Supporting Documentation for Transaction #1358949

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PHASE II COMPREHENSIVE SITE ASSESSMENT REPORT
284 Winter Street
Haverhill, Massachusetts
RTNs 3-32792 and 3-32875

April 2022
File No. 01.0172397.10

PREPARED FOR:
Boston Gas Company d/b/a National Grid
Waltham, Massachusetts

GZA GeoEnvironmental, Inc.
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Appendix K – Groundwater and NAPL Analytical Reports

ANALYTICAL REPORT

Prepared for:
NewFields
300 Ledgewood Place, Suite 305
Rockland, MA 02370

Project: National Grid Winter St. Haverhill
ETR: 1611004
Report Date: December 07, 2016

Certifications and Accreditations
Massachusetts M-MA030
Connecticut PH-0141
New Hampshire 2206
Rhode Island LAO00289
New Jersey MA015
Maine MA0030
New York 11627
Louisiana 03090
Florida E87814
Pennsylvania 68-02089
Army Corps of Engineers
Department of the Navy

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320 Forbes Blvd, Mansfield, MA 02048, (508) 822-9300, Fax (508) 822-3288

Sample ID Cross Reference

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Lab Code: **MA00030**
ETR: **1611004**

Lab Sample ID	Client Sample ID	Matrix
1611004-01	NFSB-02(MW)	Oil
1611004-02	ENV-9MW	Oil
1611004-03	ENV-3MW	Oil
1611004-04	NFNP-01	Oil
1611004-05	NFNP-02	Oil
1611004-06	NFNP-03	Oil
1611004-07	NFSB-08(MW)	Water
1611004-08	NFSB-01(MW)	Water
1611004-09	DUP-1	Water

Certificate/Approval Program Summary

Method numbers assume the most recent EPA revisions. For a complete listing of analytes for the referenced methods please contact your Alpha Woods Hole Lab Project Manager or the Quality Assurance Manager.

Connecticut Department of Public Health Certificate/Lab ID : PH-0141 - *Wastewater* (General Chemistry: EPA 120.1, 150.1, 160.1, 160.2, 180.1, 300.0, 310.1, 335.2, 365.2; Metals: 200.8, 245.1; Organics: 608, 624, 625, ETPH) *Solid Waste/Soil* (General Chemistry: 1010, 9010/9014, 9045, 9060; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270, ETPH).

Florida Department of Health Certificate/Lab ID : E87814 - Primary NELAP Accreditation Authority for Air & Emissions. Secondary NELAP Accreditation for Wastwater and Solid & Hazardous Waste. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 335.2, 365.2, SM2320B, SM2340B, SM2540G, SM4500NH3; Metals: 245.1; Organics: 608, 624, 625). *Solid and Hazardous Waste* (General Chemistry: 9010/9014, 9045, 9050, 9056, 9065, Reactivity 7.3; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270). *Air & Emissions* (Organics: EPA TO-15).

Louisiana Department of Environmental Quality Certificate/Lab ID : 03090 - Primary NELAP Accrediting Authority for Wastewater, Solid & Hazardous Waste. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1, 6020; Organics: 608, 624, 625, 8015-DRO/GRO, 8081, 8082, 8260, 8270). *Solid and Hazardous Waste* (General Chemistry: 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060, Reactivity 7.3; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270).

Maine Department of Human Services Certificate/Lab ID : MA0030 - *Wastewater* (General Chemistry: EPA 120.1/ SM2510B, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: 608, 624).

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA030 - *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: EPA 608, 624).

New Hampshire Department of Environmental Services Certificate/Lab ID: 2206 - Secondary NELAP Accreditation. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, SM2540G; Metals: 200.8, 245.4; Organics: 608, 624, 625).

New Jersey Department of Environmental Protection Certificate/Lab ID : MA015 - Secondary NELAP Accreditation. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1 6020; Organics: 608, 624, 625, 8081, 8082, 8260, 8270). *Solid & Hazardous Waste* (General Chemistry: EPA 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270). *Air & Emissions* (Organics: EPA TO-15).

New York Department of Health Certificate/Lab ID : 11627 - Secondary NELAP Accreditation. *Wastewater* (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 365.2, 376.2; Metals: 245.1; Organics: 608, 624, 625). *Solid and Hazardous Waste* (General Chemistry: EPA 1010, 1311; : 245.1; 6020, 7041; Organics: 8081, 8082, 8260, 8270). *Air & Emissions* (Organics: EPA TO-15).

Rhode Island Department of Health Certificate/Lab ID : LAO00289 - Chemistry: *Organic and Inorganic in Non-Poratable Water, Wastewater/Sewage and Soil* (Refer to LADEQ and MADEP certificates for method numbers.)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-02089 - Registered laboratory

U.S. Army Corps of Engineers

Department of the Navy

CASE NARRATIVE
Alpha Analytical

ETR: 1611004
Project: National Grid Winter St. Haverhill

All analyses were performed according to the Alpha Analytical quality assurance program and documented Standard Operating Procedures (SOPs). The analytical results contained in this report were performed within holding time, and with appropriate quality control measures, except where noted. A summary of all state and federal accreditations is provided within this report. Blank correction of results is not performed in the laboratory for any parameter. Alpha Analytical certifies that the test results within meet all of the requirements of NELAC, for all NELAC accredited parameters.

Sample Receipt

Samples 1611004-01 through -09 were received on November 2, 2016, in good condition, between 2° and 6° C, without discrepancies. Samples -01 through -03 were oil. Samples -04 through -06 were oily material collected on Teflon nets. Samples -06 though -09 were water. Samples -01 through -09 were released for SHC and PAH/BIO analysis.

Alkylated Polynuclear Aromatic Hydrocarbons and Triaromatic Steroids by GC/MS-SIM - Oil

Polynuclear aromatic hydrocarbons and triaromatic steroids were analyzed following Alpha Analytical SOP *Analysis of Parent and Alkylated Polynuclear Aromatic Hydrocarbons, Selected Heterocyclic Compounds, Steranes, Triterpanes, and Triaromatic Steroids by Gas Chromatography/Mass Spectrometry with Selected Ion Monitoring (SOP 2247, Rev. 9, 03/21/2016).* Oil samples 1611004-01, -02 and -03 were prepared by weighing approximately 0.1g of material and diluting this into 10mL of methylene chloride *(Organic Waste Dilution Extraction, SOP 2265, Rev. 5, 01/21/2016).* A 0.5mL aliquot of sample was removed from the 10mL, spiked with surrogate and internal standard, and eluted to 1mL for an effective final volume of 20mL. Oil samples 1611004-04, -05 and -06 were treated as oily material and extracted by *Organic Waste Dilution Extraction (SOP 2265, Rev. 5, 01/21/2016).* Solvent extracts are passed through a glass fiber filter with sodium sulfate. An aliquot is taken based on *Gravimetric Determination (SOP 2263, Rev. 5, 08/03/2015)*, surrogate standards and recovery standards added, and brought up to an appropriate final volume. The extract weight to column as determined by gravimetric weighing is used as the weight for the oily material. The average weight of all samples included in the extraction batch is used as the weight for the blank, laboratory control sample, and laboratory control sample duplicate. The final value is rounded accordingly. Qualitative identifications are confirmed by analyzing standards under the same conditions used for samples, comparing mass spectra, GC retention times, and patterns generated from reference oils. Quantification is based on response factors derived from a multi-level initial calibration using internal standard techniques. Alkyl homologues are quantified using the response factor of the parent PAH compound. Target steroids are quantified using the response factor of 5β(H)-Cholane. All enclosed data was evaluated below the reporting limits to three times signal to noise. All enclosed data was evaluated below the reporting limits to three times signal to noise. The sample specific reporting limit is the value reported for all compounds which are not detected ("U" qualified).

1. The method blank SO110116B02 contained low-level target compounds detected below the reporting limit, as well as Acenaphthylene above the reporting limit. Associated field sample results are flagged with "B" qualifiers if the concentration of the analyte in the sample is less than 10X the concentration in the blank. Please note that no "B" qualifiers were utilized.

2. The method blank SO111116B03 contained low-level target compounds detected below the reporting limit, as well as Naphthalene above the reporting limit. Associated field sample results are flagged with "B" qualifiers if the concentration of the analyte in the sample is less than 10X the concentration in the blank. Please note that no "B" qualifiers were utilized.

3. Concentrations for compounds flagged with "G" qualifiers may be biased high due to matrix interference included in the quantitation.

4. Sample 1611004-03 required a dilution due to over-calibration concentrations of target compounds. The diluted analysis is only quantified for the compounds that were over the calibration range of the analytical instrument in the un-diluted analyses.

5. The relative percent difference (RPD) between the sample 1611004-05 and its duplicate (1611004-05D) had most compounds above the 30% QC limit. This sample consisted of net material from which oily material was removed for analysis, making homogenization impossible. The integrations and calculations in the native sample and the duplicate were reviewed and found to be appropriate. See Duplicate Summary Report for individual compounds affected.

6. Samples 1611004-05D (141%) and -06 (153%) had the surrogate Naphthalene-d8 recover above the 130% QC limit potentially due to matrix interference. The remaining surrogates were recovered within the QC limits. No further corrective action was taken.

Alkylated Polynuclear Aromatic Hydrocarbons and Triaromatic Steroids by GC/MS-SIM - Waters

Polynuclear aromatic hydrocarbons and triaromatic steroids were analyzed following Alpha Analytical SOP *Analysis of Parent and Alkylated Polynuclear Aromatic Hydrocarbons, Selected Heterocyclic Compounds, Steranes, Triterpanes, and Triaromatic Steroids by Gas Chromatography/Mass Spectrometry with Selected Ion Monitoring (SOP 2247, Rev. 9, 03/21/2016).* Water samples (approximately 1L) are spiked with surrogate compounds and extracted by *Extraction of Water Samples by Separatory Funnel (SOP 2165, Rev. 14, 01/15/2016).* Solvent extracts are dried over sodium sulfate, concentrated to 900uL, split in half, and spiked with internal standard for instrument analysis. The average volume of all samples included in the extraction batch is used as the volume for the blank, laboratory control sample, and laboratory control sample duplicate. The final value is rounded accordingly. Qualitative identifications are confirmed by analyzing standards under the same conditions used for samples, comparing mass spectra, GC retention times, and patterns generated from reference oils. Quantification is based on response factors derived from a multi-level initial calibration using internal standard techniques. Alkyl homologues are quantified using the response factor of the parent PAH compound. Target steroids are quantified using the response factor of 5β(H)-Cholane. All enclosed data was evaluated below the reporting limits to three times signal to noise. The sample specific reporting limit is the value reported for all compounds which are not detected ("U" qualified).

1. The method blank SW110716B01 contained low-level target compounds detected below the reporting limit as well as several compounds above the reporting limit. Associated field sample results are flagged with "B" qualifiers if the concentration of the analyte in the sample is less than 10X the concentration in the blank. Please note that sample 1611004-07 contained less 10x the concentration in the blank for C3-Naphthalenes, however the sample was consumed and re-extraction could not be performed. The results have been "B" qualified.

2. Concentrations for compounds flagged with "G" qualifiers may be biased high due to matrix interference included in the quantitation.

3. Samples 1611004-08, -09 and -09D required dilutions due to over-calibration concentrations of target compounds. The diluted analyses are only quantified for the compounds that were over the calibration range of the analytical instrument in the un-diluted analyses.

4. The relative percent difference (RPD) between the sample 1611004-09 and its duplicate (1611004-09D) had a few compounds above the 30% QC limit potentially due to matrix heterogeneity. The integrations and calculations in the native sample and the duplicate were reviewed and found to be appropriate. See Duplicate Summary Report for individual compounds affected.

Steranes and Triterpanes by GC/MS-SIM - (F1) Oil

Geochemical biomarkers were analyzed following Alpha Analytical SOP *Analysis of Parent and Alkylated Polynuclear Aromatic Hydrocarbons, Selected Heterocyclic Compounds, Steranes, Triterpanes, and Triaromatic Steroids by Gas Chromatography/Mass Spectrometry with Selected Ion Monitoring (SOP 2247, Rev. 9, 03/21/2016).* Oil samples are extracted as stated above for the PAH analysis. A pre-determined volume of the pre RIS extract is silica fractionated (*Silica Gel Cleanup Preparation (Manual), SOP 2267, Rev. 2, 03/21/2012*) and concentrated to 900uL, split in half and spiked with internal standard for biomarker analysis. The average weight of all samples included in the extraction batch is used as the weight for the blank, laboratory control sample, and laboratory control sample duplicate. The final value is rounded accordingly. Qualitative identifications are confirmed by analyzing standards under the same conditions used for samples,

comparing mass spectra, GC retention times, and patterns generated from reference oils. Quantification is based on response factors derived from a multi-level initial calibration using internal standard techniques. Target triterpane biomarker concentrations are quantified using the response factor of Hopane and the steranes are quantified using the response factor of 5β(H)Cholane. All enclosed data was evaluated below the reporting limits to three times signal to noise. The sample specific reporting limit is the value reported for all compounds which are not detected ("U" qualified). Any sample preparation method deviations can be found in the "Sample Preparation and Extraction" section of this document or noted on the *Forensic Preparation Checklist* located in the sample preparation document.

In the "Steranes and Triterpanes" report section, the Lab IDs are reported with a suffix "F1" on all forms to indicate that the data reported is for fractionated biomarker analysis. The sample name in the analytical data (Quantitation Report and Injection Log) may be entered with a suffix "RF1" as a keyword requirement for LIMS data transfer.

1. The relative percent difference (RPD) between the sample 1611004-05 and its duplicate (1611004-05D) had most compounds above the 30% QC limit. This sample consisted of net material from which oily material was removed for analysis, making homogenization impossible. The integrations and calculations in the native sample and the duplicate were reviewed and found to be appropriate. See Duplicate Summary Report for individual compounds affected.

Steranes and Triterpanes by GC/MS-SIM - (F1) Water

Geochemical biomarkers were analyzed following Alpha Analytical SOP *Analysis of Parent and Alkylated Polynuclear Aromatic Hydrocarbons, Selected Heterocyclic Compounds, Steranes, Triterpanes, and Triaromatic Steroids by Gas Chromatography/Mass Spectrometry with Selected Ion Monitoring (SOP 2247, Rev. 9, 03/21/2016).* Water samples are extracted as stated above for the PAH analysis. A pre-determined volume of the pre RIS extract is silica fractionated (*Silica Gel Cleanup Preparation (Manual), SOP 2267, Rev. 2, 03/21/2012*) and concentrated to 900uL, split in half and spiked with internal standard for biomarker analysis. The average weight of all samples included in the extraction batch is used as the weight for the blank, laboratory control sample, and laboratory control sample duplicate. The final value is rounded accordingly. Qualitative identifications are confirmed by analyzing standards under the same conditions used for samples, comparing mass spectra, GC retention times, and patterns generated from reference oils. Quantification is based on response factors derived from a multi-level initial calibration using internal standard techniques. Target triterpane biomarker concentrations are quantified using the response factor of Hopane and the steranes are quantified using the response factor of 5β(H)Cholane. All enclosed data was evaluated below the reporting limits to three times signal to noise. The sample specific reporting limit is the value reported for all compounds which are not detected ("U" qualified). Any sample preparation method deviations can be found in the "Sample Preparation and Extraction" section of this document or noted on the *Forensic Preparation Checklist* located in the sample preparation document.

In the "Steranes and Triterpanes" report section, the Lab IDs are reported with a suffix "F1" on all forms to indicate that the data reported is for fractionated biomarker analysis. The sample name in the analytical data (Quantitation Report and Injection Log) may be entered with a suffix "RF1" as a keyword requirement for LIMS data transfer.

1. All quality control parameters met the specified criteria.

Total Petroleum Hydrocarbons by GC/FID – Oils

Samples for total saturated hydrocarbons were analyzed following the procedures in Alpha Analytical SOP *Total Petroleum and Saturated Hydrocarbons by Gas Chromatography/Flame Ionization Detector (SOP 2246, Rev. 7, 9/5/2015)* Method 8100/8015mod. Samples were prepared as stated above for the PAH analysis. A portion of the final extract was analyzed for GC/FID (gas chromatography with flame ionization detection). A multi-level initial calibration over the n-alkane range from C9-C40 was evaluated and quantified using internal standard techniques prior to sample analysis. All enclosed data was evaluated below the reporting limits to three times signal to noise. The sample specific reporting limit is the value reported for all compounds which are not detected ("U" qualified).

1. The relative percent difference (RPD) between the sample 1611004-05 and its duplicate (1611004-05D) had the total petroleum hydrocarbons above the 30% QC limit. This sample consisted of net material from which oily material was removed for analysis, making homogenization impossible. The integrations and calculations in the native sample and the duplicate were reviewed and found to be appropriate.

Total Petroleum Hydrocarbons by GC/FID – Waters

Samples for total saturated hydrocarbons were analyzed following the procedures in Alpha Analytical SOP *Total Petroleum and Saturated Hydrocarbons by Gas Chromatography/Flame Ionization Detector (SOP 2246, Rev. 7, 9/5/2015)* Method 8100/8015mod. Samples were prepared as stated above for the PAH analysis. A portion of the final extract was analyzed for GC/FID (gas chromatography with flame ionization detection). A multi-level initial calibration over the n-alkane range from C9-C40 was evaluated and quantified using internal standard techniques prior to sample analysis. All enclosed data was evaluated below the reporting limits to three times signal to noise. The sample specific reporting limit is the value reported for all compounds which are not detected ("U" qualified).

1. The laboratory control sample SW110716LCS01 and laboratory control sample duplicate SW110716LCSD01 recovered below the acceptance criteria (50%) for n-Nonane (14% and 10%), n-Decane (15% and 11%), n-Dodecane (23% and 21%) and n-Tetradecane (42% LCS only). Additionally, the relative percent difference (RPD) for n-Nonane (36%) and n-Decane (35%), exceeded the limit (30%). The integrations and calculations were reviewed and found to be accurate. The sample was consumed and re-extraction could not be performed

The enclosed results of analyses are representative of the samples as received by the laboratory. Alpha Analytical makes no representations or certifications as to the method of sample collection, sample identification, or transporting/handling procedures used prior to the receipt of samples by Alpha Analytical. To the best of my knowledge, the information contained in this report is accurate and complete. For any questions regarding this report, please contact the signatory below at 508-822-9300.

Approved by: Susan O'Neil Title: Project Manager Date: 12/16/16

Susan O'Neil

Sample Preparation

Alpha Woods Hole Lab
Batch Prep Report
11/10/2016 1611004OIL - OP NEWFIE

Lab ID	Prep Method	Analyst	Prep Start Date	Prep Completed Date	TCLP	Initial Amount (g or ml)	Split	PIV (ml)	Final Volume (ml)	Solvent Ex	Conc. Analyst	Conc. Date	Conc. Method	Transfer Volume (ml)	Vialed By	Vialed Date
1611004-01 (Oil - 1611004)	3580	JP	11/10/2016 3:00:00 PM	11/10/2016		0.1084	20	1	20	False	JP			0.1	JP	11/10/2016
1611004-02D (Oil - 1611004)	3580	JP	11/10/2016 3:00:00 PM	11/10/2016		0.1095	20	1	20	False	JP			0.1	JP	11/10/2016
1611004-02 (Oil - 1611004)	3580	JP	11/10/2016 3:00:00 PM	11/10/2016		0.1084	20	1	20	False	JP			0.1	JP	11/10/2016
1611004-03 (Oil - 1611004)	3580	JP	11/10/2016 3:00:00 PM	11/10/2016		0.1021	20	1	20	False	JP			0.1	JP	11/10/2016
SO111016B02 (Oil - 1611004)	3580	JP	11/10/2016 3:00:00 PM	11/10/2016		0.1	20	1	20	False	JP			0.1	JP	11/10/2016
SO111016LCS02 (Oil - 1611004)	3580	JP	11/10/2016 3:00:00 PM	11/10/2016		0.1	20	1	20	False	JP			0.1	JP	11/10/2016
SO111016LCSD02 (Oil - 1611004)	3580	JP	11/10/2016 3:00:00 PM	11/10/2016		0.1	20	1	20	False	JP			0.1	JP	11/10/2016

Alpha Woods Hole Lab
Batch Prep Report

11/10/2016 1611004OIL - OP NEWFIE

Lab ID	Notes
1611004-01 (Oil - 1611004)	1st Prep
1611004-02D (Oil - 1611004)	1st Prep
1611004-02 (Oil - 1611004)	1st Prep
1611004-03 (Oil - 1611004)	1st Prep
SO111016B02 (Oil - 1611004)	1st Prep
SO111016LCS02 (Oil - 1611004)	1st Prep
SO111016LCSD02 (Oil - 1611004)	1st Prep

Alpha Woods Hole Lab
Batch Prep Spike Report

11/10/2016 1611004OIL - OP NEWFIE Analyst: JP Witness: TJ

Lab ID	QC Type	OP NEWFIE - surr	Vol OP NEWFIE - surr	Units OP NEWFIE - surr	OP NEWFIE - spk 1	Vol OP NEWFIE - spk 1	Units OP NEWFIE - spk 1	OP NEWFIE - spk 2	Vol OP NEWFIE - spk 2	Units OP NEWFIE - spk 2
1611004-01	SAM	FRAX85	100	µl				FRAX07	100	µl
1611004-02	D	FRAX85	100	µl				FRAX07	100	µl
1611004-02	SAM	FRAX85	100	µl				FRAX07	100	µl
1611004-03	SAM	FRAX85	100	µl				FRAX07	100	µl
SO111016B02	B	FRAX85	100	µl				FRAX07	100	µl
SO111016LCS02	LCS	FRAX85	100	µl	FRAX73	100	µl	FRAX07	100	µl
SO111016LCSD02	LCSD	FRAX85	100	µl	FRAX73	100	µl	FRAX07	100	µl
SO112816B02	B	-99	-99	-99	-99	-99	-99	-99	-99	-99
SO112816PRM02	PRM	-99	-99	-99	-99	-99	-99	-99	-99	-99

STD ID	TITLE	CONTENTS	SOLVENT	LOT
FRAX07	Biomarker Surrogate	5b(H)Cholane = 10 ug/mL	dcm	DN770
FRAX73	LCS Solution PAH /SHC	Aromatic Hydrocarbon STD = 10 ug/mL MA EPH Aliphatic Std = 200 ug/mL	DCM	DP875
FRAX85	PAH/SHC SURROGATE	Deuterated PAH Surrogate = 10 ug/mL OTP = 500 ug/mL D50 Tetracosane = 500 ug/mL	DCM	DQ092

Alpha Woods Hole Lab
Batch Prep Spike Report

11/10/2016 1611004OIL - OP SHC Analyst: JP Witness: TJ

Lab ID	QC Type	OP SHC - surr	Vol OP SHC - surr	Units OP SHC - surr	OP SHC - spk 1	Vol OP SHC - spk 1	Units OP SHC - spk 1	OP SHC - spk 2	Vol OP SHC - spk 2	Units OP SHC - spk 2
1611004-01	SAM	FRAX85	100	µl				FRAX53	100	µl
1611004-02	D	FRAX85	100	µl				FRAX53	100	µl
1611004-02	SAM	FRAX85	100	µl				FRAX53	100	µl
1611004-03	SAM	FRAX85	100	µl				FRAX53	100	µl
SO111016B02	B	FRAX85	100	µl				FRAX53	100	µl
SO111016LCS02	LCS	FRAX85	100	µl	FRAX73	100	µl	FRAX53	100	µl
SO111016LCSD02	LCSD	FRAX85	100	µl	FRAX73	100	µl	FRAX53	100	µl
SO112816B02	B	-99	-99	-99	-99	-99	-99	-99	-99	-99
SO112816PRM02	PRM	-99	-99	-99	-99	-99	-99	-99	-99	-99

STD ID	TITLE	CONTENTS	SOLVENT	LOT
FRAX53	PAH/SHC RIS Spiking Solution	5 Alpha Androstane = 500 ug/mL Acenaphthene D10, Chrysene D12 = 5 ug/mL	DCM	dp875
FRAX73	LCS Solution PAH /SHC	Aromatic Hydrocarbon STD = 10 ug/mL MA EPH Aliphatic Std = 200 ug/mL	DCM	DP875
FRAX85	PAH/SHC SURROGATE	Deuterated PAH Surrogate = 10 ug/mL OTP = 500 ug/mL D50 Tetracosane = 500 ug/mL	DCM	DQ092

Batch ID: 161104 OIL Client: NewFie Project: National Grid Winter St. Haverhill

Anomalies are noted in the Prep Process Notes section below.

