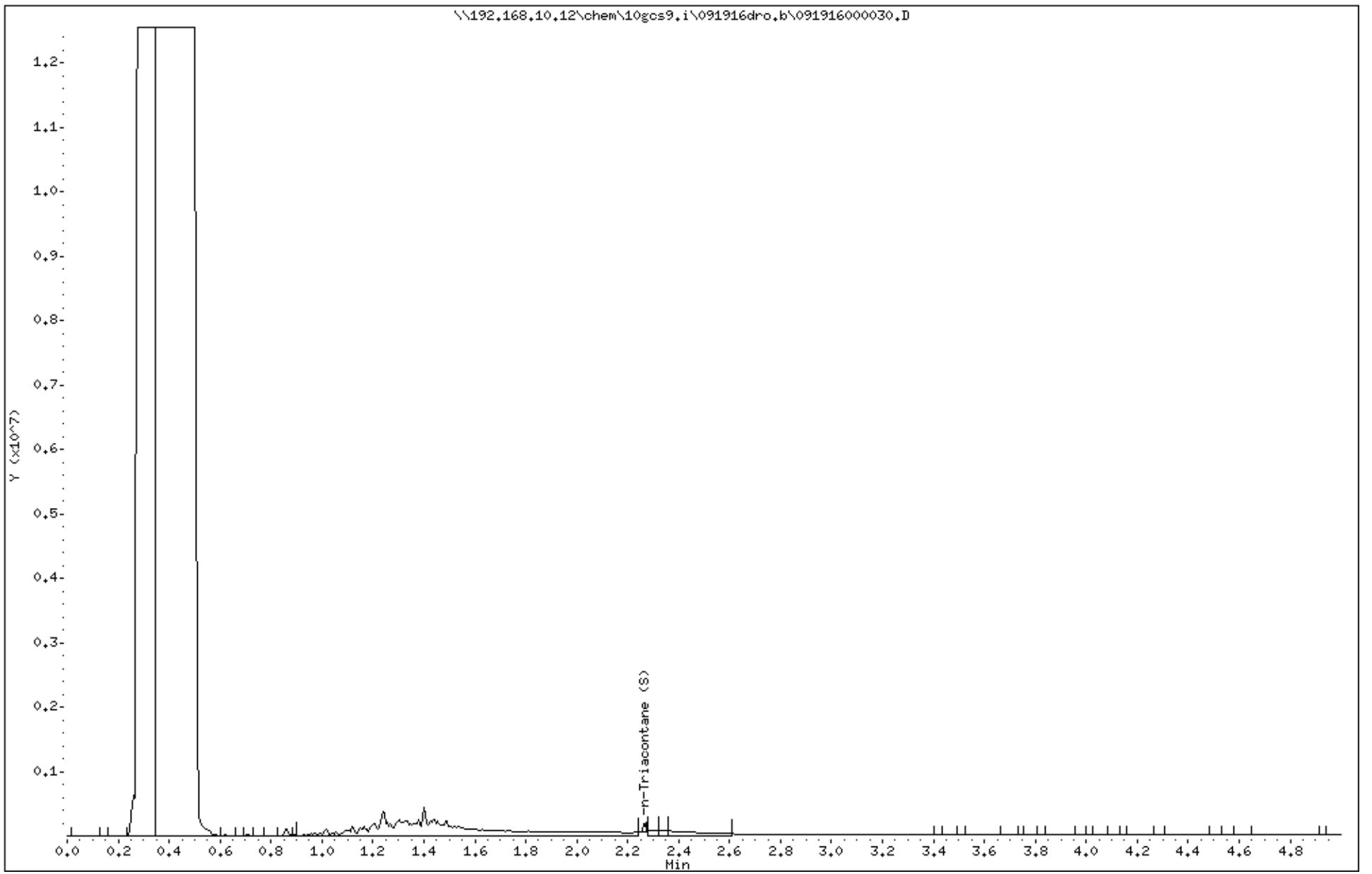
Sample Info: 10362320014X5

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000031.D

Date : 19-SEP-2016 11:04

Client ID: USGS-3A

Instrument: 10gcs9.i

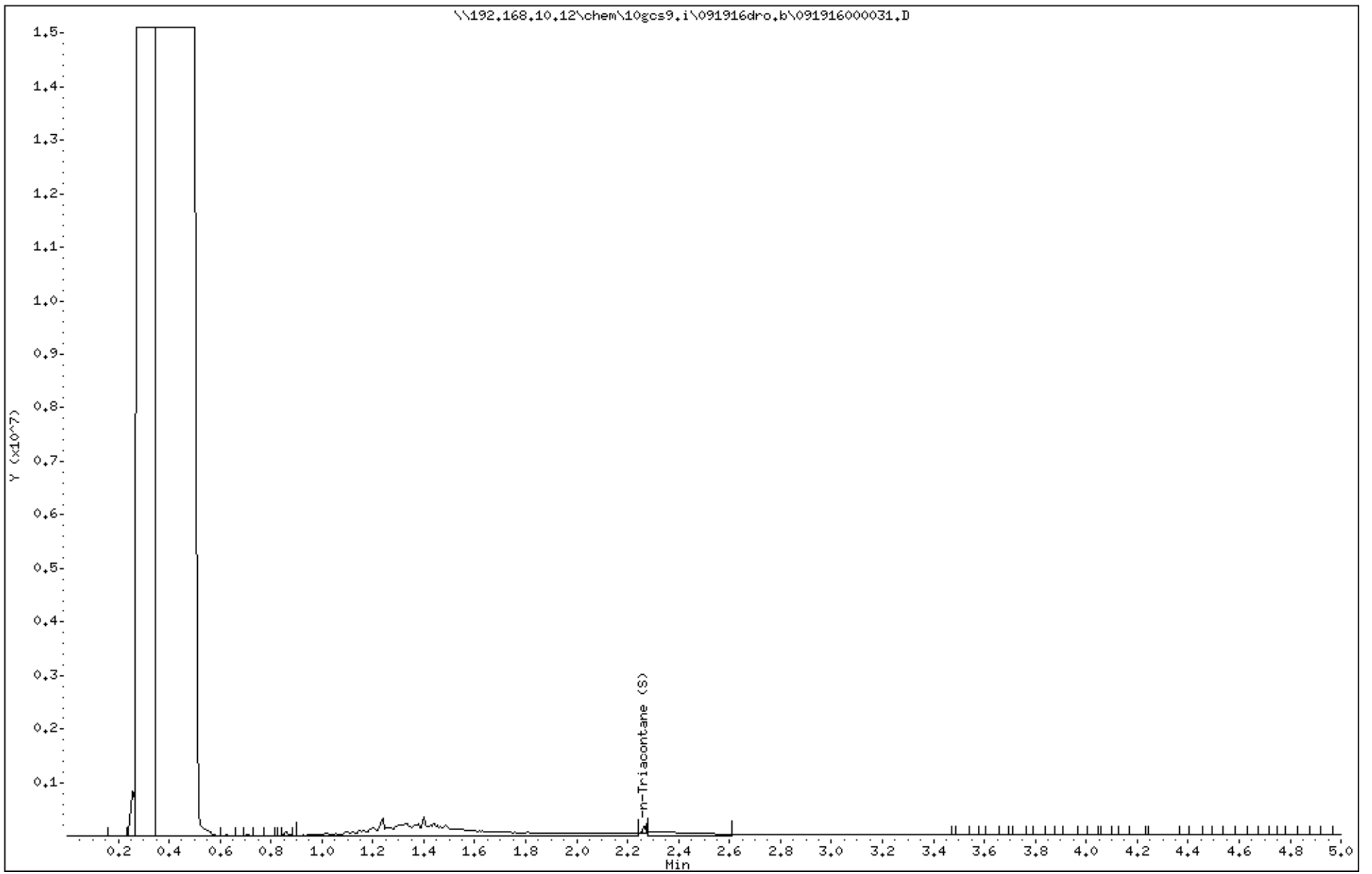
Sample Info: 10362320015X5

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\091916dro.b\091916000014.D

Date : 19-SEP-2016 08:57

Client ID: USGS-4A

Instrument: 10gcs9.i

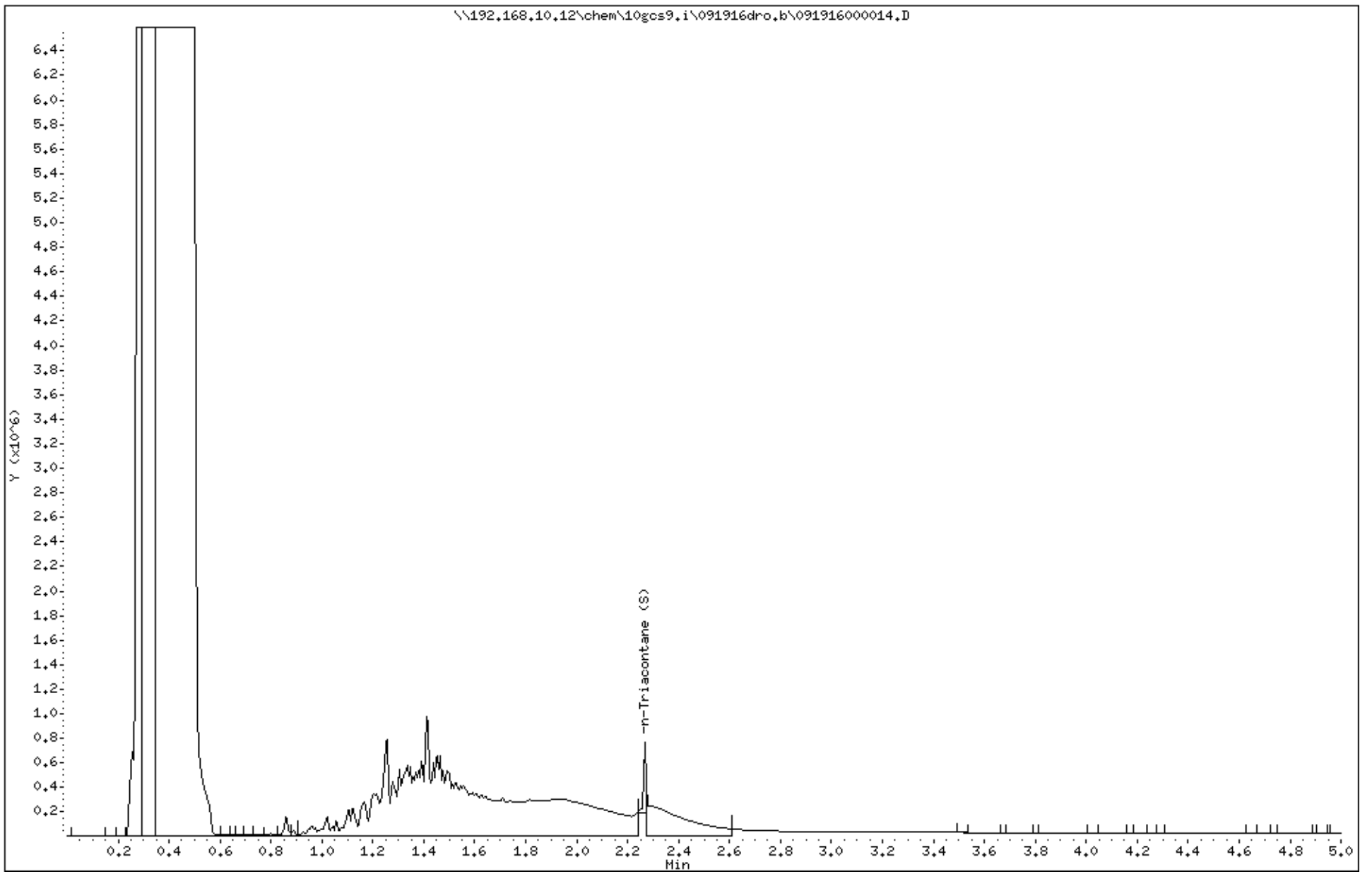
Sample Info: 10362320016

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\092016dro.b\092016000047.D

Date : 20-SEP-2016 12:29

Client ID: MW-9

Instrument: 10gcs9.i

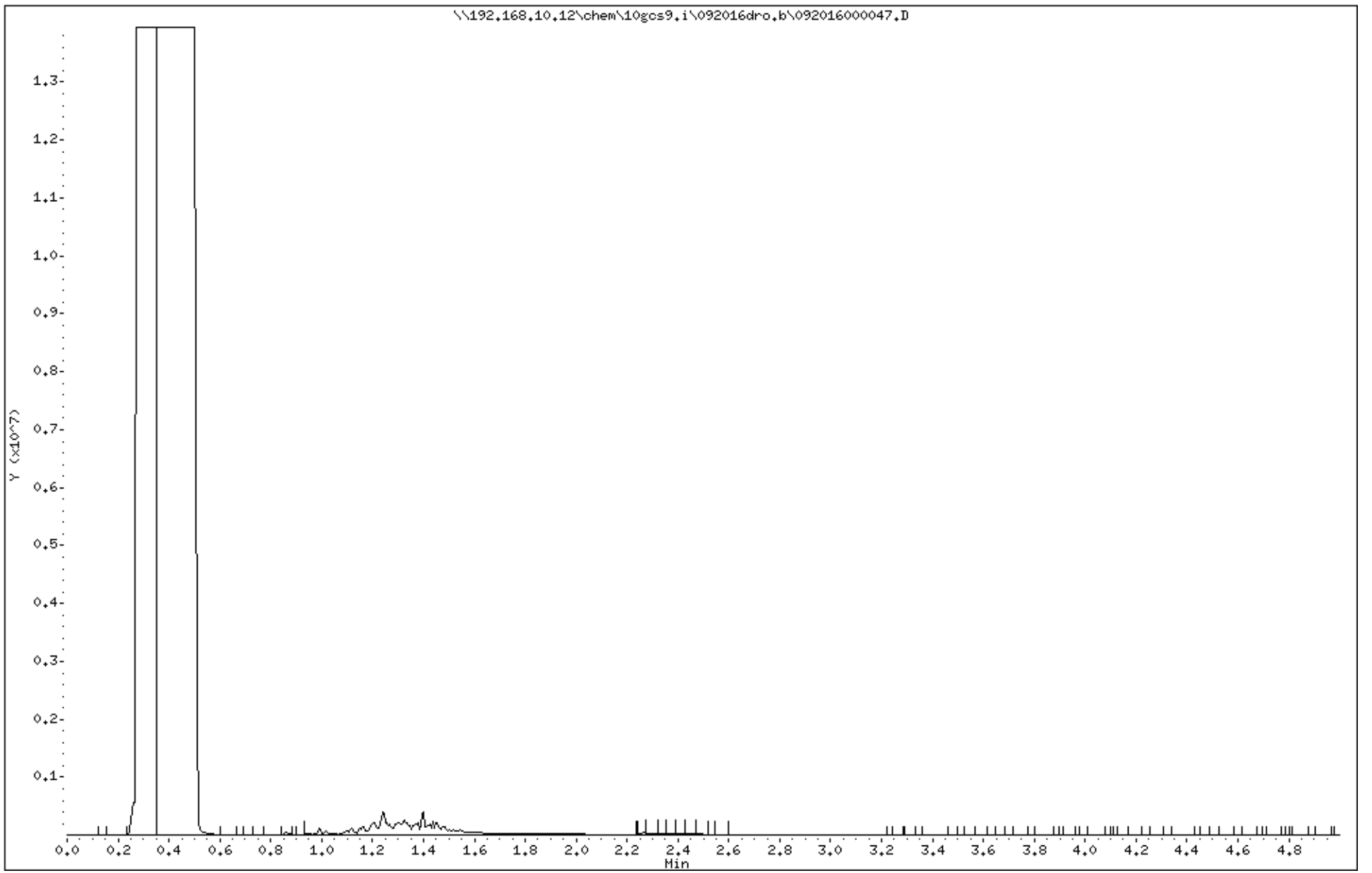
Sample Info: 10362320002X20

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\092016dro.b\092016000044.D

Date : 20-SEP-2016 12:08

Client ID: MW-10

Instrument: 10gcs9.i

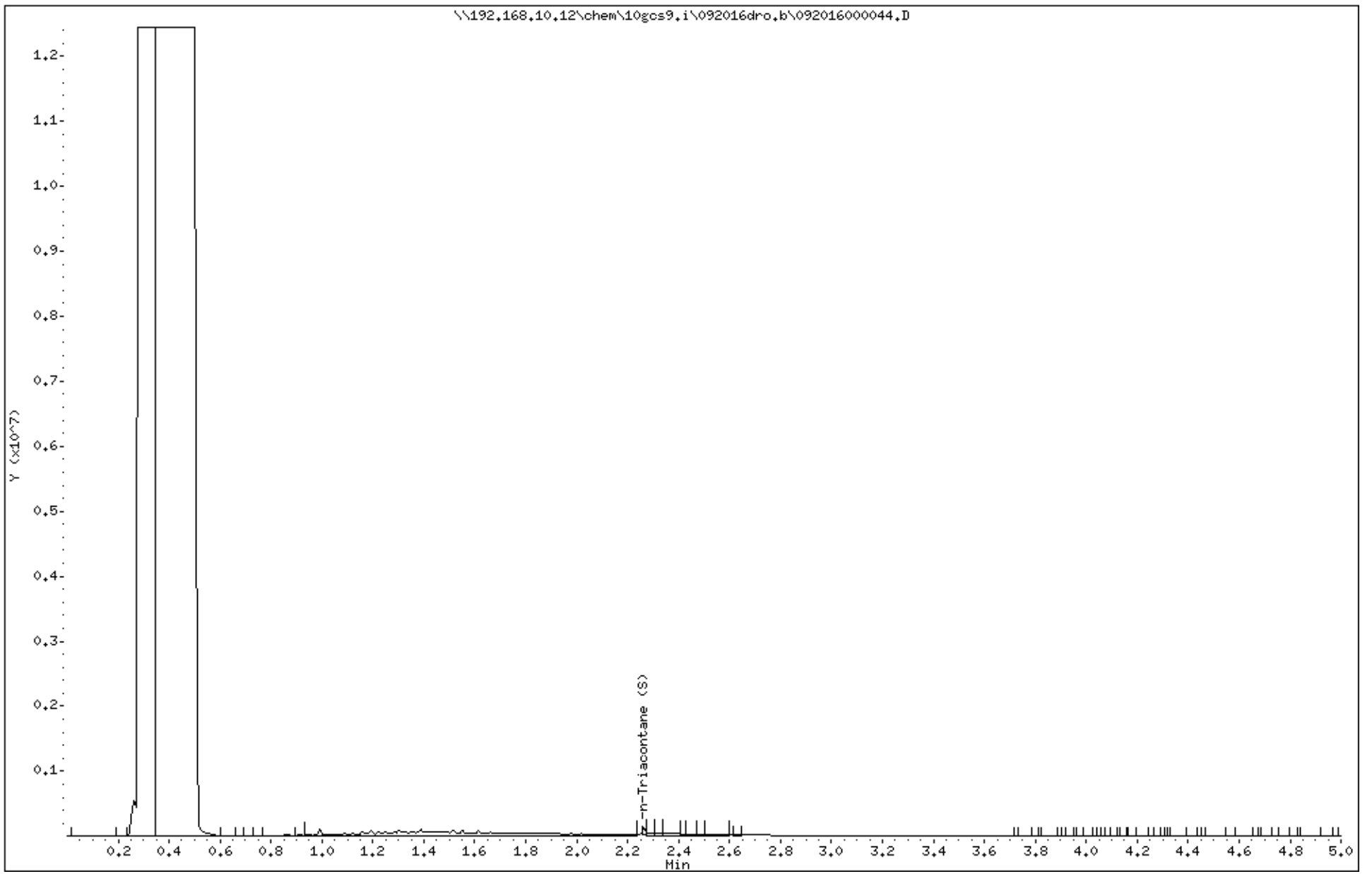
Sample Info: 10362320003X5

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\092016dro.b\092016000049.D

Date : 20-SEP-2016 12:43

Client ID: MW-16A

Instrument: 10gcs9.i

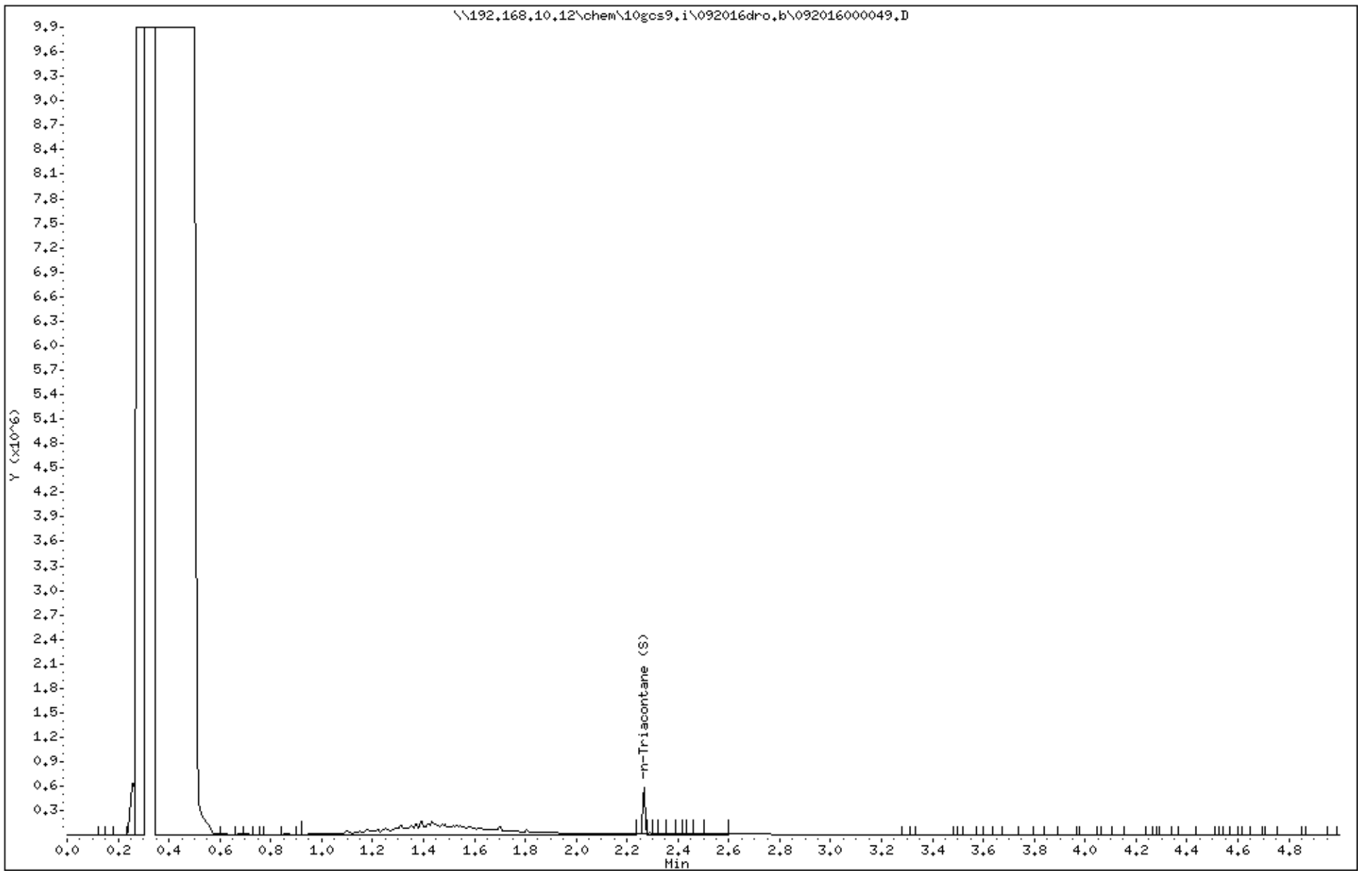
Sample Info: 10362320004

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\092016dro.b\092016000050.D

Date : 20-SEP-2016 12:50

Client ID: MW-16B

Instrument: 10gcs9.i

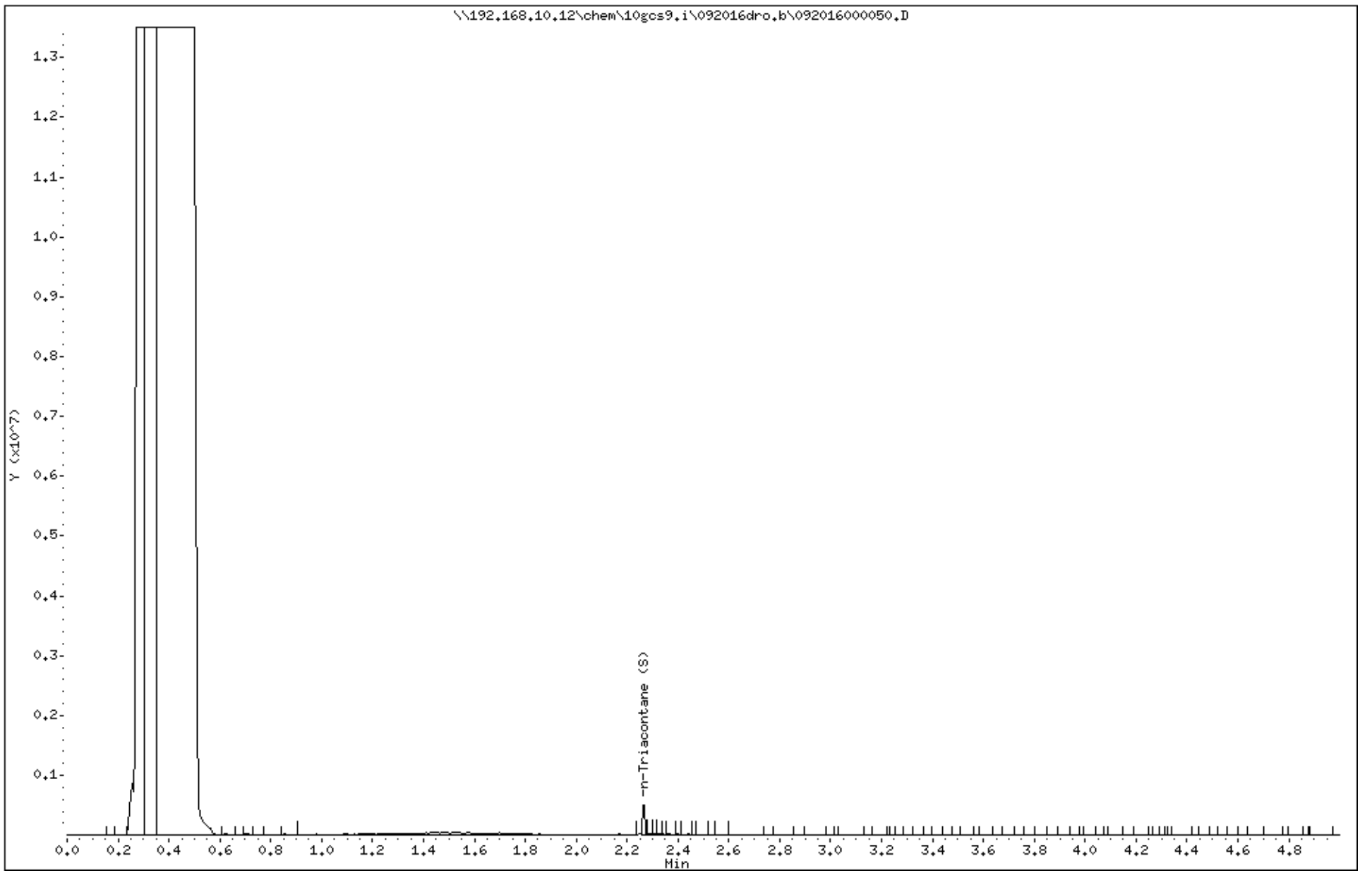
Sample Info: 10362320005

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\092016dro.b\092016000051.D

Date : 20-SEP-2016 12:57

Client ID: MW-19

Instrument: 10gcs9.i

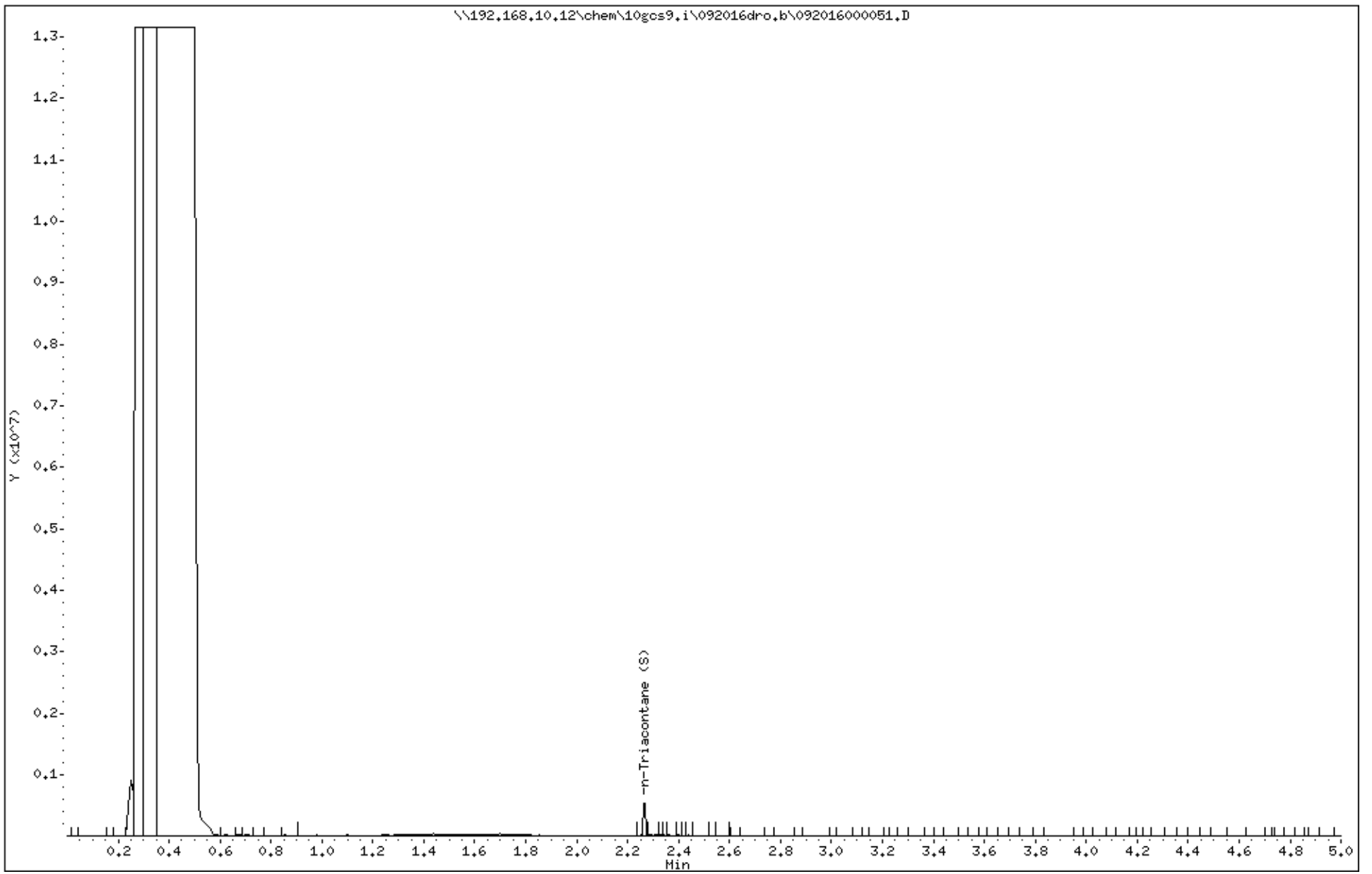
Sample Info: 10362320006

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\092016dro.b\092016000052.D

Date : 20-SEP-2016 13:04

Client ID: MW-22

Instrument: 10gcs9.i

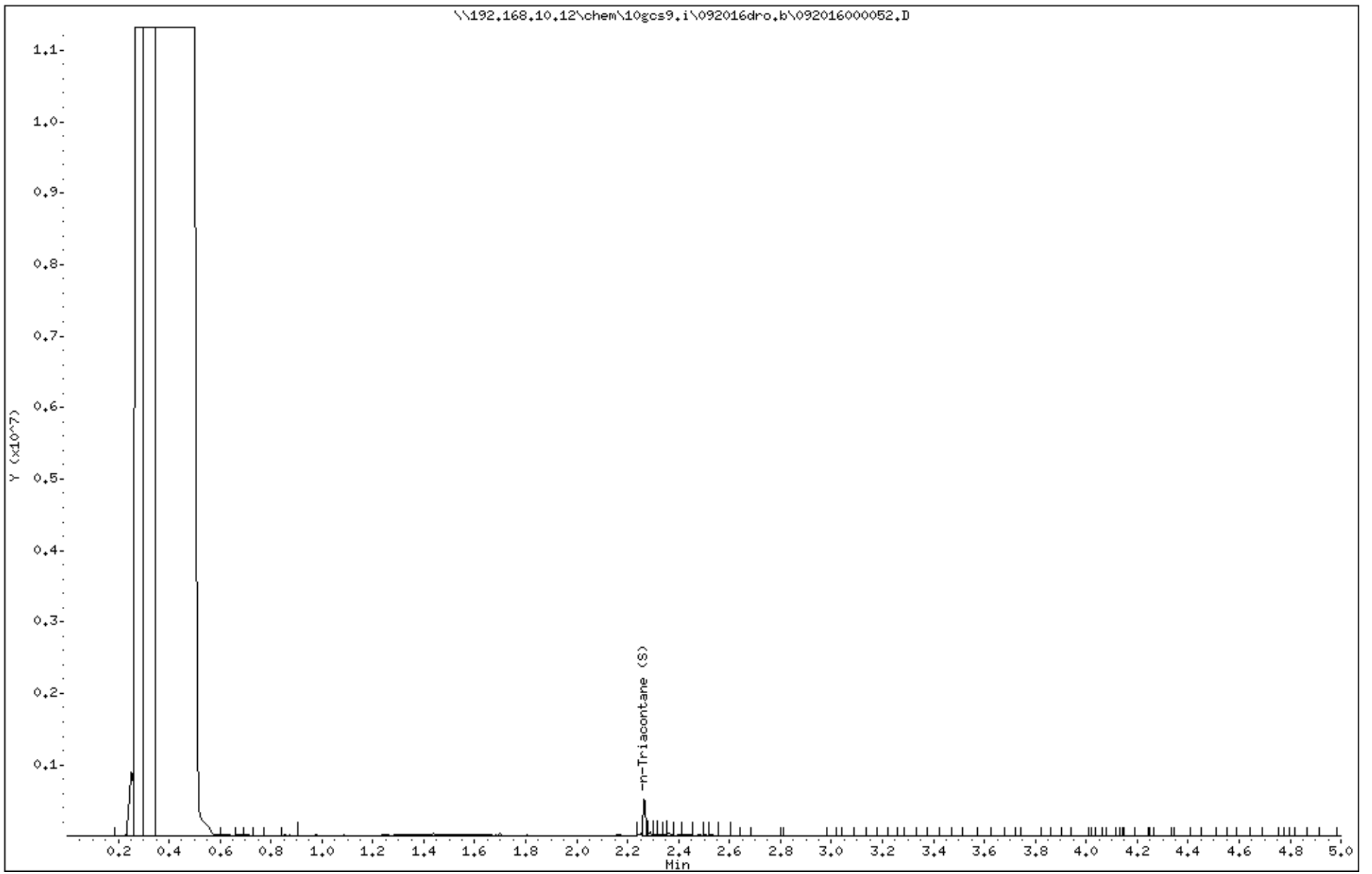
Sample Info: 10362320008

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\092016dro.b\092016000048.D

Date : 20-SEP-2016 12:36

Client ID: USGS-1A

Instrument: 10gcs9.i

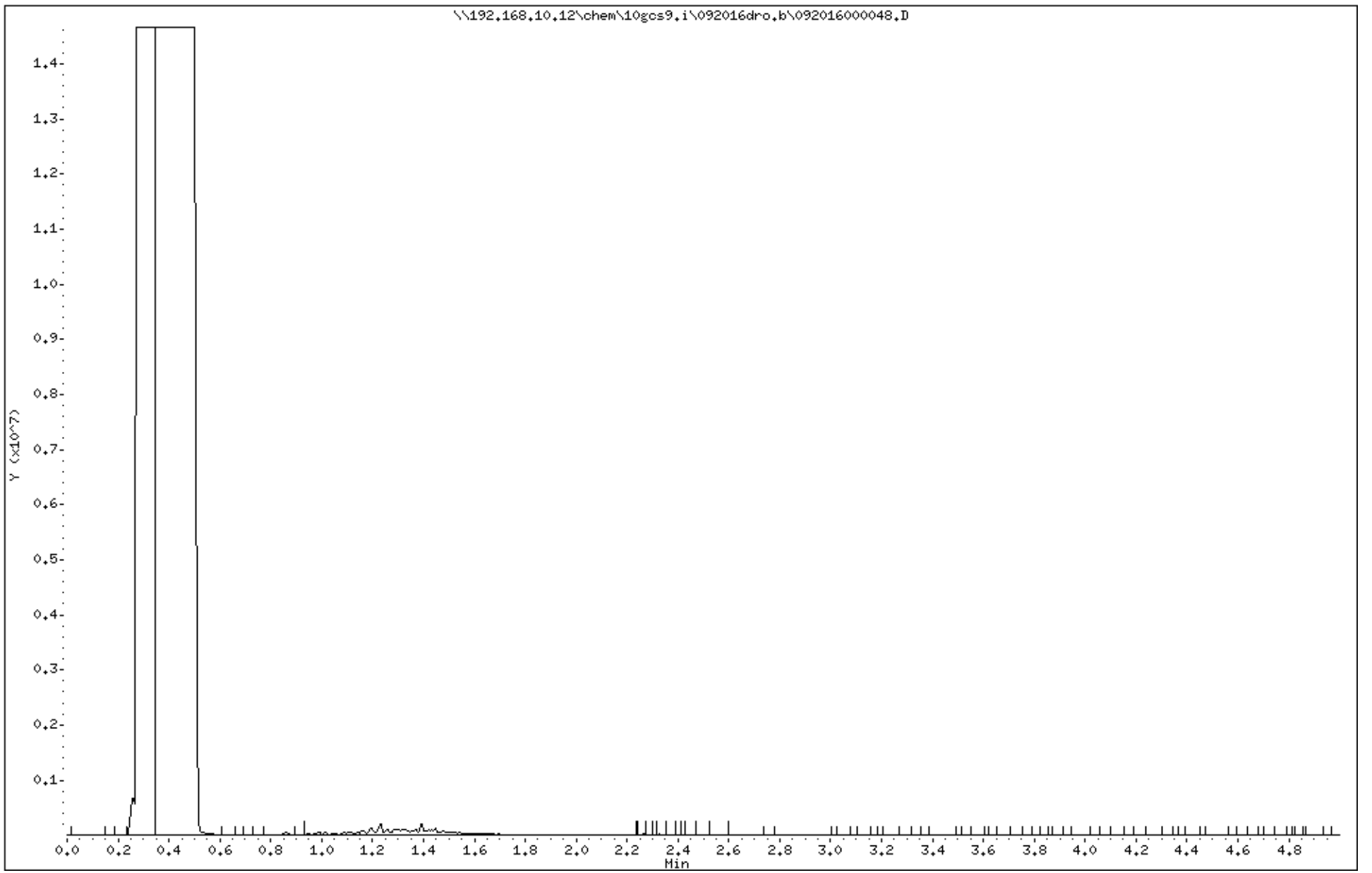
Sample Info: 10362320013X20

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\092016dro.b\092016000045.D

Date : 20-SEP-2016 12:15

Client ID: USGS-2A

Instrument: 10gcs9.i

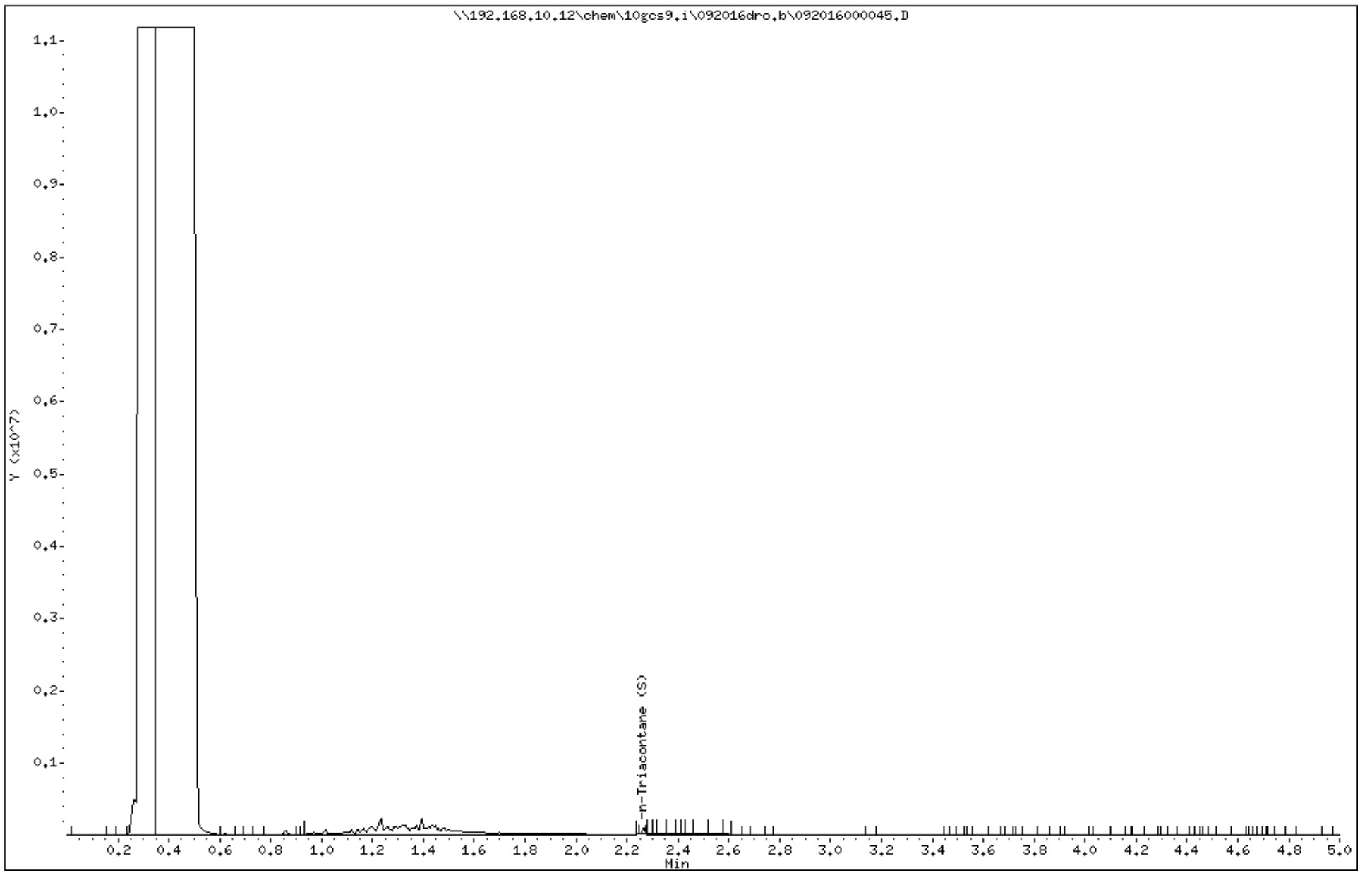
Sample Info: 10362320014X5

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\092016dro.b\092016000046.D

Date : 20-SEP-2016 12:22

Client ID: USGS-3A

Instrument: 10gcs9.i

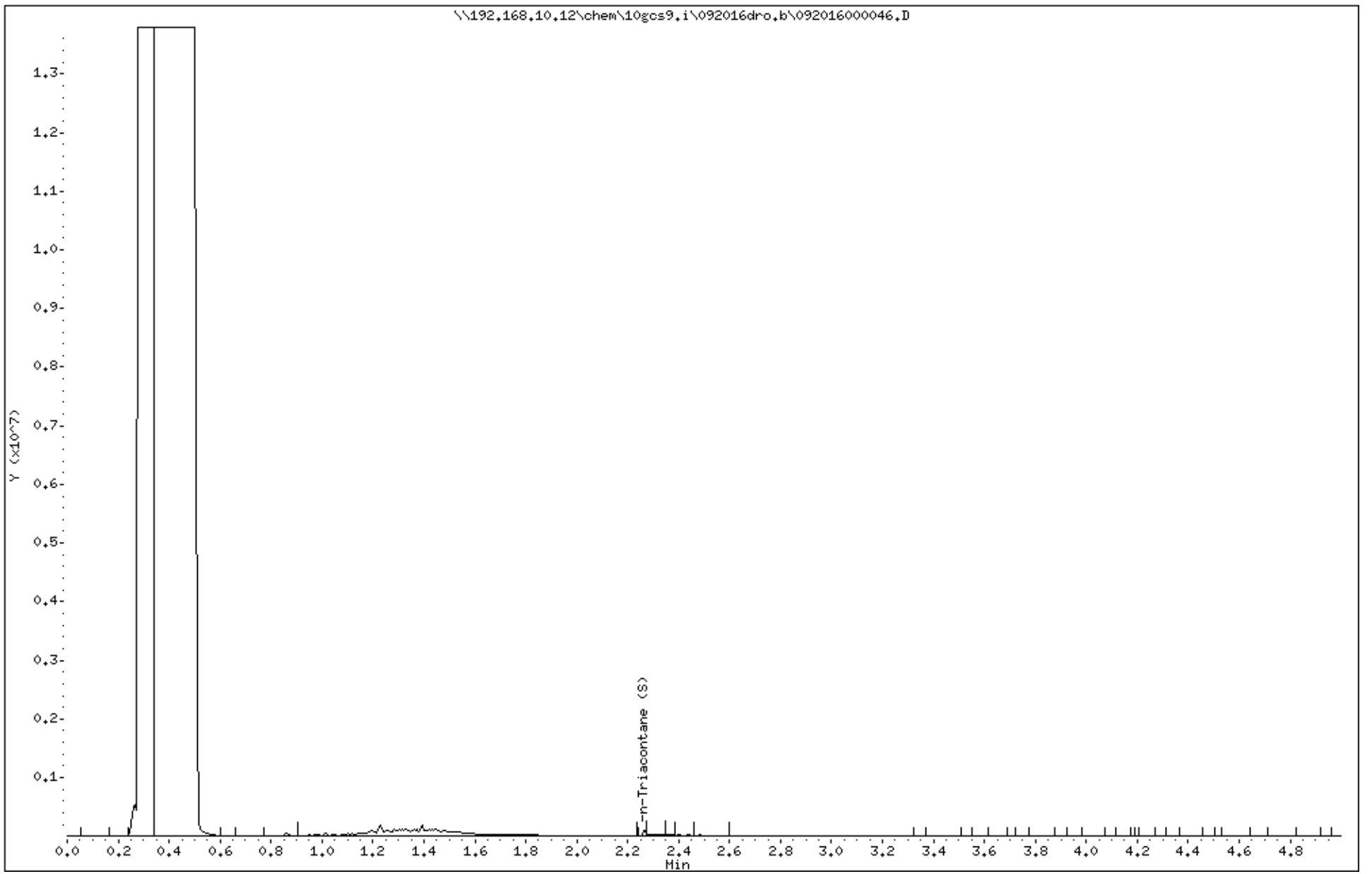
Sample Info: 10362320015X5

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Data File: \\192.168.10.12\chem\10gcs9.i\092016dro.b\092016000053.D

Date : 20-SEP-2016 13:11

Client ID: USGS-4A

Instrument: 10gcs9.i

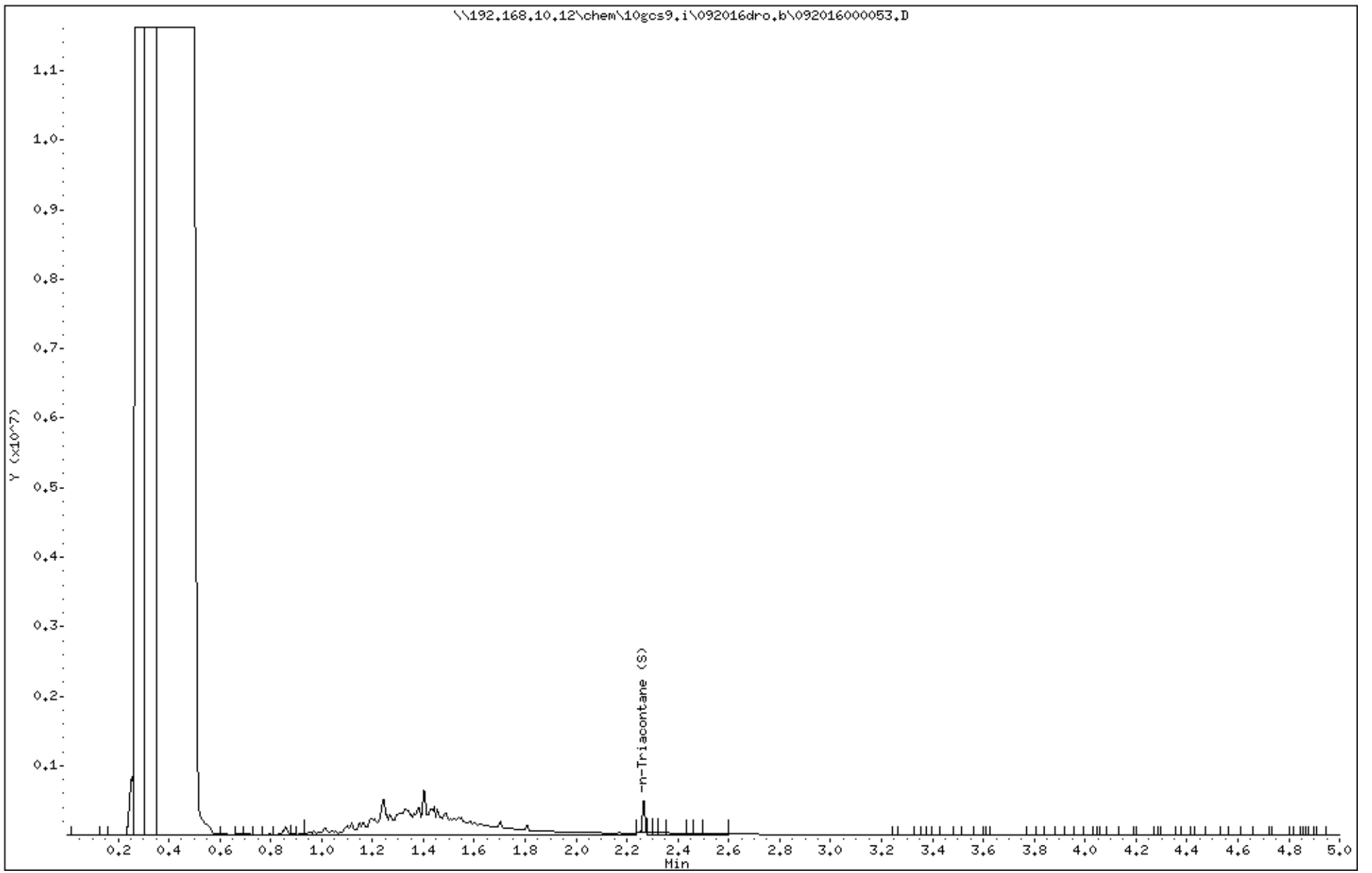
Sample Info: 10362320016

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.32



Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

December 27, 2016

Darin Albrecht
AECOM
Duluth Technology Village
11 E Superior St, Suite 260
Duluth, MN 55802

RE: Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Dear Darin Albrecht:

Enclosed are the analytical results for sample(s) received by the laboratory on December 21, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carol Davy
carol.davy@pacelabs.com
Project Manager

Enclosures

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
Alaska Certification UST-107
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10373969001	**MW8**	Water	12/20/16 12:55	12/21/16 10:50
10373969002	**MW9**	Water	12/20/16 11:05	12/21/16 10:50
10373969003	**MW10**	Water	12/20/16 15:35	12/21/16 10:50
10373969004	**MW-16A**	Water	12/20/16 12:55	12/21/16 10:50
10373969005	**MW-16B**	Water	12/20/16 12:10	12/21/16 10:50
10373969006	**MW-19**	Water	12/20/16 09:50	12/21/16 10:50
10373969007	**MW-21**	Water	12/20/16 10:40	12/21/16 10:50
10373969008	**MW-22**	Water	12/20/16 08:45	12/21/16 10:50
10373969009	**SCDW**	Water	12/20/16 15:05	12/21/16 10:50
10373969010	**USGS-1**	Water	12/20/16 11:45	12/21/16 10:50
10373969011	**USGS-2**	Water	12/20/16 13:35	12/21/16 10:50
10373969012	**USGS-3**	Water	12/20/16 14:35	12/21/16 10:50
10373969013	**USGS-4**	Water	12/20/16 14:00	12/21/16 10:50
10373969014	**Field Blank**	Water	12/20/16 13:00	12/21/16 10:50
10373969015	**Dup**	Water	12/20/16 00:00	12/21/16 10:50

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SAMPLE ANALYTE COUNT

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10373969001	**MW8**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10373969002	**MW9**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4
		WI MOD DRO	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10373969003	**MW10**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4
		WI MOD DRO	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10373969004	**MW-16A**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4
		WI MOD DRO	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10373969005	**MW-16B**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4
		WI MOD DRO	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10373969006	**MW-19**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4
		WI MOD DRO	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10373969007	**MW-21**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4

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SAMPLE ANALYTE COUNT

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10373969008	**MW-22**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4
		WI MOD DRO	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10373969009	**SCDW**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10373969010	**USGS-1**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4
		WI MOD DRO	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10373969011	**USGS-2**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4
		WI MOD DRO	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10373969012	**USGS-3**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4
		WI MOD DRO	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10373969013	**USGS-4**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4
		WI MOD DRO	MT	2
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1

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SAMPLE ANALYTE COUNT

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		ASTM D516	KEO	1
10373969014	**Field Blank**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1
10373969015	**Dup**	RSK 175	MJL	1
		Diesel Range Organics	JRH	4
		EPA 8260B	AH2	7
		SM 4500-NO3 H	DCL	1
		ASTM D516	KEO	1

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SUMMARY OF DETECTION

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
10373969001	**MW8**					
Diesel Range Organics	WDRO C10-C28	0.12	mg/L	0.11	12/24/16 18:42	
Diesel Range Organics	WDRO, Extended C10-C32	0.13	mg/L	0.11	12/24/16 18:42	
Diesel Range Organics	WDRO, Extended C10-C36	0.14	mg/L	0.11	12/24/16 18:42	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.16	mg/L	0.10	12/27/16 09:49	M1
ASTM D516	Sulfate	5.4	mg/L	2.5	12/23/16 10:42	
10373969002	**MW9**					