Test(s) Spiked for:
Choose from the following:
F1B, POIB, POIH, POIHX, POITAS, TPH+A

Extraction HT:
N/A

Identify Matrix:
Filter • Filter (L) • NAPL • Net • Oil
Product • PUF • Sediment •
Sheen Soil • Solid • SPMD •
Tissue Pom Pom • 1L
Water • 4L Water • Floc Water

	Date:	Initials:
COC/ETR Check:	11/10/16	JP
1st Extraction:		
2nd Extraction:		
3rd Extraction:		

Cleanup Methods:		Date/ Initials:
No Cleanup Required	X	11/10/16 JP
Alumina Column (3610)		
Silica Column (3630)		
Fractionation Column (3630F1)		
GPC (3640)		
Copper (3660B)		
Water pH<2 verified		
	Date/Initials:	ID & Amount:
RIS Spike Analyst:	11/10/16 JP	FBAX53
RIS Spike Witness:	11/10/16 TJ	100ul

Prep Process Notes

REAGENT	LOT #
DCM	DQ341
SODIUM SULFATE	—
SILICA GEL	—
ALUMINA	—

REAGENT	LOT #
COPPER	—
GLASS WOOL	—

BATCH COMPLETE Analyst:	JP	Date:	11/10/16
BATCH REVIEWED Analyst:	CP	Date:	11/16/16

Batch ID: J 1611004 OIL **Client:** NEWFIE **Project:** National Grid Winter-St Haverhill

Prep Process Notes

Sample ID	Low Volume	High H2O	Plant Material	Other	Difficult to homogenize	Potential High Level		Spiked High
						Visual	Odor	
-01								
-02								
-03								

Present

Alpha Woods Hole Lab
Batch Prep Report
11/11/2016 1611004SHEEN - OP NEWFIE

Lab ID	Prep Method	Analyst	Prep Start Date	Prep Completed	TCLP Date	Initial Amount (g or ml)	Split	PIV (ml)	Final Volume (ml)	Solvent Ex	Conc. Analyst	Conc. Date	Conc. Method	Transfer Volume (ml)	Vialed By	Vialed Date
1611004-04 (Oil - 1611004)	3580A	JP	11/11/2016 9:00:00 AM	11/11/2016		0.00462	1	1	1	False					JP	11/11/2016
1611004-05D (Oil - 1611004)	3580A	JP	11/11/2016 9:00:00 AM	11/11/2016		0.0037	1	1	1	False					JP	11/11/2016
1611004-05 (Oil - 1611004)	3580A	JP	11/11/2016 9:00:00 AM	11/11/2016		0.00285	1	1	1	False					JP	11/11/2016
1611004-06 (Oil - 1611004)	3580A	JP	11/11/2016 9:00:00 AM	11/11/2016		0.00328	1	1	1	False					JP	11/11/2016
SO111116B03 (Oil - 1611004)	3580A	JP	11/11/2016 9:00:00 AM	11/11/2016		0.004	1	1	1	False					JP	11/11/2016
SO111116LCS02 (Oil - 1611004)	3580A	JP	11/11/2016 9:00:00 AM	11/11/2016		0.004	1	1	1	False					JP	11/11/2016
SO111116LCSD02 (Oil - 1611004)	3580A	JP	11/11/2016 9:00:00 AM	11/11/2016		0.004	1	1	1	False					JP	11/11/2016

Alpha Woods Hole Lab
Batch Prep Report
11/11/2016 1611004SHEEN - OP NEWFIE

Lab ID	Notes
1611004-04 (Oil - 1611004)	1st Prep
1611004-05D (Oil - 1611004)	1st Prep
1611004-05 (Oil - 1611004)	1st Prep
1611004-06 (Oil - 1611004)	1st Prep
SO111116B03 (Oil - 1611004)	1st Prep
SO111116LCS02 (Oil - 1611004)	1st Prep
SO111116LCSD02 (Oil - 1611004)	1st Prep

Alpha Woods Hole Lab
Batch Weight Report
11/11/2016

Weight OF net used FOR extraction: 11/11/16 JP

Lab ID	QC Type	1611004SHEEN - Sample (g)
1611004-04	SAM	1.2072
1611004-05	D	0.3572
1611004-05	SAM	0.2441
1611004-06	SAM	0.5435
SO111116B03	B	0.7
SO111116LCS02LCS	OP NEWFIE	0.7
SO111116LCS02LCS	OP SHC	0.7
SO111116LCSD02LCSD	OP NEWFIE	0.7
SO111116LCSD02LCSD	OP SHC	0.7

Alpha Woods Hole Lab
Batch Prep Spike Report

11/11/2016 1611004SHEEN - OP NEWFIE Analyst: JP Witness: JP

Lab ID	QC Type	OP NEWFIE - surr	Vol OP NEWFIE - surr	Units OP NEWFIE - surr	OP NEWFIE - spk 1	Vol OP NEWFIE - spk 1	Units OP NEWFIE - spk 1	OP NEWFIE - spk 2	Vol OP NEWFIE - spk 2	Units OP NEWFIE - spk 2
1611004-04	SAM	FRAX85	100	µl				FRAX07	100	µl
1611004-05	D	FRAX85	100	µl				FRAX07	100	µl
1611004-05	SAM	FRAX85	100	µl				FRAX07	100	µl
1611004-06	SAM	FRAX85	100	µl				FRAX07	100	µl
SO111116B03	B	FRAX85	100	µl				FRAX07	100	µl
SO111116LCS02	LCS	FRAX85	100	µl	FRAX73	100	µl	FRAX07	100	µl
SO111116LCSD02	LCSD	FRAX85	100	µl	FRAX73	100	µl	FRAX07	100	µl
SO112816B03	B	-99	-99	-99	-99	-99	-99	-99	-99	-99
SO112816PRM03	PRM	-99	-99	-99	-99	-99	-99	-99	-99	-99

STD ID	TITLE	CONTENTS	SOLVENT	LOT
FRAX07	Biomarker Surrogate	5b(H)Cholane = 10 ug/mL	dcm	DN770
FRAX73	LCS Solution PAH /SHC	Aromatic Hydrocarbon STD = 10 ug/mL MA EPH Aliphatic Std = 200 ug/mL	DCM	DP875
FRAX85	PAH/SHC SURROGATE	Deuterated PAH Surrogate = 10 ug/mL OTP = 500 ug/mL D50 Tetracosane = 500 ug/mL	DCM	DQ092

Alpha Woods Hole Lab
Batch Prep Spike Report

11/11/2016 1611004SHEEN - OP SHC Analyst: JP Witness: JP

Lab ID	QC Type	OP SHC - surr	Vol OP SHC - surr	Units OP SHC - surr	OP SHC - spk 1	Vol OP SHC - spk 1	Units OP SHC - spk 1	OP SHC - spk 2	Vol OP SHC - spk 2	Units OP SHC - spk 2
1611004-04	SAM	FRAX85	100	µl				FRAX53	100	µl
1611004-05	D	FRAX85	100	µl				FRAX53	100	µl
1611004-05	SAM	FRAX85	100	µl				FRAX53	100	µl
1611004-06	SAM	FRAX85	100	µl				FRAX53	100	µl
SO111116B03	B	FRAX85	100	µl				FRAX53	100	µl
SO111116LCS02	LCS	FRAX85	100	µl	FRAX73	100	µl	FRAX53	100	µl
SO111116LCSD02	LCSD	FRAX85	100	µl	FRAX73	100	µl	FRAX53	100	µl
SO112816B03	B	-99	-99	-99	-99	-99	-99	-99	-99	-99
SO112816PRM03	PRM	-99	-99	-99	-99	-99	-99	-99	-99	-99

STD ID	TITLE	CONTENTS	SOLVENT	LOT
FRAX53	PAH/SHC RIS Spiking Solution	5 Alpha Androstane = 500 ug/mL Acenaphthene D10, Chrysene D12 = 5 ug/mL	DCM	dp875
FRAX73	LCS Solution PAH /SHC	Aromatic Hydrocarbon STD = 10 ug/mL MA EPH Aliphatic Std = 200 ug/mL	DCM	DP875
FRAX85	PAH/SHC SURROGATE	Deuterated PAH Surrogate = 10 ug/mL OTP = 500 ug/mL D50 Tetracosane = 500 ug/mL	DCM	DQ092

ETR 1611004SHEEN

Analyst JP

Date 11/11/2016

Alpha Analytical

- [ ] Pre-Alumina
- [ ] Post-Alumina
- [ ] Pre-Silica
- [x] Oily Material Prep.
- [ ] Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	FRAX35	Gravimetric Standard	10000	50	0.257	51.40	N/A	N/A	N/A	100%
1611004	4		10000	50	0.578	115.60	400	4.62	25.00	
1611004	5	D	10000	50	0.074	14.80	2500	3.70	4.00	26%RPD
1611004	5		10000	50	0.057	11.40	2500	2.85	4.00	
1611004	6		10000	50	0.041	8.20	4000	3.28	2.50	

Note:

Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)

Gravimetric Standard = 5 mg/mL

LCS Acceptance Criteria: 95% - 105%

Verified by: EP

Date: 11/16/16

ETR 1611004SHEEN

Analyst JP

Date 11/11/2016

Alpha Analytical

- [ ] Pre-Alumina
- [ ] Post-Alumina
- [ ] Pre-Silica
- [x] Oily Material Prep.
- [ ] Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	FRAX35	Gravimetric Standard	10000	50	0.257		N/A	N/A	N/A	0%
1611004	4		10000	50	0.578					
1611004	5	D	10000	50	0.074					#VALUE!
1611004	5		10000	50	0.057					
1611004	6		10000	50	0.041					

Note:

Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)

Gravimetric Standard = 5 mg/mL

LCS Acceptance Criteria: 95% - 105%

Verified by: _____

Date: _____

Batch ID: 161104SHEEN Client: NEWFIE Project: National Grid Winter St. Haverhill

Anomalies are noted in the Prep Process Notes section below.

Test(s) Spiked for:
Choose from the following:
F1B, POIB, POIH, POIHX, POITAS, TPH+A

Extraction HT:
N/A

Identify Matrix:
Filter • Filter (L) • NAPL • Net • Oil Product • PUF • Sediment • Sheen Soil • Solid • SPMD • Tissue Pom Pom • 1L Water • 4L Water • Floc Water

	Date:	Initials:
COC/ETR Check:	11/11/16	JP
1st Extraction:		
2nd Extraction:	11/11/16	JP
3rd Extraction:		

Cleanup Methods:		Date/ Initials:
No Cleanup Required	X	11/11/16 JP
Alumina Column (3610)		
Silica Column (3630)		
Fractionation Column (3630F1)		
GPC (3640)		
Copper (3660B)		
Water pH<2 verified		
	Date/Initials:	ID & Amount:
RIS Spike Analyst:	11/11/16 JP	FRAX53
RIS Spike Witness:	11/11/16 EP	100 ul

Prep Process Notes

Small section of the net was cut at the most contaminated area for each sample. 11/11/16 JP

REAGENT	LOT #
DCM	DQ311
SODIUM SULFATE	0000131774
SILICA GEL	—
ALUMINA	—

REAGENT	LOT #
COPPER	—
GLASS WOOL	11414001

BATCH COMPLETE Analyst:	JP	Date:	11/11/16

BATCH REVIEWED Analyst:	EP	Date:	11/16/16

Batch ID: 1101100L4.SITEEN **Client:** NEWFIE **Project:** National Grid Winter St. Haverhill

Prep Process Notes

Sample ID	Low Volume	High H2O	Plant Material	Other	Difficult to homogenize	Potential High Level		Spiked High
						Visual	Odor	
-04				Heavily contaminated with oil and soil.				
-05				Heavily contaminated with oil.			11/11/16 JT	
-06				Light oil color with traces of water.				

Present

Alpha Woods Hole Lab
Batch Prep Report
11/07/2016 1611004 - OP NEWFIE

Lab ID	Prep Method	Analyst	Prep Start Date	Prep Completed	TCLP Date	Initial Amount (g or ml)	Split	PIV (ml)	Final Volume (ml)	Solvent Ex	Conc. Analyst	Conc. Date	Conc. Method	Transfer Volume (ml)	Vialed By	Vialed Date
1611004-07 (Water - 1611004)	3510C	TS	11/7/2016 5:30:00 PM	11/7/2016		1000	2	0.5	1	False	TJ	11/9/2016	KD Flask	0.1	TJ	11/9/2016
1611004-08 (Water - 1611004)	3510C	TS	11/7/2016 5:30:00 PM	11/7/2016		1000	2	0.5	1	False	TJ	11/9/2016	KD Flask	0.1	TJ	11/9/2016
1611004-09D (Water - 1611004)	3510C	TS	11/7/2016 5:30:00 PM	11/7/2016		1000	2	0.5	1	False	TJ	11/9/2016	KD Flask	0.1	TJ	11/9/2016
1611004-09 (Water - 1611004)	3510C	TS	11/7/2016 5:30:00 PM	11/7/2016		1000	2	0.5	1	False	TJ	11/9/2016	KD Flask	0.1	TJ	11/9/2016
SW110716B01 (Water - 1611004)	3510C	TS	11/7/2016 5:30:00 PM	11/7/2016		1000	2	0.5	1	False	TJ	11/9/2016	KD Flask	0.1	TJ	11/9/2016
SW110716LCS01 (Water - 1611004)	3510C	TS	11/7/2016 5:30:00 PM	11/7/2016		1000	2	0.5	1	False	TJ	11/9/2016	KD Flask	0.1	TJ	11/9/2016
SW110716LCSD01 (Water - 1611004)	3510C	TS	11/7/2016 5:30:00 PM	11/7/2016		1000	2	0.5	1	False	TJ	11/9/2016	KD Flask	0.1	TJ	11/9/2016

Alpha Woods Hole Lab
Batch Prep Report
11/07/2016 1611004 - OP NEWFIE

Lab ID	Notes
1611004-07 (Water - 1611004)	1st Prep
1611004-08 (Water - 1611004)	1st Prep
1611004-09D (Water - 1611004)	1st Prep
1611004-09 (Water - 1611004)	1st Prep
SW110716B01 (Water - 1611004)	1st Prep
SW110716LCS01 (Water - 1611004)	1st Prep
SW110716LCSD01 (Water - 1611004)	1st Prep

Alpha Woods Hole Lab
Batch Prep Spike Report

11/07/2016 1611004 - OP NEWFIE Analyst: TS Witness: SMB

Lab ID	QC Type	OP NEWFIE - surr	Vol OP NEWFIE - surr	Units OP NEWFIE - surr	OP NEWFIE - spk 1	Vol OP NEWFIE - spk 1	Units OP NEWFIE - spk 1	OP NEWFIE - spk 2	Vol OP NEWFIE - spk 2	Units OP NEWFIE - spk 2
1611004-07	SAM	FRAX85	100	µl	FRAX07	100	µl			
1611004-08	SAM	FRAX85	500	µl	FRAX07	500	µl			
1611004-09	D	FRAX85	500	µl	FRAX07	500	µl			
1611004-09	SAM	FRAX85	500	µl	FRAX07	500	µl			
SW110716B01	B	FRAX85	100	µl	FRAX07	100	µl			
SW110716LCS01	LCS	FRAX85	100	µl	FRAX07	100	µl	FRAX73	100	µl
SW110716LCSD01	LCSD	FRAX85	100	µl	FRAX07	100	µl	FRAX73	100	µl
SW112816B01	B	-99	-99	-99	-99	-99	-99	-99	-99	-99
SW112816PRM01	PRM	-99	-99	-99	-99	-99	-99	-99	-99	-99

STD ID	TITLE	CONTENTS	SOLVENT	LOT
FRAX07	Biomarker Surrogate	5b(H)Cholane = 10 ug/mL	dcm	DN770
FRAX73	LCS Solution PAH /SHC	Aromatic Hydrocarbon STD = 10 ug/mL MA EPH Aliphatic Std = 200 ug/mL	DCM	DP875
FRAX85	PAH/SHC SURROGATE	Deuterated PAH Surrogate = 10 ug/mL OTP = 500 ug/mL D50 Tetracosane = 500 ug/mL	DCM	DQ092

Alpha Woods Hole Lab
Batch Prep Spike Report

11/07/2016 1611004 - OP SHC Analyst: TS Witness: SMB

Lab ID	QC Type	OP SHC - surr	Vol OP SHC - surr	Units OP SHC - surr	OP SHC - spk 1	Vol OP SHC - spk 1	Units OP SHC - spk 1	OP SHC - spk 2	Vol OP SHC - spk 2	Units OP SHC - spk 2
1611004-07	SAM	FRAX85	100	µl				FRAX53	50	µl
1611004-08	SAM	FRAX85	500	µl				FRAX53	50	µl
1611004-09	D	FRAX85	500	µl				FRAX53	50	µl
1611004-09	SAM	FRAX85	500	µl				FRAX53	50	µl
SW110716B01	B	FRAX85	100	µl				FRAX53	50	µl
SW110716LCS01	LCS	FRAX85	100	µl	FRAX73	100	µl	FRAX53	50	µl
SW110716LCSD01	LCSD	FRAX85	100	µl	FRAX73	100	µl	FRAX53	50	µl
SW112816B01	B	-99	-99	-99	-99	-99	-99	-99	-99	-99
SW112816PRM01	PRM	-99	-99	-99	-99	-99	-99	-99	-99	-99

STD ID	TITLE	CONTENTS	SOLVENT	LOT
FRAX53	PAH/SHC RIS Spiking Solution	5 Alpha Androstane = 500 ug/mL Acenaphthene D10, Chrysene D12 = 5 ug/mL	DCM	dp875
FRAX73	LCS Solution PAH /SHC	Aromatic Hydrocarbon STD = 10 ug/mL MA EPH Aliphatic Std = 200 ug/mL	DCM	DP875
FRAX85	PAH/SHC SURROGATE	Deuterated PAH Surrogate = 10 ug/mL OTP = 500 ug/mL D50 Tetracosane = 500 ug/mL	DCM	DQ092

Alpha Woods Hole Lab
Batch Clean Up Report
11/07/2016 1611004 - OP NEWFIE

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1611004-07	SAM	split	TJ	11/9/2016							0.9	0.45	2			True
1611004-08	SAM	split	TJ	11/9/2016							0.9	0.45	2			True
1611004-09	D	split	TJ	11/9/2016							0.9	0.45	2			True
1611004-09	SAM	split	TJ	11/9/2016							0.9	0.45	2			True
SW110716B01	B	split	TJ	11/9/2016							0.9	0.45	2			True
SW110716LCS01	LCS	split	TJ	11/9/2016							0.9	0.45	2			True
SW110716LCSD01	LCSD	split	TJ	11/9/2016							0.9	0.45	2			True

Alpha Woods Hole Lab
Batch Clean Up Report
11/07/2016 1611004 - OP NEWFIE

Lab ID	Notes
1611004-07	
1611004-08	
1611004-09	
1611004-09	
SW110716B01	
SW110716LCS01	
SW110716LCSD01	

Batch ID: 1611004 Client: NEWFIE Project: National Grid Winter St Haverhill

Anomalies are noted in the Prep Process Notes section below.

Test(s) Spiked for:
Choose from the following:
F1B, POIB, POIH, POIHX, POITAS, TPH+A

Extraction HT:
11/08/2016

Identify Matrix:
Filter • Filter (L) • NAPL • Net • Oil Product • PUF • Sediment • Sheen Soil • Solid • SPMD • Tissue Pom Pom • 1L Water • 4L Water • Floc Water

	Date:	Initials:
COC/ETR Check:	11/7/16	TS
1st Extraction:	11/7/16	TS
2nd Extraction:	11/7/16	TS
3rd Extraction:	11/7/16	TS

Cleanup Methods:	Date/ Initials:
No Cleanup Required	X 11/7/16 TS
Alumina Column (3610)	
Silica Column (3630)	
Fractionation Column (3630F1)	
GPC (3640)	
Copper (3660B)	
Water pH<2 verified	

	Date/Initials:	ID & Amount:
RIS Spike Analyst:	11/9/16 SMB	50NL
RIS Spike Witness:	11/9/16 TJ	FRAX 53

Prep Process Notes

REAGENT	LOT #
DCM	DQ092
SODIUM SULFATE	0000145845
SILICA GEL	NA
ALUMINA	NA

REAGENT	LOT #
COPPER	NA
GLASS WOOL	11414001

BATCH COMPLETE Analyst:	TJ	Date:	11/9/16

BATCH REVIEWED Analyst:	EP	Date:	11/16/16

Alkylated Polynuclear Aromatic Hydrocarbons and Triaromatic Steroids by GC/MS-SIM

Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-02(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-01**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1084	20	10	AC

Parameter	Result	Parameter	Result
cis/trans-Decalin	**1140**	C1-Dibenzothiophenes	**1420**
C1-Decalins	**2060**	C2-Dibenzothiophenes	**1000**
C2-Decalins	**2020**	C3-Dibenzothiophenes	**381**
C3-Decalins	**1240**	C4-Dibenzothiophenes	**107**
C4-Decalins	**1710**	Benzo(b)fluorene	**382**
Benzothiophene	**786**	Fluoranthene	**1560**
C1-Benzo(b)thiophenes	**1080**	Pyrene	**2260**
C2-Benzo(b)thiophenes	**1000**	C1-Fluoranthenes/Pyrenes	**2390**
C3-Benzo(b)thiophenes	**633**	C2-Fluoranthenes/Pyrenes	**837**
C4-Benzo(b)thiophenes	**297**	C3-Fluoranthenes/Pyrenes	**262**
Naphthalene	**23400**	C4-Fluoranthenes/Pyrenes	**89.4**
C1-Naphthalenes	**18000**	Naphthobenzothiophenes	**334**
C2-Naphthalenes	**13100**	C1-Naphthobenzothiophenes	**361**
C3-Naphthalenes	**6670**	C2-Naphthobenzothiophenes	**184**
C4-Naphthalenes	**2700**	C3-Naphthobenzothiophenes	**67.1**
Biphenyl	**1250**	C4-Naphthobenzothiophenes	**29.0**
Dibenzofuran	**484**	Benz[a]anthracene	**798**
Acenaphthylene	**675**	Chrysene/Triphenylene	**827**
Acenaphthene	**2310**	C1-Chrysenes	**797**
Fluorene	**2470**	C2-Chrysenes	**360**
C1-Fluorenes	**1840**	C3-Chrysenes	**156**
C2-Fluorenes	**1360**	C4-Chrysenes	18.4 U
C3-Fluorenes	**622**	Benzo[b]fluoranthene	**309**
Anthracene	**1340**	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**353**
Phenanthrene	**7240**	Benzo[a]fluoranthene	**155**
C1-Phenanthrenes/Anthracenes	**5540**	Benzo[e]pyrene	**284**
C2-Phenanthrenes/Anthracenes	**2300**	Benzo[a]pyrene	**616**
C3-Phenanthrenes/Anthracenes	**736**	Perylene	**79.1**
C4-Phenanthrenes/Anthracenes	**184**	Indeno[1,2,3-cd]pyrene	**152**
Retene	18.4 U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**61.7**
Dibenzothiophene	**1130**	Benzo[g,h,i]perylene	**161**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	104	50-130
Phenanthrene-d10	95	50-130
Benzo[a]pyrene-d12	94	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:30

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-02(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-01**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1084	20	10	AC

Parameter	Result
Carbazole	**77.2**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	104	50-130
Phenanthrene-d10	95	50-130
Benzo[a]pyrene-d12	94	50-130

N/A - Not Applicable

12/07/16 11:30

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-02(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-01**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1084	20	10	AC

Parameter	Result
4-Methyldibenzothiophene	**548**
2/3-Methyldibenzothiophene	**544**
1-Methyldibenzothiophene	**154**
3-Methylphenanthrene	**1390**
2-Methylphenanthrene	**1450**
2-Methylanthracene	**456**
9/4-Methylphenanthrene	**1260**
1-Methylphenanthrene	**899**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	104	50-130
Phenanthrene-d10	95	50-130
Benzo[a]pyrene-d12	94	50-130

N/A - Not Applicable

12/07/16 11:30

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-02(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-01**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1084	20	10	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	18.4	U
C28,20S-triaromatic steroid	18.4	U
C27,20R-triaromatic steroid	18.4	U
C28,20R-triaromatic steroid	18.4	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	89	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:30