RSK 175	Methane	2360	ug/L	10.0	12/22/16 14:54	
Diesel Range Organics	WDRO C10-C28	14.1	mg/L	0.53	12/23/16 14:56	
Diesel Range Organics	WDRO, Extended C10-C32	14.6	mg/L	0.53	12/23/16 14:56	
Diesel Range Organics	WDRO, Extended C10-C36	15.3	mg/L	0.53	12/23/16 14:56	
WI MOD DRO	WDRO C10-C28	4.9	mg/L	0.53	12/27/16 10:31	
EPA 8260B	Benzene	70.2	ug/L	1.0	12/22/16 13:51	
10373969003	**MW10**					
RSK 175	Methane	12300	ug/L	10.0	12/22/16 15:02	
Diesel Range Organics	WDRO C10-C28	24.6	mg/L	1.0	12/23/16 15:20	
Diesel Range Organics	WDRO, Extended C10-C32	25.2	mg/L	1.0	12/23/16 15:20	
Diesel Range Organics	WDRO, Extended C10-C36	26.7	mg/L	1.0	12/23/16 15:20	
WI MOD DRO	WDRO C10-C28	9.2	mg/L	1.0	12/27/16 10:46	
EPA 8260B	Benzene	3.6	ug/L	1.0	12/22/16 15:35	
EPA 8260B	Ethylbenzene	1.8	ug/L	1.0	12/22/16 15:35	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.12	mg/L	0.10	12/27/16 09:55	
10373969004	**MW-16A**					
RSK 175	Methane	514	ug/L	10.0	12/22/16 15:10	
Diesel Range Organics	WDRO C10-C28	2.1	mg/L	0.10	12/23/16 13:21	
Diesel Range Organics	WDRO, Extended C10-C32	2.2	mg/L	0.10	12/23/16 13:21	
Diesel Range Organics	WDRO, Extended C10-C36	2.3	mg/L	0.10	12/23/16 13:21	
WI MOD DRO	WDRO C10-C28	0.59	mg/L	0.10	12/27/16 10:54	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.10	mg/L	0.10	12/27/16 09:59	
10373969005	**MW-16B**					
RSK 175	Methane	48.0	ug/L	10.0	12/22/16 15:19	
Diesel Range Organics	WDRO C10-C28	0.67	mg/L	0.10	12/23/16 13:05	
Diesel Range Organics	WDRO, Extended C10-C32	0.76	mg/L	0.10	12/23/16 13:05	
Diesel Range Organics	WDRO, Extended C10-C36	0.90	mg/L	0.10	12/23/16 13:05	
WI MOD DRO	WDRO C10-C28	0.14	mg/L	0.10	12/27/16 11:02	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.15	mg/L	0.10	12/27/16 10:00	
ASTM D516	Sulfate	6.1	mg/L	2.5	12/23/16 10:45	
10373969006	**MW-19**					
RSK 175	Methane	62.8	ug/L	10.0	12/22/16 15:27	
Diesel Range Organics	WDRO C10-C28	0.53	mg/L	0.10	12/24/16 18:50	
Diesel Range Organics	WDRO, Extended C10-C32	0.56	mg/L	0.10	12/24/16 18:50	
Diesel Range Organics	WDRO, Extended C10-C36	0.59	mg/L	0.10	12/24/16 18:50	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.17	mg/L	0.10	12/27/16 10:00	
10373969007	**MW-21**					
Diesel Range Organics	WDRO, Extended C10-C32	0.11	mg/L	0.10	12/24/16 18:58	

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SUMMARY OF DETECTION

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
10373969007	**MW-21**					
Diesel Range Organics	WDRO, Extended C10-C36	0.12	mg/L	0.10	12/24/16 18:58	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	1.2	mg/L	0.10	12/27/16 10:03	
ASTM D516	Sulfate	7.2	mg/L	2.5	12/23/16 10:48	
10373969008	**MW-22**					
Diesel Range Organics	WDRO C10-C28	0.30	mg/L	0.10	12/24/16 19:06	
Diesel Range Organics	WDRO, Extended C10-C32	0.32	mg/L	0.10	12/24/16 19:06	
Diesel Range Organics	WDRO, Extended C10-C36	0.34	mg/L	0.10	12/24/16 19:06	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.18	mg/L	0.10	12/27/16 10:04	
ASTM D516	Sulfate	4.8	mg/L	2.5	12/23/16 10:48	
10373969009	**SCDW**					
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.84	mg/L	0.10	12/27/16 10:04	
ASTM D516	Sulfate	2.5	mg/L	2.5	12/23/16 10:48	
10373969010	**USGS-1**					
RSK 175	Methane	514	ug/L	10.0	12/22/16 16:33	
Diesel Range Organics	WDRO C10-C28	19.4	mg/L	0.54	12/23/16 15:04	
Diesel Range Organics	WDRO, Extended C10-C32	19.9	mg/L	0.54	12/23/16 15:04	
Diesel Range Organics	WDRO, Extended C10-C36	20.7	mg/L	0.54	12/23/16 15:04	
WI MOD DRO	WDRO C10-C28	7.5	mg/L	0.54	12/27/16 10:39	
EPA 8260B	Benzene	49.8	ug/L	1.0	12/22/16 17:36	
ASTM D516	Sulfate	3.7	mg/L	2.5	12/23/16 10:48	
10373969011	**USGS-2**					
RSK 175	Methane	476	ug/L	10.0	12/22/16 16:49	
Diesel Range Organics	WDRO C10-C28	7.1	mg/L	0.21	12/23/16 14:48	
Diesel Range Organics	WDRO, Extended C10-C32	7.3	mg/L	0.21	12/23/16 14:48	
Diesel Range Organics	WDRO, Extended C10-C36	7.6	mg/L	0.21	12/23/16 14:48	
WI MOD DRO	WDRO C10-C28	2.7	mg/L	0.21	12/27/16 10:23	
EPA 8260B	Benzene	11.2	ug/L	1.0	12/22/16 12:59	
10373969012	**USGS-3**					
RSK 175	Methane	696	ug/L	10.0	12/22/16 16:57	
Diesel Range Organics	WDRO C10-C28	1.7	mg/L	0.10	12/23/16 12:49	
Diesel Range Organics	WDRO, Extended C10-C32	1.9	mg/L	0.10	12/23/16 12:49	
Diesel Range Organics	WDRO, Extended C10-C36	2.0	mg/L	0.10	12/23/16 12:49	
WI MOD DRO	WDRO C10-C28	0.56	mg/L	0.10	12/27/16 11:10	
10373969013	**USGS-4**					
RSK 175	Methane	64.8	ug/L	10.0	12/22/16 17:05	
Diesel Range Organics	WDRO C10-C28	2.9	mg/L	0.10	12/23/16 12:57	
Diesel Range Organics	WDRO, Extended C10-C32	3.1	mg/L	0.10	12/23/16 12:57	
Diesel Range Organics	WDRO, Extended C10-C36	3.3	mg/L	0.10	12/23/16 12:57	
WI MOD DRO	WDRO C10-C28	1.0	mg/L	0.10	12/27/16 11:18	
ASTM D516	Sulfate	2.6	mg/L	2.5	12/23/16 11:23	M1
10373969015	**Dup**					
RSK 175	Methane	1140	ug/L	10.0	12/22/16 17:25	
Diesel Range Organics	WDRO C10-C28	24.3	mg/L	1.1	12/23/16 15:12	

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SUMMARY OF DETECTION

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
10373969015	**Dup**					
Diesel Range Organics	WDRO, Extended C10-C32	26.4	mg/L	1.1	12/23/16 15:12	
Diesel Range Organics	WDRO, Extended C10-C36	26.5	mg/L	1.1	12/23/16 15:12	
EPA 8260B	Benzene	3.9	ug/L	1.0	12/22/16 18:27	
EPA 8260B	Ethylbenzene	1.7	ug/L	1.0	12/22/16 18:27	
SM 4500-NO3 H	Nitrogen, NO2 plus NO3	0.13	mg/L	0.10	12/27/16 10:14	

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Method: **RSK 175**
Description: RSK 175 AIR Headspace
Client: AECOM MN ND
Date: December 27, 2016

General Information:
15 samples were analyzed for RSK 175. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Method: **Diesel Range Organics**
Description: WIDRO LV Extended GCS
Client: AECOM MN ND
Date: December 27, 2016

General Information:
15 samples were analyzed for Diesel Range Organics. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with Diesel Range Organics with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Method: **WI MOD DRO**
Description: WIDRO LV GCS Silica Gel
Client: AECOM MN ND
Date: December 27, 2016

General Information:
10 samples were analyzed for WI MOD DRO. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with WI MOD DRO with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: 453248

S4: Surrogate recovery not evaluated against control limits due to sample dilution.
- MW10 (Lab ID: 10373969003)
  - n-Triacontane (S)

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: 453248

1M: Surrogate passed in original extraction before silica cleanup, see GCSV batch 20401. Client ok to report.
- BLANK (Lab ID: 2481473)
  - n-Triacontane (S)
- MW-16B (Lab ID: 10373969005)
  - n-Triacontane (S)
- MW9 (Lab ID: 10373969002)
  - n-Triacontane (S)

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Method: **WI MOD DRO**
Description: WIDRO LV GCS Silica Gel
Client: AECOM MN ND
Date: December 27, 2016

Analyte Comments:

QC Batch: 453248

1M: Surrogate passed in original extraction before silica cleanup, see GCSV batch 20401. Client ok to report.