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281636.D
Acq On : 30 Nov 2016 6:05 pm
Operator : AC
Sample : 1611004-01
Misc : 10x
ALS Vial : 36 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:43:07 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	55040M4	500.000	ng/ml	-0.01
71) Chrysene-d12	43.570	240	102848	500.000	ng/ml	-0.01
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	24560	104.030	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.40%#			
40) Phenanthrene-d10	32.970	188	17209	95.121	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.51%#			
80) Benzo[b]fluoranthene-d12	47.485	264	20688	96.571	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.66%#			
85) Benzo[a]pyrene-d12	48.705	264	16215	94.029	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.40%#			
126) 5B(H)Cholane - Surr	44.157	217	2961	88.652	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 8.87%#			
Target Compounds						Qvalue
2) trans-Decalin	16.757	138	27468	576.028	ng/ml	100
3) cis-Decalin	17.976	138	1456M4	40.648	ng/ml	
4) C1-Decalins	18.684	152	53194M5	1115.526	ng/ml	
5) C2-Decalins	20.024	166	52227M5	1095.247	ng/ml	
6) C3-Decalins	22.493	180	32040M5	671.907	ng/ml	
7) C4-Decalins	25.895	194	44262M5	928.214	ng/ml	
9) Naphthalene	20.204	128	3286080	12656.015	ng/ml	100
10) C1-Naphthalenes	22.899	142	2530645M5	9746.531	ng/ml	
11) C2-Naphthalenes	25.744	156	1838744M5	7081.742	ng/ml	
12) C3-Naphthalenes	28.078	170	938462M5	3614.394	ng/ml	
13) C4-Naphthalenes	30.833	184	379341M5	1460.995	ng/ml	
14) 2-Methylnaphthalene	22.899	142	1530467	9271.529	ng/ml	100
15) 1-Methylnaphthalene	23.321	142	1001905	6407.146	ng/ml	100
16) Benzothiophene	20.415	134	97993	426.149	ng/ml	100
17) C1-Benzo(b)thiophenes	23.291	148	135227M5	588.070	ng/ml	
18) C2-Benzo(b)thiophenes	25.458	162	124725M5	542.400	ng/ml	
19) C3-Benzo(b)thiophenes	27.912	176	78855M5	342.922	ng	
20) C4-Benzo(b)thiophenes	30.020	190	37072M5	161.217	ng/ml	
21) Biphenyl	24.781	154	142333	679.200	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.398	156	513645	3585.307	ng/ml	100
23) Dibenzofuran	27.867	168	57721	262.409	ng/ml	88
24) Acenaphthylene	26.497	152	91957M4	365.671	ng/ml	
25) Acenaphthene	27.220	153	192865	1254.245	ng/ml	98
26) 2,3,5-Trimethylnaphthalen	28.770	170	50825M3	412.873	ng/ml	
27) Fluorene	29.237	166	224971M4	1340.099	ng/ml	
28) C1-Fluorenes	31.616	180	167814M5	999.628	ng/ml	
29) C2-Fluorenes	33.648	194	123876M5	737.900	ng/ml	
30) C3-Fluorenes	35.635	208	56597M5	337.135	ng/ml	
31) Dibenzothiophene	32.579	184	151156	610.196	ng/ml#	89
32) 4-Methyldibenzothiophene(	34.340	198	73503	296.722	ng/ml	100
33) 2/3-Methyldibenzothiophen	34.687	198	72978	294.602	ng/ml	100
34) 1-Methyldibenzothiophene(	35.108	198	20703	83.575	ng/ml	100
36) C1-Dibenzothiophenes	34.340	198	190990M5	771.001	ng/ml	
36) C1-Dibenzothiophenes BS	34.340	198	190990M5	771.001	ng/ml	
37) C2-Dibenzothiophenes	36.388	212	134483M5	542.890	ng/ml	
38) C3-Dibenzothiophenes	37.818	226	51126M5	206.389	ng/ml	
39) C4-Dibenzothiophenes	39.505	240	14348M5	57.921	ng/ml	
41) Phenanthrene	33.061	178	922919	3921.976	ng/ml	100
42) 3-Methylphenanthrene(3MP)	35.018	192	176799	751.313	ng/ml	93
43) 2-Methylphenanthrene(2MP)	35.138	192	184997	786.151	ng/ml	94
44) 2-Methylanthracene(2MA)	35.289	192	58104	246.915	ng/ml#	35
45) 9/4-Methylphenanthrene(9M	35.485	192	160228	680.894	ng/ml	93
46) 1-Methylphenanthrene(1MP)	35.560	192	114662	487.260	ng/ml	92
47) C1-Phenanthrenes/Anthrace	35.018	192	706585M5	3002.657	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281636.D
Acq On : 30 Nov 2016 6:05 pm
Operator : AC
Sample : 1611004-01
Misc : 10x
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Dec 07 09:43:07 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
48) C2-Phenanthrenes/Anthrace	37.291	206	292993M5	1245.084	ng/ml	
48) C2-Phenanthrenes/Anthr BS	37.291	206	292993M5	1245.084	ng/ml	
50) C3-Phenanthrenes/Anthrace	39.128	220	93928M5	399.150	ng/ml	
51) C4-Phenanthrenes/Anthrace	41.326	234	23436M5	99.592	ng/ml	
53) Anthracene	33.241	178	162841M4	729.138	ng/ml	
54) Carbazole	33.904	167	9129M4	41.840	ng/ml	
55) 1-Methylphenanthrene	35.560	192	114662	660.683	ng/ml	99
56) Fluoranthene	37.833	202	220131M3	842.830	ng/ml	
57) Benzo(b)fluorene	40.363	216	32013M3	206.861	ng/ml	
58) Pyrene	38.722	202	346334	1223.248	ng/ml	92
59) C1-Fluoranthenes/Pyrenes	40.107	216	367140M5	1296.735	ng/ml	
60) C2-Fluoranthenes/Pyrenes	41.853	230	128388M5	453.465	ng/ml	
61) C3-Fluoranthenes/Pyrenes	43.660	244	40179M5	141.912	ng/ml	
62) C4-Fluoranthenes/Pyrenes	45.286	258	13712M5	48.431	ng/ml	
63) Naphthobenzothiophene	42.576	234	27163	110.694	ng/ml	95
64) Naphthobenzothiophene-2,1	42.576	234	27163	110.694	ng/ml	95
65) Naphthobenzothiophene-1,2	42.922	234	8446	34.419	ng/ml#	59
66) Naphthobenzothiophene-2,3	43.208	234	8795M3	35.841	ng/ml	
67) C1-Naphthobenzothiophenes	43.976	248	47975M5	195.507	ng/ml	
68) C2-Naphthobenzothiophenes	45.467	262	24415M5	99.496	ng/ml	
69) C3-Naphthobenzothiophenes	47.590	276	8923M5	36.363	ng/ml	
70) C4-Naphthobenzothiophenes	49.126	290	3858M5	15.722	ng/ml	
72) Benz[a]anthracene	43.495	228	123196M3	432.298	ng/ml	
74) Chrysene/Triphenylene	43.660	228	119769	448.134	ng/ml	100
75) C1-Chrysenes	45.136	242	115481M5	432.089	ng/ml	
76) C2-Chrysenes	46.837	256	53335M5	199.561	ng/ml	
76) C2-Chrysenes BS	46.837	256	52134M5	195.067	ng/ml	
77) BBF-D12 Surr BKGD	47.485	256	1201	4.494	ng/ml	100
78) C3-Chrysenes	48.464	270	22543M5	84.348	ng/ml	
81) Benzo[b]fluoranthene	47.560	252	48498M4	167.261	ng/ml	
82) Benzo[j]+[k]fluoranthene	47.635	252	51080	191.106	ng/ml	96
83) Benzo[a]fluoranthene	47.967	252	22445M3	83.974	ng/ml	
84) Benzo[e]pyrene	48.599	252	41462	153.777	ng/ml	96
86) Benzo[a]pyrene	48.795	252	85962	334.161	ng/ml	94
87) Perylene	49.111	252	11173	42.895	ng/ml	98
88) Indeno[1,2,3-cd]pyrene	53.795	276	27459M4	82.658	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.840	278	9480M4	33.435	ng/ml	
90) Benzo[g,h,i]perylene	55.150	276	28117	87.504	ng/ml	100

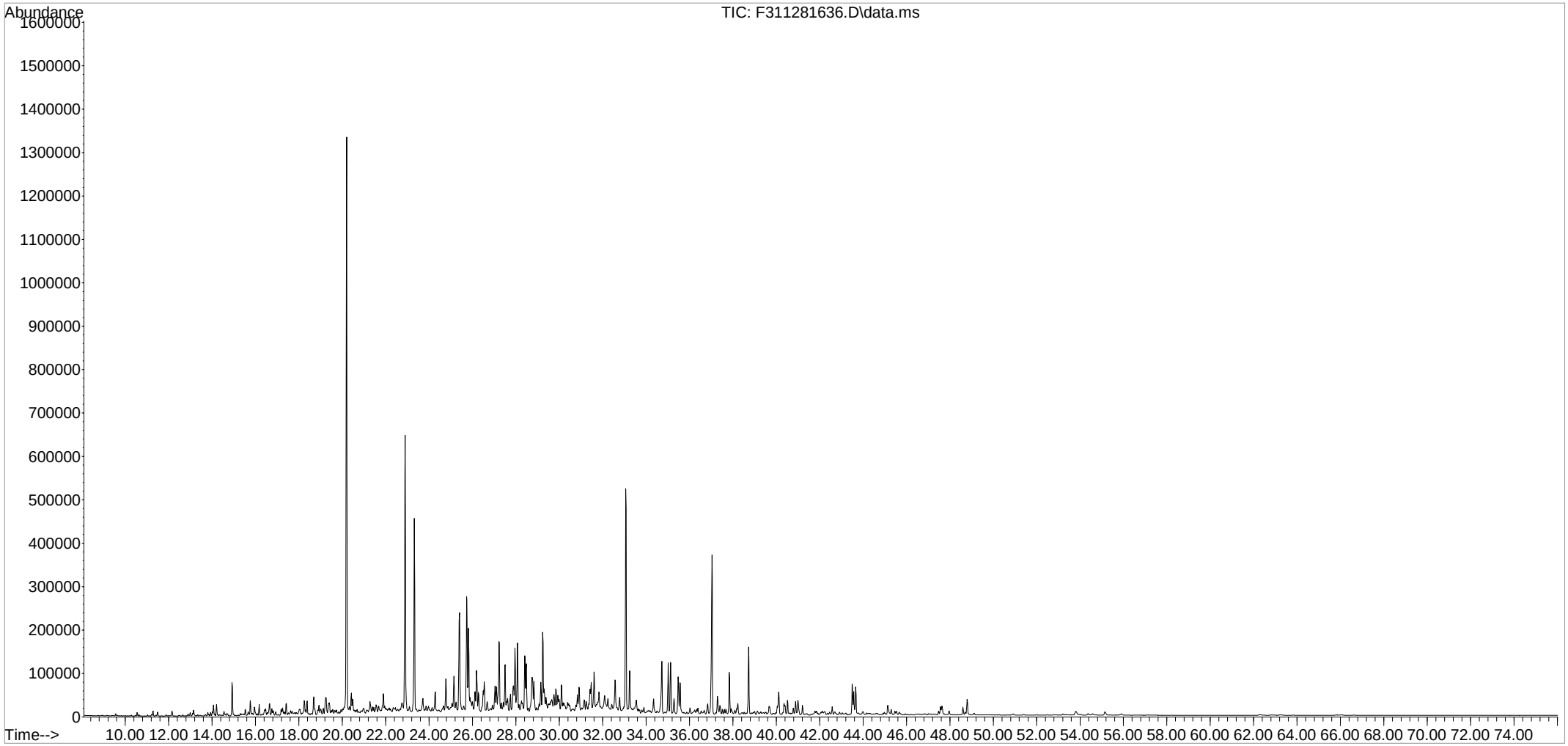
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281636.D
Acq On : 30 Nov 2016 6:05 pm
Operator : AC
Sample : 1611004-01
Misc : 10x
ALS Vial : 36 Sample Multiplier: 1

Quant Time: Dec 07 09:43:07 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1084	20	10	AC

Parameter	Result	Parameter	Result
cis/trans-Decalin	**1210**	C1-Dibenzothiophenes	**829**
C1-Decalins	**2240**	C2-Dibenzothiophenes	**643**
C2-Decalins	**1940**	C3-Dibenzothiophenes	**273**
C3-Decalins	**1190**	C4-Dibenzothiophenes	**84.0**
C4-Decalins	**2580**	Benzo(b)fluorene	**233**
Benzothiophene	**282**	Fluoranthene	**918**
C1-Benzo(b)thiophenes	**476**	Pyrene	**1620**
C2-Benzo(b)thiophenes	**488**	C1-Fluoranthenes/Pyrenes	**1680**
C3-Benzo(b)thiophenes	**390**	C2-Fluoranthenes/Pyrenes	**628**
C4-Benzo(b)thiophenes	**218**	C3-Fluoranthenes/Pyrenes	**197**
Naphthalene	**16100**	C4-Fluoranthenes/Pyrenes	**73.4**
C1-Naphthalenes	**11300**	Naphthobenzothiophenes	**166**
C2-Naphthalenes	**11500**	C1-Naphthobenzothiophenes	**192**
C3-Naphthalenes	**7610**	C2-Naphthobenzothiophenes	**114**
C4-Naphthalenes	**3580**	C3-Naphthobenzothiophenes	**48.5**
Biphenyl	**844**	C4-Naphthobenzothiophenes	**24.6**
Dibenzofuran	**337**	Benz[a]anthracene	**510**
Acenaphthylene	**279**	Chrysene/Triphenylene	**520**
Acenaphthene	**1980**	C1-Chrysenes	**550**
Fluorene	**1250**	C2-Chrysenes	**251**
C1-Fluorenes	**1330**	C3-Chrysenes	**103**
C2-Fluorenes	**1300**	C4-Chrysenes	18.4 U
C3-Fluorenes	**645**	Benzo[b]fluoranthene	**158**
Anthracene	**1000**	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**250**
Phenanthrene	**3690**	Benzo[a]fluoranthene	**102**
C1-Phenanthrenes/Anthracenes	**3900**	Benzo[e]pyrene	**198**
C2-Phenanthrenes/Anthracenes	**1920**	Benzo[a]pyrene	**388**
C3-Phenanthrenes/Anthracenes	**649**	Perylene	**46.9**
C4-Phenanthrenes/Anthracenes	**154**	Indeno[1,2,3-cd]pyrene	**95.0**
Retene	18.4 U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**38.8**
Dibenzothiophene	**506**	Benzo[g,h,i]perylene	**109**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	104	50-130
Phenanthrene-d10	95	50-130
Benzo[a]pyrene-d12	91	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:30

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1084	20	10	AC

Parameter	Result
Carbazole	**13.8** J

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	104	50-130
Phenanthrene-d10	95	50-130
Benzo[a]pyrene-d12	91	50-130

J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 11:30

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1084	20	10	AC

Parameter	Result
4-Methyldibenzothiophene	**349**
2/3-Methyldibenzothiophene	**333**
1-Methyldibenzothiophene	**76.1**
3-Methylphenanthrene	**943**
2-Methylphenanthrene	**1000**
2-Methylanthracene	**333**
9/4-Methylphenanthrene	**929**
1-Methylphenanthrene	**606**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	104	50-130
Phenanthrene-d10	95	50-130
Benzo[a]pyrene-d12	91	50-130

N/A - Not Applicable

12/07/16 11:30

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1084	20	10	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	18.4	U
C28,20S-triaromatic steroid	18.4	U
C27,20R-triaromatic steroid	18.4	U
C28,20R-triaromatic steroid	18.4	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	85	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:30

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281637.D
Acq On : 30 Nov 2016 7:31 pm
Operator : AC
Sample : 1611004-02
Misc : 10x
ALS Vial : 37 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 10:51:42 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	52679M4	500.000	ng/ml	-0.02
71) Chrysene-d12	43.570	240	102845	500.000	ng/ml	-0.02
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	23473	103.882	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.39%#			
40) Phenanthrene-d10	32.970	188	16497	95.272	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.53%#			
80) Benzo[b]fluoranthene-d12	47.485	264	19856	92.690	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.27%#			
85) Benzo[a]pyrene-d12	48.705	264	15623	90.599	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.06%#			
126) 5B(H)Cholane - Surr	44.157	217	2836	84.912	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 8.49%#			
Target Compounds						Qvalue
2) trans-Decalin	16.757	138	28143	616.635	ng/ml	100
3) cis-Decalin	17.976	138	1360M4	39.670	ng/ml	
4) C1-Decalins	18.699	152	55432M5	1214.558	ng/ml	
5) C2-Decalins	20.024	166	47868M5	1048.825	ng/ml	
6) C3-Decalins	22.493	180	29526M5	646.938	ng/ml	
7) C4-Decalins	25.895	194	63794M5	1397.776	ng/ml	
9) Naphthalene	20.204	128	2170031	8732.241	ng/ml	100
10) C1-Naphthalenes	22.899	142	1524163M5	6133.257	ng/ml	
11) C2-Naphthalenes	25.744	156	1546254M5	6222.152	ng/ml	
12) C3-Naphthalenes	28.078	170	1024821M5	4123.897	ng/ml	
13) C4-Naphthalenes	30.833	184	482635M5	1942.131	ng/ml	
14) 2-Methylnaphthalene	22.899	142	947706	5998.490	ng/ml	100
15) 1-Methylnaphthalene	23.321	142	576370	3851.061	ng/ml	100
16) Benzothiophene	20.415	134	33576	152.558	ng/ml	100
17) C1-Benzo(b)thiophenes	22.764	148	56806M5	258.108	ng/ml	
18) C2-Benzo(b)thiophenes	25.458	162	58247M5	264.655	ng/ml	
19) C3-Benzo(b)thiophenes	27.912	176	46565M5	211.576	ng	
20) C4-Benzo(b)thiophenes	30.020	190	26051M5	118.367	ng/ml	
21) Biphenyl	24.781	154	91800	457.694	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.398	156	434098	3165.862	ng/ml	100
23) Dibenzofuran	27.867	168	38475	182.753	ng/ml#	85
24) Acenaphthylene	26.497	152	36384M3	151.167	ng/ml	
25) Acenaphthene	27.220	153	157771	1072.005	ng/ml	97
26) 2,3,5-Trimethylnaphthalen	28.770	170	55569M3	471.642	ng/ml	
27) Fluorene	29.237	166	108682M4	676.408	ng/ml	
28) C1-Fluorenes	31.616	180	115838M5	720.945	ng/ml	
29) C2-Fluorenes	33.648	194	113431M5	705.965	ng/ml	
30) C3-Fluorenes	35.635	208	56151M5	349.469	ng/ml	
31) Dibenzothiophene	32.564	184	64980	274.072	ng/ml#	88
32) 4-Methyldibenzothiophene(	34.340	198	44795	188.936	ng/ml	100
33) 2/3-Methyldibenzothiophen	34.687	198	42763	180.365	ng/ml	100
34) 1-Methyldibenzothiophene(	35.108	198	9784	41.267	ng/ml	100
36) C1-Dibenzothiophenes	34.340	198	106545M5	449.385	ng/ml	
36) C1-Dibenzothiophenes BS	34.340	198	106545M5	449.385	ng/ml	
37) C2-Dibenzothiophenes	36.388	212	82625M5	348.495	ng/ml	
38) C3-Dibenzothiophenes	37.818	226	35062M5	147.884	ng/ml	
39) C4-Dibenzothiophenes	39.505	240	10799M5	45.548	ng/ml	
41) Phenanthrene	33.061	178	450522	2000.314	ng/ml	100
42) 3-Methylphenanthrene(3MP)	35.018	192	115067	510.897	ng/ml	93
43) 2-Methylphenanthrene(2MP)	35.123	192	122264	542.851	ng/ml	92
44) 2-Methylanthracene(2MA)	35.289	192	40690M4	180.663	ng/ml	
45) 9/4-Methylphenanthrene(9M	35.485	192	113428	503.619	ng/ml	95
46) 1-Methylphenanthrene(1MP)	35.575	192	74040	328.737	ng/ml	91
47) C1-Phenanthrenes/Anthrace	35.018	192	475735M5	2112.260	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281637.D
Acq On : 30 Nov 2016 7:31 pm
Operator : AC
Sample : 1611004-02
Misc : 10x
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Dec 07 10:51:42 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
48) C2-Phenanthrenes/Anthrace	37.291	206	234769M5	1042.373	ng/ml	
48) C2-Phenanthrenes/Anthr BS	37.291	206	234769M5	1042.373	ng/ml	
50) C3-Phenanthrenes/Anthrace	39.128	220	79180M5	351.559	ng/ml	
51) C4-Phenanthrenes/Anthrace	41.326	234	18790M5	83.427	ng/ml	
53) Anthracene	33.241	178	116063M4	542.976	ng/ml	
54) Carbazole	33.904	167	1556M4	7.451	ng/ml	
55) 1-Methylphenanthrene	35.575	192	74208	446.751	ng/ml	100
56) Fluoranthene	37.833	202	124425M3	497.746	ng/ml	
57) Benzo(b)fluorene	40.363	216	18662M3	125.995	ng/ml	
58) Pyrene	38.722	202	238589	880.462	ng/ml	92
59) C1-Fluoranthenes/Pyrenes	40.107	216	245953M5	907.638	ng/ml	
60) C2-Fluoranthenes/Pyrenes	41.778	230	92156M5	340.082	ng/ml	
61) C3-Fluoranthenes/Pyrenes	44.036	244	28892M5	106.620	ng/ml	
62) C4-Fluoranthenes/Pyrenes	45.286	258	10780M5	39.781	ng/ml	
63) Naphthobenzothiophene	42.576	234	12909	54.964	ng/ml#	93
64) Naphthobenzothiophene-2,1	42.576	234	12909	54.964	ng/ml#	93
65) Naphthobenzothiophene-1,2	42.922	234	4107	17.487	ng/ml#	72
66) Naphthobenzothiophene-2,3	43.208	234	4102M3	17.466	ng/ml	
67) C1-Naphthobenzothiophenes	43.976	248	24480M5	104.232	ng/ml	
68) C2-Naphthobenzothiophenes	45.467	262	14460M5	61.568	ng/ml	
69) C3-Naphthobenzothiophenes	47.590	276	6178M5	26.305	ng/ml	
70) C4-Naphthobenzothiophenes	48.720	290	3136M5	13.353	ng/ml	
72) Benz[a]anthracene	43.494	228	78804M3	276.534	ng/ml	
74) Chrysene/Triphenylene	43.660	228	75323	281.840	ng/ml	99
75) C1-Chrysenes	45.136	242	79654M5	298.046	ng/ml	
76) C2-Chrysenes	46.837	256	37398M5	139.934	ng/ml	
76) C2-Chrysenes BS	46.837	256	36387M5	136.151	ng/ml	
77) BBF-D12 Surr BKGD	47.485	256	1011	3.783	ng/ml	100
78) C3-Chrysenes	48.464	270	14912M5	55.797	ng/ml	
81) Benzo[b]fluoranthene	47.560	252	24752	85.368	ng/ml	96
82) Benzo[j]+[k]fluoranthene	47.635	252	36235	135.570	ng/ml	96
83) Benzo[a]fluoranthene	47.967	252	14814M4	55.425	ng/ml	
84) Benzo[e]pyrene	48.599	252	28874	107.093	ng/ml	98
86) Benzo[a]pyrene	48.795	252	54069	210.189	ng/ml	97
87) Perylene	49.126	252	6617	25.405	ng/ml	89
88) Indeno[1,2,3-cd]pyrene	53.795	276	17110M4	51.507	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.855	278	5954M4	21.000	ng/ml	
90) Benzo[g,h,i]perylene	55.150	276	18978	59.064	ng/ml	97