- USGS-1 (Lab ID: 10373969010)
  - n-Triacontane (S)
- USGS-2 (Lab ID: 10373969011)
  - n-Triacontane (S)

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Method: **EPA 8260B**
Description: 8260B MSV UST
Client: AECOM MN ND
Date: December 27, 2016

General Information:
15 samples were analyzed for EPA 8260B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 452985

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Method: **SM 4500-NO3 H**
Description: SM4500NO3-H, NO2 + NO3 pres.
Client: AECOM MN ND
Date: December 27, 2016

General Information:
15 samples were analyzed for SM 4500-NO3 H. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 453325

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10373969001,10373969002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2481866)
  - Nitrogen, NO2 plus NO3
- MSD (Lab ID: 2481867)
  - Nitrogen, NO2 plus NO3

Additional Comments:

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PROJECT NARRATIVE

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Method: **ASTM D516**
Description: ASTM D516 Sulfate Water
Client: AECOM MN ND
Date: December 27, 2016

General Information:
15 samples were analyzed for ASTM D516. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 453178

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10373762001,10373969002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2480742)
  - Sulfate
- MS (Lab ID: 2480744)
  - Sulfate
- MSD (Lab ID: 2480743)
  - Sulfate
- MSD (Lab ID: 2480745)
  - Sulfate

QC Batch: 453191

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10373256007,10373969013

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2480818)
  - Sulfate
- MS (Lab ID: 2480820)
  - Sulfate
- MSD (Lab ID: 2480819)
  - Sulfate
- MSD (Lab ID: 2480821)
  - Sulfate

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: MW8 **Lab ID: 10373969001** Collected: 12/20/16 12:55 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		12/22/16 14:38	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	**0.12**	mg/L	0.11	0.033	1	12/23/16 16:16	12/24/16 18:42		
WDRO, Extended C10-C32	**0.13**	mg/L	0.11	0.11	1	12/23/16 16:16	12/24/16 18:42		
WDRO, Extended C10-C36	**0.14**	mg/L	0.11	0.11	1	12/23/16 16:16	12/24/16 18:42		
Surrogates									
n-Triacontane (S)	87	%.	50-150		1	12/23/16 16:16	12/24/16 18:42	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.095	1		12/22/16 15:17	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.089	1		12/22/16 15:17	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 15:17	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 15:17	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	110	%.	75-125		1		12/22/16 15:17	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		12/22/16 15:17	2037-26-5	
4-Bromofluorobenzene (S)	106	%.	75-125		1		12/22/16 15:17	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.16**	mg/L	0.10	0.050	1		12/27/16 09:49		M1
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**5.4**	mg/L	2.5	1.0	1		12/23/16 10:42	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: MW9 **Lab ID: 10373969002** Collected: 12/20/16 11:05 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**2360**	ug/L	10.0	0.49	1		12/22/16 14:54	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	**14.1**	mg/L	0.53	0.16	5	12/21/16 17:53	12/23/16 14:56		
WDRO, Extended C10-C32	**14.6**	mg/L	0.53	0.53	5	12/21/16 17:53	12/23/16 14:56		
WDRO, Extended C10-C36	**15.3**	mg/L	0.53	0.53	5	12/21/16 17:53	12/23/16 14:56		
Surrogates									
n-Triacontane (S)	98	%.	50-150		5	12/21/16 17:53	12/23/16 14:56	638-68-6	
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	**4.9**	mg/L	0.53	0.16	5	12/21/16 17:53	12/27/16 10:31		
Surrogates									
n-Triacontane (S)	56	%.	62-125		5	12/21/16 17:53	12/27/16 10:31	638-68-6	1M
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**70.2**	ug/L	1.0	0.095	1		12/22/16 13:51	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.089	1		12/22/16 13:51	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 13:51	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 13:51	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	104	%.	75-125		1		12/22/16 13:51	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		12/22/16 13:51	2037-26-5	
4-Bromofluorobenzene (S)	106	%.	75-125		1		12/22/16 13:51	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/27/16 09:50		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		12/23/16 10:42	14808-79-8	M1

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: MW10 **Lab ID: 10373969003** Collected: 12/20/16 15:35 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**12300**	ug/L	10.0	0.49	1		12/22/16 15:02	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	**24.6**	mg/L	1.0	0.32	10	12/21/16 17:53	12/23/16 15:20		
WDRO, Extended C10-C32	**25.2**	mg/L	1.0	1.0	10	12/21/16 17:53	12/23/16 15:20		
WDRO, Extended C10-C36	**26.7**	mg/L	1.0	1.0	10	12/21/16 17:53	12/23/16 15:20		
Surrogates									
n-Triacontane (S)	121	%.	50-150		10	12/21/16 17:53	12/23/16 15:20	638-68-6	
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	**9.2**	mg/L	1.0	0.32	10	12/21/16 17:53	12/27/16 10:46		
Surrogates									
n-Triacontane (S)	0	%.	62-125		10	12/21/16 17:53	12/27/16 10:46	638-68-6	S4
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**3.6**	ug/L	1.0	0.095	1		12/22/16 15:35	71-43-2	
Ethylbenzene	**1.8**	ug/L	1.0	0.089	1		12/22/16 15:35	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 15:35	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 15:35	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	107	%.	75-125		1		12/22/16 15:35	17060-07-0	
Toluene-d8 (S)	96	%.	75-125		1		12/22/16 15:35	2037-26-5	
4-Bromofluorobenzene (S)	104	%.	75-125		1		12/22/16 15:35	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.12**	mg/L	0.10	0.050	1		12/27/16 09:55		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		12/23/16 10:52	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: MW-16A **Lab ID: 10373969004** Collected: 12/20/16 12:55 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**514**	ug/L	10.0	0.49	1		12/22/16 15:10	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	**2.1**	mg/L	0.10	0.032	1	12/21/16 17:53	12/23/16 13:21		
WDRO, Extended C10-C32	**2.2**	mg/L	0.10	0.10	1	12/21/16 17:53	12/23/16 13:21		
WDRO, Extended C10-C36	**2.3**	mg/L	0.10	0.10	1	12/21/16 17:53	12/23/16 13:21		
Surrogates									
n-Triacontane (S)	99	%.	50-150		1	12/21/16 17:53	12/23/16 13:21	638-68-6	
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	**0.59**	mg/L	0.10	0.032	1	12/21/16 17:53	12/27/16 10:54		
Surrogates									
n-Triacontane (S)	67	%.	62-125		1	12/21/16 17:53	12/27/16 10:54	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.095	1		12/22/16 15:52	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.089	1		12/22/16 15:52	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 15:52	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 15:52	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	110	%.	75-125		1		12/22/16 15:52	17060-07-0	
Toluene-d8 (S)	96	%.	75-125		1		12/22/16 15:52	2037-26-5	
4-Bromofluorobenzene (S)	103	%.	75-125		1		12/22/16 15:52	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.10**	mg/L	0.10	0.050	1		12/27/16 09:59		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		12/23/16 10:45	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: MW-16B **Lab ID: 10373969005** Collected: 12/20/16 12:10 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**48.0**	ug/L	10.0	0.49	1		12/22/16 15:19	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	**0.67**	mg/L	0.10	0.032	1	12/21/16 17:53	12/23/16 13:05		
WDRO, Extended C10-C32	**0.76**	mg/L	0.10	0.10	1	12/21/16 17:53	12/23/16 13:05		
WDRO, Extended C10-C36	**0.90**	mg/L	0.10	0.10	1	12/21/16 17:53	12/23/16 13:05		
Surrogates									
n-Triacontane (S)	97	%.	50-150		1	12/21/16 17:53	12/23/16 13:05	638-68-6	
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	**0.14**	mg/L	0.10	0.032	1	12/21/16 17:53	12/27/16 11:02		
Surrogates									
n-Triacontane (S)	53	%.	62-125		1	12/21/16 17:53	12/27/16 11:02	638-68-6	1M
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.095	1		12/22/16 16:09	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.089	1		12/22/16 16:09	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 16:09	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 16:09	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	111	%.	75-125		1		12/22/16 16:09	17060-07-0	
Toluene-d8 (S)	95	%.	75-125		1		12/22/16 16:09	2037-26-5	
4-Bromofluorobenzene (S)	106	%.	75-125		1		12/22/16 16:09	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.15**	mg/L	0.10	0.050	1		12/27/16 10:00		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**6.1**	mg/L	2.5	1.0	1		12/23/16 10:45	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: MW-19 **Lab ID: 10373969006** Collected: 12/20/16 09:50 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**62.8**	ug/L	10.0	0.49	1		12/22/16 15:27	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	**0.53**	mg/L	0.10	0.032	1	12/23/16 16:16	12/24/16 18:50		
WDRO, Extended C10-C32	**0.56**	mg/L	0.10	0.10	1	12/23/16 16:16	12/24/16 18:50		
WDRO, Extended C10-C36	**0.59**	mg/L	0.10	0.10	1	12/23/16 16:16	12/24/16 18:50		
Surrogates									
n-Triacontane (S)	88	%.	50-150		1	12/23/16 16:16	12/24/16 18:50	638-68-6	
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/L	0.10	0.032	1	12/23/16 16:16	12/27/16 09:35		
Surrogates									
n-Triacontane (S)	63	%.	62-125		1	12/23/16 16:16	12/27/16 09:35	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.095	1		12/22/16 16:26	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.089	1		12/22/16 16:26	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 16:26	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 16:26	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	113	%.	75-125		1		12/22/16 16:26	17060-07-0	
Toluene-d8 (S)	96	%.	75-125		1		12/22/16 16:26	2037-26-5	
4-Bromofluorobenzene (S)	105	%.	75-125		1		12/22/16 16:26	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.17**	mg/L	0.10	0.050	1		12/27/16 10:00		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		12/23/16 10:47	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: MW-21 **Lab ID: 10373969007** Collected: 12/20/16 10:40 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		12/22/16 15:35	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	ND	mg/L	0.10	0.032	1	12/23/16 16:16	12/24/16 18:58		
WDRO, Extended C10-C32	**0.11**	mg/L	0.10	0.10	1	12/23/16 16:16	12/24/16 18:58		
WDRO, Extended C10-C36	**0.12**	mg/L	0.10	0.10	1	12/23/16 16:16	12/24/16 18:58		
Surrogates									
n-Triacontane (S)	94	%.	50-150		1	12/23/16 16:16	12/24/16 18:58	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.095	1		12/22/16 16:44	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.089	1		12/22/16 16:44	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 16:44	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 16:44	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	111	%.	75-125		1		12/22/16 16:44	17060-07-0	
Toluene-d8 (S)	95	%.	75-125		1		12/22/16 16:44	2037-26-5	
4-Bromofluorobenzene (S)	105	%.	75-125		1		12/22/16 16:44	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**1.2**	mg/L	0.10	0.050	1		12/27/16 10:03		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**7.2**	mg/L	2.5	1.0	1		12/23/16 10:48	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: MW-22 **Lab ID: 10373969008** Collected: 12/20/16 08:45 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		12/22/16 15:44	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	**0.30**	mg/L	0.10	0.032	1	12/23/16 16:16	12/24/16 19:06		
WDRO, Extended C10-C32	**0.32**	mg/L	0.10	0.10	1	12/23/16 16:16	12/24/16 19:06		
WDRO, Extended C10-C36	**0.34**	mg/L	0.10	0.10	1	12/23/16 16:16	12/24/16 19:06		
Surrogates									
n-Triacontane (S)	86	%.	50-150		1	12/23/16 16:16	12/24/16 19:06	638-68-6	
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	ND	mg/L	0.10	0.032	1	12/23/16 16:16	12/27/16 09:43		
Surrogates									
n-Triacontane (S)	64	%.	62-125		1	12/23/16 16:16	12/27/16 09:43	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.095	1		12/22/16 17:01	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.089	1		12/22/16 17:01	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 17:01	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 17:01	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	112	%.	75-125		1		12/22/16 17:01	17060-07-0	
Toluene-d8 (S)	96	%.	75-125		1		12/22/16 17:01	2037-26-5	
4-Bromofluorobenzene (S)	105	%.	75-125		1		12/22/16 17:01	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.18**	mg/L	0.10	0.050	1		12/27/16 10:04		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**4.8**	mg/L	2.5	1.0	1		12/23/16 10:48	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: SCDW **Lab ID: 10373969009** Collected: 12/20/16 15:05 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		12/22/16 15:52	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	ND	mg/L	0.10	0.031	1	12/23/16 16:16	12/24/16 19:14		
WDRO, Extended C10-C32	ND	mg/L	0.10	0.10	1	12/23/16 16:16	12/24/16 19:14		
WDRO, Extended C10-C36	ND	mg/L	0.10	0.10	1	12/23/16 16:16	12/24/16 19:14		
Surrogates									
n-Triacontane (S)	94	%.	50-150		1	12/23/16 16:16	12/24/16 19:14	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.095	1		12/22/16 17:18	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.089	1		12/22/16 17:18	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 17:18	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 17:18	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	109	%.	75-125		1		12/22/16 17:18	17060-07-0	
Toluene-d8 (S)	96	%.	75-125		1		12/22/16 17:18	2037-26-5	
4-Bromofluorobenzene (S)	107	%.	75-125		1		12/22/16 17:18	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.84**	mg/L	0.10	0.050	1		12/27/16 10:04		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**2.5**	mg/L	2.5	1.0	1		12/23/16 10:48	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: USGS-1 **Lab ID: 10373969010** Collected: 12/20/16 11:45 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**514**	ug/L	10.0	0.49	1		12/22/16 16:33	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	**19.4**	mg/L	0.54	0.17	5	12/21/16 17:53	12/23/16 15:04		
WDRO, Extended C10-C32	**19.9**	mg/L	0.54	0.54	5	12/21/16 17:53	12/23/16 15:04		
WDRO, Extended C10-C36	**20.7**	mg/L	0.54	0.54	5	12/21/16 17:53	12/23/16 15:04		
Surrogates									
n-Triacontane (S)	89	%.	50-150		5	12/21/16 17:53	12/23/16 15:04	638-68-6	
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	**7.5**	mg/L	0.54	0.17	5	12/21/16 17:53	12/27/16 10:39		
Surrogates									
n-Triacontane (S)	57	%.	62-125		5	12/21/16 17:53	12/27/16 10:39	638-68-6	1M
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**49.8**	ug/L	1.0	0.095	1		12/22/16 17:36	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.089	1		12/22/16 17:36	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 17:36	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 17:36	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	103	%.	75-125		1		12/22/16 17:36	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		12/22/16 17:36	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	75-125		1		12/22/16 17:36	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/27/16 10:05		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**3.7**	mg/L	2.5	1.0	1		12/23/16 10:48	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: USGS-2 **Lab ID: 10373969011** Collected: 12/20/16 13:35 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**476**	ug/L	10.0	0.49	1		12/22/16 16:49	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	**7.1**	mg/L	0.21	0.065	2	12/21/16 17:53	12/23/16 14:48		
WDRO, Extended C10-C32	**7.3**	mg/L	0.21	0.21	2	12/21/16 17:53	12/23/16 14:48		
WDRO, Extended C10-C36	**7.6**	mg/L	0.21	0.21	2	12/21/16 17:53	12/23/16 14:48		
Surrogates									
n-Triacontane (S)	87	%.	50-150		2	12/21/16 17:53	12/23/16 14:48	638-68-6	
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	**2.7**	mg/L	0.21	0.065	2	12/21/16 17:53	12/27/16 10:23		
Surrogates									
n-Triacontane (S)	58	%.	62-125		2	12/21/16 17:53	12/27/16 10:23	638-68-6	1M
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**11.2**	ug/L	1.0	0.095	1		12/22/16 12:59	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.089	1		12/22/16 12:59	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 12:59	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 12:59	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	103	%.	75-125		1		12/22/16 12:59	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		12/22/16 12:59	2037-26-5	
4-Bromofluorobenzene (S)	104	%.	75-125		1		12/22/16 12:59	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/27/16 10:08		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		12/23/16 10:48	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: USGS-3 **Lab ID: 10373969012** Collected: 12/20/16 14:35 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**696**	ug/L	10.0	0.49	1		12/22/16 16:57	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	**1.7**	mg/L	0.10	0.032	1	12/21/16 17:53	12/23/16 12:49		
WDRO, Extended C10-C32	**1.9**	mg/L	0.10	0.10	1	12/21/16 17:53	12/23/16 12:49		
WDRO, Extended C10-C36	**2.0**	mg/L	0.10	0.10	1	12/21/16 17:53	12/23/16 12:49		
Surrogates									
n-Triacontane (S)	96	%.	50-150		1	12/21/16 17:53	12/23/16 12:49	638-68-6	
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	**0.56**	mg/L	0.10	0.032	1	12/21/16 17:53	12/27/16 11:10		
Surrogates									
n-Triacontane (S)	63	%.	62-125		1	12/21/16 17:53	12/27/16 11:10	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.095	1		12/22/16 17:53	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.089	1		12/22/16 17:53	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 17:53	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 17:53	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	112	%.	75-125		1		12/22/16 17:53	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		12/22/16 17:53	2037-26-5	
4-Bromofluorobenzene (S)	104	%.	75-125		1		12/22/16 17:53	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/27/16 10:08		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		12/23/16 10:49	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: USGS-4 **Lab ID: 10373969013** Collected: 12/20/16 14:00 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**64.8**	ug/L	10.0	0.49	1		12/22/16 17:05	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	**2.9**	mg/L	0.10	0.031	1	12/21/16 17:53	12/23/16 12:57		
WDRO, Extended C10-C32	**3.1**	mg/L	0.10	0.10	1	12/21/16 17:53	12/23/16 12:57		
WDRO, Extended C10-C36	**3.3**	mg/L	0.10	0.10	1	12/21/16 17:53	12/23/16 12:57		
Surrogates									
n-Triacontane (S)	100	%.	50-150		1	12/21/16 17:53	12/23/16 12:57	638-68-6	
WIDRO LV GCS Silica Gel	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
WDRO C10-C28	**1.0**	mg/L	0.10	0.031	1	12/21/16 17:53	12/27/16 11:18		
Surrogates									
n-Triacontane (S)	76	%.	62-125		1	12/21/16 17:53	12/27/16 11:18	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.095	1		12/22/16 18:10	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.089	1		12/22/16 18:10	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 18:10	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 18:10	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	109	%.	75-125		1		12/22/16 18:10	17060-07-0	
Toluene-d8 (S)	98	%.	75-125		1		12/22/16 18:10	2037-26-5	
4-Bromofluorobenzene (S)	105	%.	75-125		1		12/22/16 18:10	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/27/16 10:09		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	**2.6**	mg/L	2.5	1.0	1		12/23/16 11:23	14808-79-8	M1

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: Field Blank **Lab ID: 10373969014** Collected: 12/20/16 13:00 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	ND	ug/L	10.0	0.49	1		12/22/16 17:17	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	ND	mg/L	0.10	0.031	1	12/23/16 16:16	12/24/16 19:22		
WDRO, Extended C10-C32	ND	mg/L	0.10	0.10	1	12/23/16 16:16	12/24/16 19:22		
WDRO, Extended C10-C36	ND	mg/L	0.10	0.10	1	12/23/16 16:16	12/24/16 19:22		
Surrogates									
n-Triacontane (S)	94	%.	50-150		1	12/23/16 16:16	12/24/16 19:22	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	ND	ug/L	1.0	0.095	1		12/22/16 12:25	71-43-2	
Ethylbenzene	ND	ug/L	1.0	0.089	1		12/22/16 12:25	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 12:25	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 12:25	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	113	%.	75-125		1		12/22/16 12:25	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		12/22/16 12:25	2037-26-5	
4-Bromofluorobenzene (S)	104	%.	75-125		1		12/22/16 12:25	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	0.050	1		12/27/16 10:13		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		12/23/16 11:25	14808-79-8	

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ANALYTICAL RESULTS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Sample: Dup **Lab ID: 10373969015** Collected: 12/20/16 00:00 Received: 12/21/16 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 AIR Headspace	Analytical Method: RSK 175								
Methane	**1140**	ug/L	10.0	0.49	1		12/22/16 17:25	74-82-8	
WIDRO LV Extended GCS	Analytical Method: Diesel Range Organics Preparation Method: Diesel Range Organics								
WDRO C10-C28	**24.3**	mg/L	1.1	0.33	10	12/21/16 17:53	12/23/16 15:12		
WDRO, Extended C10-C32	**26.4**	mg/L	1.1	1.1	10	12/21/16 17:53	12/23/16 15:12		
WDRO, Extended C10-C36	**26.5**	mg/L	1.1	1.1	10	12/21/16 17:53	12/23/16 15:12		
Surrogates									
n-Triacontane (S)	100	%.	50-150		10	12/21/16 17:53	12/23/16 15:12	638-68-6	
8260B MSV UST	Analytical Method: EPA 8260B								
Benzene	**3.9**	ug/L	1.0	0.095	1		12/22/16 18:27	71-43-2	
Ethylbenzene	**1.7**	ug/L	1.0	0.089	1		12/22/16 18:27	100-41-4	
Toluene	ND	ug/L	1.0	0.083	1		12/22/16 18:27	108-88-3	
Xylene (Total)	ND	ug/L	3.0	0.19	1		12/22/16 18:27	1330-20-7	
Surrogates									
1,2-Dichloroethane-d4 (S)	104	%.	75-125		1		12/22/16 18:27	17060-07-0	
Toluene-d8 (S)	97	%.	75-125		1		12/22/16 18:27	2037-26-5	
4-Bromofluorobenzene (S)	105	%.	75-125		1		12/22/16 18:27	460-00-4	
SM4500NO3-H, NO2 + NO3 pres.	Analytical Method: SM 4500-NO3 H								
Nitrogen, NO2 plus NO3	**0.13**	mg/L	0.10	0.050	1		12/27/16 10:14		
ASTM D516 Sulfate Water	Analytical Method: ASTM D516								
Sulfate	ND	mg/L	2.5	1.0	1		12/23/16 11:25	14808-79-8	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

QC Batch: 452993 | Analysis Method: RSK 175
QC Batch Method: RSK 175 | Analysis Description: RSK 175 AIR HEADSPACE
Associated Lab Samples: 10373969001, 10373969002, 10373969003, 10373969004, 10373969005, 10373969006, 10373969007, 10373969008, 10373969009, 10373969010, 10373969011, 10373969012, 10373969013, 10373969014, 10373969015

METHOD BLANK: 2479904 | Matrix: Water
Associated Lab Samples: 10373969001, 10373969002, 10373969003, 10373969004, 10373969005, 10373969006, 10373969007, 10373969008, 10373969009, 10373969010, 10373969011, 10373969012, 10373969013, 10373969014, 10373969015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Methane	ug/L	ND	10.0	0.49	12/22/16 14:30	

LABORATORY CONTROL SAMPLE & LCSD: 2479905 2479906

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Methane	ug/L	60.7	61.5	62.3	101	103	85-115	1	20	

SAMPLE DUPLICATE: 2480896

Parameter	Units	10373969001 Result	Dup Result	RPD	Max RPD	Qualifiers
Methane	ug/L	ND	1.9J		20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

QC Batch: 452985 | Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B | Analysis Description: 8260B MSV UST-WATER
Associated Lab Samples: 10373969001, 10373969002, 10373969003, 10373969004, 10373969005, 10373969006, 10373969007, 10373969008, 10373969009, 10373969010, 10373969011, 10373969012, 10373969013, 10373969014, 10373969015

METHOD BLANK: 2479844 | Matrix: Water
Associated Lab Samples: 10373969001, 10373969002, 10373969003, 10373969004, 10373969005, 10373969006, 10373969007, 10373969008, 10373969009, 10373969010, 10373969011, 10373969012, 10373969013, 10373969014, 10373969015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	0.095	12/22/16 11:16	
Ethylbenzene	ug/L	ND	1.0	0.089	12/22/16 11:16	
Toluene	ug/L	ND	1.0	0.083	12/22/16 11:16	
Xylene (Total)	ug/L	ND	3.0	0.19	12/22/16 11:16	
1,2-Dichloroethane-d4 (S)	%.	109	75-125		12/22/16 11:16	
4-Bromofluorobenzene (S)	%.	104	75-125		12/22/16 11:16	
Toluene-d8 (S)	%.	98	75-125		12/22/16 11:16	

LABORATORY CONTROL SAMPLE & LCSD: 2479845 2479846

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	ug/L	20	19.2	19.4	96	97	75-125	1	20	
Ethylbenzene	ug/L	20	18.6	18.6	93	93	75-125	0	20	
Toluene	ug/L	20	18.6	19.3	93	97	75-125	4	20	
Xylene (Total)	ug/L	60	57.0	58.6	95	98	75-125	3	20	
1,2-Dichloroethane-d4 (S)	%.				100	98	75-125			
4-Bromofluorobenzene (S)	%.				102	104	75-125			
Toluene-d8 (S)	%.				97	99	75-125			

MATRIX SPIKE SAMPLE: 2479858

Parameter	Units	10373969011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	11.2	20	32.4	106	52-147	
Ethylbenzene	ug/L	ND	20	20.5	102	67-149	
Toluene	ug/L	ND	20	20.2	101	69-139	
Xylene (Total)	ug/L	ND	60	63.9	107	70-147	
1,2-Dichloroethane-d4 (S)	%.				103	75-125	
4-Bromofluorobenzene (S)	%.				106	75-125	
Toluene-d8 (S)	%.				99	75-125	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

SAMPLE DUPLICATE: 2479848

Parameter	Units	10373496005 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzene	ug/L	132	140	6	30	
Ethylbenzene	ug/L	15.3	15.9	4	30	
Toluene	ug/L	7.2	7.3	1	30	
Xylene (Total)	ug/L	ND	2.8J		30	
1,2-Dichloroethane-d4 (S)	%.	113	117	4		
4-Bromofluorobenzene (S)	%.	101	105	4		
Toluene-d8 (S)	%.	97	97	0		

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

QC Batch: 452895 | Analysis Method: Diesel Range Organics
QC Batch Method: Diesel Range Organics | Analysis Description: WIDRO Low Volume Extended GCS
Associated Lab Samples: 10373969002, 10373969003, 10373969004, 10373969005, 10373969010, 10373969011, 10373969012, 10373969013, 10373969015

METHOD BLANK: 2479036 | Matrix: Water
Associated Lab Samples: 10373969002, 10373969003, 10373969004, 10373969005, 10373969010, 10373969011, 10373969012, 10373969013, 10373969015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/L	ND	0.10	0.031	12/23/16 11:14	
WDRO, Extended C10-C32	mg/L	ND	0.10	0.10	12/23/16 11:14	
WDRO, Extended C10-C36	mg/L	ND	0.10	0.10	12/23/16 11:14	
n-Triacontane (S)	%.	90	50-150		12/23/16 11:14	

LABORATORY CONTROL SAMPLE & LCSD: 2479037 2479038

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/L	.8	0.74	0.76	92	96	75-115	4	20	
WDRO, Extended C10-C32	mg/L	.8	0.74	0.76	92	96	75-115	4	20	
WDRO, Extended C10-C36	mg/L	.8	0.74	0.76	92	96	75-115	4	20	
n-Triacontane (S)	%.				99	102	50-150			

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

QC Batch: 453228 | Analysis Method: Diesel Range Organics
QC Batch Method: Diesel Range Organics | Analysis Description: WIDRO Low Volume Extended GCS
Associated Lab Samples: 10373969001, 10373969006, 10373969007, 10373969008, 10373969009, 10373969014

METHOD BLANK: 2481221 | Matrix: Water
Associated Lab Samples: 10373969001, 10373969006, 10373969007, 10373969008, 10373969009, 10373969014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/L	ND	0.10	0.031	12/24/16 18:10	
WDRO, Extended C10-C32	mg/L	ND	0.10	0.10	12/24/16 18:10	
WDRO, Extended C10-C36	mg/L	ND	0.10	0.10	12/24/16 18:10	
n-Triacontane (S)	%.	95	50-150		12/24/16 18:10	

LABORATORY CONTROL SAMPLE & LCSD: 2481222 2481223

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/L	.8	0.66	0.73	82	92	75-115	11	20	
WDRO, Extended C10-C32	mg/L	.8	0.66	0.73	82	92	75-115	11	20	
WDRO, Extended C10-C36	mg/L	.8	0.66	0.73	82	92	75-115	11	20	
n-Triacontane (S)	%.				83	95	50-150			

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

QC Batch: 453248 | Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO | Analysis Description: WIDRO Low Volume GCS w/Cleanup
Associated Lab Samples: 10373969002, 10373969003, 10373969004, 10373969005, 10373969010, 10373969011, 10373969012, 10373969013

METHOD BLANK: 2481473 | Matrix: Water
Associated Lab Samples: 10373969002, 10373969003, 10373969004, 10373969005, 10373969010, 10373969011, 10373969012, 10373969013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/L	ND	0.10	0.031	12/27/16 10:07	
n-Triacontane (S)	%.	59	62-125		12/27/16 10:07	1M

LABORATORY CONTROL SAMPLE & LCSD: 2481474 2481475

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/L	.8	0.63	0.62	78	77	47-125	2	20	
n-Triacontane (S)	%.				73	75	62-125			

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

QC Batch: 453281 | Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO | Analysis Description: WIDRO Low Volume GCS w/Cleanup
Associated Lab Samples: 10373969006, 10373969008

METHOD BLANK: 2481725 | Matrix: Water
Associated Lab Samples: 10373969006, 10373969008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
WDRO C10-C28	mg/L	ND	0.10	0.031	12/27/16 09:19	
n-Triacontane (S)	%.	70	62-125		12/27/16 09:19	

LABORATORY CONTROL SAMPLE & LCSD: 2481726 2481727

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/L	.8	0.62	0.62	78	78	47-125	0	20	
n-Triacontane (S)	%.				71	73	62-125			

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

QC Batch: 453325 | Analysis Method: SM 4500-NO3 H
QC Batch Method: SM 4500-NO3 H | Analysis Description: SM4500NO3-H, NO2 + NO3 pres.
Associated Lab Samples: 10373969001, 10373969002, 10373969003, 10373969004, 10373969005, 10373969006, 10373969007, 10373969008, 10373969009, 10373969010, 10373969011, 10373969012, 10373969013, 10373969014, 10373969015

METHOD BLANK: 2481864 | Matrix: Water
Associated Lab Samples: 10373969001, 10373969002, 10373969003, 10373969004, 10373969005, 10373969006, 10373969007, 10373969008, 10373969009, 10373969010, 10373969011, 10373969012, 10373969013, 10373969014, 10373969015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	0.050	12/27/16 11:35	

LABORATORY CONTROL SAMPLE: 2481865

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2481866 2481867

Parameter	Units	10373969001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.16	2.5	2.5	2.1	2.1	79	76	80-120	4	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2481868 2481869

Parameter	Units	10373969002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	2.4	2.4	93	92	80-120	1	30	

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

QC Batch: 453178 | Analysis Method: ASTM D516
QC Batch Method: ASTM D516 | Analysis Description: ASTM D516 Sulfate Water
Associated Lab Samples: 10373969001, 10373969002, 10373969003, 10373969004, 10373969005, 10373969006, 10373969007, 10373969008, 10373969009, 10373969010, 10373969011, 10373969012

METHOD BLANK: 2480739 | Matrix: Water
Associated Lab Samples: 10373969001, 10373969002, 10373969003, 10373969004, 10373969005, 10373969006, 10373969007, 10373969008, 10373969009, 10373969010, 10373969011, 10373969012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	2.5	1.0	12/23/16 10:34	

LABORATORY CONTROL SAMPLE & LCSD: 2480740 2480741

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Sulfate	mg/L	7.5	7.6	7.4	101	99	80-120	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2480742 2480743

Parameter	Units	10373762001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	3.4	20	20	17.3	17.3	70	70	80-120	0	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2480744 2480745

Parameter	Units	10373969002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	ND	20	20	11.8	11.3	59	56	80-120	5	30	M1

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QUALITY CONTROL DATA

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

QC Batch: 453191 | Analysis Method: ASTM D516
QC Batch Method: ASTM D516 | Analysis Description: ASTM D516 Sulfate Water
Associated Lab Samples: 10373969013, 10373969014, 10373969015

METHOD BLANK: 2480815 | Matrix: Water
Associated Lab Samples: 10373969013, 10373969014, 10373969015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	2.5	1.0	12/23/16 11:23	

LABORATORY CONTROL SAMPLE & LCSD: 2480816 2480817

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Sulfate	mg/L	7.5	7.5	8.0	100	106	80-120	6	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2480818 2480819

Parameter	Units	10373969013 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	2.6	20	20	15.6	15.9	65	66	80-120	2	30	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2480820 2480821

Parameter	Units	10373256007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	21.7	20	20	28.7	28.6	35	34	80-120	0	30	M1