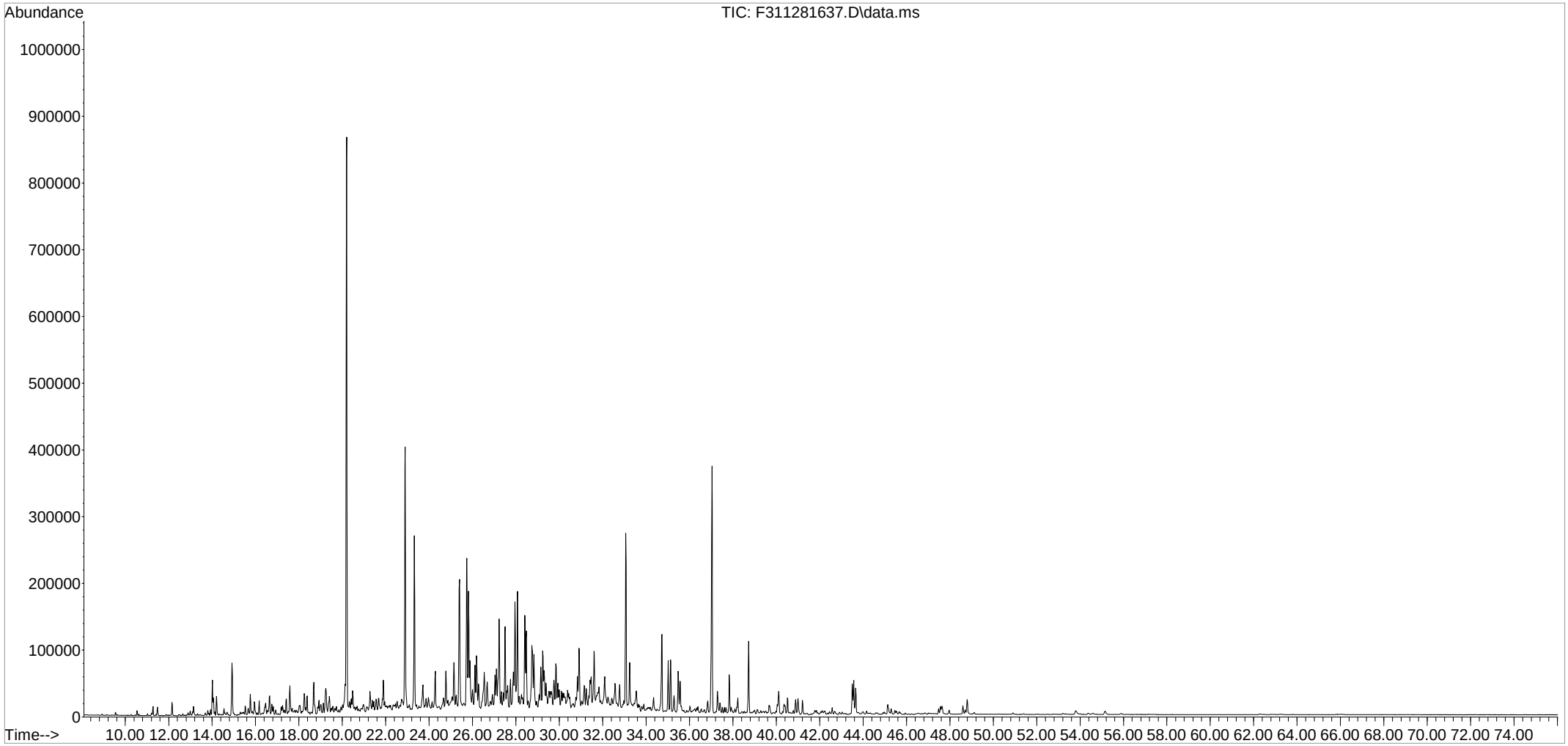
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281637.D
Acq On : 30 Nov 2016 7:31 pm
Operator : AC
Sample : 1611004-02
Misc : 10x
ALS Vial : 37 Sample Multiplier: 1

Quant Time: Dec 07 10:51:42 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Duplicate
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02 D**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1095	20	10	AC

Parameter	Result	Parameter	Result
cis/trans-Decalin	**1260**	C1-Dibenzothiophenes	**858**
C1-Decalins	**2270**	C2-Dibenzothiophenes	**667**
C2-Decalins	**2020**	C3-Dibenzothiophenes	**283**
C3-Decalins	**1210**	C4-Dibenzothiophenes	**84.0**
C4-Decalins	**2690**	Benzo(b)fluorene	**238**
Benzothiophene	**291**	Fluoranthene	**944**
C1-Benzo(b)thiophenes	**492**	Pyrene	**1690**
C2-Benzo(b)thiophenes	**506**	C1-Fluoranthenes/Pyrenes	**1710**
C3-Benzo(b)thiophenes	**415**	C2-Fluoranthenes/Pyrenes	**643**
C4-Benzo(b)thiophenes	**213**	C3-Fluoranthenes/Pyrenes	**204**
Naphthalene	**16500**	C4-Fluoranthenes/Pyrenes	**68.5**
C1-Naphthalenes	**11700**	Naphthobenzothiophenes	**183**
C2-Naphthalenes	**11800**	C1-Naphthobenzothiophenes	**200**
C3-Naphthalenes	**7880**	C2-Naphthobenzothiophenes	**116**
C4-Naphthalenes	**3680**	C3-Naphthobenzothiophenes	**57.5**
Biphenyl	**877**	C4-Naphthobenzothiophenes	**24.2**
Dibenzofuran	**352**	Benz[a]anthracene	**516**
Acenaphthylene	**280**	Chrysene/Triphenylene	**521**
Acenaphthene	**2040**	C1-Chrysenes	**567**
Fluorene	**1280**	C2-Chrysenes	**258**
C1-Fluorenes	**1380**	C3-Chrysenes	**100**
C2-Fluorenes	**1340**	C4-Chrysenes	18.3 U
C3-Fluorenes	**645**	Benzo[b]fluoranthene	**157**
Anthracene	**1030**	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**260**
Phenanthrene	**3800**	Benzo[a]fluoranthene	**104**
C1-Phenanthrenes/Anthracenes	**3970**	Benzo[e]pyrene	**200**
C2-Phenanthrenes/Anthracenes	**1970**	Benzo[a]pyrene	**394**
C3-Phenanthrenes/Anthracenes	**667**	Perylene	**48.2**
C4-Phenanthrenes/Anthracenes	**163**	Indeno[1,2,3-cd]pyrene	**97.4**
Retene	18.3 U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**39.0**
Dibenzothiophene	**520**	Benzo[g,h,i]perylene	**119**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	103	50-130
Phenanthrene-d10	96	50-130
Benzo[a]pyrene-d12	90	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:30

Form I
Duplicate
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02 D**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1095	20	10	AC

Parameter	Result
Carbazole	**13.6** J

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	103	50-130
Phenanthrene-d10	96	50-130
Benzo[a]pyrene-d12	90	50-130

J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 11:30

Form I
Duplicate
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02 D**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1095	20	10	AC

Parameter	Result
4-Methyldibenzothiophene	**356**
2/3-Methyldibenzothiophene	**344**
1-Methyldibenzothiophene	**79.0**
3-Methylphenanthrene	**963**
2-Methylphenanthrene	**1020**
2-Methylanthracene	**347**
9/4-Methylphenanthrene	**949**
1-Methylphenanthrene	**609**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	103	50-130
Phenanthrene-d10	96	50-130
Benzo[a]pyrene-d12	90	50-130

N/A - Not Applicable

12/07/16 11:30

Form I
Duplicate
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02 D**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1095	20	10	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	18.3	U
C28,20S-triaromatic steroid	18.3	U
C27,20R-triaromatic steroid	18.3	U
C28,20R-triaromatic steroid	18.3	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	88	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:30

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281638.D
Acq On : 30 Nov 2016 8:57 pm
Operator : AC
Sample : 1611004-02d
Misc : 10x
ALS Vial : 38 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Dec 07 09:43:16 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	51729M4	500.000	ng/ml	-0.01
71) Chrysene-d12	43.570	240	101724	500.000	ng/ml	-0.01
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	22936	103.369	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.34%#			
40) Phenanthrene-d10	32.970	188	16351	96.163	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.62%#			
80) Benzo[b]fluoranthene-d12	47.485	264	19423	91.667	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.17%#			
85) Benzo[a]pyrene-d12	48.705	264	15319	89.815	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 8.98%#			
126) 5B(H)Cholane - Surr	44.157	217	2909	88.058	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 8.81%#			
Target Compounds						Qvalue
2) trans-Decalin	16.757	138	28815	642.954	ng/ml	100
3) cis-Decalin	17.976	138	1509M3	44.824	ng/ml	
4) C1-Decalins	18.699	152	55790M5	1244.852	ng/ml	
5) C2-Decalins	20.024	166	49577M5	1106.220	ng/ml	
6) C3-Decalins	22.493	180	29699M5	662.679	ng/ml	
7) C4-Decalins	25.895	194	65942M5	1471.375	ng/ml	
9) Naphthalene	20.204	128	2202153	9024.241	ng/ml	100
10) C1-Naphthalenes	22.899	142	1557555M5	6382.732	ng/ml	
11) C2-Naphthalenes	25.744	156	1581556M5	6481.086	ng/ml	
12) C3-Naphthalenes	28.078	170	1052927M5	4314.808	ng/ml	
13) C4-Naphthalenes	30.833	184	492036M5	2016.323	ng/ml	
14) 2-Methylnaphthalene	22.899	142	966955	6232.726	ng/ml	100
15) 1-Methylnaphthalene	23.321	142	590931	4020.862	ng/ml	100
16) Benzothiophene	20.415	134	34387	159.113	ng/ml	100
17) C1-Benzo(b)thiophenes	22.764	148	58225M5	269.414	ng/ml	
18) C2-Benzo(b)thiophenes	25.458	162	59863M5	276.993	ng/ml	
19) C3-Benzo(b)thiophenes	27.912	176	49119M5	227.279	ng	
20) C4-Benzo(b)thiophenes	30.020	190	25264M5	116.899	ng/ml	
21) Biphenyl	24.781	154	94548	480.052	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.398	156	443801	3296.066	ng/ml	100
23) Dibenzofuran	27.867	168	39784	192.441	ng/ml#	85
24) Acenaphthylene	26.497	152	36264M3	153.435	ng/ml	
25) Acenaphthene	27.220	153	161445	1117.115	ng/ml	97
26) 2,3,5-Trimethylnaphthalen	28.770	170	55777M3	482.101	ng/ml	
27) Fluorene	29.237	166	110780M4	702.128	ng/ml	
28) C1-Fluorenes	31.616	180	118787M5	752.876	ng/ml	
29) C2-Fluorenes	33.648	194	116135M5	736.068	ng/ml	
30) C3-Fluorenes	35.620	208	55750M5	353.346	ng/ml	
31) Dibenzothiophene	32.579	184	66265	284.625	ng/ml#	86
32) 4-Methyldibenzothiophene(	34.340	198	45442	195.185	ng/ml	100
33) 2/3-Methyldibenzothiophen	34.687	198	43815	188.196	ng/ml	100
34) 1-Methyldibenzothiophene(	35.108	198	10072	43.262	ng/ml	100
36) C1-Dibenzothiophenes	34.340	198	109323M5	469.570	ng/ml	
36) C1-Dibenzothiophenes BS	34.340	198	109323M5	469.570	ng/ml	
37) C2-Dibenzothiophenes	36.027	212	85049M5	365.307	ng/ml	
38) C3-Dibenzothiophenes	37.818	226	36020M5	154.715	ng/ml	
39) C4-Dibenzothiophenes	39.505	240	10713M5	46.015	ng/ml	
41) Phenanthrene	33.061	178	459938	2079.625	ng/ml	100
42) 3-Methylphenanthrene(3MP)	35.018	192	116639	527.387	ng/ml	94
43) 2-Methylphenanthrene(2MP)	35.123	192	123309	557.546	ng/ml	93
44) 2-Methylanthracene(2MA)	35.289	192	42038M3	190.076	ng/ml	
45) 9/4-Methylphenanthrene(9M	35.470	192	114930	519.660	ng/ml	95
46) 1-Methylphenanthrene(1MP)	35.575	192	73776	333.581	ng/ml	92
47) C1-Phenanthrenes/Anthrace	35.123	192	480267M5	2171.543	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281638.D
Acq On : 30 Nov 2016 8:57 pm
Operator : AC
Sample : 1611004-02d
Misc : 10x
ALS Vial : 38 Sample Multiplier: 1

Quant Time: Dec 07 09:43:16 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
48) C2-Phenanthrenes/Anthrace	37.291	206	238672M5	1079.163	ng/ml	
48) C2-Phenanthrenes/Anthr BS	37.291	206	238672M5	1079.163	ng/ml	
50) C3-Phenanthrenes/Anthrace	39.128	220	80721M5	364.983	ng/ml	
51) C4-Phenanthrenes/Anthrace	41.326	234	19752M5	89.309	ng/ml	
53) Anthracene	33.241	178	118496M4	564.539	ng/ml	
54) Carbazole	33.904	167	1525M3	7.437	ng/ml	
55) 1-Methylphenanthrene	35.575	192	73977	453.539	ng/ml	99
56) Fluoranthene	37.833	202	126863M3	516.819	ng/ml	
57) Benzo(b)fluorene	40.363	216	18963M3	130.378	ng/ml	
58) Pyrene	38.722	202	245809	923.765	ng/ml	92
59) C1-Fluoranthenes/Pyrenes	40.107	216	248928M5	935.487	ng/ml	
60) C2-Fluoranthenes/Pyrenes	41.778	230	93646M5	351.927	ng/ml	
61) C3-Fluoranthenes/Pyrenes	44.036	244	29729M5	111.723	ng/ml	
62) C4-Fluoranthenes/Pyrenes	45.286	258	9977M5	37.494	ng/ml	
63) Naphthobenzothiophene	42.576	234	13469	58.402	ng/ml#	93
64) Naphthobenzothiophene-2,1	42.576	234	13469	58.402	ng/ml#	93
65) Naphthobenzothiophene-1,2	42.922	234	4184	18.142	ng/ml#	72
66) Naphthobenzothiophene-2,3	43.208	234	5451M3	23.636	ng/ml	
67) C1-Naphthobenzothiophenes	43.961	248	25190M5	109.224	ng/ml	
68) C2-Naphthobenzothiophenes	45.467	262	14590M5	63.263	ng/ml	
69) C3-Naphthobenzothiophenes	47.590	276	7261M5	31.484	ng/ml	
70) C4-Naphthobenzothiophenes	48.720	290	3054M5	13.242	ng/ml	
72) Benz[a]anthracene	43.494	228	79548M3	282.221	ng/ml	
74) Chrysene/Triphenylene	43.660	228	75457	285.453	ng/ml	98
75) C1-Chrysenes	45.136	242	82017M5	310.270	ng/ml	
76) C2-Chrysenes	46.837	256	38419M5	145.339	ng/ml	
76) C2-Chrysenes BS	46.837	256	37359M5	141.329	ng/ml	
77) BBF-D12 Surr BKGD	47.485	256	1060	4.010	ng/ml	100
78) C3-Chrysenes	48.479	270	14470M5	54.740	ng/ml	
81) Benzo[b]fluoranthene	47.560	252	24599	85.775	ng/ml	94
82) Benzo[j]+[k]fluoranthene	47.635	252	37581	142.156	ng/ml	91
83) Benzo[a]fluoranthene	47.967	252	15069M4	57.001	ng/ml	
84) Benzo[e]pyrene	48.599	252	29186	109.443	ng/ml	99
86) Benzo[a]pyrene	48.795	252	54913	215.823	ng/ml	96
87) Perylene	49.111	252	6800	26.395	ng/ml	95
88) Indeno[1,2,3-cd]pyrene	53.795	276	17528M4	53.346	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.855	278	5993M4	21.370	ng/ml	
90) Benzo[g,h,i]perylene	55.165	276	20645	64.960	ng/ml	99

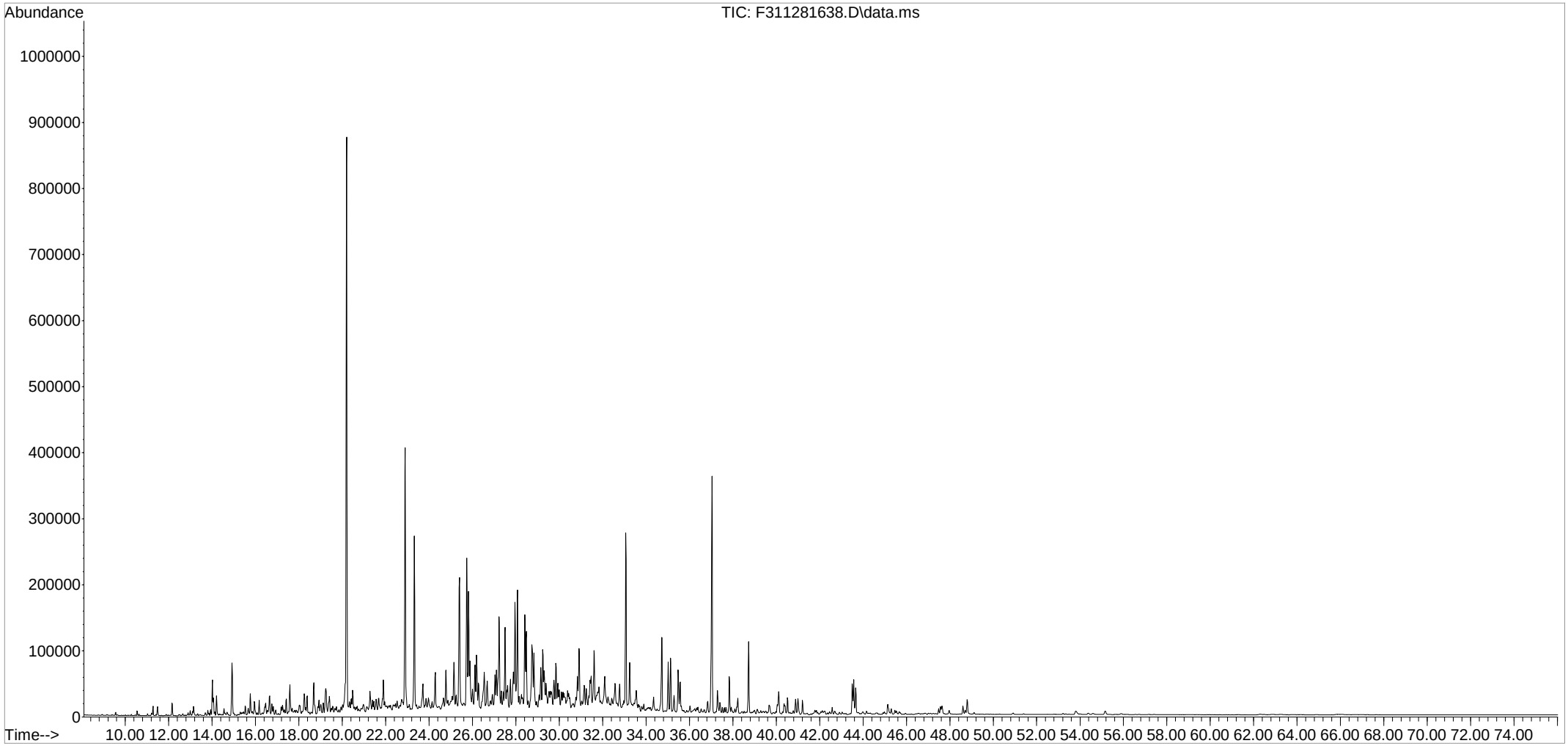
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281638.D
Acq On : 30 Nov 2016 8:57 pm
Operator : AC
Sample : 1611004-02d
Misc : 10x
ALS Vial : 38 Sample Multiplier: 1

Quant Time: Dec 07 09:43:16 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Duplicate
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/10/16	100	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
cis/trans-Decalin	**1210**	**1260**	4	30
C1-Decalins	**2240**	**2270**	1	30
C2-Decalins	**1940**	**2020**	4	30
C3-Decalins	**1190**	**1210**	1	30
C4-Decalins	**2580**	**2690**	4	30
Benzothiophene	**282**	**291**	3	30
C1-Benzo(b)thiophenes	**476**	**492**	3	30
C2-Benzo(b)thiophenes	**488**	**506**	4	30
C3-Benzo(b)thiophenes	**390**	**415**	6	30
C4-Benzo(b)thiophenes	**218**	**213**	2	30
Naphthalene	**16100**	**16500**	2	30
C1-Naphthalenes	**11300**	**11700**	3	30
C2-Naphthalenes	**11500**	**11800**	3	30
C3-Naphthalenes	**7610**	**7880**	4	30
C4-Naphthalenes	**3580**	**3680**	3	30
Biphenyl	**844**	**877**	4	30
Dibenzofuran	**337**	**352**	4	30
Acenaphthylene	**279**	**280**	0	30
Acenaphthene	**1980**	**2040**	3	30
Fluorene	**1250**	**1280**	3	30
C1-Fluorenes	**1330**	**1380**	3	30
C2-Fluorenes	**1300**	**1340**	3	30
C3-Fluorenes	**645**	**645**	0	30
Anthracene	**1000**	**1030**	3	30
Phenanthrene	**3690**	**3800**	3	30
C1-Phenanthrenes/Anthracenes	**3900**	**3970**	2	30
C2-Phenanthrenes/Anthracenes	**1920**	**1970**	2	30
C3-Phenanthrenes/Anthracenes	**649**	**667**	3	30
C4-Phenanthrenes/Anthracenes	**154**	**163**	6	30
Retene	18.4 U	18.3 U	N/A	30
Dibenzothiophene	**506**	**520**	3	30
C1-Dibenzothiophenes	**829**	**858**	3	30
C2-Dibenzothiophenes	**643**	**667**	4	30
C3-Dibenzothiophenes	**273**	**283**	4	30
C4-Dibenzothiophenes	**84.0**	**84.0**	0	30

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:33

Duplicate
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/10/16	100	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
Benzo(b)fluorene	**233**	**238**	2	30
Fluoranthene	**918**	**944**	3	30
Pyrene	**1620**	**1690**	4	30
C1-Fluoranthenes/Pyrenes	**1680**	**1710**	2	30
C2-Fluoranthenes/Pyrenes	**628**	**643**	2	30
C3-Fluoranthenes/Pyrenes	**197**	**204**	4	30
C4-Fluoranthenes/Pyrenes	**73.4**	**68.5**	7	30
Naphthobenzothiophenes	**166**	**183**	10	30
C1-Naphthobenzothiophenes	**192**	**200**	4	30
C2-Naphthobenzothiophenes	**114**	**116**	2	30
C3-Naphthobenzothiophenes	**48.5**	**57.5**	17	30
C4-Naphthobenzothiophenes	**24.6**	**24.2**	2	30
Benz[a]anthracene	**510**	**516**	1	30
Chrysene/Triphenylene	**520**	**521**	0	30
C1-Chrysenes	**550**	**567**	3	30
C2-Chrysenes	**251**	**258**	3	30
C3-Chrysenes	**103**	**100**	3	30
C4-Chrysenes	18.4 U	18.3 U	N/A	30
Benzo[b]fluoranthene	**158**	**157**	1	30
Benzo[j]fluoranthene/Benzo[k]fluoranthene	**250**	**260**	4	30
Benzo[a]fluoranthene	**102**	**104**	2	30
Benzo[e]pyrene	**198**	**200**	1	30
Benzo[a]pyrene	**388**	**394**	2	30
Perylene	**46.9**	**48.2**	3	30
Indeno[1,2,3-cd]pyrene	**95.0**	**97.4**	2	30
Dibenz[ah]anthracene/Dibenz[ac]anthracene	**38.8**	**39.0**	1	30
Benzo[g,h,i]perylene	**109**	**119**	9	30

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	104	103	50-130
Phenanthrene-d10	95	96	50-130
Benzo[a]pyrene-d12	91	90	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 11:33

Duplicate
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/10/16	100	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
Carbazole	**13.8** J	**13.6** J	1	30

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	104	103	50-130
Phenanthrene-d10	95	96	50-130
Benzo[a]pyrene-d12	91	90	50-130

J - Estimated value, below quantitation limit.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 11:33

Duplicate
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/10/16	100	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
4-Methyldibenzothiophene	**349**	**356**	2	30
2/3-Methyldibenzothiophene	**333**	**344**	3	30
1-Methyldibenzothiophene	**76.1**	**79.0**	4	30
3-Methylphenanthrene	**943**	**963**	2	30
2-Methylphenanthrene	**1000**	**1020**	2	30
2-Methylanthracene	**333**	**347**	4	30
9/4-Methylphenanthrene	**929**	**949**	2	30
1-Methylphenanthrene	**606**	**609**	0	30

N/A - Not Applicable

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	104	103	50-130
Phenanthrene-d10	95	96	50-130
Benzo[a]pyrene-d12	91	90	50-130

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 11:33

Duplicate
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/10/16	100	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
C26,20R- +C27,20S- triaromatic steroid	18.4 U	18.3 U	N/A	30
C28,20S-triaromatic steroid	18.4 U	18.3 U	N/A	30
C27,20R-triaromatic steroid	18.4 U	18.3 U	N/A	30
C28,20R-triaromatic steroid	18.4 U	18.3 U	N/A	30

Surrogate	% Recovery		Acceptance Range (%)
5B(H)Cholane	85	88	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 12:00

Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-3MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-03**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1021	20	10	AC

Parameter	Result	
cis/trans-Decalin	**410**	
C1-Decalins	**1010**	
C2-Decalins	**1280**	
C3-Decalins	**857**	
C4-Decalins	**1190**	
Benzothiophene	**1290**	
C1-Benzo(b)thiophenes	**1170**	
C2-Benzo(b)thiophenes	**838**	
C3-Benzo(b)thiophenes	**491**	
C4-Benzo(b)thiophenes	**233**	
Naphthalene	**50400**	E
C1-Naphthalenes	**24200**	
C2-Naphthalenes	**11000**	
C3-Naphthalenes	**5030**	
C4-Naphthalenes	**2080**	
Biphenyl	**1310**	
Dibenzofuran	**378**	
Acenaphthylene	**762**	
Acenaphthene	**2660**	
Fluorene	**1860**	
C1-Fluorenes	**1450**	
C2-Fluorenes	**1160**	
C3-Fluorenes	**545**	
Anthracene	**1280**	
Phenanthrene	**5700**	
C1-Phenanthrenes/Anthracenes	**4600**	
C2-Phenanthrenes/Anthracenes	**2090**	
C3-Phenanthrenes/Anthracenes	**756**	
C4-Phenanthrenes/Anthracenes	**211**	
Retene	19.6	U
Dibenzothiophene	**663**	

Parameter	Result	
C1-Dibenzothiophenes	**872**	
C2-Dibenzothiophenes	**679**	
C3-Dibenzothiophenes	**315**	
C4-Dibenzothiophenes	**116**	
Benzo(b)fluorene	**352**	
Fluoranthene	**1530**	
Pyrene	**2080**	
C1-Fluoranthenes/Pyrenes	**2170**	
C2-Fluoranthenes/Pyrenes	**866**	
C3-Fluoranthenes/Pyrenes	**337**	
C4-Fluoranthenes/Pyrenes	**132**	
Naphthobenzothiophenes	**240**	
C1-Naphthobenzothiophenes	**262**	
C2-Naphthobenzothiophenes	**164**	
C3-Naphthobenzothiophenes	**73.7**	
C4-Naphthobenzothiophenes	**34.5**	
Benz[a]anthracene	**823**	
Chrysene/Triphenylene	**873**	
C1-Chrysenes	**847**	
C2-Chrysenes	**457**	
C3-Chrysenes	**208**	
C4-Chrysenes	19.6	U
Benzo[b]fluoranthene	**434**	
Benzo[j]fluoranthene/Benzo[k]fluoranthene	**444**	
Benzo[a]fluoranthene	**196**	
Benzo[e]pyrene	**391**	
Benzo[a]pyrene	**727**	
Perylene	**108**	
Indeno[1,2,3-cd]pyrene	**260**	
Dibenz[ah]anthracene/Dibenz[ac]anthracene	**86.4**	
Benzo[g,h,i]perylene	**285**	

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	100	50-130
Phenanthrene-d10	98	50-130
Benzo[a]pyrene-d12	95	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
E - Estimated value, exceeds the upper limit of calibration.
N/A - Not Applicable

12/07/16 11:30

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-3MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-03**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1021	20	10	AC

Parameter	Result
Carbazole	**71.4**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	100	50-130
Phenanthrene-d10	98	50-130
Benzo[a]pyrene-d12	95	50-130

N/A - Not Applicable

12/07/16 11:30

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-3MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-03**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1021	20	10	AC

Parameter	Result
4-Methyldibenzothiophene	**342**
2/3-Methyldibenzothiophene	**334**
1-Methyldibenzothiophene	**91.8**
3-Methylphenanthrene	**1100**
2-Methylphenanthrene	**1140**
2-Methylanthracene	**427**
9/4-Methylphenanthrene	**1090**
1-Methylphenanthrene	**734**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	100	50-130
Phenanthrene-d10	98	50-130
Benzo[a]pyrene-d12	95	50-130

N/A - Not Applicable

12/07/16 11:30

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-3MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-03**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/30/16	100	0.1021	20	10	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	**12.9**	J
C28,20S-triaromatic steroid	19.6	U
C27,20R-triaromatic steroid	19.6	U
C28,20R-triaromatic steroid	19.6	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	89	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 11:30

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281639.D
Acq On : 30 Nov 2016 10:23 pm
Operator : AC
Sample : 1611004-03
Misc : 10x
ALS Vial : 39 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Dec 07 10:52:00 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	54389M4	500.000	ng/ml	-0.02
71) Chrysene-d12	43.570	240	97801	500.000	ng/ml	-0.02
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	23273	99.758	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.98%#			
40) Phenanthrene-d10	32.970	188	17467	97.703	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.77%#			
80) Benzo[b]fluoranthene-d12	47.485	264	19519	95.816	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.58%#			
85) Benzo[a]pyrene-d12	48.705	264	15539	94.759	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.48%#			
126) 5B(H)Cholane - Surr	44.157	217	2829	89.071	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 8.91%#			
Target Compounds						Qvalue
2) trans-Decalin	16.757	138	8922	189.342	ng/ml	100
3) cis-Decalin	17.976	138	708M3	20.002	ng/ml	
4) C1-Decalins	18.684	152	24263M5	514.907	ng/ml	
5) C2-Decalins	20.024	166	30813M5	653.910	ng/ml	
6) C3-Decalins	22.493	180	20606M5	437.298	ng/ml	
7) C4-Decalins	25.880	194	28674M5	608.517	ng/ml	
9) Naphthalene	20.204	128	6607249	25751.758	ng/ml	100
10) C1-Naphthalenes	22.899	142	3174545M5	12372.791	ng/ml	
11) C2-Naphthalenes	25.729	156	1436099M5	5597.197	ng/ml	
12) C3-Naphthalenes	28.078	170	658503M5	2566.516	ng/ml	
13) C4-Naphthalenes	30.833	184	271739M5	1059.103	ng/ml	
14) 2-Methylnaphthalene	22.899	142	2015900	12358.442	ng/ml	100
15) 1-Methylnaphthalene	23.321	142	1158795	7499.150	ng/ml	100
16) Benzothiophene	20.415	134	149970	659.990	ng/ml	100
17) C1-Benzo(b)thiophenes	23.275	148	136137M5	599.114	ng/ml	
18) C2-Benzo(b)thiophenes	25.458	162	97229M5	427.887	ng/ml	
19) C3-Benzo(b)thiophenes	27.912	176	56993M5	250.816	ng	
20) C4-Benzo(b)thiophenes	30.005	190	27062M5	119.095	ng/ml	
21) Biphenyl	24.766	154	138526	668.945	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.398	156	390322	2757.107	ng/ml	100
23) Dibenzofuran	27.867	168	41985	193.155	ng/ml	87
24) Acenaphthylene	26.497	152	96644M3	388.909	ng/ml	
25) Acenaphthene	27.220	153	206515	1359.089	ng/ml	98
26) 2,3,5-Trimethylnaphthalen	28.770	170	34093M3	280.267	ng/ml	
27) Fluorene	29.237	166	157467M4	949.221	ng/ml	
28) C1-Fluorenes	31.600	180	123027M5	741.614	ng/ml	
29) C2-Fluorenes	33.648	194	97887M5	590.069	ng/ml	
30) C3-Fluorenes	35.635	208	46156M5	278.231	ng/ml	
31) Dibenzothiophene	32.564	184	82864	338.515	ng/ml#	82
32) 4-Methyldibenzothiophene(	34.340	198	42761	174.687	ng/ml	100
33) 2/3-Methyldibenzothiophen	34.687	198	41716	170.418	ng/ml	100
34) 1-Methyldibenzothiophene(	35.108	198	11473	46.869	ng/ml	100
36) C1-Dibenzothiophenes	34.340	198	108941M5	445.044	ng/ml	
36) C1-Dibenzothiophenes BS	34.340	198	108941M5	445.044	ng/ml	
37) C2-Dibenzothiophenes	36.388	212	84802M5	346.432	ng/ml	
38) C3-Dibenzothiophenes	37.818	226	39327M5	160.658	ng/ml	
39) C4-Dibenzothiophenes	39.505	240	14506M5	59.260	ng/ml	
41) Phenanthrene	33.061	178	676774	2910.398	ng/ml	100
42) 3-Methylphenanthrene(3MP)	35.018	192	131211	564.260	ng/ml	93
43) 2-Methylphenanthrene(2MP)	35.123	192	135512	582.756	ng/ml	92
44) 2-Methylanthracene(2MA)	35.289	192	50713M3	218.086	ng/ml	
45) 9/4-Methylphenanthrene(9M	35.485	192	129765	558.041	ng/ml	95
46) 1-Methylphenanthrene(1MP)	35.560	192	87069	374.431	ng/ml	91
47) C1-Phenanthrenes/Anthrace	35.018	192	546074M5	2348.336	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281639.D
Acq On : 30 Nov 2016 10:23 pm
Operator : AC
Sample : 1611004-03
Misc : 10x
ALS Vial : 39 Sample Multiplier: 1

Quant Time: Dec 07 10:52:00 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
48)	C2-Phenanthrenes/Anthrace	37.291	206	248087M5	1066.873	ng/ml	
48)	C2-Phenanthrenes/Anthr BS	37.291	206	248087M5	1066.873	ng/ml	
50)	C3-Phenanthrenes/Anthrace	39.128	220	89748M5	385.952	ng/ml	
51)	C4-Phenanthrenes/Anthrace	41.326	234	25014M5	107.570	ng/ml	
53)	Anthracene	33.241	178	143827M4	651.709	ng/ml	
54)	Carbazole	33.904	167	7861M4	36.460	ng/ml	
55)	1-Methylphenanthrene	35.560	192	87188	508.391	ng/ml	100
56)	Fluoranthene	37.833	202	201923M3	782.370	ng/ml	
57)	Benzo(b)fluorene	40.363	216	27475M3	179.663	ng/ml	
58)	Pyrene	38.722	202	297130	1062.021	ng/ml	92
59)	C1-Fluoranthenes/Pyrenes	40.107	216	310400M5	1109.452	ng/ml	
60)	C2-Fluoranthenes/Pyrenes	41.778	230	123716M5	442.194	ng/ml	
61)	C3-Fluoranthenes/Pyrenes	43.645	244	48105M5	171.940	ng/ml	
62)	C4-Fluoranthenes/Pyrenes	45.286	258	18809M5	67.228	ng/ml	
63)	Naphthobenzothiophene	42.576	234	18138	74.800	ng/ml#	93
64)	Naphthobenzothiophene-2,1	42.576	234	18138	74.800	ng/ml#	93
65)	Naphthobenzothiophene-1,2	42.922	234	5741	23.676	ng/ml#	73
66)	Naphthobenzothiophene-2,3	43.208	234	5831M3	24.047	ng/ml	
67)	C1-Naphthobenzothiophenes	43.961	248	32397M5	133.604	ng/ml	
68)	C2-Naphthobenzothiophenes	45.467	262	20359M5	83.960	ng/ml	
69)	C3-Naphthobenzothiophenes	47.590	276	9120M5	37.611	ng/ml	
70)	C4-Naphthobenzothiophenes	48.705	290	4269M5	17.605	ng/ml	
72)	Benz[a]anthracene	43.494	228	113873M3	420.204	ng/ml	
74)	Chrysene/Triphenylene	43.660	228	113273	445.699	ng/ml	100
75)	C1-Chrysenes	45.136	242	109850M5	432.231	ng/ml	
76)	C2-Chrysenes	46.837	256	59263M5	233.184	ng/ml	
76)	C2-Chrysenes BS	46.837	256	59263M5	233.184	ng/ml	
78)	C3-Chrysenes	48.479	270	27000M5	106.238	ng/ml	
81)	Benzo[b]fluoranthene	47.560	252	61097	221.587	ng/ml	98
82)	Benzo[j]+[k]fluoranthene	47.635	252	57665	226.876	ng/ml	97
83)	Benzo[a]fluoranthene	47.967	252	25443M4	100.102	ng/ml	
84)	Benzo[e]pyrene	48.599	252	51119	199.378	ng/ml	97
86)	Benzo[a]pyrene	48.795	252	90733	370.909	ng/ml	97
87)	Perylene	49.111	252	13605	54.928	ng/ml	96
88)	Indeno[1,2,3-cd]pyrene	53.795	276	41944M4	132.777	ng/ml	
89)	Dibenz[ah]+[ac]anthracene	53.840	278	11887M4	44.087	ng/ml	
90)	Benzo[g,h,i]perylene	55.150	276	44475	145.555	ng/ml	99
144)	C26,20R- +C27,20S- triaro	50.000	231	209	6.580	ng/mL	100

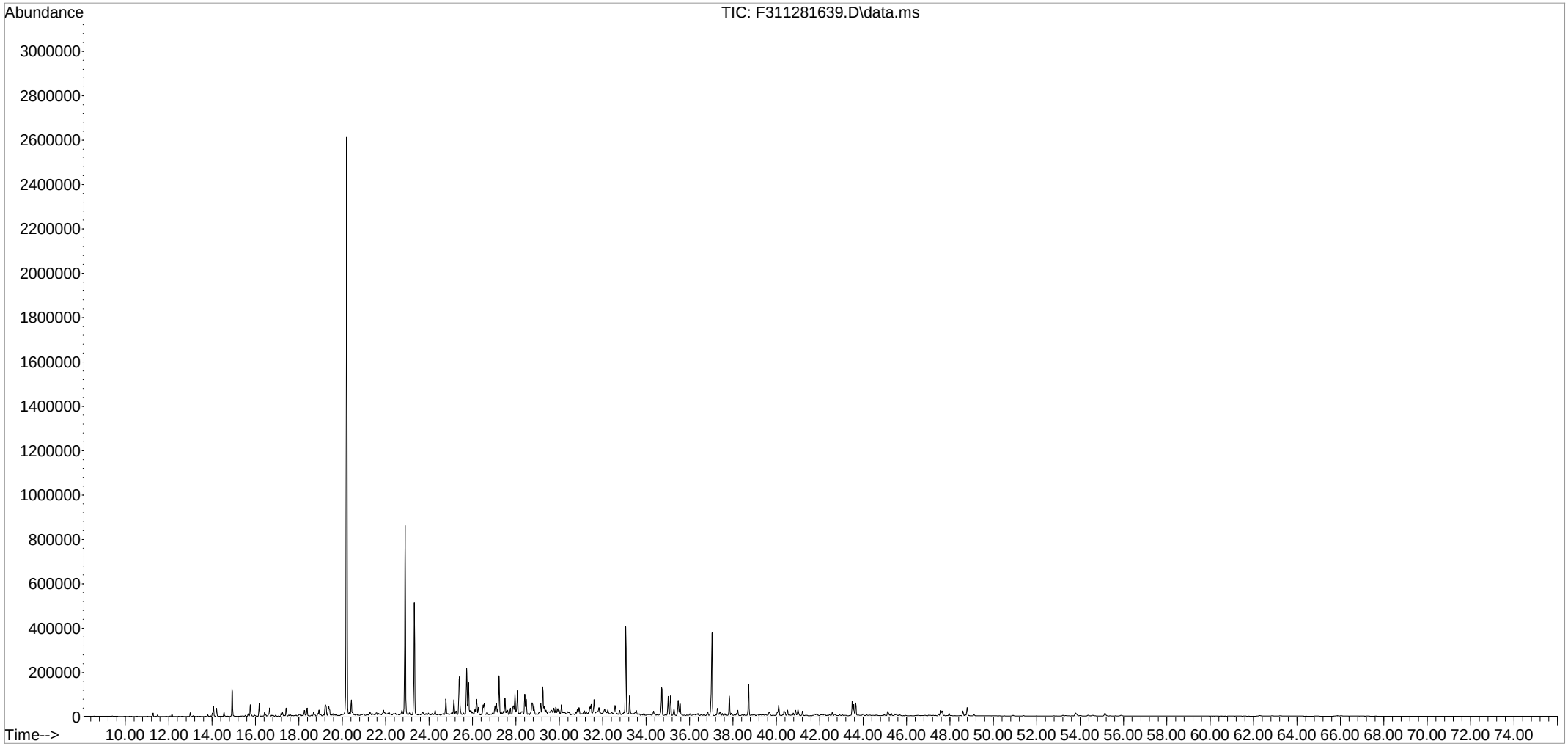
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281639.D
Acq On : 30 Nov 2016 10:23 pm
Operator : AC
Sample : 1611004-03
Misc : 10x
ALS Vial : 39 Sample Multiplier: 1

Quant Time: Dec 07 10:52:00 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-3MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-03E**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	12/02/16	100	0.1021	20	50	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	97.9	U	C1-Dibenzothiophenes	97.9	U
C1-Decalins	97.9	U	C2-Dibenzothiophenes	97.9	U
C2-Decalins	97.9	U	C3-Dibenzothiophenes	97.9	U
C3-Decalins	97.9	U	C4-Dibenzothiophenes	97.9	U
C4-Decalins	97.9	U	Benzo(b)fluorene	97.9	U
Benzothiophene	97.9	U	Fluoranthene	97.9	U
C1-Benzo(b)thiophenes	97.9	U	Pyrene	97.9	U
C2-Benzo(b)thiophenes	97.9	U	C1-Fluoranthenes/Pyrenes	97.9	U
C3-Benzo(b)thiophenes	97.9	U	C2-Fluoranthenes/Pyrenes	97.9	U
C4-Benzo(b)thiophenes	97.9	U	C3-Fluoranthenes/Pyrenes	97.9	U
Naphthalene	**55500**		C4-Fluoranthenes/Pyrenes	97.9	U
C1-Naphthalenes	97.9	U	Naphthobenzothiophenes	97.9	U
C2-Naphthalenes	97.9	U	C1-Naphthobenzothiophenes	97.9	U
C3-Naphthalenes	97.9	U	C2-Naphthobenzothiophenes	97.9	U
C4-Naphthalenes	97.9	U	C3-Naphthobenzothiophenes	97.9	U
Biphenyl	97.9	U	C4-Naphthobenzothiophenes	97.9	U
Dibenzofuran	97.9	U	Benz[a]anthracene	97.9	U
Acenaphthylene	97.9	U	Chrysene/Triphenylene	97.9	U
Acenaphthene	97.9	U	C1-Chrysenes	97.9	U
Fluorene	97.9	U	C2-Chrysenes	97.9	U
C1-Fluorenes	97.9	U	C3-Chrysenes	97.9	U
C2-Fluorenes	97.9	U	C4-Chrysenes	97.9	U
C3-Fluorenes	97.9	U	Benzo[b]fluoranthene	97.9	U
Anthracene	97.9	U	Benzo[j]fluoranthene/Benzo[k]fluoranthene	97.9	U
Phenanthrene	97.9	U	Benzo[a]fluoranthene	97.9	U
C1-Phenanthrenes/Anthracenes	97.9	U	Benzo[e]pyrene	97.9	U
C2-Phenanthrenes/Anthracenes	97.9	U	Benzo[a]pyrene	97.9	U
C3-Phenanthrenes/Anthracenes	97.9	U	Perylene	97.9	U
C4-Phenanthrenes/Anthracenes	97.9	U	Indeno[1,2,3-cd]pyrene	97.9	U
Retene	97.9	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	97.9	U
Dibenzothiophene	97.9	U	Benzo[g,h,i]perylene	97.9	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	96	50-130
Phenanthrene-d10	99	50-130
Benzo[a]pyrene-d12	79	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 12:02

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011615.D
Acq On : 2 Dec 2016 6:36 am
Operator : AC
Sample : 1611004-03-RE
Misc : 50x
ALS Vial : 15 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Dec 07 11:59:54 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.039	164	49997M4	500.000	ng/ml	-0.08
71) Chrysene-d12	43.510	240	83737	500.000	ng/ml	-0.08
System Monitoring Compounds						
8) Naphthalene-d8	20.069	136	4134M4	19.277	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1.93%#			
40) Phenanthrene-d10	32.925	188	3252	19.788	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1.98%#			
80) Benzo[b]fluoranthene-d12	47.425	264	2919	16.736	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1.67%#			
85) Benzo[a]pyrene-d12	48.644	264	2207	15.719	ng/ml	-0.06
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1.57%#			
126) 5B(H)Cholane - Surr	44.112	217	481	17.688	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1.77%#			
Target Compounds						Qvalue
9) Naphthalene	20.144	128	1337049	5668.924	ng/ml	100

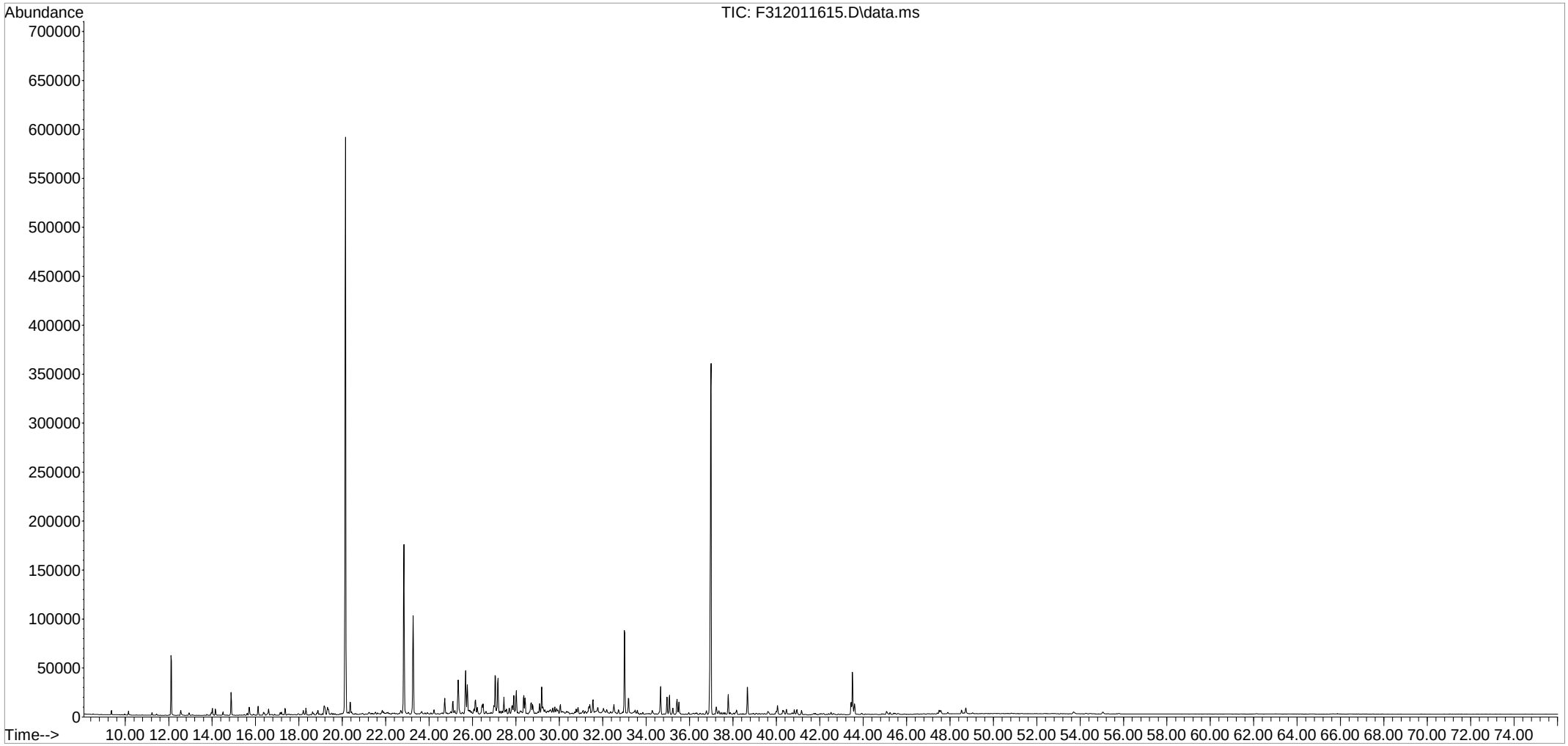
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011615.D
Acq On : 2 Dec 2016 6:36 am
Operator : AC
Sample : 1611004-03-RE
Misc : 50x
ALS Vial : 15 Sample Multiplier: 1