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QUALIFIERS

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

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BATCH QUALIFIERS

Batch: 452985

[M5]	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

1M	Surrogate passed in original extraction before silica cleanup, see GCSV batch 20401. Client ok to report.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10373969001	**MW8**	RSK 175	452993		
10373969002	**MW9**	RSK 175	452993		
10373969003	**MW10**	RSK 175	452993		
10373969004	**MW-16A**	RSK 175	452993		
10373969005	**MW-16B**	RSK 175	452993		
10373969006	**MW-19**	RSK 175	452993		
10373969007	**MW-21**	RSK 175	452993		
10373969008	**MW-22**	RSK 175	452993		
10373969009	**SCDW**	RSK 175	452993		
10373969010	**USGS-1**	RSK 175	452993		
10373969011	**USGS-2**	RSK 175	452993		
10373969012	**USGS-3**	RSK 175	452993		
10373969013	**USGS-4**	RSK 175	452993		
10373969014	**Field Blank**	RSK 175	452993		
10373969015	**Dup**	RSK 175	452993		
10373969001	**MW8**	Diesel Range Organics	453228	Diesel Range Organics	453272
10373969002	**MW9**	Diesel Range Organics	452895	Diesel Range Organics	453140
10373969003	**MW10**	Diesel Range Organics	452895	Diesel Range Organics	453140
10373969004	**MW-16A**	Diesel Range Organics	452895	Diesel Range Organics	453140
10373969005	**MW-16B**	Diesel Range Organics	452895	Diesel Range Organics	453140
10373969006	**MW-19**	Diesel Range Organics	453228	Diesel Range Organics	453272
10373969007	**MW-21**	Diesel Range Organics	453228	Diesel Range Organics	453272
10373969008	**MW-22**	Diesel Range Organics	453228	Diesel Range Organics	453272
10373969009	**SCDW**	Diesel Range Organics	453228	Diesel Range Organics	453272
10373969010	**USGS-1**	Diesel Range Organics	452895	Diesel Range Organics	453140
10373969011	**USGS-2**	Diesel Range Organics	452895	Diesel Range Organics	453140
10373969012	**USGS-3**	Diesel Range Organics	452895	Diesel Range Organics	453140
10373969013	**USGS-4**	Diesel Range Organics	452895	Diesel Range Organics	453140
10373969014	**Field Blank**	Diesel Range Organics	453228	Diesel Range Organics	453272
10373969015	**Dup**	Diesel Range Organics	452895	Diesel Range Organics	453140
10373969002	**MW9**	WI MOD DRO	453248	WI MOD DRO	453314
10373969003	**MW10**	WI MOD DRO	453248	WI MOD DRO	453314
10373969004	**MW-16A**	WI MOD DRO	453248	WI MOD DRO	453314
10373969005	**MW-16B**	WI MOD DRO	453248	WI MOD DRO	453314
10373969006	**MW-19**	WI MOD DRO	453281	WI MOD DRO	453312
10373969008	**MW-22**	WI MOD DRO	453281	WI MOD DRO	453312
10373969010	**USGS-1**	WI MOD DRO	453248	WI MOD DRO	453314
10373969011	**USGS-2**	WI MOD DRO	453248	WI MOD DRO	453314
10373969012	**USGS-3**	WI MOD DRO	453248	WI MOD DRO	453314
10373969013	**USGS-4**	WI MOD DRO	453248	WI MOD DRO	453314
10373969001	**MW8**	EPA 8260B	452985		
10373969002	**MW9**	EPA 8260B	452985		
10373969003	**MW10**	EPA 8260B	452985		
10373969004	**MW-16A**	EPA 8260B	452985		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60503816 South Cass Lake
Pace Project No.: 10373969

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10373969005	**MW-16B**	EPA 8260B	452985		
10373969006	**MW-19**	EPA 8260B	452985		
10373969007	**MW-21**	EPA 8260B	452985		
10373969008	**MW-22**	EPA 8260B	452985		
10373969009	**SCDW**	EPA 8260B	452985		
10373969010	**USGS-1**	EPA 8260B	452985		
10373969011	**USGS-2**	EPA 8260B	452985		
10373969012	**USGS-3**	EPA 8260B	452985		
10373969013	**USGS-4**	EPA 8260B	452985		
10373969014	**Field Blank**	EPA 8260B	452985		
10373969015	**Dup**	EPA 8260B	452985		
10373969001	**MW8**	SM 4500-NO3 H	453325		
10373969002	**MW9**	SM 4500-NO3 H	453325		
10373969003	**MW10**	SM 4500-NO3 H	453325		
10373969004	**MW-16A**	SM 4500-NO3 H	453325		
10373969005	**MW-16B**	SM 4500-NO3 H	453325		
10373969006	**MW-19**	SM 4500-NO3 H	453325		
10373969007	**MW-21**	SM 4500-NO3 H	453325		
10373969008	**MW-22**	SM 4500-NO3 H	453325		
10373969009	**SCDW**	SM 4500-NO3 H	453325		
10373969010	**USGS-1**	SM 4500-NO3 H	453325		
10373969011	**USGS-2**	SM 4500-NO3 H	453325		
10373969012	**USGS-3**	SM 4500-NO3 H	453325		
10373969013	**USGS-4**	SM 4500-NO3 H	453325		
10373969014	**Field Blank**	SM 4500-NO3 H	453325		
10373969015	**Dup**	SM 4500-NO3 H	453325		
10373969001	**MW8**	ASTM D516	453178		
10373969002	**MW9**	ASTM D516	453178		
10373969003	**MW10**	ASTM D516	453178		
10373969004	**MW-16A**	ASTM D516	453178		
10373969005	**MW-16B**	ASTM D516	453178		
10373969006	**MW-19**	ASTM D516	453178		
10373969007	**MW-21**	ASTM D516	453178		
10373969008	**MW-22**	ASTM D516	453178		
10373969009	**SCDW**	ASTM D516	453178		
10373969010	**USGS-1**	ASTM D516	453178		
10373969011	**USGS-2**	ASTM D516	453178		
10373969012	**USGS-3**	ASTM D516	453178		
10373969013	**USGS-4**	ASTM D516	453191		
10373969014	**Field Blank**	ASTM D516	453191		
10373969015	**Dup**	ASTM D516	453191		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10373969

Page: 1 of 2

Section A Required Client Information:

Company:	AECOM
Address:	11 East Superior Street, Suite 260
	Duluth, MN 55802
Email To:	darin.albrecht@aecom.com
Phone: (218) 625-8768	Fax: (218) 625-2201
Requested Due Date/TAT:	5 Day Enbridge Standard

Section B Required Project Information:

Report To:	Darin Albrecht
Copy To:	
Purchase Order No.:	
Project Name:	South Cass Lake
Project Number:	60503816

Section C Invoice Information:

Attention:	Karl Beaster
Company Name:	Enbridge Energy
Address:	1100 Louisiana St. Ste 3000
Pace Quote Reference:	Houston, TX 77002
Pace Project Manager:	Carol Davy
Pace Profile #:	32482 #18

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
UST RCRA OTHER _____

Site Location STATE: MN

Requested Analysis Filtered (Y/N)

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start Date	Composite Start Time	Composite End/Grab Date	Composite End/Grab Time	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	BTEX	Extended Range DRO	Sulfate	Nitrate + Nitrite	Methane	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
										Preservatives									N	N	N	N	N		
1	MW-8	WT	G			12/20/16	1255		10	4	1		5						3	2	1	1	3		w1
2	MW-9	WT	G			12/20/16	1105		10	4	1		5						3	2	1	1	3		w2
3	MW-10	WT	G			12/20/16	~~1045~~ 535		10	4	1		5						3	2	1	1	3		w3
4	MW-16A	WT	G			12/20/16	1255		10	4	1		5						3	2	1	1	3		w4
5	MW-16B	WT	G			12/20/16	1210		10	4	1		5						3	2	1	1	3		w5
6	MW-19	WT	G			12/20/16	0950		10	4	1		5						3	2	1	1	3		w6
7	MW-21	WT	G			12/20/16	1040		10	4	1		5						3	2	1	1	3		w7
8	MW-22	WT	G			12/20/16	0845		10	4	1		5						3	2	1	1	3		w8
9	~~MW-23~~	~~WT~~	~~G~~						~~10~~	~~4~~	~~1~~		~~5~~						~~3~~	~~2~~	~~1~~	~~1~~	~~3~~		
10	SCDW	WT	G			12/20/16	1505		10	4	1		5						3	2	1	1	3		w9
11	USGS-1	WT	G			12/20/16	1145		10	4	1		5						3	2	1	1	3		w10
12	USGS-2	WT	G			12/20/16	1335		10	4	1		5						3	2	1	1	3		w11

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Please send Chroms with DRO hits	[signature] / AECOM	12/20/16	1800	[signature] / PACE	12-20-16	1050	0.9	Y	Y	[signature] 12-21-16
							1.3			N
							1.3			
							2.0			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Joe Pearson

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 12/20/16

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-Feb-2007

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CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 2 of 2

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Email To:	darin.albrecht@aecom.com
Phone: (218) 625-8768	Fax: (218) 625-2201
Requested Due Date/TAT:	5 Day Enbridge Standard

Section B Required Project Information:

Report To:	Darin Albrecht
Copy To:	
Purchase Order No.:	
Project Name:	South Cass lake
Project Number:	6053816

Section C Invoice Information:

Attention:	Karl Beater
Company Name:	Enbridge Energy
Address:	1100 Lousiana St Sutie 3000
Pace Quote Reference:	Houston, TX 77002
Pace Project Manager:	Carol Davy
Pace Profile #:	32482 #18

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER
UST | RCRA | OTHER _____

Site Location STATE: MN

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
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WATER	WT
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PRODUCT	P
SOIL/SOLID	SL
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AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start Date	Composite Start Time	Composite End/Grab Date	Composite End/Grab Time	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): BTEX	Extended Range DRO	Sulfate	Nitrate + Nitrite	Methane	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		N	N	N	N	N		
1	USGS-3	WT	G			12/20/16	1435		10	4	1		5					3	2	1	1	3		012
2	USGS-4	WT	G			12/20/16	1400		10	4	1		5					3	2	1	1	3		013
3	Field Blank	WT	G			12/20/16	1300		10	4	1		5					3	2	1	1	3		014
4	DUP	WT	G			12/20/16			10	4	1		5					3	2	1	1	3		
5		WT	G																					
6		WT	G																					
7		WT	G																					
8		WT	G																					
9		DW	G																					
10		WT	G																					
11		OT	-																					
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Please send Chroms with GRO or DRO hits	AECOM	12/20/16	1800	PACE	12-20-16	10:50

SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
0.9	X	X	X
1.3			N
1.3			
2.0			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Joe Pearson

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 12/20/16

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-Feb-2007

Pace Analytical®	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 12Dec2016 Page 1 of 2
	Document No.: **F-MN-L-213-rev.19**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Aecom

Project #: WO# : 10373969

10373969

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

Tracking Number: 6751 5819 9148, 6751 5819 9148, 6751 5819 9132, 6751 5819 9115

Custody Seal on Cooler/Box Present? ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☑ Yes ☐ No

Thermometer Used: ☑ 151401163 ☐ 151401164 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Read (°C): 1.3, 0.9, 1.3, 2.0 **Cooler Temp Corrected (°C):** 1.3, 1.3, 0.9, 2.0 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** True **Date and Initials of Person Examining Contents:** ~~B C 12-21-16~~ B C 12-21-16

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No		1.
Chain of Custody Filled Out?	☑ Yes	☐ No		2.
Chain of Custody Relinquished?	☑ Yes	☐ No		3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No		5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		6.
Rush Turn Around Time Requested?	☑ Yes	☐ No		7.
Sufficient Volume?	☑ Yes	☐ No		8.
Correct Containers Used?	☑ Yes	☐ No		9.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☐ Yes	☑ No		10. Broken Trip Blanks
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No		12.
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13. ☐ HNO_3 ☑ H_2SO_4 ☐ NaOH Positive for Res. Chlorine? Y N Sample # 1.)-16.) 1/1
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin.	☑ Yes	☐ No	☐ N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☑ No	☐ N/A	14. 1 MW-22 vial frozen
Trip Blank Present?	☐ Yes	☑ No	☐ N/A	15. Broken Trip Blanks
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Darin Albrecht Date/Time: 12/21/16

Comments/Resolution:

Client was informed of frozen/broken vials.

Project Manager Review: Carol Doug **Date:** 12/21/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Data File: \\192.168.10.12\chem\10gcs4.i\122416droLL.b\12240057.D

Date : 24-DEC-2016 18:42

Client ID: MW8

Instrument: 10gcs4.i

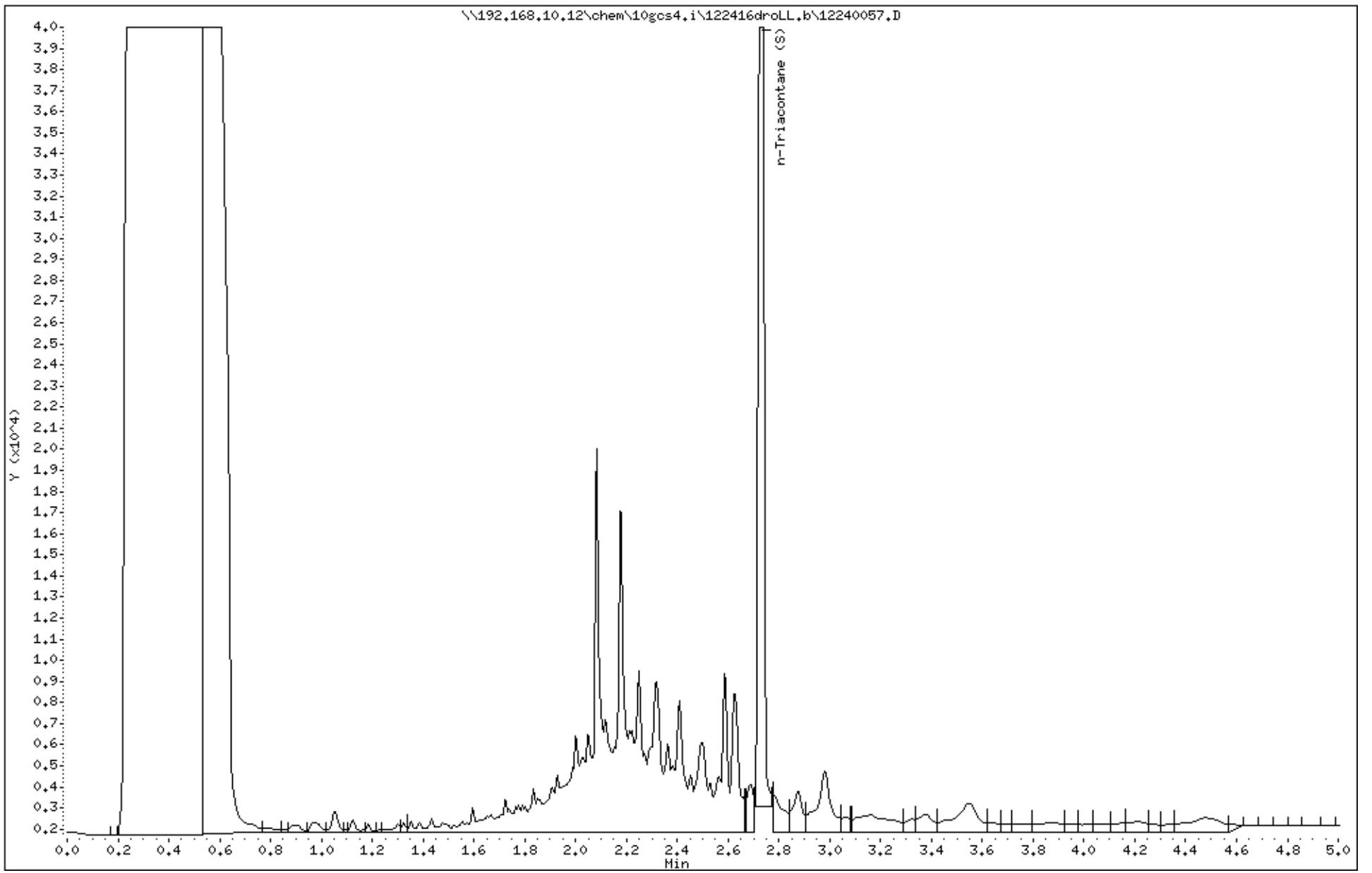
Sample Info: 10373969001

Volume Injected (uL): 1.0

Operator: JRH

Column phase: DB-5MS

Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122316droLL.b\12230027.D

Date : 23-DEC-2016 14:56

Client ID: MW9

Instrument: 10gcs4.i

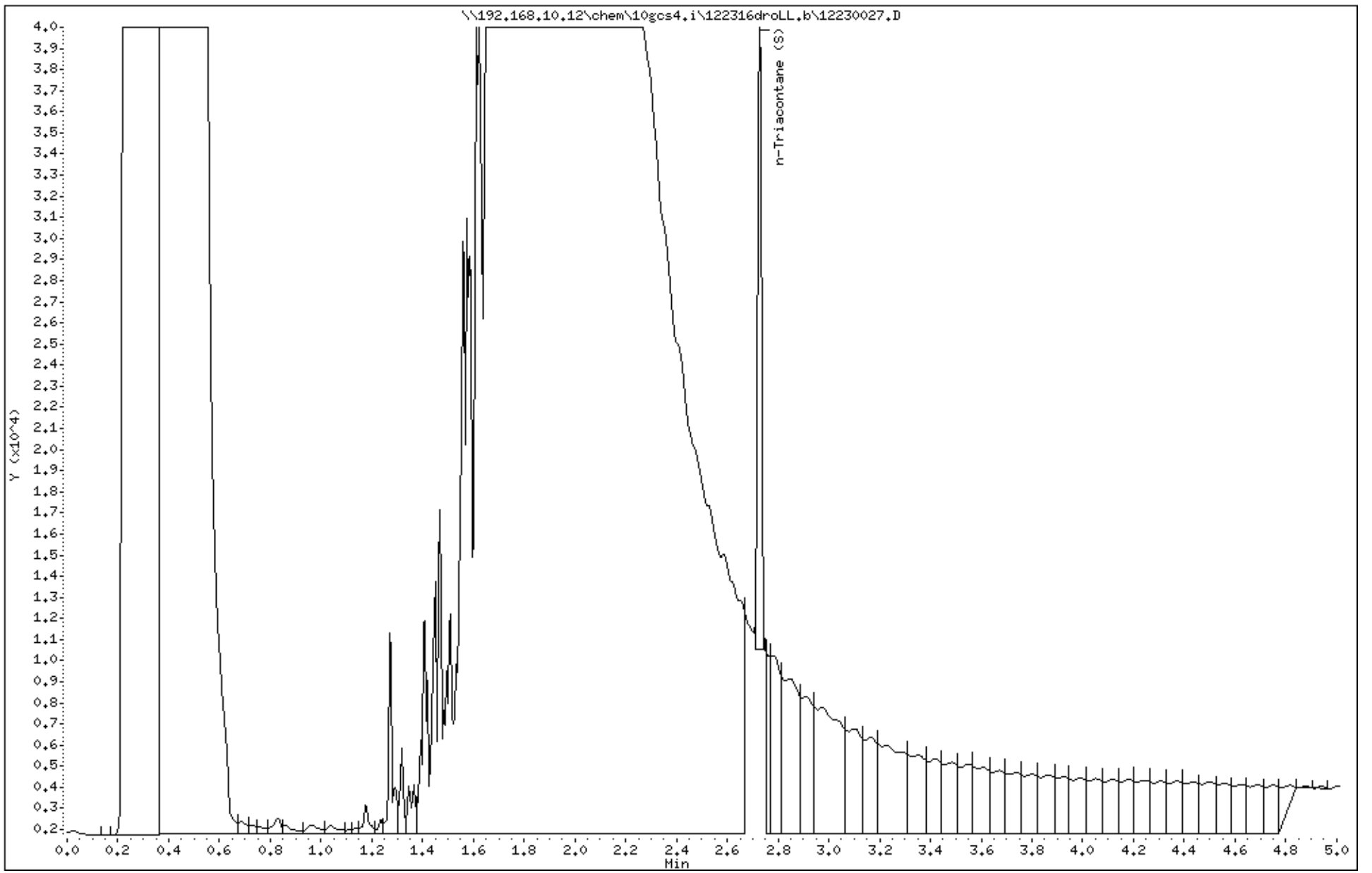
Sample Info: 10373969002X5

Volume Injected (uL): 1.0

Operator: JRH

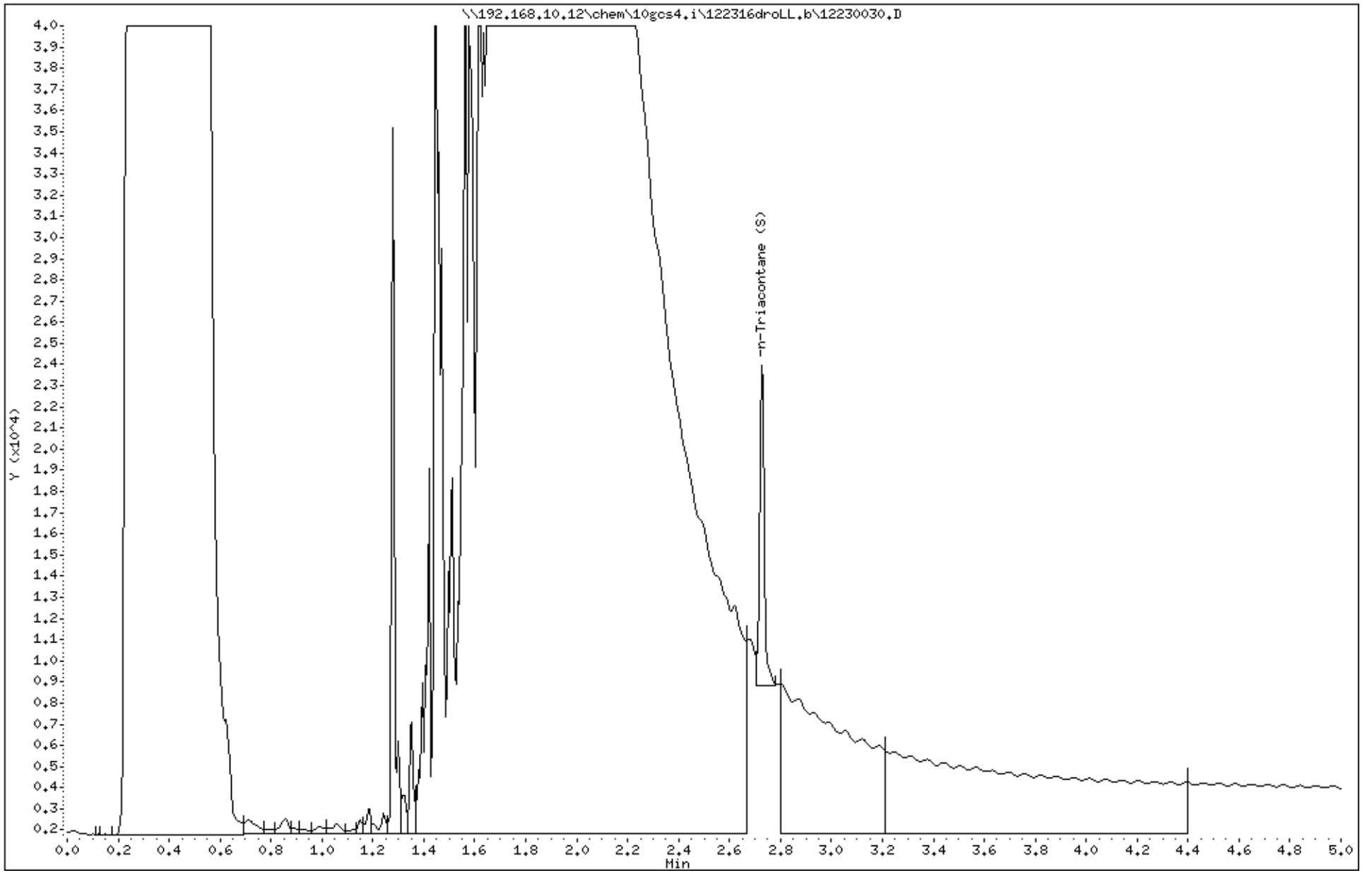
Column phase: DB-5MS

Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122316droLL.b\12230030.D
Date : 23-DEC-2016 15:20
Client ID: MW10
Sample Info: 10373969003X10
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs4.i
Operator: JRH
Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122316droLL.b\12230021.D

Date : 23-DEC-2016 13:21

Client ID: MW-16A

Instrument: 10gcs4.i

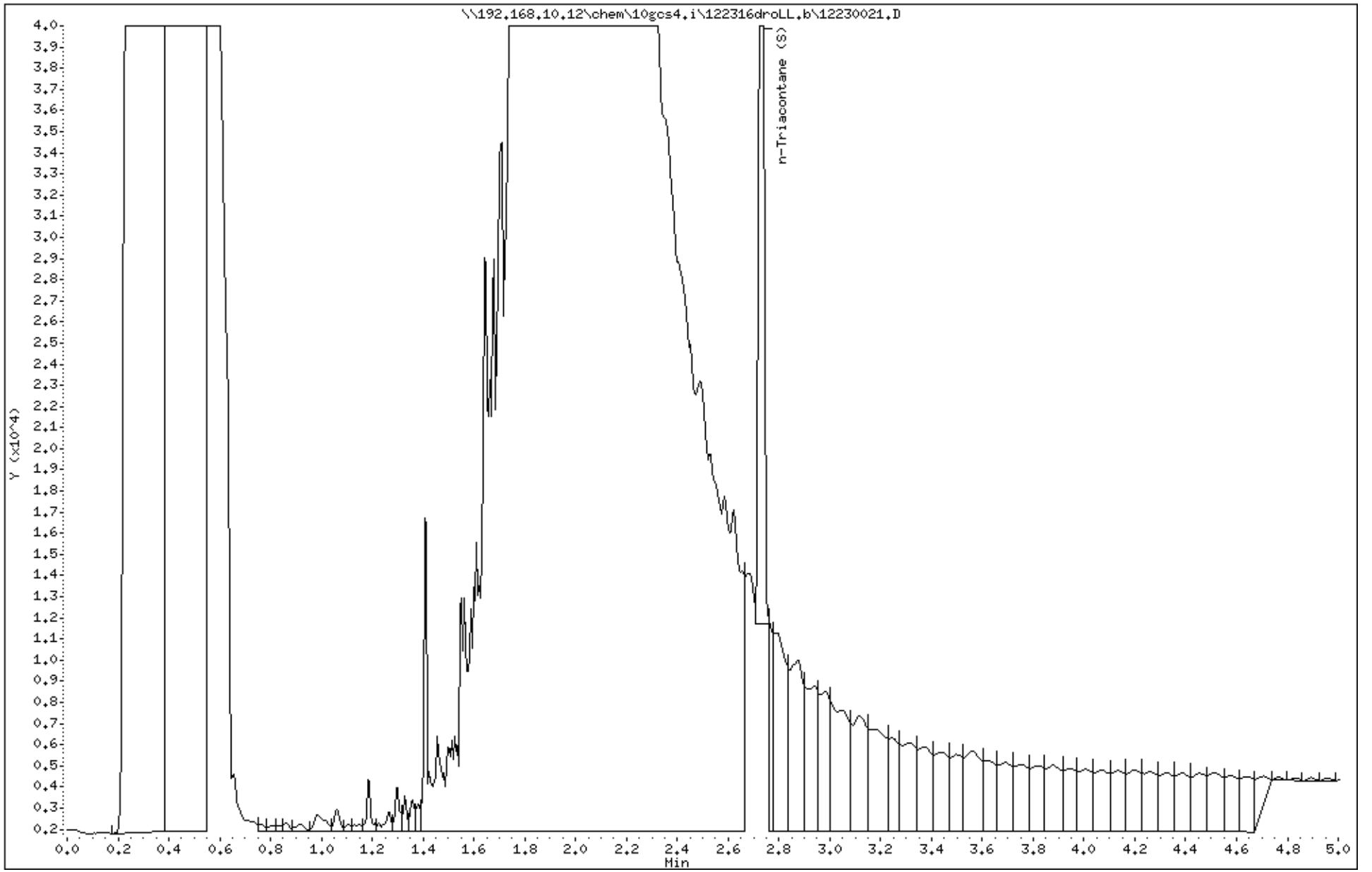
Sample Info: 10373969004

Volume Injected (uL): 1.0

Operator: JRH

Column phase: DB-5MS

Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122316droLL.b\12230019.D

Date : 23-DEC-2016 13:05

Client ID: MW-16B

Instrument: 10gcs4.i

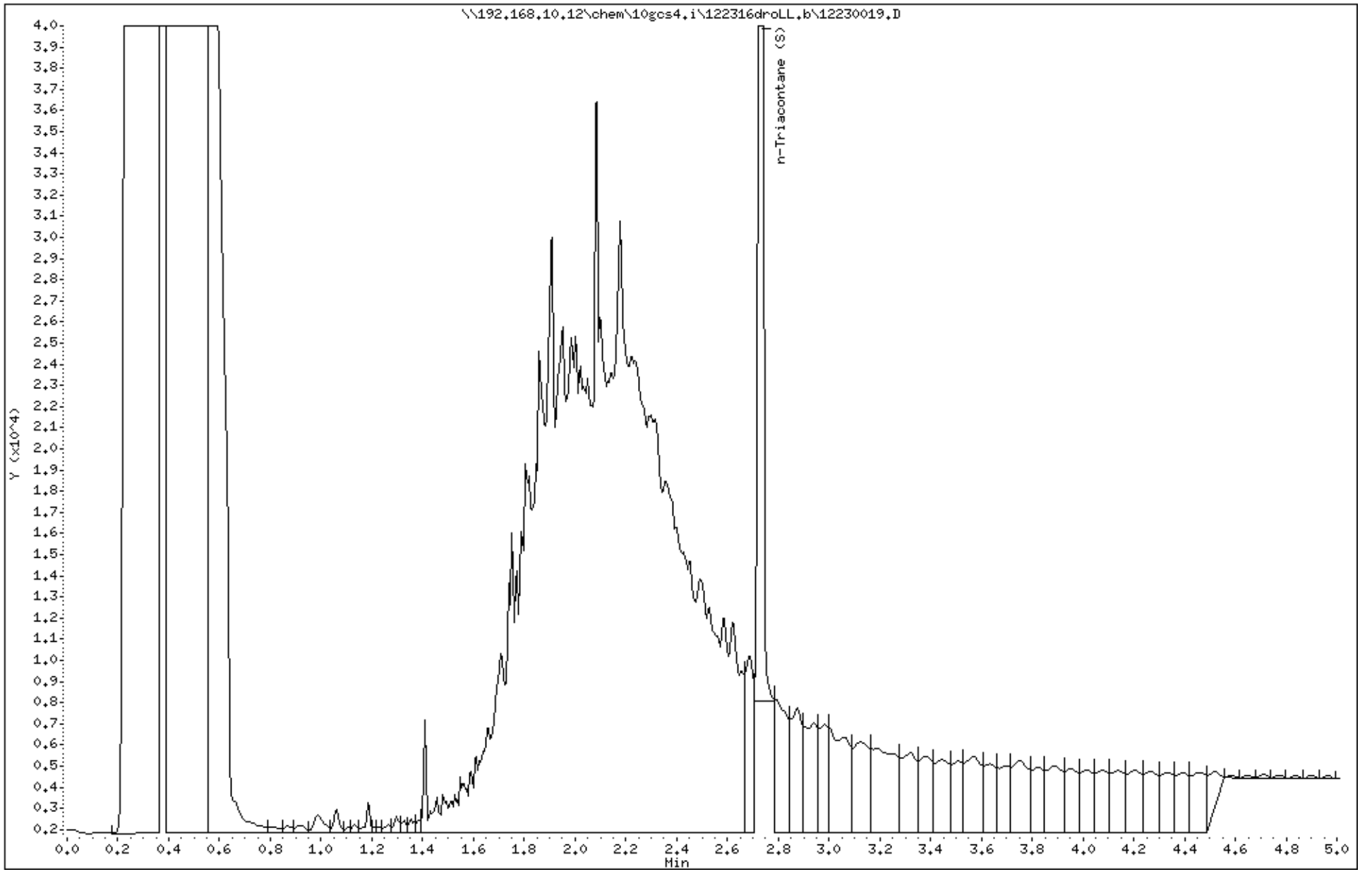
Sample Info: 10373969005

Volume Injected (uL): 1.0

Operator: JRH

Column phase: DB-5MS

Column diameter: 0.25



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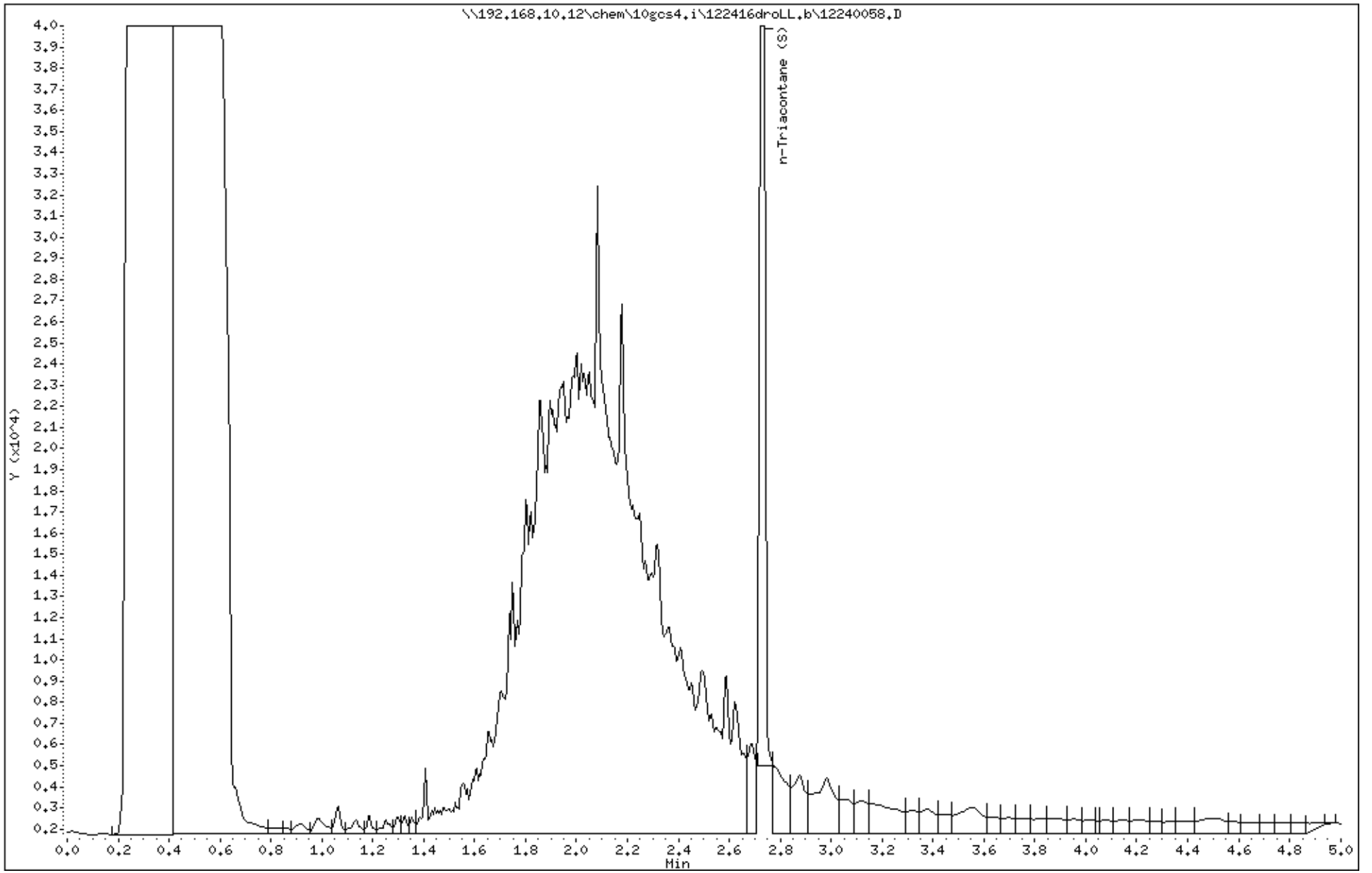
Date : 24-DEC-2016 18:50
Client ID: MW-19
Sample Info: 10373969006
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs4.i
Operator: JRH
Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122416droLL.b\12240059.D

Date : 24-DEC-2016 18:58

Client ID: MW-21

Instrument: 10gcs4.i

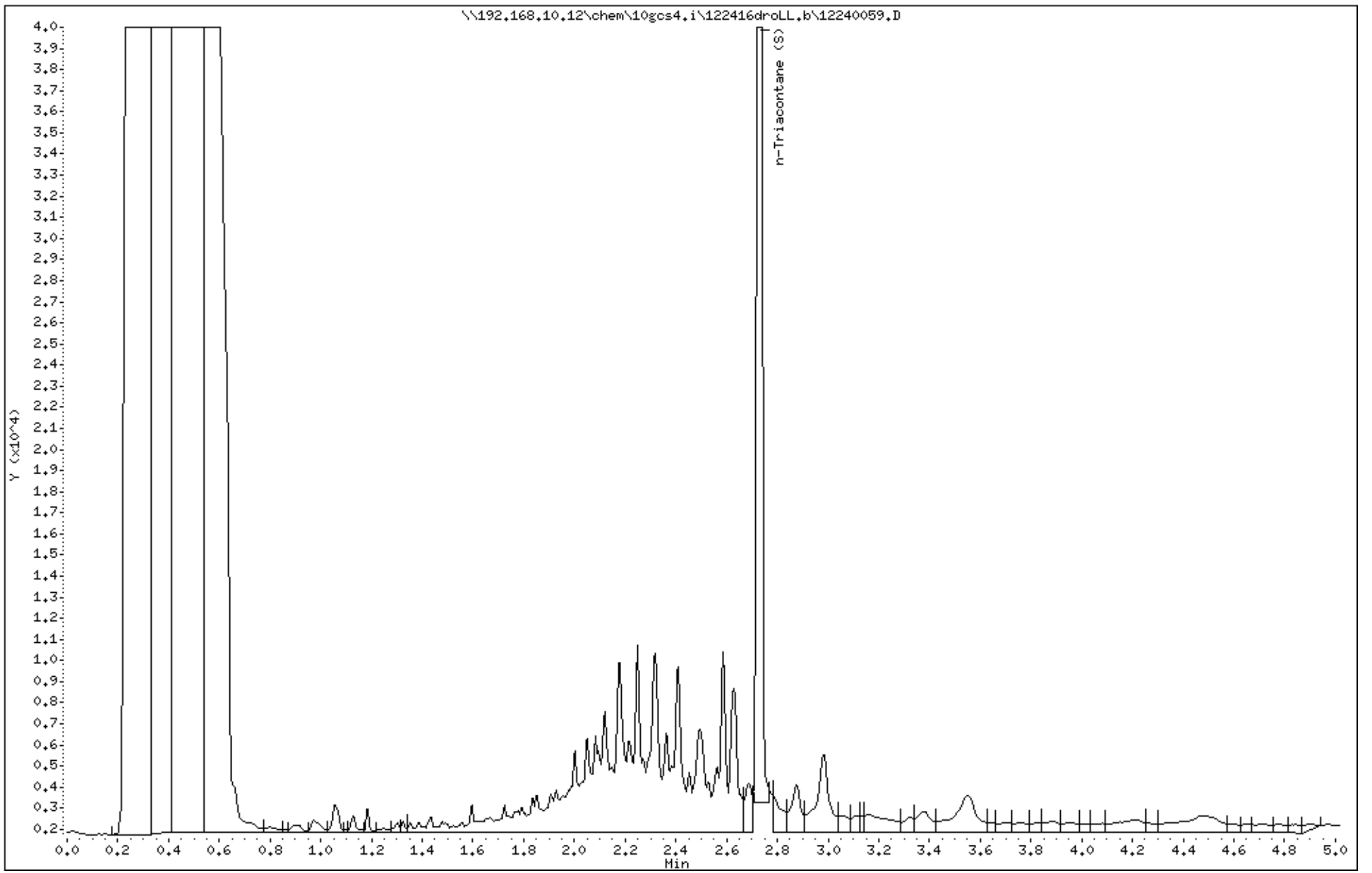
Sample Info: 10373969007

Volume Injected (uL): 1.0

Operator: JRH

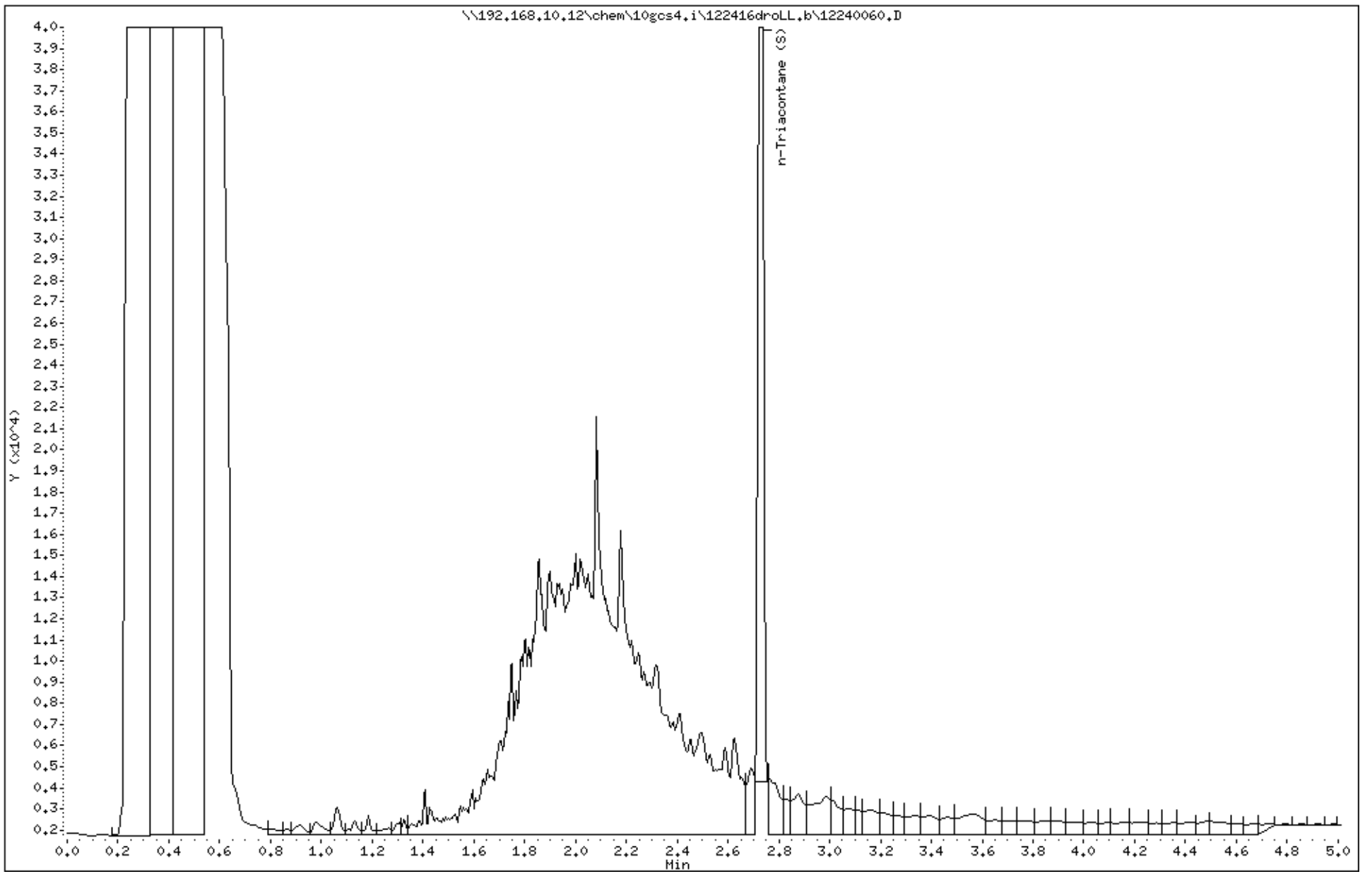
Column phase: DB-5MS

Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122416droLL.b\12240060.D
Date : 24-DEC-2016 19:06
Client ID: MW-22
Sample Info: 10373969008
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs4.i
Operator: JRH
Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122416droLL.b\12240061.D

Date : 24-DEC-2016 19:14

Client ID: SCDW

Instrument: 10gcs4.i

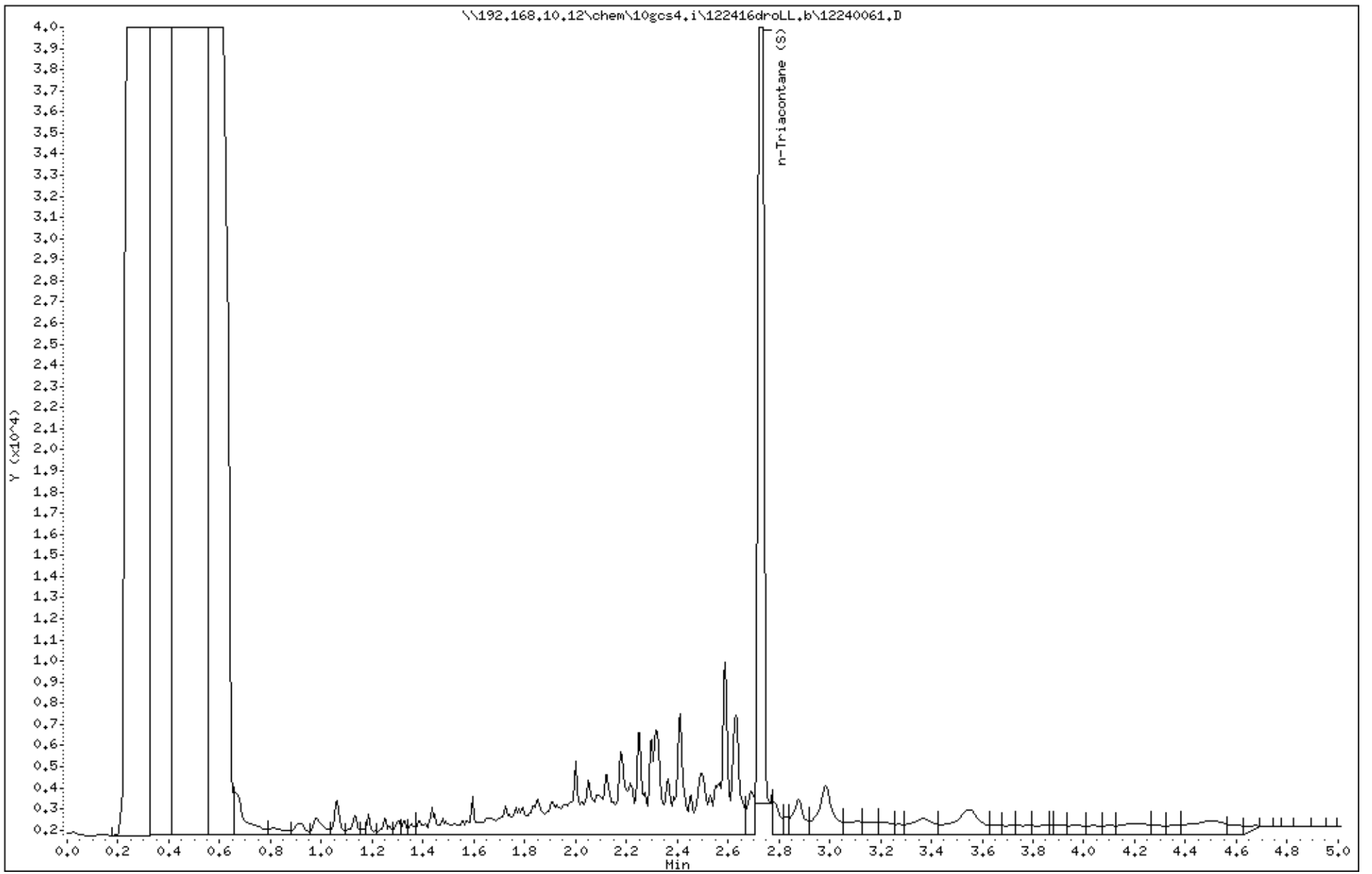
Sample Info: 10373969009

Volume Injected (uL): 1.0

Operator: JRH

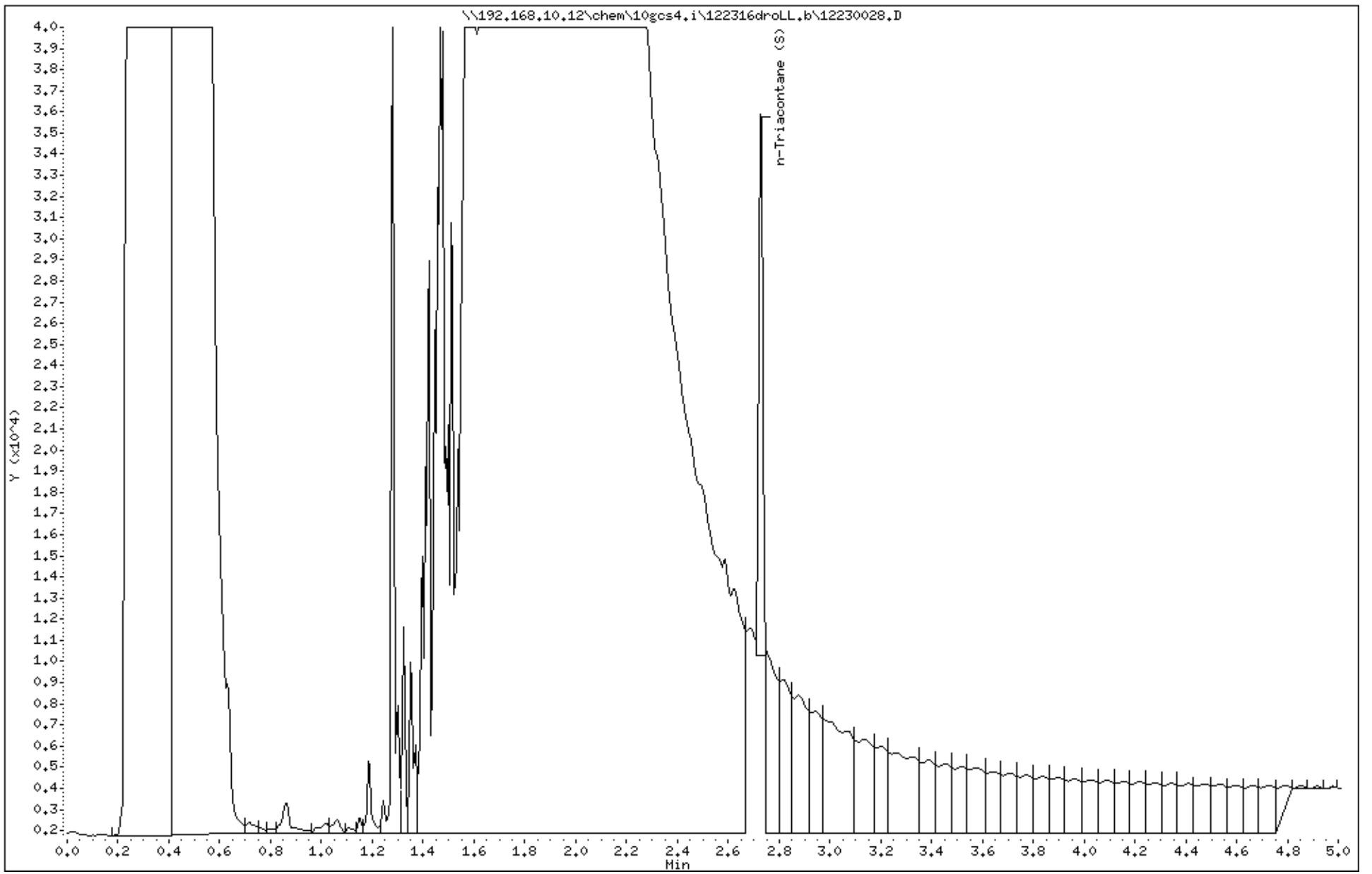
Column phase: DB-5MS

Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122316droLL.b\12230028.D
Date : 23-DEC-2016 15:04
Client ID: USGS-1
Sample Info: 10373969010X5
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs4.i
Operator: JRH
Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122316droLL.b\12230026.D

Date : 23-DEC-2016 14:48

Client ID: USGS-2

Instrument: 10gcs4.i

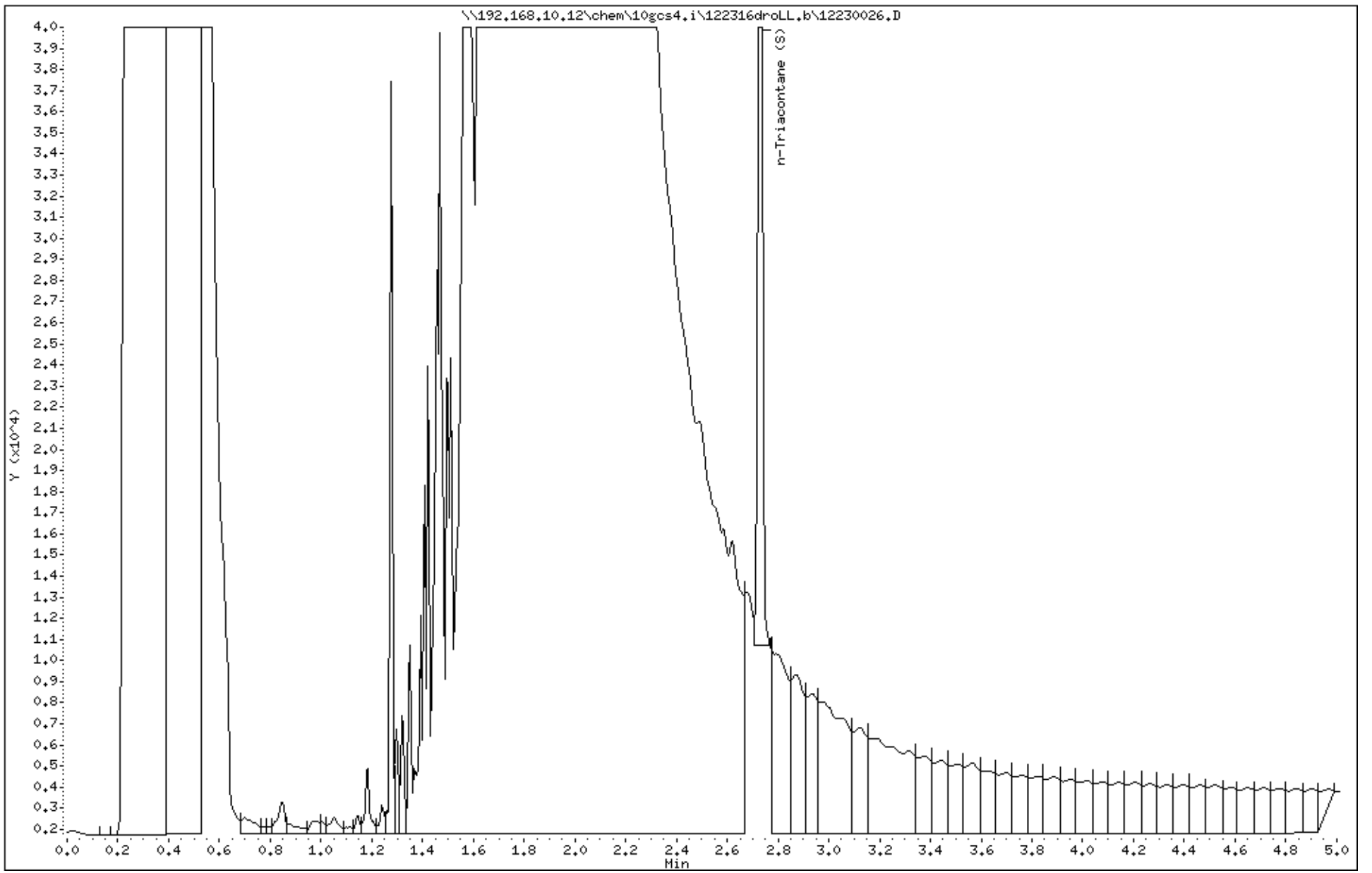
Sample Info: 10373969011X2

Volume Injected (uL): 1.0

Operator: JRH

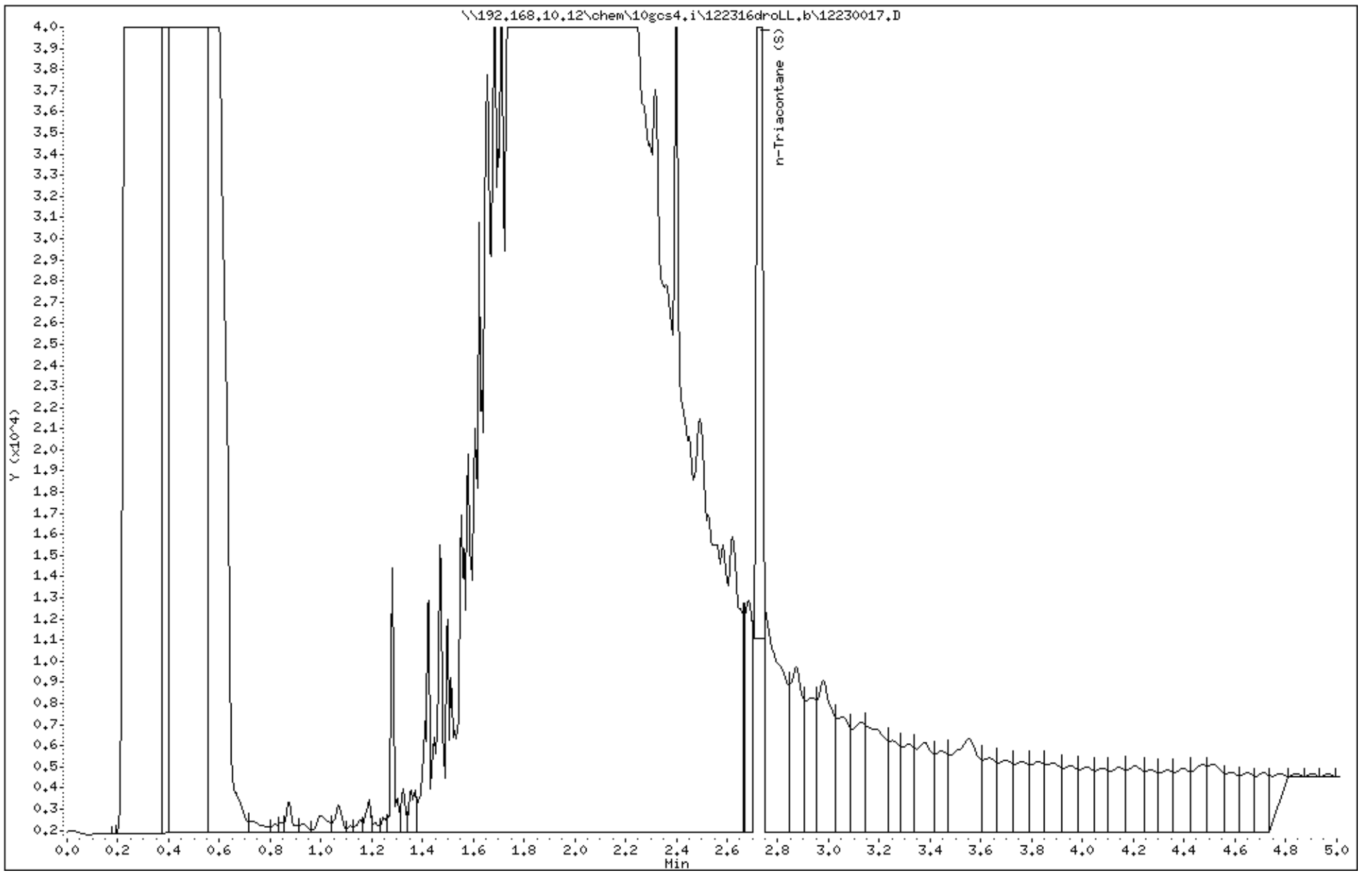
Column phase: DB-5MS

Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122316droLL.b\12230017.D
Date : 23-DEC-2016 12:49
Client ID: USGS-3
Sample Info: 10373969012
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs4.i
Operator: JRH
Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122316droLL.b\12230018.D