Quant Time: Dec 07 11:59:54 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-01**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-04**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.00462	1	10	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**83.8**	G	C1-Dibenzothiophenes	**1090**
C1-Decalins	**48.8**		C2-Dibenzothiophenes	**860**
C2-Decalins	**69.8**		C3-Dibenzothiophenes	**394**
C3-Decalins	**59.1**		C4-Dibenzothiophenes	**132**
C4-Decalins	**191**		Benzo(b)fluorene	**413**
Benzothiophene	**569**		Fluoranthene	**1680**
C1-Benzo(b)thiophenes	**636**		Pyrene	**2640**
C2-Benzo(b)thiophenes	**569**		C1-Fluoranthenes/Pyrenes	**2960**
C3-Benzo(b)thiophenes	**384**		C2-Fluoranthenes/Pyrenes	**1560**
C4-Benzo(b)thiophenes	**138**		C3-Fluoranthenes/Pyrenes	**693**
Naphthalene	**21600**		C4-Fluoranthenes/Pyrenes	**249**
C1-Naphthalenes	**16800**		Naphthobenzothiophenes	**326**
C2-Naphthalenes	**9290**		C1-Naphthobenzothiophenes	**479**
C3-Naphthalenes	**3990**		C2-Naphthobenzothiophenes	**359**
C4-Naphthalenes	**1280**		C3-Naphthobenzothiophenes	**174**
Biphenyl	**1040**		C4-Naphthobenzothiophenes	**79.3**
Dibenzofuran	**368**		Benz[a]anthracene	**1030**
Acenaphthylene	**2070**		Chrysene/Triphenylene	**1230**
Acenaphthene	**790**		C1-Chrysenes	**1800**
Fluorene	**2050**		C2-Chrysenes	**1210**
C1-Fluorenes	**1950**		C3-Chrysenes	**565**
C2-Fluorenes	**1570**		C4-Chrysenes	**179**
C3-Fluorenes	**600**		Benzo[b]fluoranthene	**417**
Anthracene	**1900**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**546**
Phenanthrene	**7170**		Benzo[a]fluoranthene	**249**
C1-Phenanthrenes/Anthracenes	**6810**		Benzo[e]pyrene	**489**
C2-Phenanthrenes/Anthracenes	**3160**		Benzo[a]pyrene	**936**
C3-Phenanthrenes/Anthracenes	**1090**		Perylene	**186**
C4-Phenanthrenes/Anthracenes	**238**		Indeno[1,2,3-cd]pyrene	**365**
Retene	21.6	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**131**
Dibenzothiophene	**786**		Benzo[g,h,i]perylene	**492**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	101	50-130
Phenanthrene-d10	102	50-130
Benzo[a]pyrene-d12	106	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable
G - Matrix Interference

12/07/16 11:29

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-01**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-04**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.00462	1	10	AC

Parameter	Result
Carbazole	**49.5**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	101	50-130
Phenanthrene-d10	102	50-130
Benzo[a]pyrene-d12	106	50-130

N/A - Not Applicable

12/07/16 11:29

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-01**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-04**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.00462	1	10	AC

Parameter	Result
4-Methyldibenzothiophene	**422**
2/3-Methyldibenzothiophene	**428**
1-Methyldibenzothiophene	**112**
3-Methylphenanthrene	**1580**
2-Methylphenanthrene	**1720**
2-Methylanthracene	**737**
9/4-Methylphenanthrene	**1630**
1-Methylphenanthrene	**1100**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	101	50-130
Phenanthrene-d10	102	50-130
Benzo[a]pyrene-d12	106	50-130

N/A - Not Applicable

12/07/16 11:29

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-01**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-04**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.00462	1	10	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	21.6	U
C28,20S-triaromatic steroid	21.6	U
C27,20R-triaromatic steroid	21.6	U
C28,20R-triaromatic steroid	21.6	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	101	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:29

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281623a.D
Acq On : 29 Nov 2016 9:53 pm
Operator : AC
Sample : 1611004-04
Misc : 10x
ALS Vial : 99 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 10:47:18 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	69133M4	500.000	ng/ml	-0.01
71) Chrysene-d12	43.570	240	108726	500.000	ng/ml	-0.01
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	30036	101.289	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.13%#			
40) Phenanthrene-d10	32.970	188	23282	102.455	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.25%#			
80) Benzo[b]fluoranthene-d12	47.485	264	24022	106.071	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.61%#			
85) Benzo[a]pyrene-d12	48.705	264	19368	106.241	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.62%#			
126) 5B(H)Cholane - Surr	44.157	217	3581	101.419	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.14%#			
Target Compounds						Qvalue
2) trans-Decalin	16.757	138	497M4	8.298	ng/ml	
3) cis-Decalin	17.991	138G	1368	30.406	ng/ml	100
4) C1-Decalins	18.699	152	1349M5	22.523	ng/ml	
5) C2-Decalins	20.009	166	1932M5	32.256	ng/ml	
6) C3-Decalins	22.718	180	1636M5	27.314	ng/ml	
7) C4-Decalins	25.895	194	5290M5	88.321	ng/ml	
9) Naphthalene	20.204	128	3248135	9959.693	ng/ml	100
10) C1-Naphthalenes	22.899	142	2523290M5	7737.115	ng/ml	
11) C2-Naphthalenes	25.729	156	1400395M5	4294.004	ng/ml	
12) C3-Naphthalenes	28.078	170	600867M5	1842.427	ng/ml	
13) C4-Naphthalenes	30.833	184	192307M5	589.667	ng/ml	
14) 2-Methylnaphthalene	22.899	142	1525483	7357.458	ng/ml	100
15) 1-Methylnaphthalene	23.321	142	997274	5077.449	ng/ml	100
16) Benzothiophene	20.415	134	75921	262.858	ng/ml	100
17) C1-Benzo(b)thiophenes	22.914	148	84838M5	293.731	ng/ml	
18) C2-Benzo(b)thiophenes	25.458	162	75887M5	262.740	ng/ml	
19) C3-Benzo(b)thiophenes	27.912	176	51187M5	177.222	ng	
20) C4-Benzo(b)thiophenes	30.020	190	18416M5	63.761	ng/ml	
21) Biphenyl	24.781	154	126924	482.202	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.398	156	379382	2108.303	ng/ml	100
23) Dibenzofuran	27.867	168	46913M4	169.797	ng/ml	
24) Acenaphthylene	26.497	152	302332M4	957.156	ng/ml	
25) Acenaphthene	27.220	153	70508	365.057	ng/ml	95
26) 2,3,5-Trimethylnaphthalen	28.770	170	35213M3	227.738	ng/ml	
27) Fluorene	29.237	166	199383M4	945.565	ng/ml	
28) C1-Fluorenes	31.616	180	189685M5	899.573	ng/ml	
29) C2-Fluorenes	33.648	194	152953M5	725.373	ng/ml	
30) C3-Fluorenes	35.635	208	58466M5	277.273	ng/ml	
31) Dibenzothiophene	32.579	184	112939	362.979	ng/ml	97
32) 4-Methyldibenzothiophene(	34.340	198	60713	195.128	ng/ml	100
33) 2/3-Methyldibenzothiophen	34.687	198	61574	197.895	ng/ml	100
34) 1-Methyldibenzothiophene(	35.108	198	16138	51.867	ng/ml	100
36) C1-Dibenzothiophenes	34.340	198	156886M5	504.222	ng/ml	
36) C1-Dibenzothiophenes BS	34.340	198	156886M5	504.222	ng/ml	
37) C2-Dibenzothiophenes	36.027	212	123650M5	397.403	ng/ml	
38) C3-Dibenzothiophenes	37.818	226	56565M5	181.796	ng/ml	
39) C4-Dibenzothiophenes	39.505	240	18929M5	60.837	ng/ml	
41) Phenanthrene	33.061	178	978520	3310.580	ng/ml	100
42) 3-Methylphenanthrene(3MP)	35.018	192	215364	728.631	ng/ml	93
43) 2-Methylphenanthrene(2MP)	35.138	192	234633	793.823	ng/ml	92
44) 2-Methylanthracene(2MA)	35.289	192	100594	340.335	ng/ml#	34
45) 9/4-Methylphenanthrene(9M	35.485	192	222524	752.855	ng/ml	97
46) 1-Methylphenanthrene(1MP)	35.575	192	150516	509.234	ng/ml	91
47) C1-Phenanthrenes/Anthrace	35.138	192	929673M5	3145.318	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281623a.D
Acq On : 29 Nov 2016 9:53 pm
Operator : AC
Sample : 1611004-04
Misc : 10x
ALS Vial : 99 Sample Multiplier: 1

Quant Time: Dec 07 10:47:18 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
48) C2-Phenanthrenes/Anthrace	37.291	206	431354M5	1459.379	ng/ml	
48) C2-Phenanthrenes/Anthr BS	37.291	206	431354M5	1459.379	ng/ml	
50) C3-Phenanthrenes/Anthrace	39.128	220	149242M5	504.923	ng/ml	
51) C4-Phenanthrenes/Anthrace	41.327	234	32471M5	109.858	ng/ml	
53) Anthracene	33.241	178	245628M4	875.623	ng/ml	
54) Carbazole	33.904	167	6269M4	22.875	ng/ml	
55) 1-Methylphenanthrene	35.575	192	150549	690.628	ng/ml	100
56) Fluoranthene	37.848	202	255343M3	778.352	ng/ml	
57) Benzo(b)fluorene	40.363	216	37085M3	190.785	ng/ml	
58) Pyrene	38.722	202	433663	1219.452	ng/ml	93
59) C1-Fluoranthenes/Pyrenes	40.107	216	486476M5	1367.961	ng/ml	
60) C2-Fluoranthenes/Pyrenes	41.853	230	257095M5	722.946	ng/ml	
61) C3-Fluoranthenes/Pyrenes	44.037	244	113913M5	320.321	ng/ml	
62) C4-Fluoranthenes/Pyrenes	45.271	258	40846M5	114.858	ng/ml	
63) Naphthobenzothiophene	42.576	234	29282	95.004	ng/ml#	91
64) Naphthobenzothiophene-2,1	42.576	234	29282	95.004	ng/ml#	91
65) Naphthobenzothiophene-1,2	42.922	234	8239	26.731	ng/ml	77
66) Naphthobenzothiophene-2,3	43.209	234	8843M3	28.691	ng/ml	
67) C1-Naphthobenzothiophenes	43.976	248	68232M5	221.375	ng/ml	
68) C2-Naphthobenzothiophenes	45.467	262	51105M5	165.807	ng/ml	
69) C3-Naphthobenzothiophenes	47.590	276	24849M5	80.621	ng/ml	
70) C4-Naphthobenzothiophenes	48.795	290	11292M5	36.636	ng/ml	
72) Benz[a]anthracene	43.495	228	143926M3	477.737	ng/ml	
74) Chrysene/Triphenylene	43.660	228	159916	566.001	ng/ml	97
75) C1-Chrysenes	45.136	242	234817M5	831.103	ng/ml	
76) C2-Chrysenes	46.837	256	157475M5	557.362	ng/ml	
76) C2-Chrysenes BS	46.837	256	157475M5	557.362	ng/ml	
78) C3-Chrysenes	48.464	270	73735M5	260.975	ng/ml	
79) C4-Chrysenes	50.241	284	23315M5	82.520	ng/ml	
81) Benzo[b]fluoranthene	47.560	252	59009	192.510	ng/ml	98
82) Benzo[j]+[k]fluoranthene	47.635	252	71255	252.174	ng/ml	98
83) Benzo[a]fluoranthene	47.967	252	32518	115.083	ng/ml#	1
84) Benzo[e]pyrene	48.599	252	64367	225.823	ng/ml	100
86) Benzo[a]pyrene	48.795	252	117593	432.408	ng/ml	97
87) Perylene	49.111	252	23628	85.809	ng/ml	100
88) Indeno[1,2,3-cd]pyrene	53.795	276	59277M4	168.791	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.840	278	18088M4	60.345	ng/ml	
90) Benzo[g,h,i]perylene	55.150	276	77162	227.156	ng/ml	98

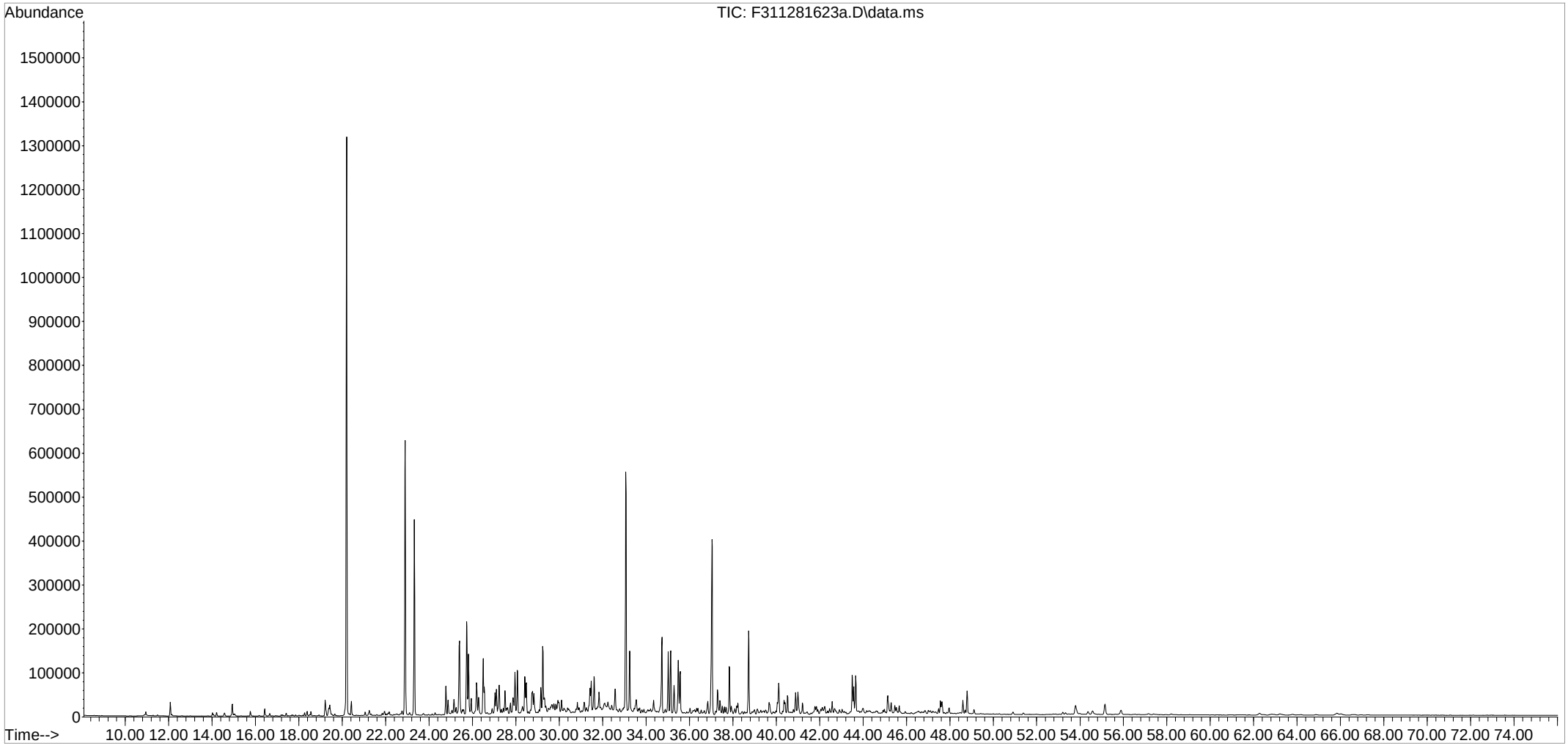
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281623a.D
Acq On : 29 Nov 2016 9:53 pm
Operator : AC
Sample : 1611004-04
Misc : 10x
ALS Vial : 99 Sample Multiplier: 1

Quant Time: Dec 07 10:47:18 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/28/16	100	0.00285	1	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**75.5**		C1-Dibenzothiophenes	**867**
C1-Decalins	**206**		C2-Dibenzothiophenes	**892**
C2-Decalins	**276**		C3-Dibenzothiophenes	**461**
C3-Decalins	**235**		C4-Dibenzothiophenes	**151**
C4-Decalins	**929**		Benzo(b)fluorene	**326**
Benzothiophene	**18.3**		Fluoranthene	**1610**
C1-Benzo(b)thiophenes	**78.1**		Pyrene	**2630**
C2-Benzo(b)thiophenes	**132**		C1-Fluoranthenes/Pyrenes	**2370**
C3-Benzo(b)thiophenes	**183**		C2-Fluoranthenes/Pyrenes	**1260**
C4-Benzo(b)thiophenes	**146**		C3-Fluoranthenes/Pyrenes	**562**
Naphthalene	**284**		C4-Fluoranthenes/Pyrenes	**298**
C1-Naphthalenes	**774**		Naphthobenzothiophenes	**409**
C2-Naphthalenes	**2820**		C1-Naphthobenzothiophenes	**508**
C3-Naphthalenes	**3740**		C2-Naphthobenzothiophenes	**303**
C4-Naphthalenes	**2600**		C3-Naphthobenzothiophenes	**130**
Biphenyl	**53.3**		C4-Naphthobenzothiophenes	**59.0**
Dibenzofuran	**102**		Benz[a]anthracene	**716**
Acenaphthylene	**697**		Chrysene/Triphenylene	**1270**
Acenaphthene	**619**		C1-Chrysenes	**1210**
Fluorene	**462**		C2-Chrysenes	**579**
C1-Fluorenes	**873**		C3-Chrysenes	**220**
C2-Fluorenes	**1340**		C4-Chrysenes	**113**
C3-Fluorenes	**1230**	G	Benzo[b]fluoranthene	**608**
Anthracene	**511**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**645**
Phenanthrene	**2280**		Benzo[a]fluoranthene	**233**
C1-Phenanthrenes/Anthracenes	**3320**		Benzo[e]pyrene	**661**
C2-Phenanthrenes/Anthracenes	**2410**		Benzo[a]pyrene	**600**
C3-Phenanthrenes/Anthracenes	**942**		Perylene	**70.6**
C4-Phenanthrenes/Anthracenes	**278**		Indeno[1,2,3-cd]pyrene	**388**
Retene	3.51	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**145**
Dibenzothiophene	**319**		Benzo[g,h,i]perylene	**412**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	128	50-130
Phenanthrene-d10	77	50-130
Benzo[a]pyrene-d12	113	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable
G - Matrix Interference

12/07/16 11:27

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/28/16	100	0.00285	1	1	AC

Parameter	Result
Carbazole	**12.8**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	128	50-130
Phenanthrene-d10	77	50-130
Benzo[a]pyrene-d12	113	50-130

N/A - Not Applicable

12/07/16 11:27

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/28/16	100	0.00285	1	1	AC

Parameter	Result
4-Methyldibenzothiophene	**375**
2/3-Methyldibenzothiophene	**346**
1-Methyldibenzothiophene	**88.5**
3-Methylphenanthrene	**792**
2-Methylphenanthrene	**907**
2-Methylanthracene	**160**
9/4-Methylphenanthrene	**893**
1-Methylphenanthrene	**554**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	128	50-130
Phenanthrene-d10	77	50-130
Benzo[a]pyrene-d12	113	50-130

N/A - Not Applicable

12/07/16 11:28

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/28/16	100	0.00285	1	1	AC

Parameter	Result
C26,20R- +C27,20S- triaromatic steroid	**11.6**
C28,20S-triaromatic steroid	**10.4**
C27,20R-triaromatic steroid	**7.72**
C28,20R-triaromatic steroid	**7.17**

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	99	50-130

N/A - Not Applicable

12/07/16 11:28

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281610.D
Acq On : 28 Nov 2016 11:35 pm
Operator : AC
Sample : 1611004-05
Misc : 1x
ALS Vial : 10 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:41:28 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.114	164	49733M4	500.000	ng/ml	0.00
71) Chrysene-d12	43.570	240	86373	500.000	ng/ml	-0.02
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	272457	1277.206	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 127.72%			
40) Phenanthrene-d10	32.985	188	126603	774.458	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 77.45%			
80) Benzo[b]fluoranthene-d12	47.485	264	212066	1178.733	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 117.87%			
85) Benzo[a]pyrene-d12	48.705	264	163597	1129.640	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 112.96%			
126) 5B(H)Cholane - Surr	44.172	217	27668	986.384	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 98.64%			
Target Compounds						Qvalue
2) trans-Decalin	16.757	138	8460	196.346	ng/ml	100
3) cis-Decalin	17.976	138	609M3	18.816	ng/ml	
4) C1-Decalins	18.699	152	25317M5	587.574	ng/ml	
5) C2-Decalins	20.024	166	33835M5	785.266	ng/ml	
6) C3-Decalins	22.492	180	28906M5	670.870	ng/ml	
7) C4-Decalins	25.895	194	114135M5	2648.924	ng/ml	
9) Naphthalene	20.189	128	189998	809.845	ng/ml	100
10) C1-Naphthalenes	23.320	142	517176M5	2204.403	ng/ml	
11) C2-Naphthalenes	25.744	156	1882193M5	8022.630	ng/ml	
12) C3-Naphthalenes	28.078	170	2503438M5	10670.615	ng/ml	
13) C4-Naphthalenes	30.848	184	1740498M5	7418.672	ng/ml	
14) 2-Methylnaphthalene	22.899	142	181355	1215.880	ng/ml	100
15) 1-Methylnaphthalene	23.320	142	336162	2379.143	ng/ml	100
16) Benzothiophene	20.415	134	10862	52.277	ng/ml	100
17) C1-Benzo(b)thiophenes	23.290	148	46250M5	222.593	ng/ml	
18) C2-Benzo(b)thiophenes	25.458	162	78442M5	377.527	ng/ml	
19) C3-Benzo(b)thiophenes	27.927	176	108361M5	521.522	ng	
20) C4-Benzo(b)thiophenes	30.020	190	86321M5	415.448	ng/ml	
21) Biphenyl	24.781	154	28745	151.806	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.398	156	488606	3774.468	ng/ml	100
23) Dibenzofuran	27.867	168	57657M4	290.088	ng/ml	
24) Acenaphthylene	26.497	152	451492M4	1986.961	ng/ml	
25) Acenaphthene	27.235	153	245257M4	1765.160	ng/ml	
26) 2,3,5-Trimethylnaphthalen	28.785	170	131203M3	1179.550	ng/ml	
27) Fluorene	29.252	166	199820M4	1317.295	ng/ml	
28) C1-Fluorenes	31.630	180	377321M5	2487.455	ng/ml	
29) C2-Fluorenes	33.663	194	580464M5	3826.656	ng/ml	
30) C3-Fluorenes	36.328	208G	532763M5	3512.192	ng/ml	
31) Dibenzothiophene	32.579	184	203427	908.838	ng/ml#	68
32) 4-Methyldibenzothiophene(	34.355	198	239357	1069.361	ng/ml	100
33) 2/3-Methyldibenzothiophen	34.702	198	220536M4	985.275	ng/ml	
34) 1-Methyldibenzothiophene(	35.123	198	56446	252.180	ng/ml	100
35) OTP	34.747	198	8135M3	36.344	ng/ml	
36) C1-Dibenzothiophenes	34.355	198	561185M5	2507.172	ng/ml	
36) C1-Dibenzothiophenes BS	34.355	198	553050M5	2470.828	ng/ml	
37) C2-Dibenzothiophenes	36.042	212	568932M5	2541.783	ng/ml	
38) C3-Dibenzothiophenes	37.833	226	293741M5	1312.329	ng/ml	
39) C4-Dibenzothiophenes	39.520	240	96585M5	431.507	ng/ml	
41) Phenanthrene	33.091	178	1381347	6496.477	ng/ml	99
42) 3-Methylphenanthrene(3MP)	35.048	192	479700	2256.030	ng/ml	97
43) 2-Methylphenanthrene(2MP)	35.153	192	549852	2585.955	ng/ml	96
44) 2-Methylanthracene(2MA)	35.304	192	96673	454.653	ng/ml#	40
45) 9/4-Methylphenanthrene(9M	35.500	192	541318	2545.819	ng/ml	90
46) 1-Methylphenanthrene(1MP)	35.590	192	335405	1577.410	ng/ml	96