Date : 23-DEC-2016 12:57

Client ID: USGS-4

Instrument: 10gcs4.i

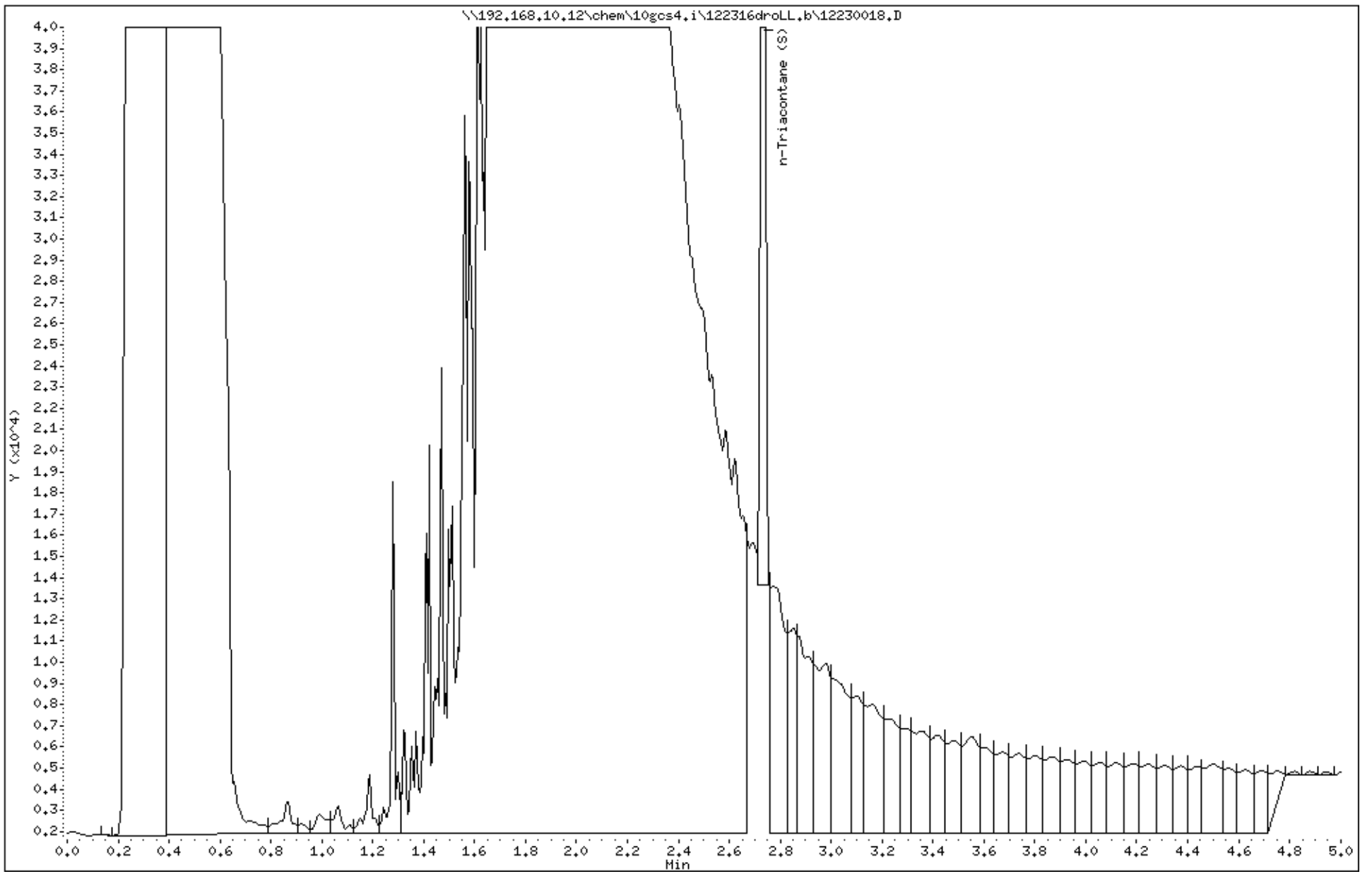
Sample Info: 10373969013

Volume Injected (uL): 1.0

Operator: JRH

Column phase: DB-5MS

Column diameter: 0.25



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Date : 24-DEC-2016 19:22

Client ID: Field Blank

Instrument: 10gcs4.i

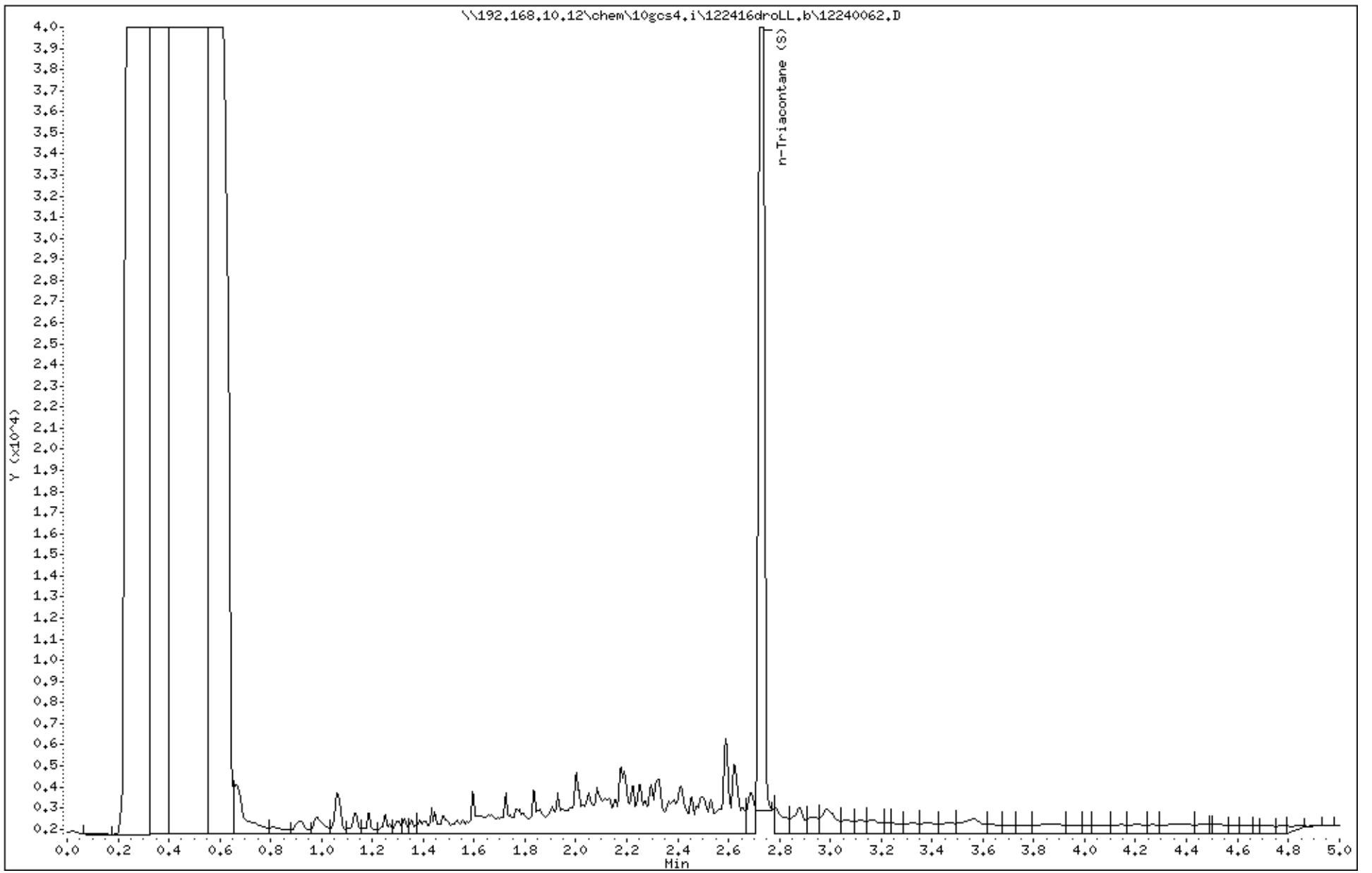
Sample Info: 10373969014

Volume Injected (uL): 1.0

Operator: JRH

Column phase: DB-5MS

Column diameter: 0.25



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Date : 23-DEC-2016 15:12

Client ID: Dup

Instrument: 10gcs4.i

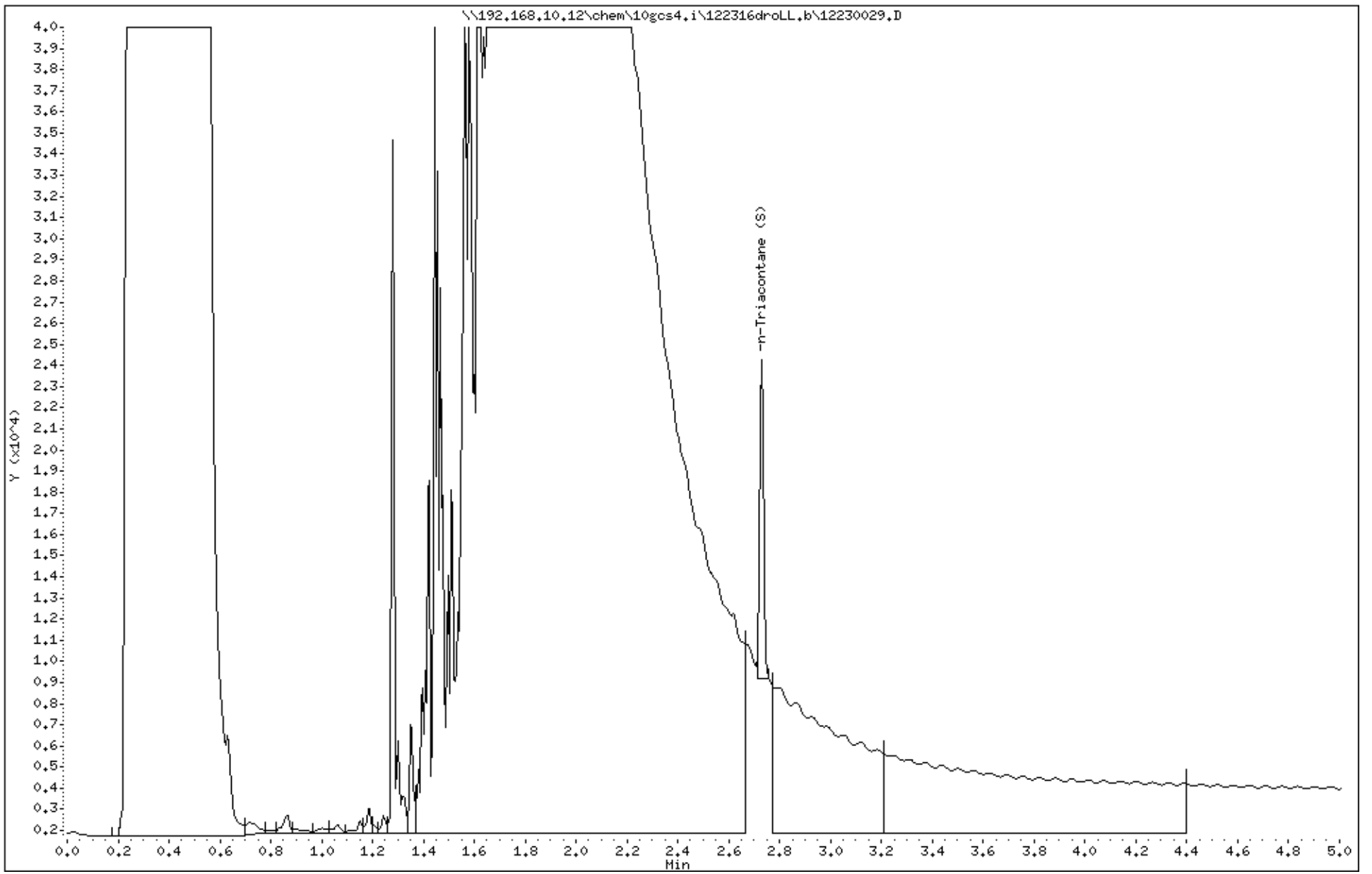
Sample Info: 10373969015X10

Volume Injected (uL): 1.0

Operator: JRH

Column phase: DB-5MS

Column diameter: 0.25



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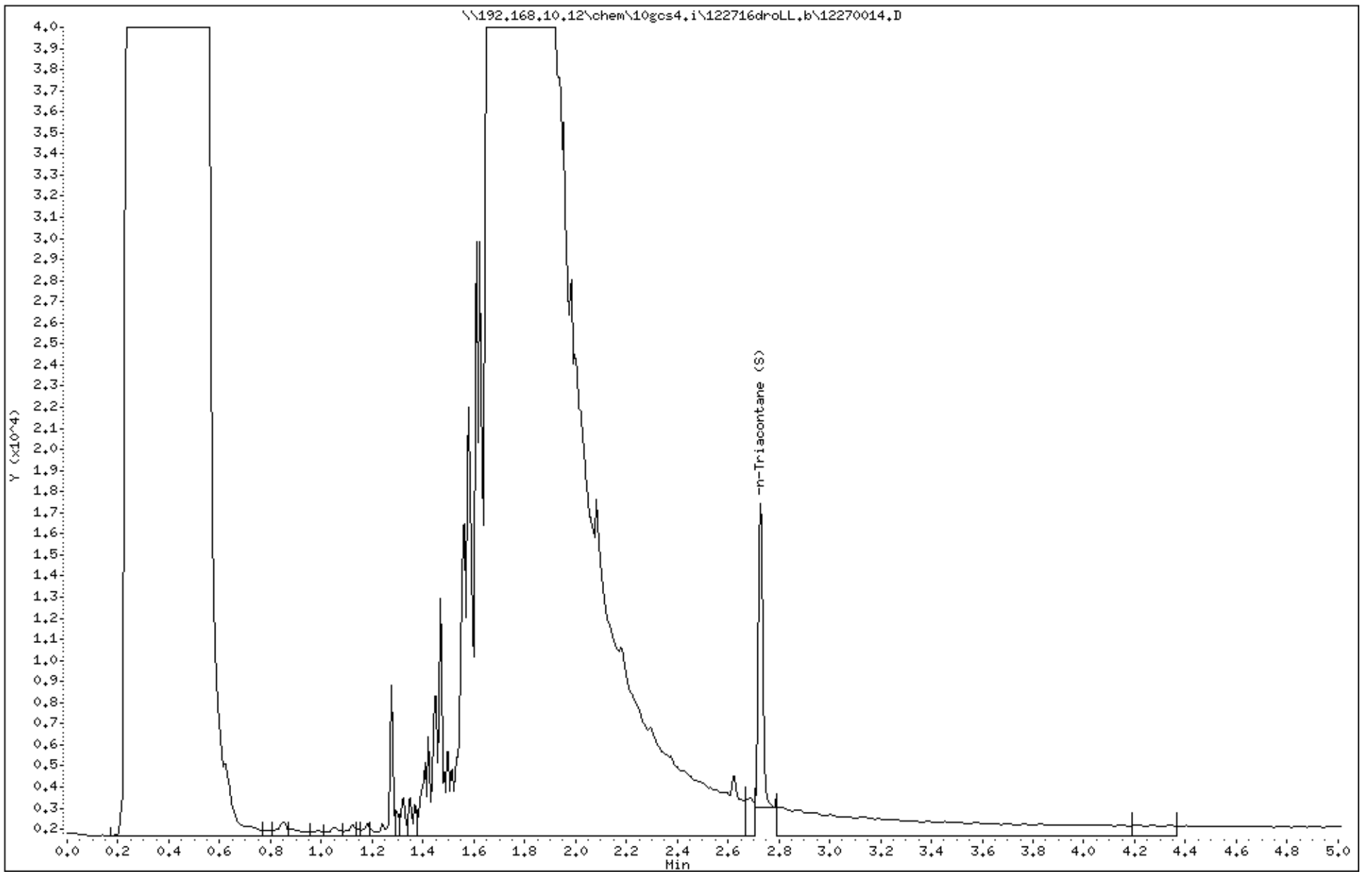
Date : 27-DEC-2016 10:31
Client ID: MW9
Sample Info: 10373969002X5
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs4.i
Operator: MT
Column diameter: 0.25



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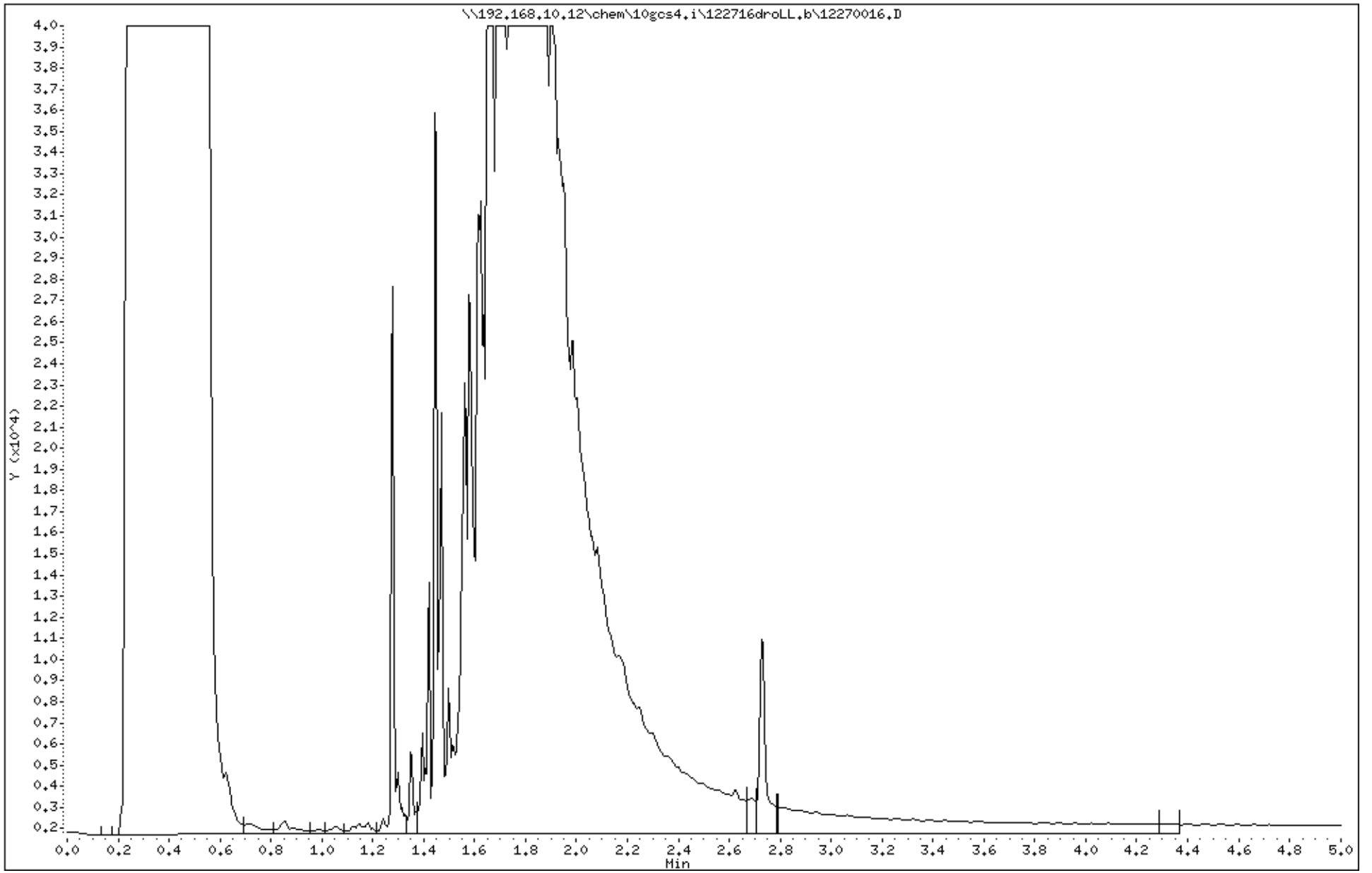
Date : 27-DEC-2016 10:46
Client ID: MW10
Sample Info: 10373969003X10
Volume Injected (uL): 1.0
Column phase: DB-5MS

Instrument: 10gcs4.i
Operator: MT
Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122716droLL.b\12270017.D

Date : 27-DEC-2016 10:54

Client ID: MW-16A

Instrument: 10gcs4.i

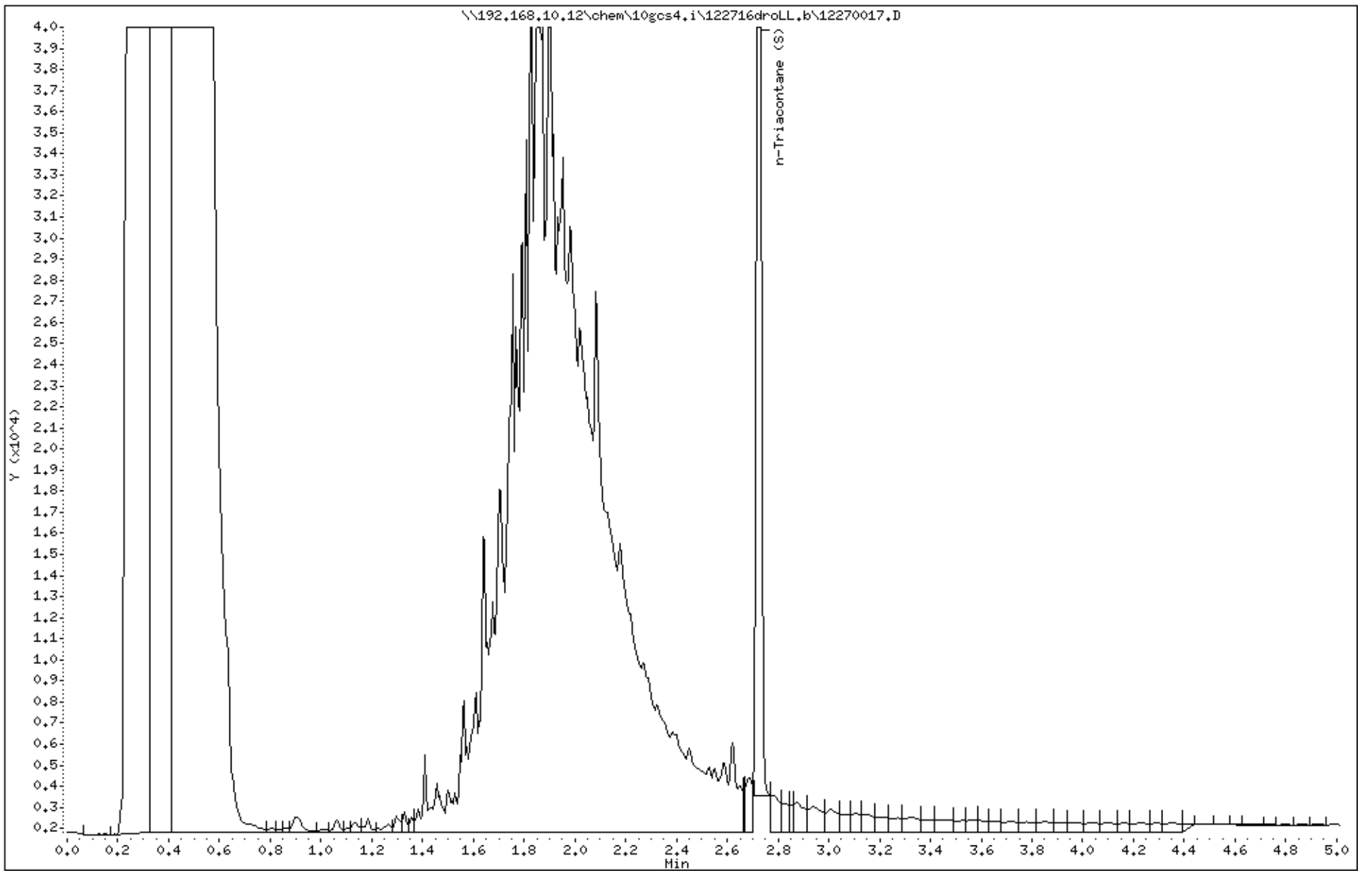
Sample Info: 10373969004

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.25



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Date : 27-DEC-2016 11:02

Client ID: MW-16B

Instrument: 10gcs4.i

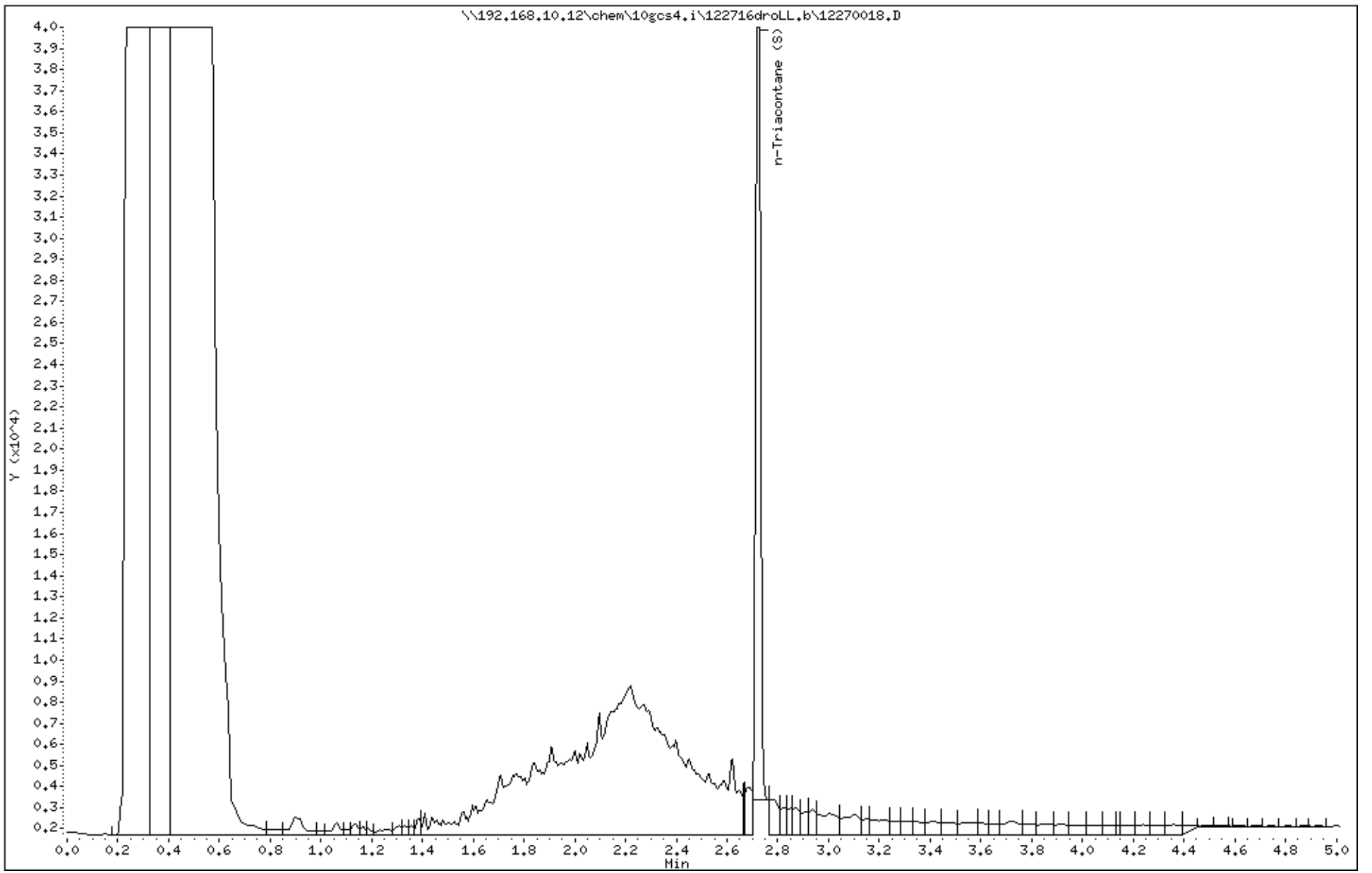
Sample Info: 10373969005

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.25



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Date : 27-DEC-2016 09:35

Client ID: MW-19

Instrument: 10gcs4.i

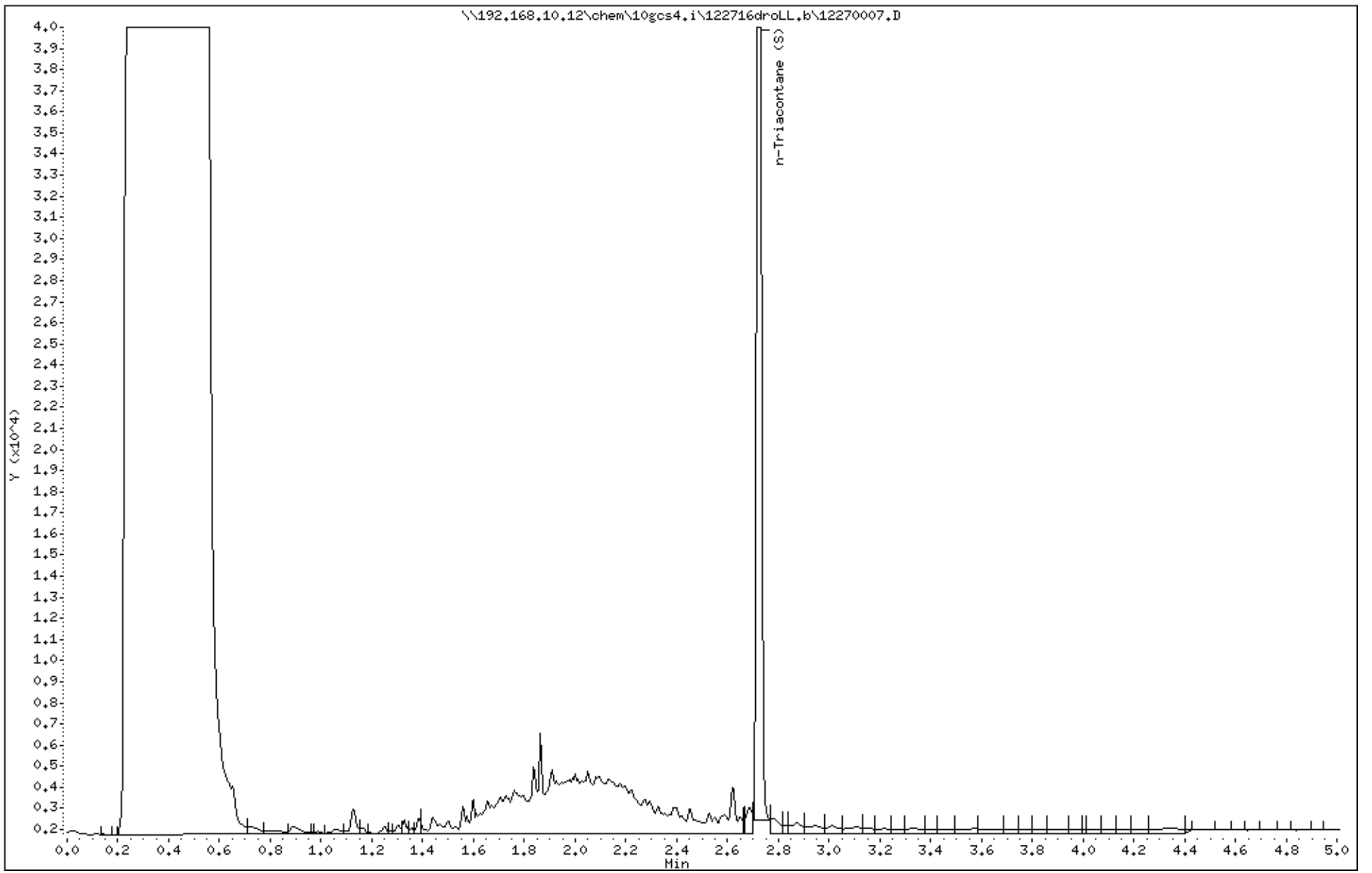
Sample Info: 10373969006

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122716droLL.b\12270008.D

Date : 27-DEC-2016 09:43

Client ID: MW-22

Instrument: 10gcs4.i

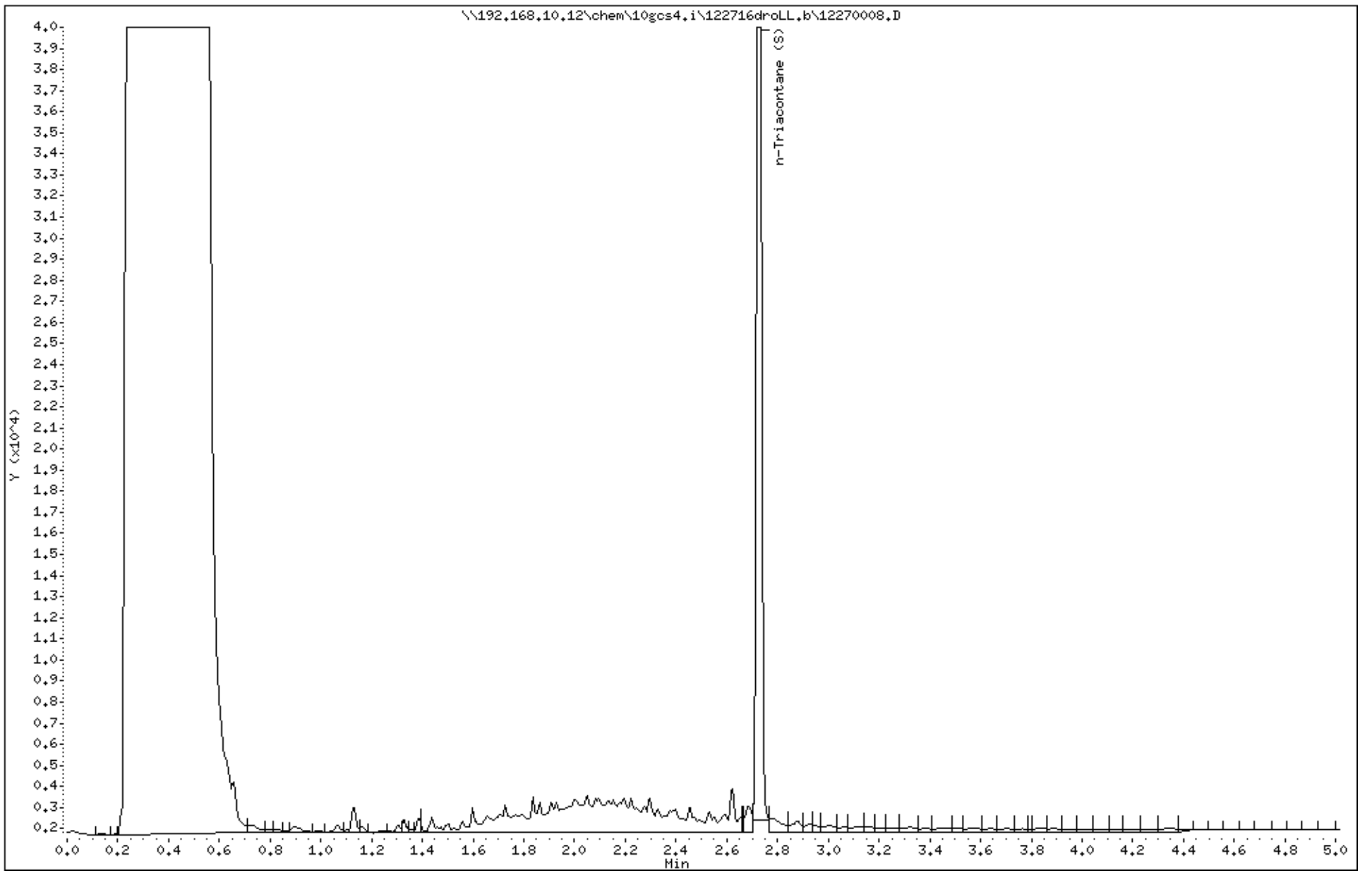
Sample Info: 10373969008

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122716droLL.b\12270015.D

Date : 27-DEC-2016 10:39

Client ID: USGS-1

Instrument: 10gcs4.i

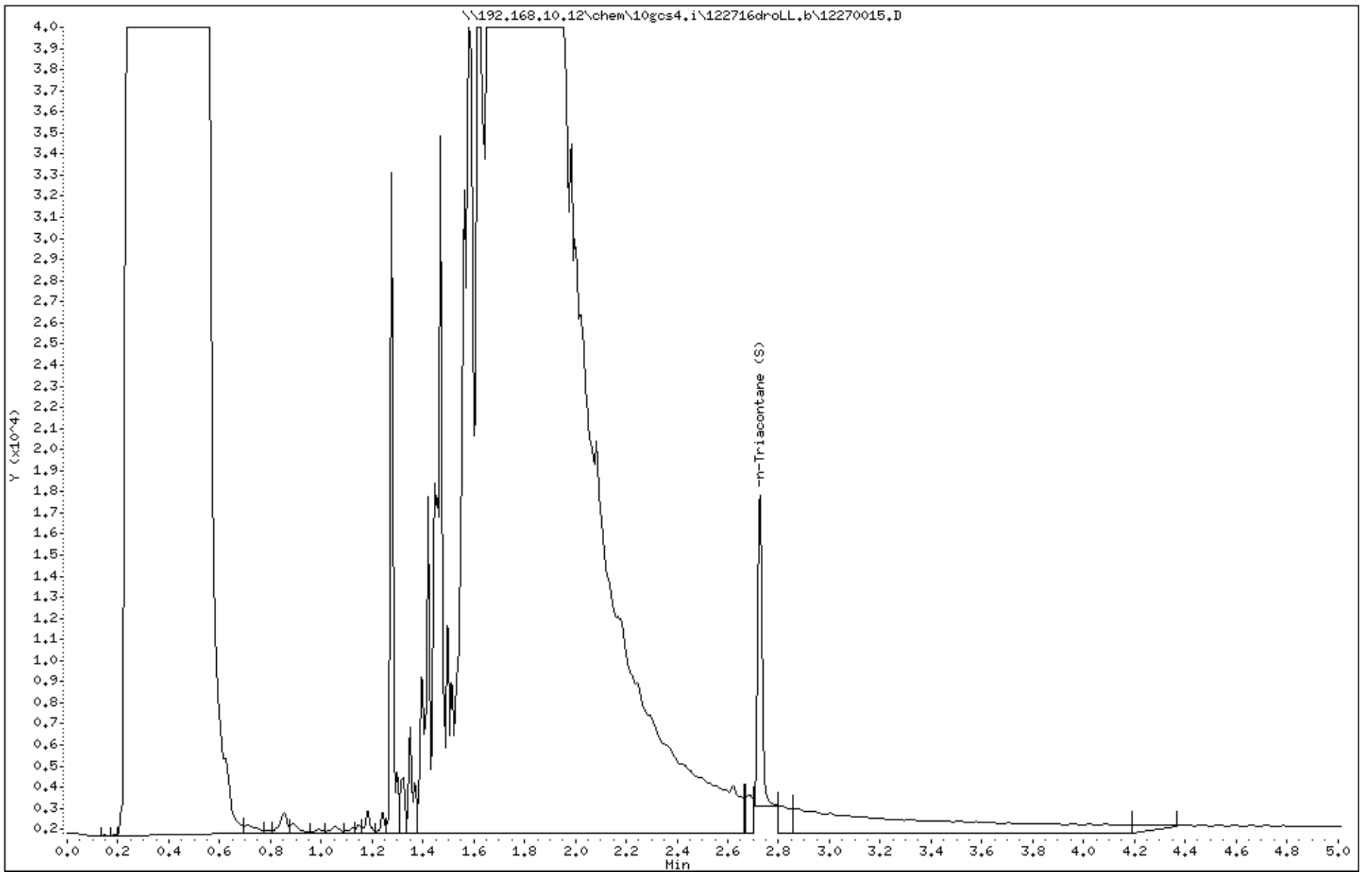
Sample Info: 10373969010X5

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122716droLL.b\12270013.D

Date : 27-DEC-2016 10:23

Client ID: USGS-2

Instrument: 10gcs4.i

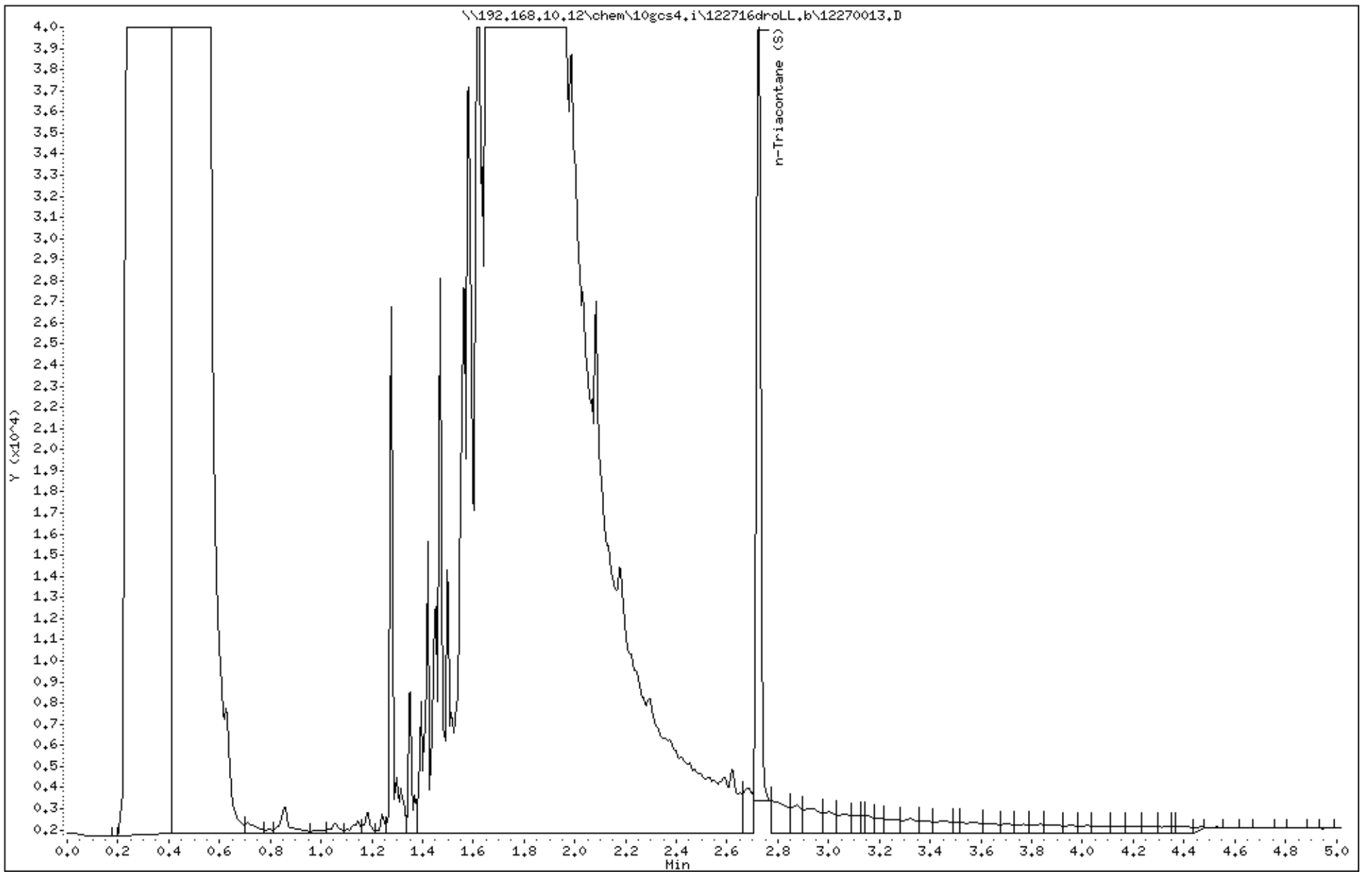
Sample Info: 10373969011X2

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122716droLL.b\12270019.D

Date : 27-DEC-2016 11:10

Client ID: USGS-3

Instrument: 10gcs4.i

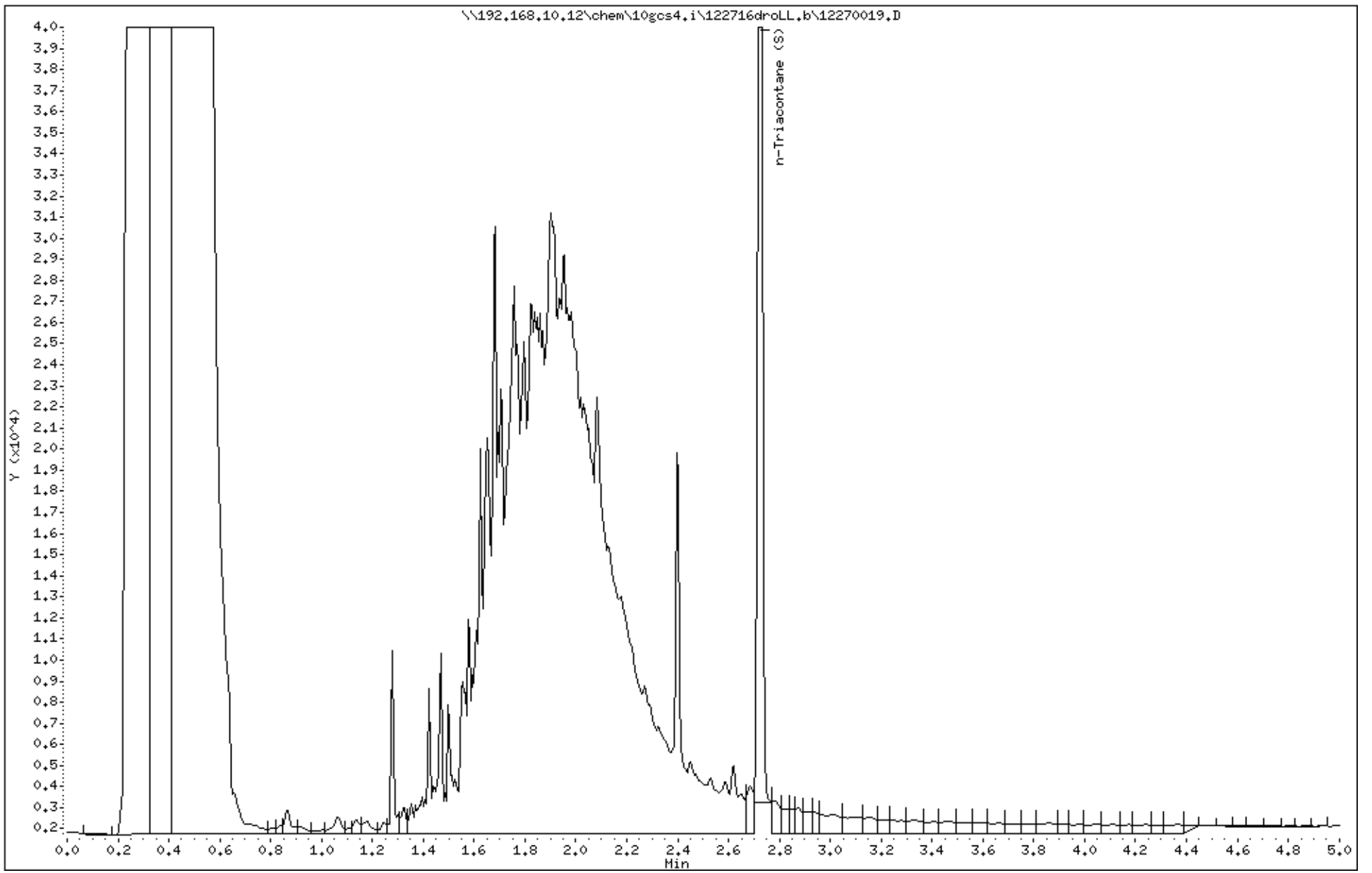
Sample Info: 10373969012

Volume Injected (uL): 1.0

Operator: MT

Column phase: DB-5MS

Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\122716droLL.b\12270020.D

Date : 27-DEC-2016 11:18

Client ID: USGS-4

Instrument: 10gcs4.i

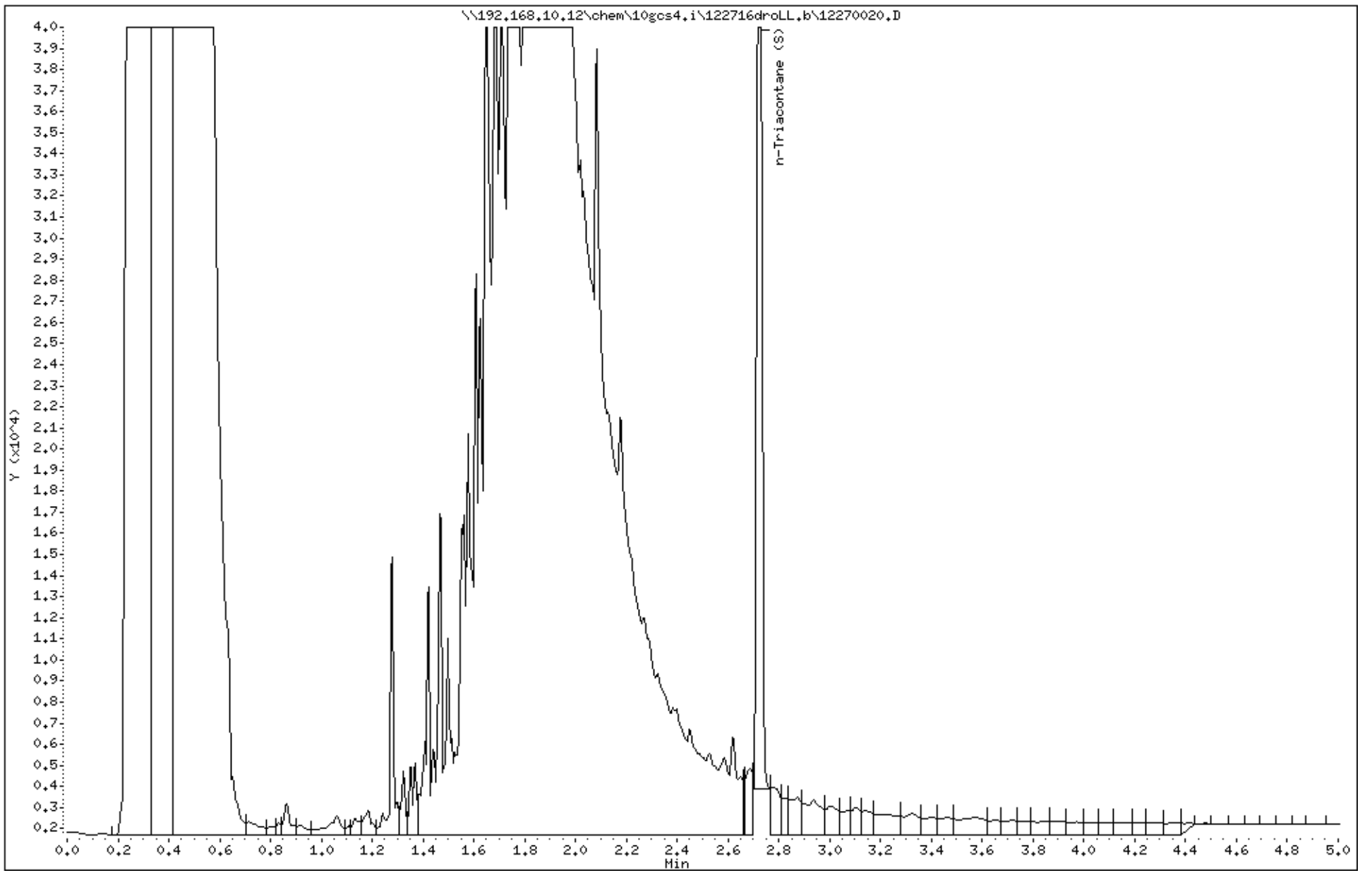
Sample Info: 10373969013

Volume Injected (uL): 1.0

Operator: MT

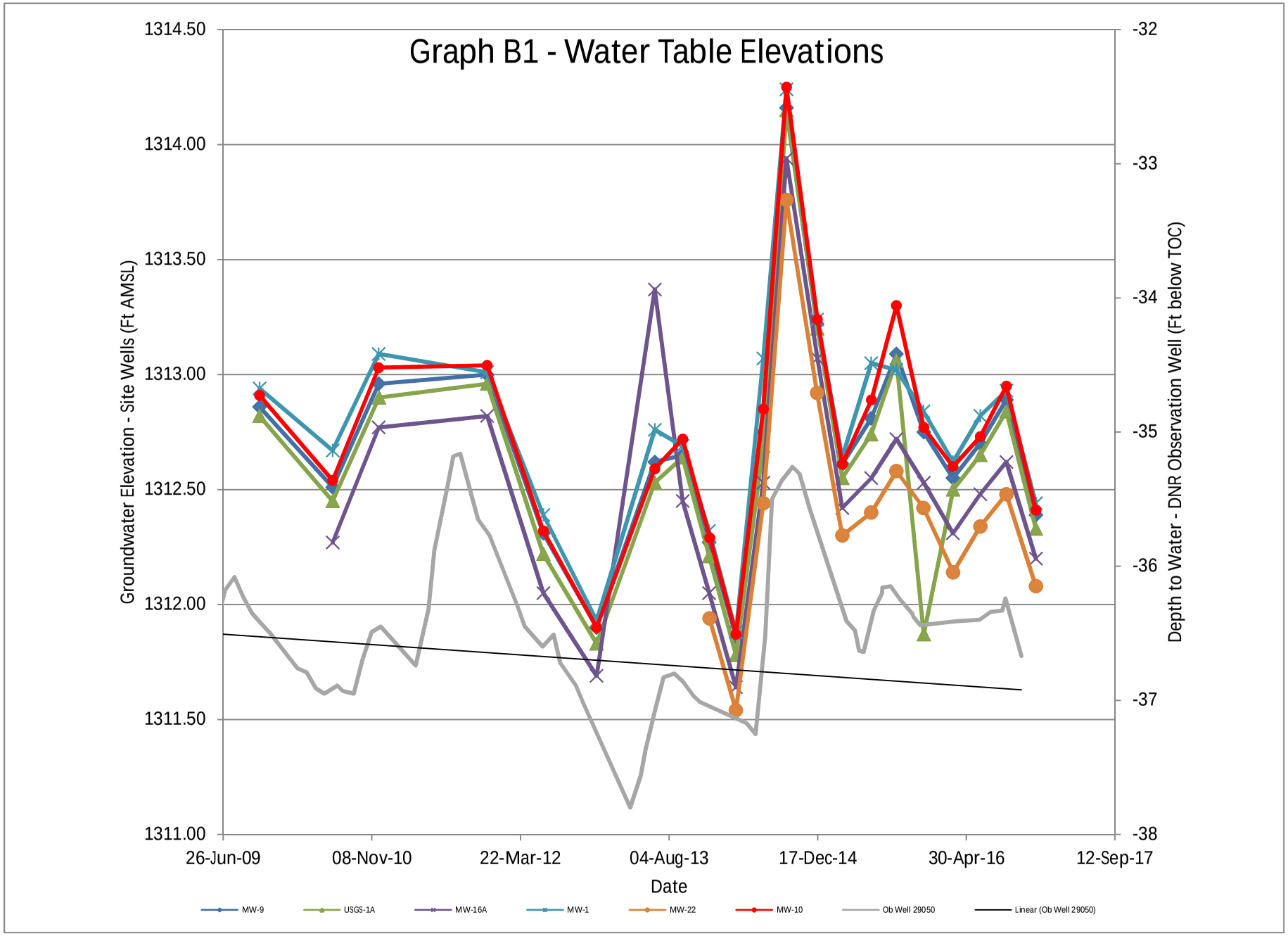
Column phase: DB-5MS

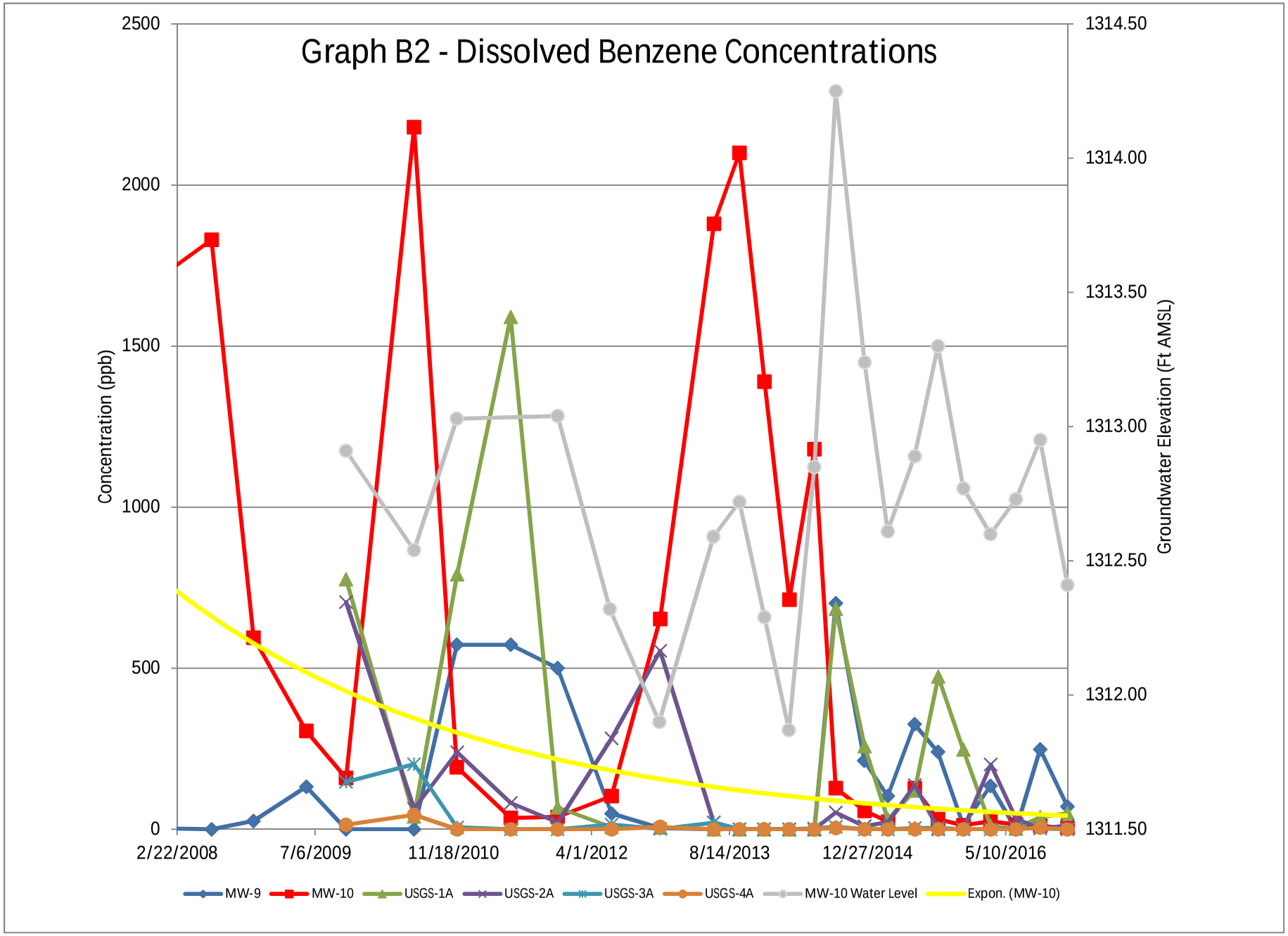
Column diameter: 0.25

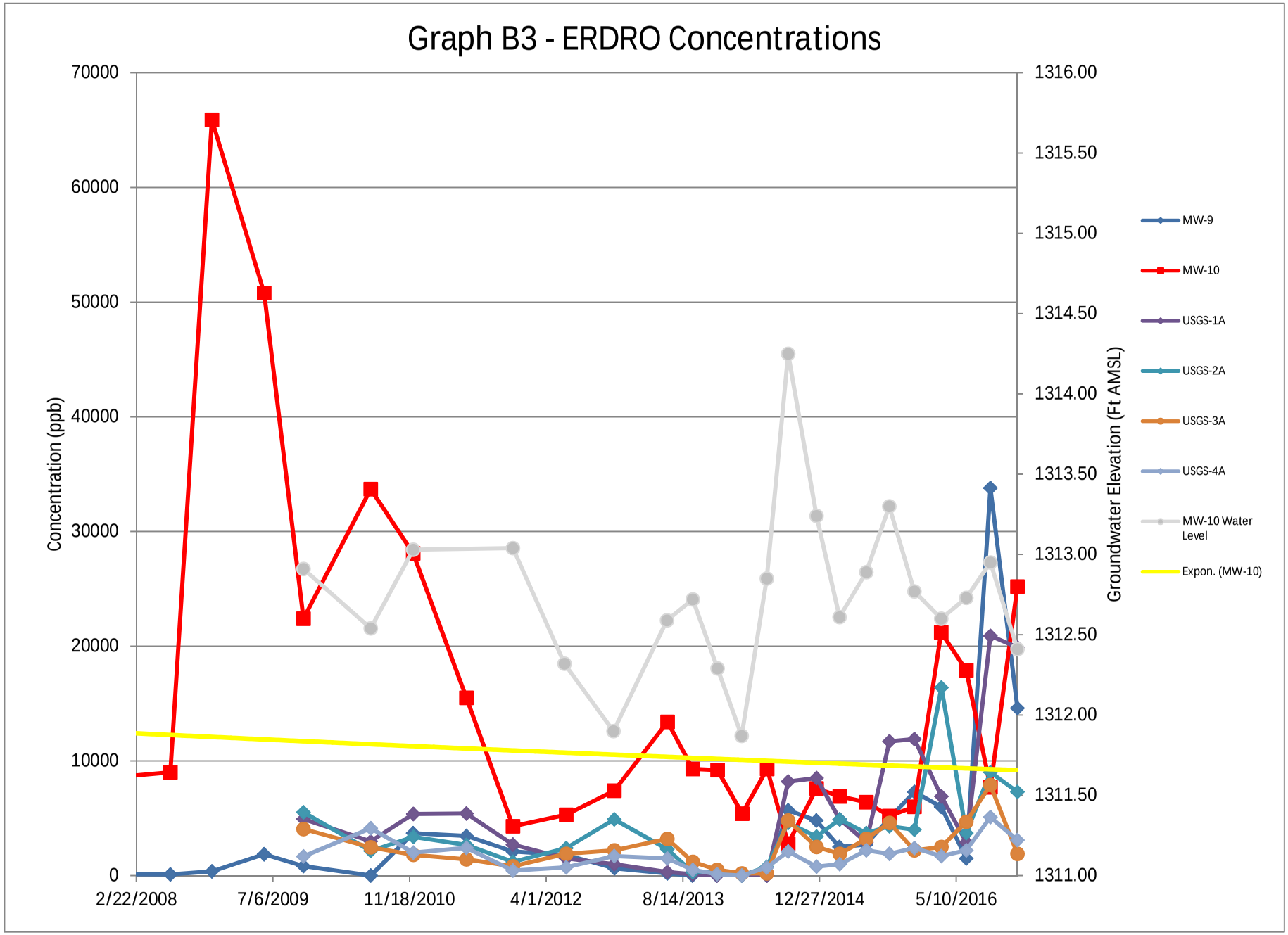


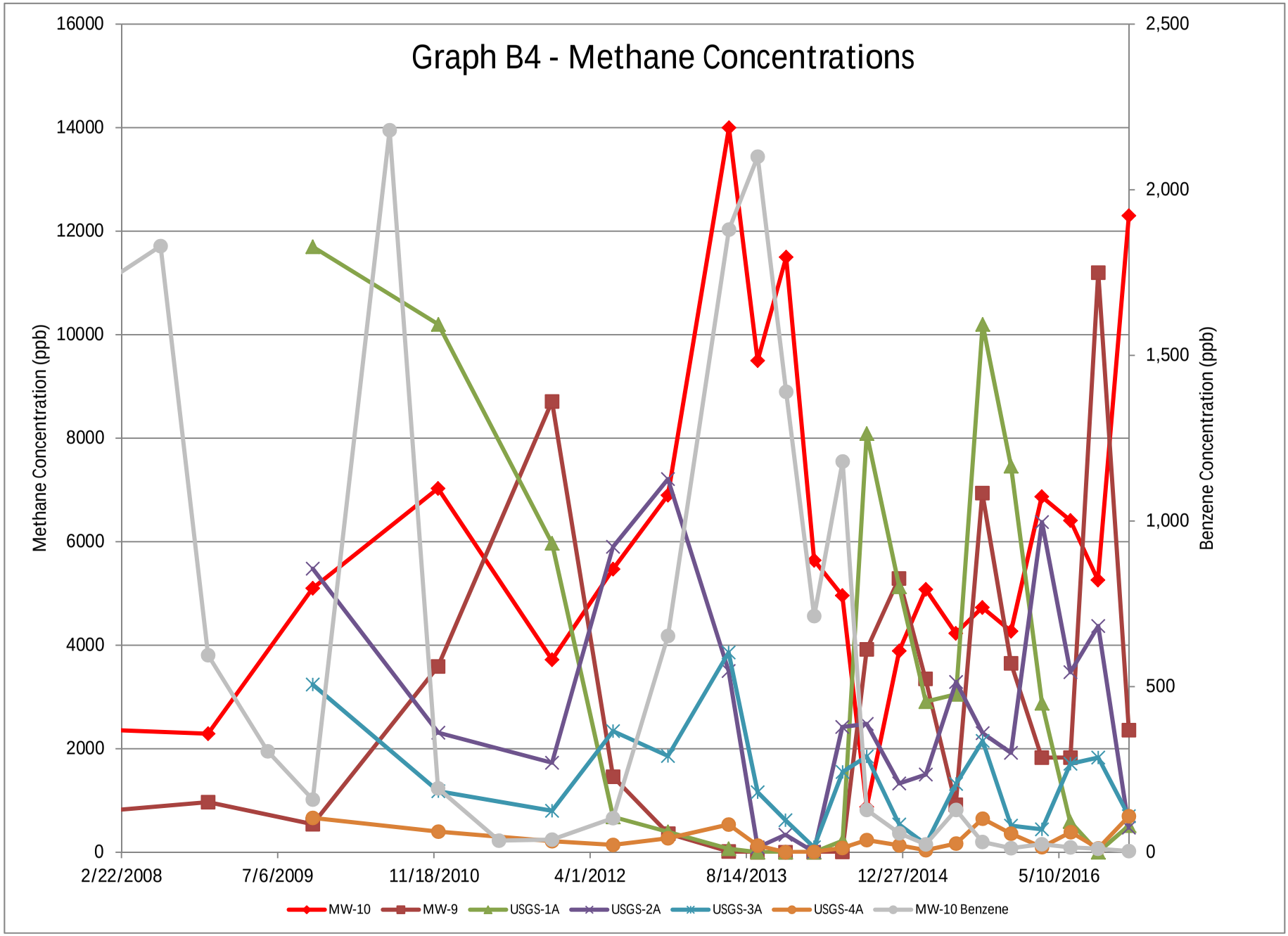
Appendix B
Time-Series Graphs – Historical Groundwater Data

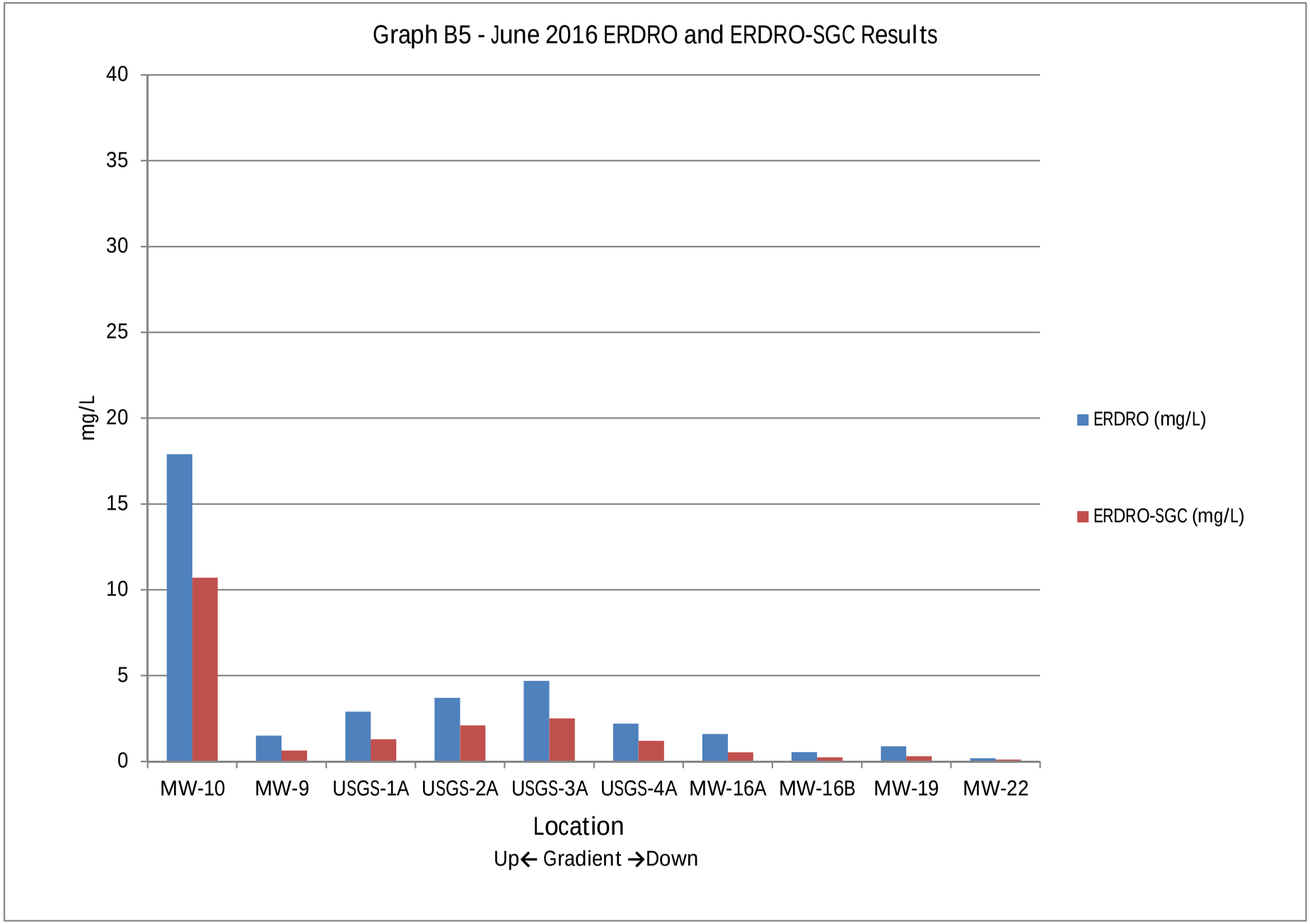
Graph B1 - Water Table Elevations
Graph B2 - Dissolved Benzene Concentrations
Graph B3 - ERDRO Concentrations
Graph B4 - Methane Concentrations
Graph B5 - June ERDRO/ SGC Comparison
Graph B6 - September ERDRO/ SGC Comparison
Graph B7 - December ERDRO/ SGC Comparison