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281610.D
Acq On : 28 Nov 2016 11:35 pm
Operator : AC
Sample : 1611004-05
Misc : 1x
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Dec 07 09:41:28 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
47)	C1-Phenanthrenes/Anthrace	35.153	192	2011430M5	9459.758	ng/ml	
48)	C2-Phenanthrenes/Anthrace	37.306	206	1460397M5	6868.249	ng/ml	
48)	C2-Phenanthrenes/Anthr BS	37.306	206	1460397M5	6868.249	ng/ml	
50)	C3-Phenanthrenes/Anthrace	39.128	220	570727M5	2684.130	ng/ml	
51)	C4-Phenanthrenes/Anthrace	41.341	234	168606M5	792.954	ng/ml	
53)	Anthracene	33.256	178	293924M4	1456.515	ng/ml	
54)	Carbazole	33.919	167	7205M4	36.546	ng/ml	
55)	1-Methylphenanthrene	35.590	192	338978	2161.617	ng/ml	96
56)	Fluoranthene	37.863	202	1083273M3	4590.188	ng/ml	
57)	Benzo(b)fluorene	40.363	216	130068M3	930.159	ng/ml	
58)	Pyrene	38.752	202	1919924	7504.767	ng/ml#	90
59)	C1-Fluoranthenes/Pyrenes	40.122	216	1724664M5	6741.518	ng/ml	
60)	C2-Fluoranthenes/Pyrenes	42.169	230	916972M5	3584.341	ng/ml	
61)	C3-Fluoranthenes/Pyrenes	44.051	244	409450M5	1600.494	ng/ml	
62)	C4-Fluoranthenes/Pyrenes	45.331	258	217040M5	848.385	ng/ml	
63)	Naphthobenzothiophene	42.576	234	155252	700.194	ng/ml#	87
64)	Naphthobenzothiophene-2,1	42.576	234	155252	700.194	ng/ml#	87
65)	Naphthobenzothiophene-1,2	42.922	234	49588M4	223.644	ng/ml	
66)	Naphthobenzothiophene-2,3	43.223	234	53385M3	240.769	ng/ml	
67)	C1-Naphthobenzothiophenes	43.976	248	320962M5	1447.554	ng/ml	
68)	C2-Naphthobenzothiophenes	45.467	262	191391M5	863.183	ng/ml	
69)	C3-Naphthobenzothiophenes	47.590	276	82221M5	370.821	ng/ml	
70)	C4-Naphthobenzothiophenes	49.412	290	37275M5	168.112	ng/ml	
72)	Benz[a]anthracene	43.509	228	488622M3	2041.634	ng/ml	
74)	Chrysene/Triphenylene	43.675	228	814163	3627.373	ng/ml	99
75)	C1-Chrysenes	45.135	242	776732M5	3460.605	ng/ml	
76)	C2-Chrysenes	46.837	256	379187M5	1689.407	ng/ml	
76)	C2-Chrysenes BS	46.837	256	370346M5	1650.017	ng/ml	
77)	BBF-D12 Surr BKGD	47.485	256	8841	39.390	ng/ml	100
78)	C3-Chrysenes	48.479	270	140566M5	626.269	ng/ml	
79)	C4-Chrysenes	48.373	284	72174M5	321.560	ng/ml	
81)	Benzo[b]fluoranthene	47.575	252	421598	1731.364	ng/ml	98
82)	Benzo[j]+[k]fluoranthene	47.635	252	412386	1837.152	ng/ml	97
83)	Benzo[a]fluoranthene	47.967	252	148714	662.511	ng/ml#	1
84)	Benzo[e]pyrene	48.614	252	426306	1882.702	ng/ml	96
86)	Benzo[a]pyrene	48.810	252	369173	1708.824	ng/ml	94
87)	Perylene	49.126	252	44020	201.238	ng/ml	99
88)	Indeno[1,2,3-cd]pyrene	53.795	276	308752M4	1106.694	ng/ml	
89)	Dibenz[ah]+[ac]anthracene	53.840	278	98482	413.584	ng/ml	95
90)	Benzo[g,h,i]perylene	55.165	276	317215	1175.520	ng/ml	98
144)	C26,20R- +C27,20S- triaro	50.000	231	931M4	33.191	ng/mL	
145)	C28,20S-triaromatic stero	50.873	231	830M4	29.590	ng/mL	
146)	C27,20R-triaromatic stero	51.370	231	617	21.996	ng/mL	100
147)	C28,20R-triaromatic stero	52.620	231	573M4	20.428	ng/mL	

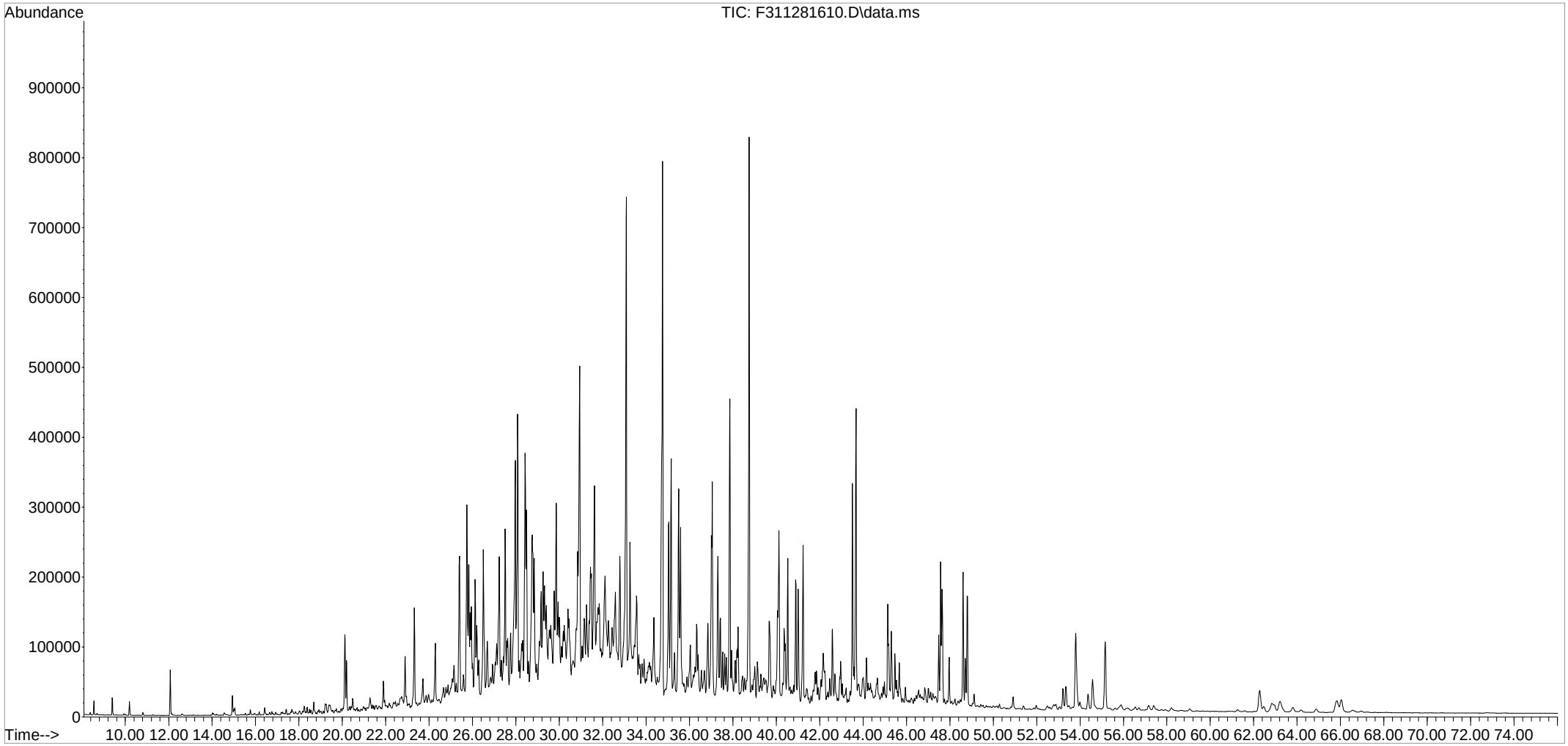
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281610.D
Acq On : 28 Nov 2016 11:35 pm
Operator : AC
Sample : 1611004-05
Misc : 1x
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Dec 07 09:41:28 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Duplicate
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05 D**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.0037	1	1	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	**142**		C1-Dibenzothiophenes	**1430**
C1-Decalins	**389**		C2-Dibenzothiophenes	**1490**
C2-Decalins	**482**		C3-Dibenzothiophenes	**755**
C3-Decalins	**419**		C4-Dibenzothiophenes	**248**
C4-Decalins	**1520**		Benzo(b)fluorene	**519**
Benzothiophene	**30.6**		Fluoranthene	**2750**
C1-Benzo(b)thiophenes	**131**		Pyrene	**4390**
C2-Benzo(b)thiophenes	**184**		C1-Fluoranthenes/Pyrenes	**3770**
C3-Benzo(b)thiophenes	**250**		C2-Fluoranthenes/Pyrenes	**2080**
C4-Benzo(b)thiophenes	**218**		C3-Fluoranthenes/Pyrenes	**960**
Naphthalene	**482**		C4-Fluoranthenes/Pyrenes	**501**
C1-Naphthalenes	**1210**		Naphthobenzothiophenes	**646**
C2-Naphthalenes	**3810**		C1-Naphthobenzothiophenes	**824**
C3-Naphthalenes	**5140**		C2-Naphthobenzothiophenes	**489**
C4-Naphthalenes	**3900**		C3-Naphthobenzothiophenes	**215**
Biphenyl	**74.6**		C4-Naphthobenzothiophenes	**105**
Dibenzofuran	**138**		Benz[a]anthracene	**1010**
Acenaphthylene	**999**		Chrysene/Triphenylene	**1880**
Acenaphthene	**819**		C1-Chrysenes	**1760**
Fluorene	**622**		C2-Chrysenes	**869**
C1-Fluorenes	**1310**		C3-Chrysenes	**329**
C2-Fluorenes	**2210**		C4-Chrysenes	**159**
C3-Fluorenes	**2140**	G	Benzo[b]fluoranthene	**923**
Anthracene	**800**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**926**
Phenanthrene	**3490**		Benzo[a]fluoranthene	**330**
C1-Phenanthrenes/Anthracenes	**5680**		Benzo[e]pyrene	**965**
C2-Phenanthrenes/Anthracenes	**4050**		Benzo[a]pyrene	**832**
C3-Phenanthrenes/Anthracenes	**1560**		Perylene	**94.6**
C4-Phenanthrenes/Anthracenes	**460**		Indeno[1,2,3-cd]pyrene	**573**
Retene	2.70	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**213**
Dibenzothiophene	**488**		Benzo[g,h,i]perylene	**615**

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	141	§	50-130
Phenanthrene-d10	82		50-130
Benzo[a]pyrene-d12	112		50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable
§ - Surrogate value outside of acceptable range.
G - Matrix Interference

12/07/16 11:28

Form I
Duplicate
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05 D**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.0037	1	1	AC

Parameter	Result
Carbazole	**20.5**

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	141	§	50-130
Phenanthrene-d10	82		50-130
Benzo[a]pyrene-d12	112		50-130

N/A - Not Applicable
§ - Surrogate value outside of acceptable range.

12/07/16 11:28

Form I
Duplicate
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05 D**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.0037	1	1	AC

Parameter	Result
4-Methyldibenzothiophene	**617**
2/3-Methyldibenzothiophene	**556**
1-Methyldibenzothiophene	**159**
3-Methylphenanthrene	**1380**
2-Methylphenanthrene	**1580**
2-Methylanthracene	**264**
9/4-Methylphenanthrene	**1540**
1-Methylphenanthrene	**924**

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	141	§	50-130
Phenanthrene-d10	82		50-130
Benzo[a]pyrene-d12	112		50-130

N/A - Not Applicable
§ - Surrogate value outside of acceptable range.

12/07/16 11:28

Form I
Duplicate
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05 D**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.0037	1	1	AC

Parameter	Result
C26,20R- +C27,20S- triaromatic steroid	**16.6**
C28,20S-triaromatic steroid	**16.3**
C27,20R-triaromatic steroid	**9.98**
C28,20R-triaromatic steroid	**10.7**

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	100	50-130

N/A - Not Applicable

12/07/16 11:28

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281611.D
Acq On : 29 Nov 2016 1:00 am
Operator : AC
Sample : 1611004-05d
Misc : 1x
ALS Vial : 11 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:41:34 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.114	164	45118M4	500.000	ng/ml	0.00
71) Chrysene-d12	43.585	240	86485	500.000	ng/ml	0.00
System Monitoring Compounds						
8) Naphthalene-d8	20.129	136	272740	1409.310	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 140.93%#			
40) Phenanthrene-d10	33.000	188	121404	818.619	ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 81.86%			
80) Benzo[b]fluoranthene-d12	47.500	264	211331	1173.127	ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 117.31%			
85) Benzo[a]pyrene-d12	48.720	264	162173	1118.357	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 111.84%			
126) 5B(H)Cholane - Surr	44.172	217	28169	1002.945	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 100.29%			
Target Compounds						Qvalue
2) trans-Decalin	16.757	138	18691	478.165	ng/ml	100
3) cis-Decalin	17.976	138	1421M3	48.395	ng/ml	
4) C1-Decalins	18.699	152	56234M5	1438.615	ng/ml	
5) C2-Decalins	20.024	166	69711M5	1783.392	ng/ml	
6) C3-Decalins	22.508	180	60549M5	1549.004	ng/ml	
7) C4-Decalins	25.910	194	220388M5	5638.108	ng/ml	
9) Naphthalene	20.204	128	379444	1782.769	ng/ml	100
10) C1-Naphthalenes	23.321	142	952632M5	4475.820	ng/ml	
11) C2-Naphthalenes	25.759	156	2997759M5	14084.588	ng/ml	
12) C3-Naphthalenes	28.093	170	4051428M5	19035.118	ng/ml	
13) C4-Naphthalenes	30.863	184	3074073M5	14443.140	ng/ml	
14) 2-Methylnaphthalene	22.899	142	334299	2470.535	ng/ml	100
15) 1-Methylnaphthalene	23.321	142	616668	4810.809	ng/ml	100
16) Benzothiophene	20.415	134	21339	113.206	ng/ml	100
17) C1-Benzo(b)thiophenes	23.305	148	91086M5	483.221	ng/ml	
18) C2-Benzo(b)thiophenes	25.473	162	127996M5	679.033	ng/ml	
19) C3-Benzo(b)thiophenes	27.927	176	174600M5	926.272	ng	
20) C4-Benzo(b)thiophenes	30.035	190	151968M5	806.207	ng/ml	
21) Biphenyl	24.781	154	47437	276.145	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.398	156	798403	6798.514	ng/ml	100
23) Dibenzofuran	27.882	168	91763M4	508.910	ng/ml	
24) Acenaphthylene	26.512	152	761802	3695.526	ng/ml	100
25) Acenaphthene	27.235	153	382073	3031.124	ng/ml	100
26) 2,3,5-Trimethylnaphthalen	28.800	170	210147M3	2082.526	ng/ml	
27) Fluorene	29.267	166	316498M4	2299.905	ng/ml	
28) C1-Fluorenes	31.646	180	668062M5	4854.626	ng/ml	
29) C2-Fluorenes	33.678	194	1126832M5	8188.383	ng/ml	
30) C3-Fluorenes	36.343	208G	1088415M5	7909.217	ng/ml	
31) Dibenzothiophene	32.594	184	366821	1806.455	ng/ml#	70
32) 4-Methyldibenzothiophene(	34.370	198	463553	2282.823	ng/ml	100
33) 2/3-Methyldibenzothiophen	34.687	198	417652M4	2056.778	ng/ml	
34) 1-Methyldibenzothiophene(	35.153	198	119677	589.364	ng/ml	100
35) OTP	34.762	198	6813M3	33.551	ng/ml	
36) C1-Dibenzothiophenes	34.370	198	1078031M5	5308.895	ng/ml	
36) C1-Dibenzothiophenes BS	34.370	198	1071218M5	5275.344	ng/ml	
37) C2-Dibenzothiophenes	36.057	212	1121647M5	5523.687	ng/ml	
38) C3-Dibenzothiophenes	37.848	226	567335M5	2793.910	ng/ml	
39) C4-Dibenzothiophenes	39.520	240	186448M5	918.186	ng/ml	
41) Phenanthrene	33.106	178	2488316	12899.577	ng/ml	98
42) 3-Methylphenanthrene(3MP)	35.063	192	982864M6	5095.225	ng/ml	
43) 2-Methylphenanthrene(2MP)	35.168	192	1127172M6	5843.326	ng/ml	
44) 2-Methylanthracene(2MA)	35.319	192	188505	977.221	ng/ml#	40
45) 9/4-Methylphenanthrene(9M	35.515	192	1096877	5686.275	ng/ml	90
46) 1-Methylphenanthrene(1MP)	35.605	192	659511	3418.944	ng/ml	95

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281611.D
Acq On : 29 Nov 2016 1:00 am
Operator : AC
Sample : 1611004-05d
Misc : 1x
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Dec 07 09:41:34 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

	Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
47)	C1-Phenanthrenes/Anthrace	35.168	192	4053629M5	21014.252 ng/ml	
48)	C2-Phenanthrenes/Anthrace	37.321	206	2891576M5	14990.100 ng/ml	
48)	C2-Phenanthrenes/Anthr BS	37.321	206	2891576M5	14990.100 ng/ml	
50)	C3-Phenanthrenes/Anthrace	39.143	220	1111630M5	5762.755 ng/ml	
51)	C4-Phenanthrenes/Anthrace	41.341	234	328349M5	1702.181 ng/ml	
53)	Anthracene	33.286	178	541578M4	2958.255 ng/ml	
54)	Carbazole	33.934	167	13587M4	75.967 ng/ml	
55)	1-Methylphenanthrene	35.605	192	659511	4635.794 ng/ml	96
56)	Fluoranthene	37.878	202	2175431M4	10160.912 ng/ml	
57)	Benzo(b)fluorene	40.378	216	243635M3	1920.530 ng/ml	
58)	Pyrene	38.767	202	3773600	16259.376 ng/ml#	90
59)	C1-Fluoranthenes/Pyrenes	40.137	216	3241172M5	13965.294 ng/ml	
60)	C2-Fluoranthenes/Pyrenes	42.185	230	1786833M5	7698.959 ng/ml	
61)	C3-Fluoranthenes/Pyrenes	44.051	244	824395M5	3552.085 ng/ml	
62)	C4-Fluoranthenes/Pyrenes	45.346	258	430105M5	1853.201 ng/ml	
63)	Naphthobenzothiophene	42.591	234	300817	1495.472 ng/ml#	88
64)	Naphthobenzothiophene-2,1	42.591	234	300817	1495.472 ng/ml#	88
65)	Naphthobenzothiophene-1,2	42.937	234	95619M4	475.357 ng/ml	
66)	Naphthobenzothiophene-2,3	43.223	234	84765M3	421.398 ng/ml	
67)	C1-Naphthobenzothiophenes	43.991	248	613059M5	3047.742 ng/ml	
68)	C2-Naphthobenzothiophenes	45.482	262	364027M5	1809.712 ng/ml	
69)	C3-Naphthobenzothiophenes	47.605	276	160378M5	797.298 ng/ml	
70)	C4-Naphthobenzothiophenes	49.428	290	78122M5	388.373 ng/ml	
72)	Benz[a]anthracene	43.525	228	898281M3	3748.472 ng/ml	
74)	Chrysene/Triphenylene	43.690	228	1562118	6950.754 ng/ml	98
75)	C1-Chrysenes	45.151	242	1465903M5	6522.639 ng/ml	
76)	C2-Chrysenes	46.852	256	722803M5	3216.163 ng/ml	
76)	C2-Chrysenes BS	46.852	256	722803M5	3216.163 ng/ml	
78)	C3-Chrysenes	48.494	270	273324M5	1216.174 ng/ml	
79)	C4-Chrysenes	48.388	284	132148M5	588.002 ng/ml	
81)	Benzo[b]fluoranthene	47.590	252	832766	3415.467 ng/ml	98
82)	Benzo[j]+[k]fluoranthene	47.665	252	769642	3424.264 ng/ml	98
83)	Benzo[a]fluoranthene	47.982	252	274228	1220.085 ng/ml#	1
84)	Benzo[e]pyrene	48.629	252	809731	3571.397 ng/ml	96
86)	Benzo[a]pyrene	48.825	252	666001	3078.785 ng/ml	95
87)	Perylene	49.126	252	76652	349.961 ng/ml	98
88)	Indeno[1,2,3-cd]pyrene	53.825	276	592337M4	2120.429 ng/ml	
89)	Dibenz[ah]+[ac]anthracene	53.870	278	187560M3	786.656 ng/ml	
90)	Benzo[g,h,i]perylene	55.195	276	614699	2274.972 ng/ml	98
144)	C26,20R- +C27,20S- triaro	50.000	231	1726	61.453 ng/mL	100
145)	C28,20S-triaromatic stero	50.888	231	1690	60.172 ng/mL	100
146)	C27,20R-triaromatic stero	51.370	231	1037M4	36.922 ng/mL	
147)	C28,20R-triaromatic stero	52.620	231	1111M4	39.557 ng/mL	

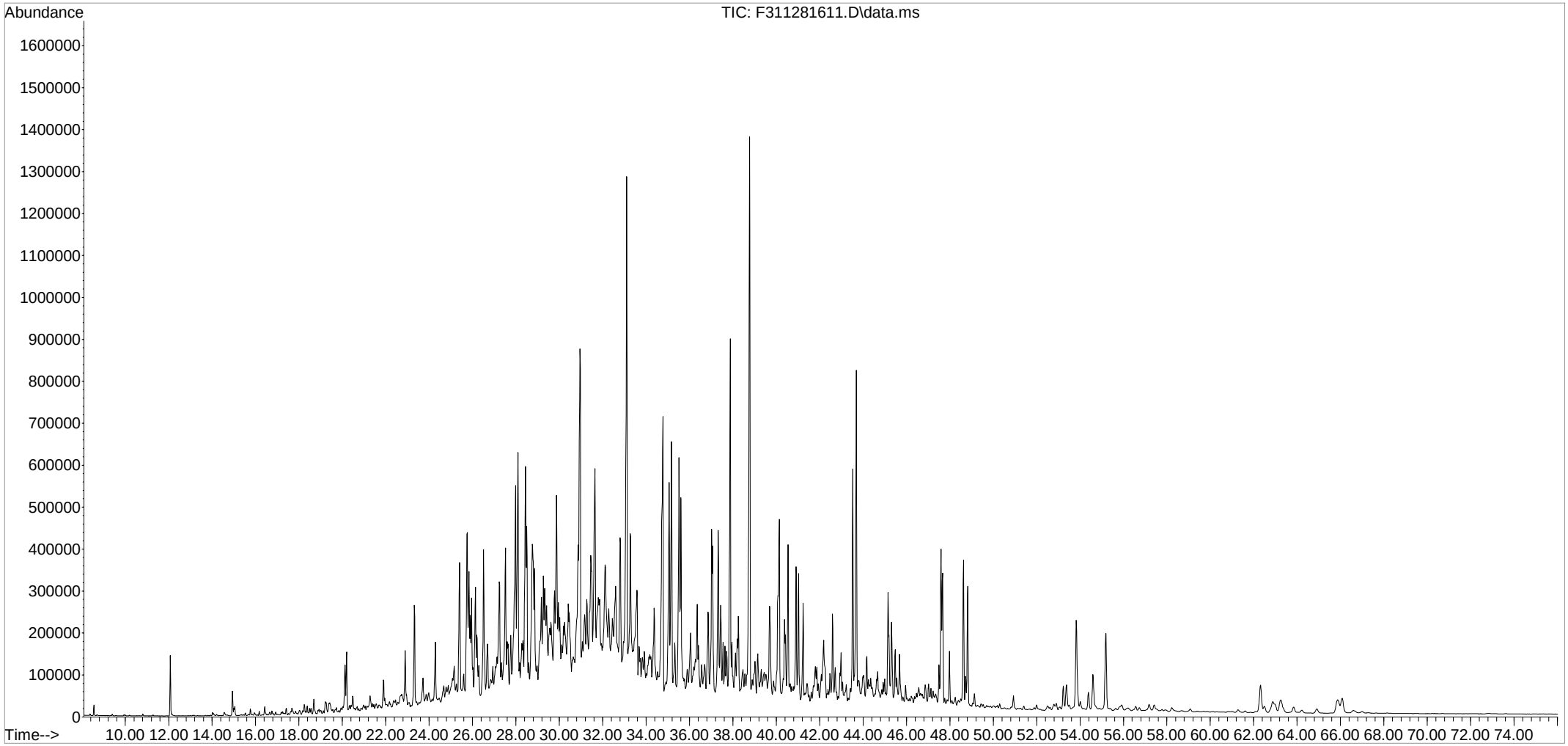
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281611.D
Acq On : 29 Nov 2016 1:00 am
Operator : AC
Sample : 1611004-05d
Misc : 1x
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Dec 07 09:41:34 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Duplicate
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/11/16	100	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
cis/trans-Decalin	**75.5**	**142**	61[a]	30
C1-Decalins	**206**	**389**	61[a]	30
C2-Decalins	**276**	**482**	55[a]	30
C3-Decalins	**235**	**419**	56[a]	30
C4-Decalins	**929**	**1520**	48[a]	30
Benzothiophene	**18.3**	**30.6**	50[a]	30
C1-Benzo(b)thiophenes	**78.1**	**131**	50[a]	30
C2-Benzo(b)thiophenes	**132**	**184**	32[a]	30
C3-Benzo(b)thiophenes	**183**	**250**	31[a]	30
C4-Benzo(b)thiophenes	**146**	**218**	40[a]	30
Naphthalene	**284**	**482**	52[a]	30
C1-Naphthalenes	**774**	**1210**	44[a]	30
C2-Naphthalenes	**2820**	**3810**	30	30
C3-Naphthalenes	**3740**	**5140**	32[a]	30
C4-Naphthalenes	**2600**	**3900**	40[a]	30
Biphenyl	**53.3**	**74.6**	33[a]	30
Dibenzofuran	**102**	**138**	30	30
Acenaphthylene	**697**	**999**	36[a]	30
Acenaphthene	**619**	**819**	28	30
Fluorene	**462**	**622**	29	30
C1-Fluorenes	**873**	**1310**	40[a]	30
C2-Fluorenes	**1340**	**2210**	49[a]	30
C3-Fluorenes	**1230** G	**2140** G	54[a]	30
Anthracene	**511**	**800**	44[a]	30
Phenanthrene	**2280**	**3490**	42[a]	30
C1-Phenanthrenes/Anthracenes	**3320**	**5680**	52[a]	30
C2-Phenanthrenes/Anthracenes	**2410**	**4050**	51[a]	30
C3-Phenanthrenes/Anthracenes	**942**	**1560**	49[a]	30
C4-Phenanthrenes/Anthracenes	**278**	**460**	49[a]	30
Retene	3.51 U	2.70 U	N/A	30
Dibenzothiophene	**319**	**488**	42[a]	30
C1-Dibenzothiophenes	**867**	**1430**	49[a]	30
C2-Dibenzothiophenes	**892**	**1490**	50[a]	30
C3-Dibenzothiophenes	**461**	**755**	48[a]	30
C4-Dibenzothiophenes	**151**	**248**	48[a]	30