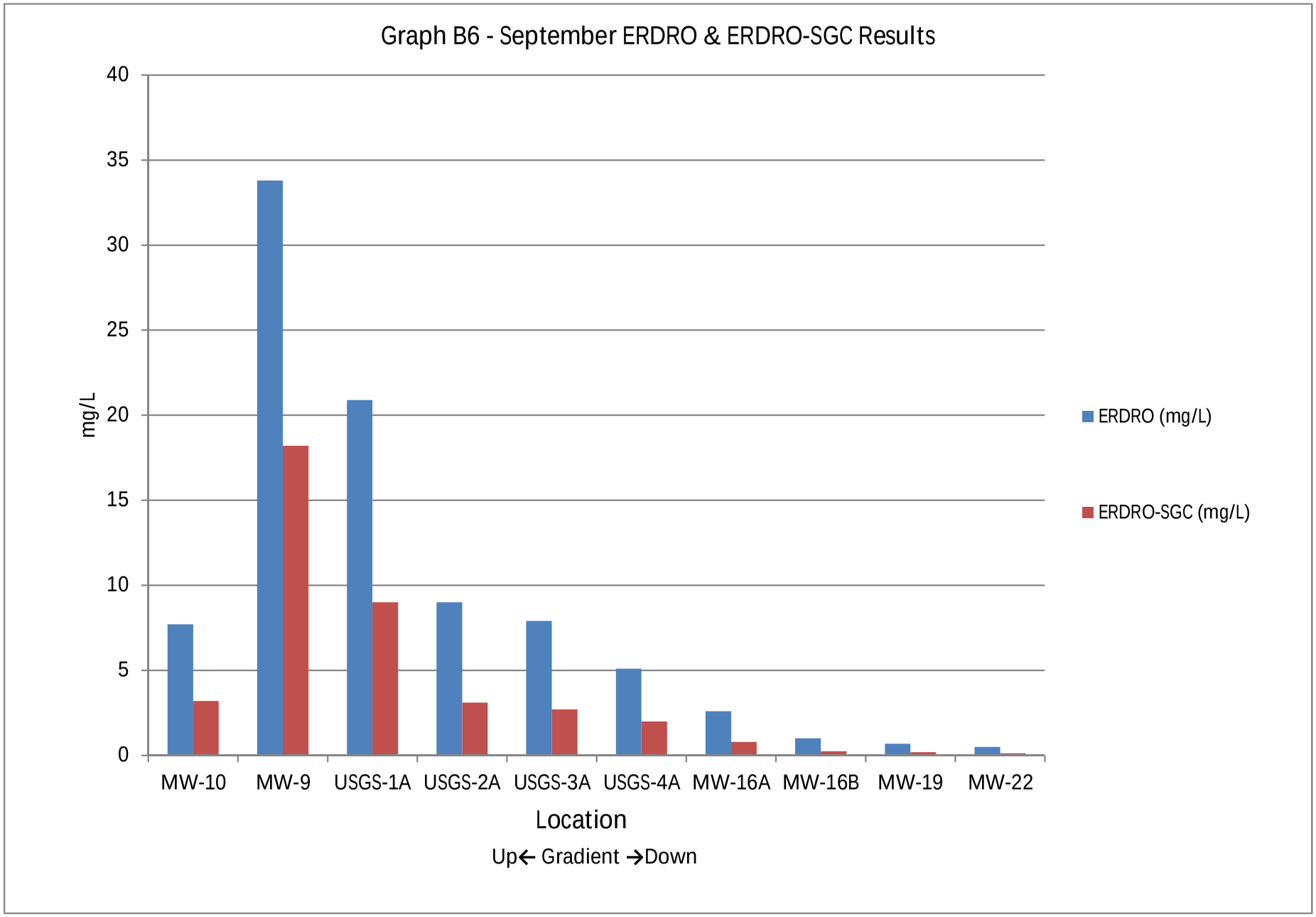

Graph B1 - Water Table Elevations
Groundwater Elevation - Site Wells (Ft AMSL)
Depth to Water - DNR Observation Well (Ft below TOC)
1314.50
1314.00
1313.50
1313.00
1312.50
1312.00
1311.50
1311.00
-32
-33
-34
-35
-36
-37
-38
26-Jun-09
08-Nov-10
22-Mar-12
04-Aug-13
17-Dec-14
30-Apr-16
12-Sep-17
Date
MW-9
USGS-1A
MW-16A
MW-1
MW-22
MW-10
Ob Well 29050
Linear (Ob Well 29050)

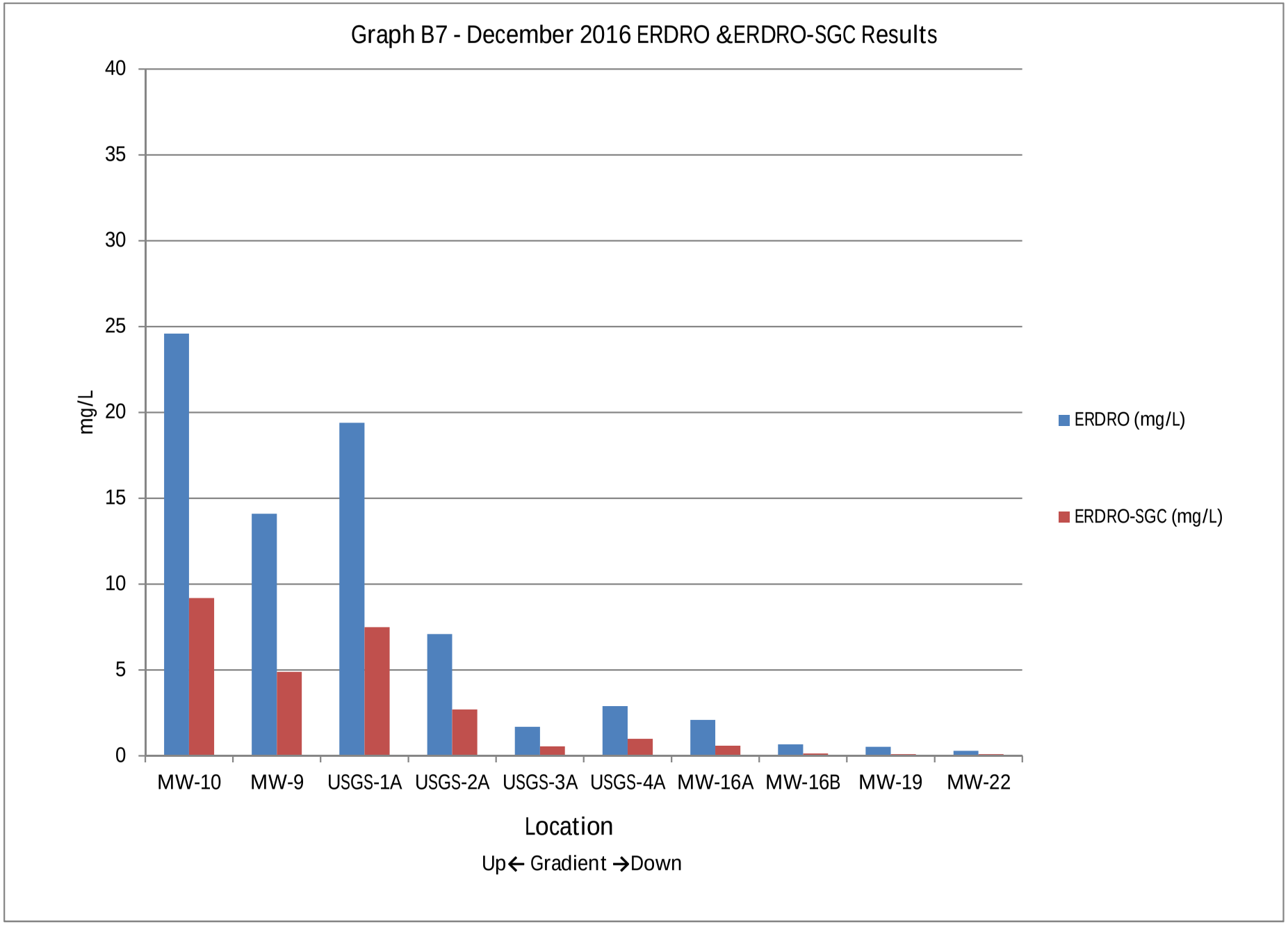

Graph B2 - Dissolved Benzene Concentrations
Concentration (ppb)
Groundwater Elevation (Ft AMSL)
2500
2000
1500
1000
500
0
1314.50
1314.00
1313.50
1313.00
1312.50
1312.00
1311.50
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
MW-9
MW-10
USGS-1A
USGS-2A
USGS-3A
USGS-4A
MW-10 Water Level
Expon. (MW-10)


Graph B3 - ERDRO Concentrations
Concentration (ppb)
Groundwater Elevation (Ft AMSL)
70000
60000
50000
40000
30000
20000
10000
0
1316.00
1315.50
1315.00
1314.50
1314.00
1313.50
1313.00
1312.50
1312.00
1311.50
1311.00
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
MW-9
MW-10
USGS-1A
USGS-2A
USGS-3A
USGS-4A
MW-10 Water Level
Expon. (MW-10)


Graph B4 - Methane Concentrations
Methane Concentration (ppb)
Benzene Concentration (ppb)
16000
14000
12000
10000
8000
6000
4000
2000
0
2,500
2,000
1,500
1,000
500
0
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
MW-10
MW-9
USGS-1A
USGS-2A
USGS-3A
USGS-4A
MW-10 Benzene


Graph B5 - June 2016 ERDRO and ERDRO-SGC Results
40
35
30
25
20
15
10
5
0
mg/L
MW-10
MW-9
USGS-1A
USGS-2A
USGS-3A
USGS-4A
MW-16A
MW-16B
MW-19
MW-22
Location
Up← Gradient →Down
ERDRO (mg/L)
ERDRO-SGC (mg/L)


Graph B6 - September ERDRO & ERDRO-SGC Results
40
35
30
25
20
15
10
5
0
mg/L
MW-10
MW-9
USGS-1A
USGS-2A
USGS-3A
USGS-4A
MW-16A
MW-16B
MW-19
MW-22
Location
Up← Gradient →Down
ERDRO (mg/L)
ERDRO-SGC (mg/L)

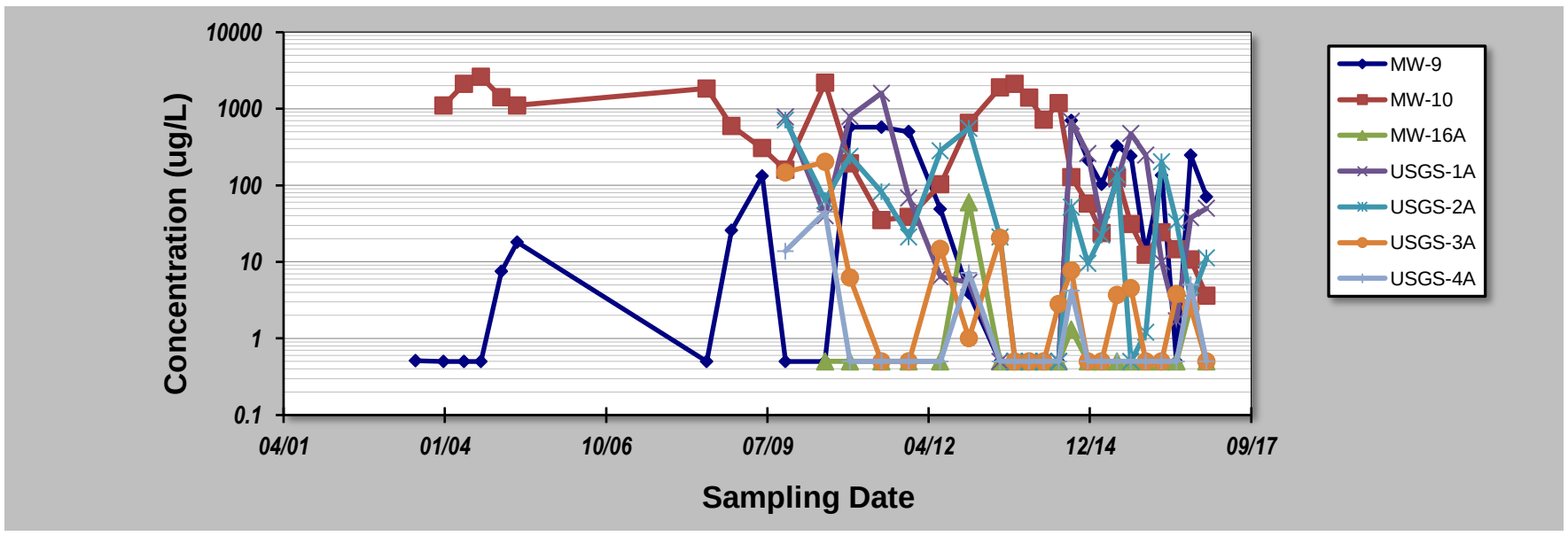

Graph B7 - December 2016 ERDRO &ERDRO-SGC Results
40
35
30
25
20
15
10
5
0
mg/L
MW-10
MW-9
USGS-1A
USGS-2A
USGS-3A
USGS-4A
MW-16A
MW-16B
MW-19
MW-22
Location
Up← Gradient →Down
ERDRO (mg/L)
ERDRO-SGC (mg/L)

Appendix C
Mann-Kendall Trend Analysis – Benzene and ERDRO in Groundwater

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	3-Mar-17	Job ID:	60503816
Facility Name:	Enbridge Energy - South Cass Lake	Constituent:	Benzene
Conducted By:	Dan Cervin	Concentration Units:	ug/L

Sampling Point ID:		MW-9	MW-10	MW-16A	USGS-1A	USGS-2A	USGS-3A	USGS-4A
Sampling Event	Sampling Date	BENZENE CONCENTRATION (ug/L)						
1	16-Jul-03	0.51						
2	6-Jan-04	0.5	1100					
3	12-May-04	0.5	2100					
4	26-Aug-04	0.5	2600					
5	30-Dec-04	7.5	1400					
6	6-Apr-05	18	1100					
7	26-Jun-08	0.5	1830					
8	25-Nov-08	25.7	595					
9	4-Jun-09	132	305					
10	26-Oct-09	0.5	159		776	705	147	13.8
11	29-Jun-10	0.5	2180	0.5	39.7	63.5	202	44.8
12	1-Dec-10	573	193	0.5	791	239	6.2	0.5
13	14-Jun-11	573	35.2	0.5	1590	81.7	0.5	0.5
14	1-Dec-11	500	38.3	0.5	67.8	21.1	0.5	0.5
15	13-Jun-12	48.9	103	0.5	6.4	282	14.7	0.5
16	7-Dec-12	3.9	653	59.8	5.4	554	1	7.2
17	18-Jun-13	0.5	1880	0.5	0.5	21.1	20.5	0.5
18	18-Sep-13	0.5	2100	0.5	0.5	0.5	0.5	0.5
19	16-Dec-13	0.5	1390	0.5	0.5	0.5	0.5	0.5
20	17-Mar-14	0.5	713	0.5	0.5	0.5	0.5	0.5
21	17-Jun-14	0.5	1180	0.5	0.5	0.5	2.8	0.5
22	3-Sep-14	702	128	1.3	684	52	7.7	4.2
23	15-Dec-14	213	57.4	0.5	258	9.5	0.5	0.5
24	10-Mar-15	103	23.8	0.5	30.5	22.3	0.5	0.5
25	15-Jun-15	326	128	0.5	120	137	3.7	0.5
26	8-Sep-15	240	31.1	0.5	474	0.5	4.5	0.5
27	9-Dec-15	13	12.4	0.5	247	1.2	0.5	0.5
28	16-Mar-16	135	24.4	0.5	10	201	0.5	0.5
29	16-Jun-16	0.5	14.6	0.5	1.7	33	3.8	0.5
30	12-Sep-16	248	10.7	2.6	37.8	3.1	2.5	5
31	20-Dec-16	70.2	3.6	0.5	49.8	11.2	0.5	0.5
32								
33								
34								
35								
Coefficient of Variation:		1.59	1.13	3.73	1.70	1.70	2.68	2.56
Mann-Kendall Statistic (S):		96	-244	9	-25	-56	-54	-33
Confidence Factor:		94.7%	>99.9%	59.5%	74.8%	93.9%	93.2%	81.4%
Concentration Trend:		Prob. Increasing	Decreasing	No Trend	No Trend	Prob. Decreasing	Prob. Decreasing	No Trend



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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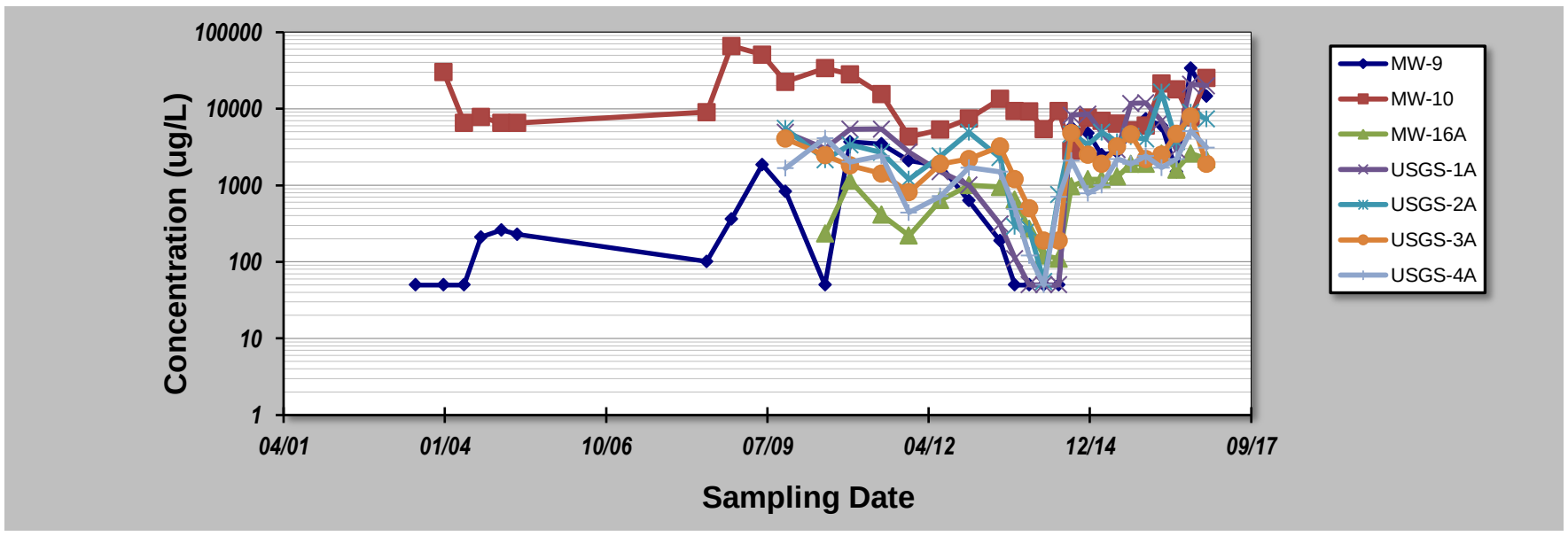
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 3-Mar-17
Facility Name: Enbridge Energy - South Cass Lake
Conducted By: Dan Cervin

Job ID: 60503816
Constituent: ERDRO C10-C32
Concentration Units: ug/L

Sampling Point ID:		MW-9	MW-10	MW-16A	USGS-1A	USGS-2A	USGS-3A	USGS-4A
Sampling Event	Sampling Date	ERDRO C10-C32 CONCENTRATION (ug/L)						
1	16-Jul-03	50						
2	6-Jan-04	50	30000					
3	12-May-04	50	6500					
4	26-Aug-04	210	7800					
5	30-Dec-04	260	6500					
6	6-Apr-05	230	6500					
7	26-Jun-08	101	9000					
8	25-Nov-08	364	65900					
9	4-Jun-09	1860	50800					
10	26-Oct-09	831	22400		4930	5520	4060	1670
11	29-Jun-10	50	33700	234	2990	2150	2470	4130
12	1-Dec-10	3690	28100	1150	5370	3370	1810	2010
13	14-Jun-11	3460	15500	413	5410	2670	1420	2420
14	1-Dec-11	2100	4300	220	2700	1200	810	440
15	13-Jun-12	1800	5300	640	1500	2400	1900	720
16	7-Dec-12	630	7400	1000	1000	4900	2200	1700
17	18-Jun-13	190	13400	950	310	2300	3200	1500
18	18-Sep-13	50	9300	650	110	290	1200	490
19	16-Dec-13	50	9200	270	50	270	500	120
20	17-Mar-14	50	5400	120	50	55	190	50
21	17-Jun-14	50	9300	110	50	760	190	700
22	3-Sep-14	5700	2800	970	8200	4600	4800	2100
23	15-Dec-14	4800	7600	1200	8500	3400	2500	780
24	10-Mar-15	2500	6900	1200	4900	4900	1900	1000
25	15-Jun-15	2700	6400	1300	2900	3700	3200	2200
26	8-Sep-15	5000	5200	1900	11700	4300	4600	1900
27	9-Dec-15	7300	6000	1900	11900	4000	2200	2400
28	16-Mar-16	6000	21200	2600	6900	16400	2500	1700
29	16-Jun-16	1500	17900	1600	2900	3700	4700	2200
30	12-Sep-16	33800	7700	2600	20900	9000	7900	5100
31	20-Dec-16	14600	25200	2200	19900	7300	1900	3100
32								
33								
34								
35								
Coefficient of Variation:		2.01	0.96	0.71	1.07	0.90	0.71	0.72
Mann-Kendall Statistic (S):		213	-61	121	57	67	48	53
Confidence Factor:		>99.9%	85.6%	>99.9%	94.2%	96.9%	90.6%	92.8%
Concentration Trend:		Increasing	Stable	Increasing	Prob. Increasing	Increasing	Prob. Increasing	Prob. Increasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

DISCLAIMER: *The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.*

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Appendix D
Monitoring Well Installation Records

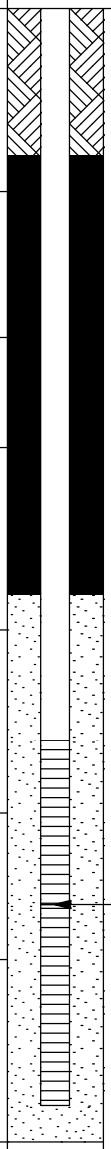
ENVIRONMENTAL BORING LOG

CLIENT: Enbridge Energy, LP	JOB NO.: 60503816	LOCATION: Cass Lake, MN	
PROJECT: South Cass Lake Pumping Station	DRILLING METHOD: HSA		BORING NO. MW-23
LOGGED BY: JMP / CHECKED BY: DC			SHEET 1 OF 1
DRILLING CONTR.: Thein Well			
DRILLER: Brian Hilbrands / EQUIP.: Hollow Stem Auger	SAMPLING METHOD:		DRILLING
BORING DEPTH: 31			START / FINISH
GROUND SURFACE ELEVATION: 1337.32	WATER LEVEL: 24.5		TIME: 1120 / TIME: 1620
DATUM: NAD 1983 StatePlane Minnesota North	TIME: 1620		
COMMENTS: Unique Well No. 821219	DATE: 7/18/2016		DATE: 7/18/16 / DATE: 7/18/16
	CASING DEPTH: 30		

SURFACE CONDITIONS: Gravel

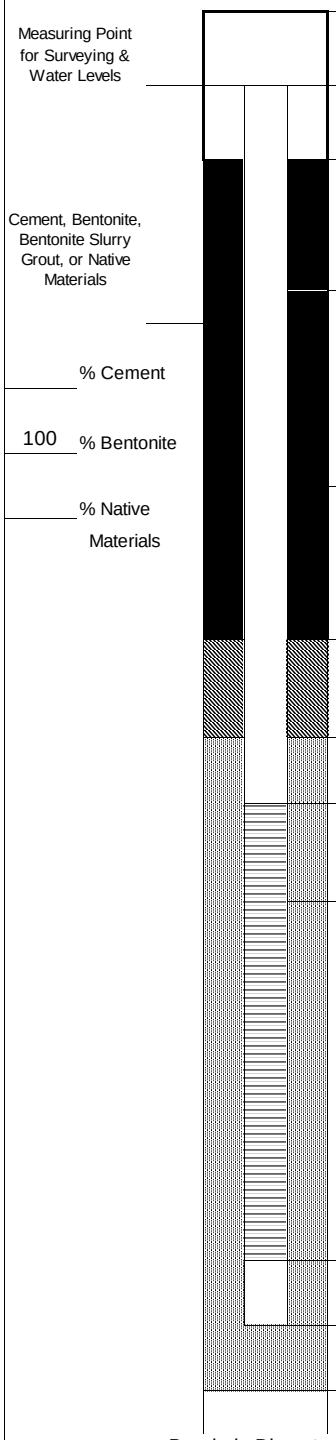
SAMPLER TYPE	SAMPLE NO / SAMPLE DEPTH	INCHES DRIVEN / INCHES RECOVERED	PID (ppm)	U.S.C.S.	DEPTH IN FEET	SOIL/ROCK GRAPH	MATERIAL DESCRIPTION
					1–4		Air-Knife, No recovery.
	6	24 / 24	7.1	SP	5–8		Loose, light brown, meduim grained SAND, moist, poorly graded.
	8	24 / 24	2.2				
	10	24 / 24	1.3	SP	9–12		Loose, light brown, course to medium grained SAND, moist, poorly graded.
	12	24 / 24	1.9				
	14	24 / 24	8.4	SP	12–16		Loose, light brown, medium to fine grained SAND, moist, poorly graded.
	16	24 / 21	7.0				
	18	24 / 21	30.6	SP	17–22		Loose, light brown, medium to fine grained SAND, moist, poorly graded, mild petroleum odor.
	20	24 / 21	3.3				
	22	24 / 21	79.8				
	24	24 / 18	438	SP	22–26		Loose, light brown, medium to fine grained SAND, moist, poorly graded, strong odor, petroleum saturated.
	26	24 / 18	682				
	28	24 / 18	160.2	GP	26–31		Loose, light brown, SANDY GRAVEL, moist, poorly graded, strong petroleum odor, petroleum saturated.
	30	24 / 18	39.9				
					31–34		End of boring at 31 feet bgs. Drilled to full depth with a 4 1/4" HSA with continuous split spoon sampling, 6 1/4" HSA tooling used to install 4" diameter monitoring well Soil screened with a photoionization detector (PID).

WELL DIAGRAM



AECOM	*Client: Engbrige Energy, LP*	***WELL ID: MW - 23***
	Project Number: 60503816	
	Site Location: South Cass Lake Pumping Station, Cass Lake, MN	*Date Installed: 18-Jul-16*
	Coords: Northing 651970.7 feet Easting: 2243753.7 feet	*Inspector: Dan Cervin/Joseph Pearson*
	Air Knife/ Hollow Stem Auger Drill Rig	*Contractor: Thein Well*

MONITORING WELL CONSTRUCTION DETAIL



Measuring Point for Surveying & Water Levels

Cement, Bentonite, Bentonite Slurry Grout, or Native Materials

% Cement

100 % Bentonite

% Native Materials

		Depth from ground surface (feet)	Elevation (feet above msl) Datum (NAVD88)
Pro -Top			1337.32
Top of Riser Pipe			1337.18
Height of Riser Pipe above ground (feet)		-0.14	
Ground Surface Elevation			1337.32
Riser Pipe:			
Length (feet)	19.86		
Inside Diameter (ID)	4-inch		
Type of Material	Stainless Steel		
Bottom of Steel Guard Pipe		NA	NA
Top of Bentonite		1.00	1336.32
Bentonite Seal Thickness		15.00	
Top of Sand		16.00	1321.32
Top of Screen		20.00	1317.32
▲ Stabilized Water Level		24.50	1312.82
Screen:			
Length (feet)	10		
Inside Diameter (ID)	4-inch		
Slot Size	0.010		
Type of Material	PVC		
Type/Size of Sand	#40 Red Flint Sand		
Sand Pack Thickness	15.00 feet		
Bottom of Screen		30.00	1307.32
Bottom of Tail Pipe:		30.00	1307.32
Bottom of Borehole		31.00	1306.32

Borehole Diameter: 12 inch

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING CONSTRUCTION RECORD

Minnesota Statutes, Chapter 103I

MINNESOTA UNIQUE WELL AND BORING NO. 821219

WELL OR BORING LOCATION

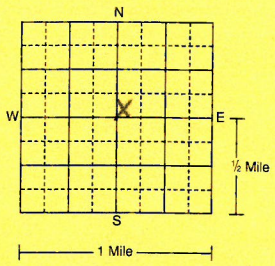
County Name: Cass

Township Name	Township No.	Range No.	Section No.	Fraction
Pike Bay	145	31W	17	SW SW NE

GPS LOCATION — decimal degrees (to four decimal places).
Latitude N47 22.682 Longitude W94 38.256

House Number, Street Name, City, and ZIP Code of Well Location: 6667 160th St NW Cass Lake

Show exact location of well/boring in section grid with "X." Sketch map of well/boring location. Showing property lines, roads, buildings, and direction.



See attached map

PROPERTY OWNER'S NAME/COMPANY NAME: Enbridge Energy

Property owner's mailing address if different than well location address indicated above.
119 N 25th St E
Superior WI 54880

WELL OWNER'S NAME/COMPANY NAME: Same

Well/boring owner's mailing address if different than property owner's address indicated above.

GEOLOGICAL MATERIALS	COLOR	HARDNESS OF MATERIAL	FROM	TO
Rocks to fine sand	Blk	Soft	0	5
Dry fine sand	Brn	Soft	5	19
Dry fine sand	DK Brn	Soft	19	23
Fine sand wet	Brn/Blk	Soft	23	25
Wet mud fine sand/gravel	Grey	Soft	25	31

Use a second sheet, if needed.

REMARKS, ELEVATION, SOURCE OF DATA, etc.
MW-23

AECOM

LOCAL COPY 821219

WELL/BORING DEPTH (completed): 30 ft. DATE WORK COMPLETED: 7-19-16

DRILLING METHOD: ☐ Cable Tool ☐ Driven ☒ Auger ☐ Rotary ☐ Other

DRILLING FLUID: None WELL HYDROFRACTURED? ☐ Yes ☒ No From ft. To ft.

USE: ☐ Domestic ☒ Monitoring ☐ Heating/Cooling ☐ Noncommunity PWS ☐ Environ. Bore Hole ☐ Industry/Commercial ☐ Community PWS ☐ Irrigation ☐ Remedial ☐ Elevator ☐ Dewatering ☐

CASING MATERIAL: ☐ Steel ☒ Plastic Drive Shoe? ☐ Yes ☒ No ☐ Threaded ☐ Welded

HOLE DIAM.

CASING Diameter	Weight	Specifications	HOLE DIAM.
4 in. To 20 ft.	lbs./ft.		10 1/4 in. To ft.
in. To ft.	lbs./ft.		in. To ft.
in. To ft.	lbs./ft.		in. To ft.

SCREEN: Make Johnson; Type PVC; Diam. 4"; Slot/Gauze 10; Length 10'; Set between 20 ft. and 30 ft.; FITTINGS

OPEN HOLE: From ft. To ft.

STATIC WATER LEVEL: 24 ft. ☒ Below ☐ Above land surface; Measured from; Date measured 7-19-16

PUMPING LEVEL (below land surface): n/a ft. after hrs. pumping g.p.m.

WELLHEAD COMPLETION: ☐ Pitless/adapter manufacturer Model; ☐ Casing protection ☐ 12 in. above grade; ☒ At-grade ☐ Well House ☐ Hand Pump

GROUT INFORMATION (specify bentonite, cement-sand, neat-cement, concrete, cuttings, or other)

Material	From	To	ft.		
Neat cement	0	4		2	☐ Yds. ☒ Bags
Bentonite	4	16		1.5	☐ Yds. ☒ Bags
					☐ Yds. ☐ Bags

Driven casing seal From To Bags

NEAREST KNOWN SOURCE OF CONTAMINATION: feet direction Unknown type

Well disinfected upon completion? ☐ Yes ☒ No

PUMP: ☒ Not installed Date installed; Manufacturer's name; Model Number HP Volts; Length of drop pipe ft. Capacity g.p.m.; Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐

ABANDONED WELLS: Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

VARIANCE: Was a variance granted from the MDH for this well? ☐ Yes ☒ No TN#

WELL CONTRACTOR CERTIFICATION
This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

Thein Well Co. — Licensee Business Name — Lic. or Reg. No. 1337

Certified Representative Signature — Certified Rep. No. 576 — Date 7-22-16

Brian Hillands — Name of Driller

ID #52603

HE-01205-15 (Rev. 8/13)