[a] - Value outside of QC Limits.
U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable
G - Matrix Interference

12/07/16 11:32

Duplicate
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/11/16	100	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
Benzo(b)fluorene	**326**	**519**	46[a]	30
Fluoranthene	**1610**	**2750**	52[a]	30
Pyrene	**2630**	**4390**	50[a]	30
C1-Fluoranthenes/Pyrenes	**2370**	**3770**	46[a]	30
C2-Fluoranthenes/Pyrenes	**1260**	**2080**	49[a]	30
C3-Fluoranthenes/Pyrenes	**562**	**960**	52[a]	30
C4-Fluoranthenes/Pyrenes	**298**	**501**	51[a]	30
Naphthobenzothiophenes	**409**	**646**	45[a]	30
C1-Naphthobenzothiophenes	**508**	**824**	47[a]	30
C2-Naphthobenzothiophenes	**303**	**489**	47[a]	30
C3-Naphthobenzothiophenes	**130**	**215**	49[a]	30
C4-Naphthobenzothiophenes	**59.0**	**105**	56[a]	30
Benz[a]anthracene	**716**	**1010**	34[a]	30
Chrysene/Triphenylene	**1270**	**1880**	38[a]	30
C1-Chrysenes	**1210**	**1760**	37[a]	30
C2-Chrysenes	**579**	**869**	40[a]	30
C3-Chrysenes	**220**	**329**	40[a]	30
C4-Chrysenes	**113**	**159**	34[a]	30
Benzo[b]fluoranthene	**608**	**923**	41[a]	30
Benzo[j]fluoranthene/Benzo[k]fluoranthene	**645**	**926**	36[a]	30
Benzo[a]fluoranthene	**233**	**330**	35[a]	30
Benzo[e]pyrene	**661**	**965**	37[a]	30
Benzo[a]pyrene	**600**	**832**	32[a]	30
Perylene	**70.6**	**94.6**	29	30
Indeno[1,2,3-cd]pyrene	**388**	**573**	38[a]	30
Dibenz[ah]anthracene/Dibenz[ac]anthracene	**145**	**213**	38[a]	30
Benzo[g,h,i]perylene	**412**	**615**	39[a]	30

Surrogate	% Recovery			Acceptance Range (%)
Naphthalene-d8	128	141	§	50-130
Phenanthrene-d10	77	82		50-130
Benzo[a]pyrene-d12	113	112		50-130

[a] - Value outside of QC Limits.
N/A - Not Applicable
§ - Surrogate value outside of acceptable range.

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 11:32

Duplicate
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/11/16	100	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
Carbazole	**12.8**	**20.5**	46[a]	30

Surrogate	% Recovery			Acceptance Range (%)
Naphthalene-d8	128	141	§	50-130
Phenanthrene-d10	77	82		50-130
Benzo[a]pyrene-d12	113	112		50-130

[a] - Value outside of QC Limits.
N/A - Not Applicable
§ - Surrogate value outside of acceptable range.

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 11:32

Duplicate
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/11/16	100	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
4-Methyldibenzothiophene	**375**	**617**	49[a]	30
2/3-Methyldibenzothiophene	**346**	**556**	47[a]	30
1-Methyldibenzothiophene	**88.5**	**159**	57[a]	30
3-Methylphenanthrene	**792**	**1380**	54[a]	30
2-Methylphenanthrene	**907**	**1580**	54[a]	30
2-Methylanthracene	**160**	**264**	49[a]	30
9/4-Methylphenanthrene	**893**	**1540**	53[a]	30
1-Methylphenanthrene	**554**	**924**	50[a]	30

Surrogate	% Recovery			Acceptance Range (%)
Naphthalene-d8	128	141	§	50-130
Phenanthrene-d10	77	82		50-130
Benzo[a]pyrene-d12	113	112		50-130

[a] - Value outside of QC Limits.
N/A - Not Applicable
§ - Surrogate value outside of acceptable range.

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 11:32

Duplicate
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/11/16	100	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
C26,20R- +C27,20S- triaromatic steroid	**11.6**	**16.6**	35[a]	30
C28,20S-triaromatic steroid	**10.4**	**16.3**	44[a]	30
C27,20R-triaromatic steroid	**7.72**	**9.98**	26	30
C28,20R-triaromatic steroid	**7.17**	**10.7**	39[a]	30

Surrogate	% Recovery		Acceptance Range (%)
5B(H)Cholane	99	100	50-130

[a] - Value outside of QC Limits.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 12:05

Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-03**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-06**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.00328	1	2	AC

Parameter	Result		Parameter	Result
cis/trans-Decalin	6.10	U	C1-Dibenzothiophenes	**1310**
C1-Decalins	6.10	U	C2-Dibenzothiophenes	**1130**
C2-Decalins	**24.3**		C3-Dibenzothiophenes	**557**
C3-Decalins	**210**		C4-Dibenzothiophenes	**186**
C4-Decalins	**2390**		Benzo(b)fluorene	**387**
Benzothiophene	**89.6**		Fluoranthene	**1090**
C1-Benzo(b)thiophenes	**77.7**		Pyrene	**1810**
C2-Benzo(b)thiophenes	**467**		C1-Fluoranthenes/Pyrenes	**2160**
C3-Benzo(b)thiophenes	**860**		C2-Fluoranthenes/Pyrenes	**972**
C4-Benzo(b)thiophenes	**570**		C3-Fluoranthenes/Pyrenes	**378**
Naphthalene	**2580**		C4-Fluoranthenes/Pyrenes	**138**
C1-Naphthalenes	**750**		Naphthobenzothiophenes	**237**
C2-Naphthalenes	**8900**		C1-Naphthobenzothiophenes	**297**
C3-Naphthalenes	**11700**		C2-Naphthobenzothiophenes	**181**
C4-Naphthalenes	**6650**		C3-Naphthobenzothiophenes	**76.0**
Biphenyl	**187**		C4-Naphthobenzothiophenes	**34.9**
Dibenzofuran	**216**		Benz[a]anthracene	**670**
Acenaphthylene	**409**		Chrysene/Triphenylene	**697**
Acenaphthene	**627**		C1-Chrysenes	**847**
Fluorene	**872**		C2-Chrysenes	**438**
C1-Fluorenes	**1570**		C3-Chrysenes	**206**
C2-Fluorenes	**2040**		C4-Chrysenes	**54.6**
C3-Fluorenes	**1260**		Benzo[b]fluoranthene	**261**
Anthracene	**718**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**369**
Phenanthrene	**3880**		Benzo[a]fluoranthene	**145**
C1-Phenanthrenes/Anthracenes	**4950**		Benzo[e]pyrene	**306**
C2-Phenanthrenes/Anthracenes	**3250**		Benzo[a]pyrene	**589**
C3-Phenanthrenes/Anthracenes	**1370**		Perylene	**79.6**
C4-Phenanthrenes/Anthracenes	**394**		Indeno[1,2,3-cd]pyrene	**182**
Retene	6.10	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**74.8**
Dibenzothiophene	**612**		Benzo[g,h,i]perylene	**197**

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	153	§	50-130
Phenanthrene-d10	85		50-130
Benzo[a]pyrene-d12	117		50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable
§ - Surrogate value outside of acceptable range.

12/07/16 11:29

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-03**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-06**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.00328	1	2	AC

Parameter	Result
Carbazole	**27.3**

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	153	§	50-130
Phenanthrene-d10	85		50-130
Benzo[a]pyrene-d12	117		50-130

N/A - Not Applicable
§ - Surrogate value outside of acceptable range.

12/07/16 11:29

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-03**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-06**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.00328	1	2	AC

Parameter	Result
4-Methyldibenzothiophene	**522**
2/3-Methyldibenzothiophene	**561**
1-Methyldibenzothiophene	**112**
3-Methylphenanthrene	**1230**
2-Methylphenanthrene	**1340**
2-Methylanthracene	**341**
9/4-Methylphenanthrene	**1190**
1-Methylphenanthrene	**795**

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	153	§	50-130
Phenanthrene-d10	85		50-130
Benzo[a]pyrene-d12	117		50-130

N/A - Not Applicable
§ - Surrogate value outside of acceptable range.

12/07/16 11:29

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-03**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-06**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.00328	1	2	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	6.10	U
C28,20S-triaromatic steroid	6.10	U
C27,20R-triaromatic steroid	6.10	U
C28,20R-triaromatic steroid	6.10	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	96	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:29

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281623b.D
Acq On : 29 Nov 2016 11:20 pm
Operator : AC
Sample : 1611004-06
Misc : 2x
ALS Vial : 100 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 10:48:30 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.114	164	40659M4	500.000	ng/ml	0.00
71) Chrysene-d12	43.570	240	85093M4	500.000	ng/ml	-0.02
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	133020	762.725	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 76.27%			
40) Phenanthrene-d10	32.985	188	57109	427.313	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.73%#			
80) Benzo[b]fluoranthene-d12	47.485	264	104776	591.140	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 59.11%			
85) Benzo[a]pyrene-d12	48.705	264	83648	586.279	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 58.63%			
126) 5B(H)Cholane - Surr	44.157	217	13218	478.320	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.83%#			
Target Compounds						Qvalue
5) C2-Decalins	21.183	166	1405M5	39.885	ng/ml	
6) C3-Decalins	22.492	180	12113M5	343.867	ng/ml	
7) C4-Decalins	25.895	194	138155M5	3921.979	ng/ml	
9) Naphthalene	20.189	128	813198	4239.717	ng/ml	100
10) C1-Naphthalenes	23.320	142	235754M5	1229.135	ng/ml	
11) C2-Naphthalenes	25.744	156	2799187M5	14593.938	ng/ml	
12) C3-Naphthalenes	28.093	170	3678829M5	19180.070	ng/ml	
13) C4-Naphthalenes	30.848	184	2093094M5	10912.627	ng/ml	
14) 2-Methylnaphthalene	22.899	142	90658	743.456	ng/ml	100
15) 1-Methylnaphthalene	23.320	142	145136	1256.420	ng/ml	100
16) Benzothiophene	20.415	134	24951	146.884	ng/ml	100
17) C1-Benzo(b)thiophenes	22.447	148	21648M5	127.440	ng/ml	
18) C2-Benzo(b)thiophenes	25.458	162	130044M5	765.558	ng/ml	
19) C3-Benzo(b)thiophenes	27.927	176	239497M5	1409.898	ng	
20) C4-Benzo(b)thiophenes	30.020	190	158788M5	934.771	ng/ml	
21) Biphenyl	24.781	154	47381M4	306.068	ng/ml	
22) 2,6-Dimethylnaphthalene	25.398	156	817315	7722.794	ng/ml	100
23) Dibenzofuran	27.882	168	57572	354.305	ng/ml#	56
24) Acenaphthylene	26.497	152	124693M4	671.227	ng/ml	
25) Acenaphthene	27.235	153	116883M4	1028.968	ng/ml	
26) 2,3,5-Trimethylnaphthalen	28.785	170	182603M3	2008.021	ng/ml	
27) Fluorene	29.252	166	177443M4	1430.840	ng/ml	
28) C1-Fluorenes	31.630	180	319365M5	2575.250	ng/ml	
29) C2-Fluorenes	33.663	194	414474M5	3342.177	ng/ml	
30) C3-Fluorenes	35.635	208	257163M5	2073.675	ng/ml	
31) Dibenzothiophene	32.579	184	183512	1002.837	ng/ml#	55
32) 4-Methyldibenzothiophene(	34.355	198	156564	855.575	ng/ml	100
33) 2/3-Methyldibenzothiophen	34.702	198	168473M4	920.654	ng/ml	
34) 1-Methyldibenzothiophene(	35.123	198	33541	183.291	ng/ml	100
36) C1-Dibenzothiophenes	34.355	198	392467M5	2144.713	ng/ml	
36) C1-Dibenzothiophenes BS	34.355	198	392467M5	2144.713	ng/ml	
37) C2-Dibenzothiophenes	36.388	212	339628M5	1855.964	ng/ml	
38) C3-Dibenzothiophenes	37.833	226	167046M5	912.856	ng/ml	
39) C4-Dibenzothiophenes	39.504	240	55886M5	305.400	ng/ml	
41) Phenanthrene	33.076	178	1105420	6359.023	ng/ml	98
42) 3-Methylphenanthrene(3MP)	35.033	192	351352	2021.182	ng/ml	98
43) 2-Methylphenanthrene(2MP)	35.153	192	383273	2204.811	ng/ml	96
44) 2-Methylanthracene(2MA)	35.304	192	97280M3	559.612	ng/ml	
45) 9/4-Methylphenanthrene(9M	35.484	192	338238	1945.743	ng/ml	94
46) 1-Methylphenanthrene(1MP)	35.575	192	226751	1304.405	ng/ml	96
47) C1-Phenanthrenes/Anthrace	35.153	192	1411633M5	8120.539	ng/ml	
48) C2-Phenanthrenes/Anthrace	37.306	206	927428M5	5335.109	ng/ml	
48) C2-Phenanthrenes/Anthr BS	37.306	206	927428M5	5335.109	ng/ml	
50) C3-Phenanthrenes/Anthrace	39.128	220	391056M5	2249.583	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281623b.D
Acq On : 29 Nov 2016 11:20 pm
Operator : AC
Sample : 1611004-06
Misc : 2x
ALS Vial : 100 Sample Multiplier: 1

Quant Time: Dec 07 10:48:30 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) C4-Phenanthrenes/Anthrace	41.326	234	112372M5	646.430	ng/ml	
53) Anthracene	33.256	178	194133M4	1176.704	ng/ml	
54) Carbazole	33.919	167	7215M4	44.764	ng/ml	
55) 1-Methylphenanthrene	35.575	192	226751	1768.660	ng/ml	95
56) Fluoranthene	37.848	202	345515M3	1790.801	ng/ml	
57) Benzo(b)fluorene	40.363	216	72539M3	634.521	ng/ml	
58) Pyrene	38.737	202	622385	2975.776	ng/ml#	90
59) C1-Fluoranthenes/Pyrenes	40.122	216	741400M5	3544.816	ng/ml	
60) C2-Fluoranthenes/Pyrenes	41.778	230	333233M5	1593.269	ng/ml	
61) C3-Fluoranthenes/Pyrenes	44.036	244	129598M5	619.640	ng/ml	
62) C4-Fluoranthenes/Pyrenes	45.286	258	47433M5	226.789	ng/ml	
63) Naphthobenzothiophene	42.576	234	43879	242.062	ng/ml#	89
64) Naphthobenzothiophene-2,1	42.576	234	43879	242.062	ng/ml#	89
65) Naphthobenzothiophene-1,2	42.922	234	13296	73.348	ng/ml#	71
66) Naphthobenzothiophene-2,3	43.208	234	13344M3	73.613	ng/ml	
67) C1-Naphthobenzothiophenes	43.976	248	88251M5	486.843	ng/ml	
68) C2-Naphthobenzothiophenes	45.467	262	53827M5	296.940	ng/ml	
69) C3-Naphthobenzothiophenes	47.590	276	22593M5	124.636	ng/ml	
70) C4-Naphthobenzothiophenes	48.689	290	10383M5	57.279	ng/ml	
72) Benz[a]anthracene	43.509	228	259098M3	1098.887	ng/ml	
74) Chrysene/Triphenylene	43.660	228	252873	1143.583	ng/ml	99
75) C1-Chrysenes	45.135	242	307049M5	1388.586	ng/ml	
76) C2-Chrysenes	46.837	256	163730M5	740.446	ng/ml	
76) C2-Chrysenes BS	46.837	256	158730M5	717.834	ng/ml	
77) BBF-D12 Surr BKGD	47.470	256	5000	22.612	ng/ml	100
78) C3-Chrysenes	48.464	270	74625M5	337.481	ng/ml	
79) C4-Chrysenes	49.518	284	19792M5	89.507	ng/ml	
81) Benzo[b]fluoranthene	47.560	252	102837	428.670	ng/ml	97
82) Benzo[j]+[k]fluoranthene	47.635	252	133666	604.430	ng/ml	96
83) Benzo[a]fluoranthene	47.967	252	52456	237.203	ng/ml#	1
84) Benzo[e]pyrene	48.599	252	111773	501.050	ng/ml	96
86) Benzo[a]pyrene	48.795	252	205707	966.497	ng/ml	93
87) Perylene	49.111	252	28151	130.628	ng/ml	99
88) Indeno[1,2,3-cd]pyrene	53.795	276	82109M3	298.739	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.840	278	28793M4	122.738	ng/ml	
90) Benzo[g,h,i]perylene	55.150	276	85865	322.981	ng/ml	99

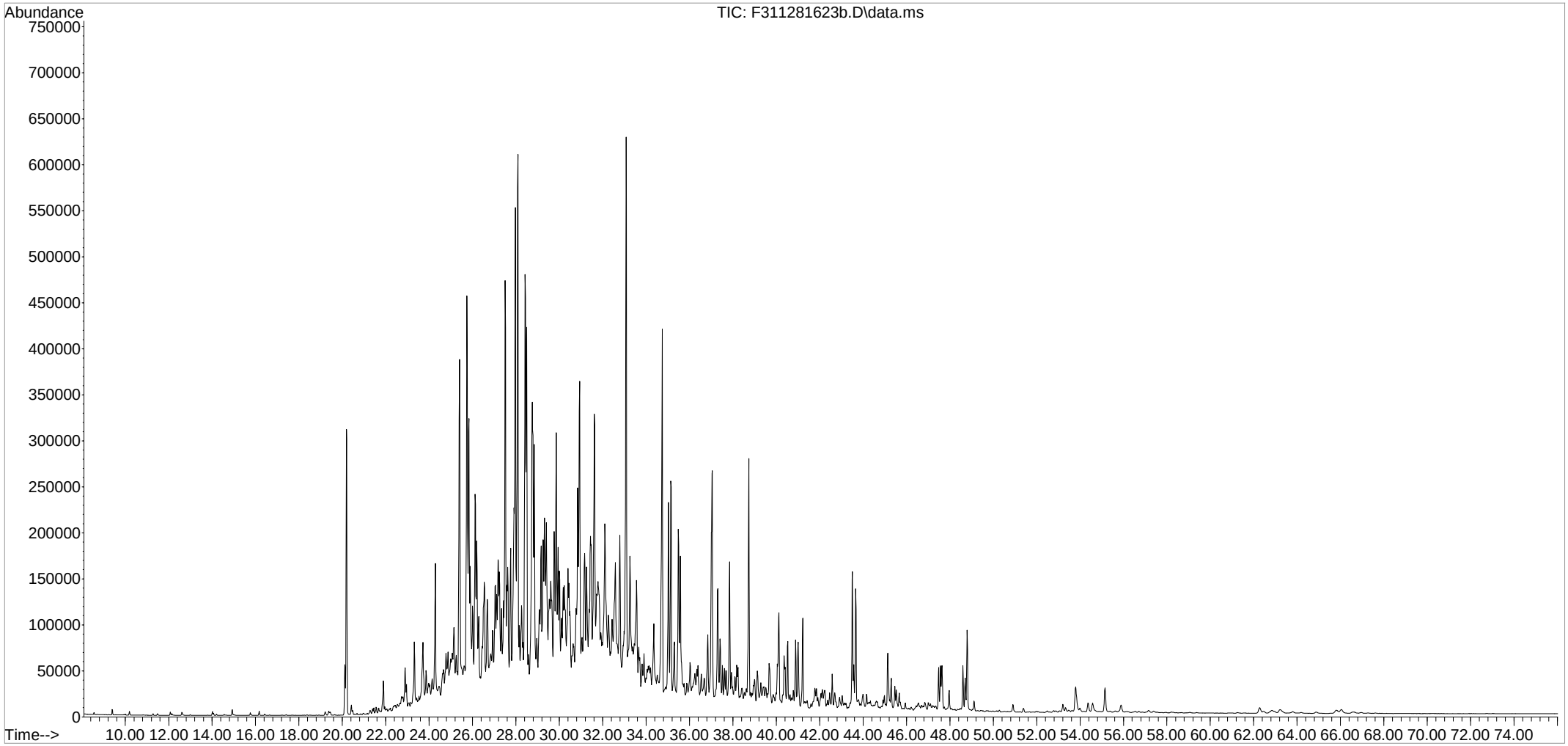
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281623b.D
Acq On : 29 Nov 2016 11:20 pm
Operator : AC
Sample : 1611004-06
Misc : 2x
ALS Vial : 100 Sample Multiplier: 1

Quant Time: Dec 07 10:48:30 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-08(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-07**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	12/02/16	1000	1	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	**39.6**		C1-Dibenzothiophenes	**9.86**	JB
C1-Decalins	**31.3**		C2-Dibenzothiophenes	**9.76**	JB
C2-Decalins	**20.3**		C3-Dibenzothiophenes	10.0	U
C3-Decalins	10.0	U	C4-Dibenzothiophenes	10.0	U
C4-Decalins	**29.9**		Benzo(b)fluorene	**2.37**	J
Benzothiophene	**32.9**		Fluoranthene	**72.6**	
C1-Benzo(b)thiophenes	**63.7**		Pyrene	**65.6**	
C2-Benzo(b)thiophenes	**48.3**		C1-Fluoranthenes/Pyrenes	**21.3**	B
C3-Benzo(b)thiophenes	**37.7**	GB	C2-Fluoranthenes/Pyrenes	**12.7**	
C4-Benzo(b)thiophenes	**11.2**		C3-Fluoranthenes/Pyrenes	10.0	U
Naphthalene	**530**		C4-Fluoranthenes/Pyrenes	10.0	U
C1-Naphthalenes	**11600**		Naphthobenzothiophenes	**0.961**	J
C2-Naphthalenes	**2410**		C1-Naphthobenzothiophenes	10.0	U
C3-Naphthalenes	**129**	B	C2-Naphthobenzothiophenes	10.0	U
C4-Naphthalenes	**763**	G	C3-Naphthobenzothiophenes	10.0	U
Biphenyl	**2350**		C4-Naphthobenzothiophenes	10.0	U
Dibenzofuran	**74.6**		Benz[a]anthracene	**24.4**	
Acenaphthylene	**386**		Chrysene/Triphenylene	**26.0**	
Acenaphthene	**473**		C1-Chrysenes	10.0	U
Fluorene	**617**		C2-Chrysenes	10.0	U
C1-Fluorenes	**75.4**		C3-Chrysenes	10.0	U
C2-Fluorenes	**35.3**		C4-Chrysenes	10.0	U
C3-Fluorenes	10.0	U	Benzo[b]fluoranthene	**22.2**	
Anthracene	**147**		Benzo[j]fluoranthene/Benzo[k]fluoranthene	**25.6**	
Phenanthrene	**263**		Benzo[a]fluoranthene	**0.713**	J
C1-Phenanthrenes/Anthracenes	**43.4**	B	Benzo[e]pyrene	**1.20**	J
C2-Phenanthrenes/Anthracenes	**17.3**		Benzo[a]pyrene	**23.3**	
C3-Phenanthrenes/Anthracenes	10.0	U	Perylene	10.0	U
C4-Phenanthrenes/Anthracenes	10.0	U	Indeno[1,2,3-cd]pyrene	**20.3**	
Retene	10.0	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**22.0**	
Dibenzothiophene	**27.9**		Benzo[g,h,i]perylene	**21.4**	

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	68	50-130
Phenanthrene-d10	95	50-130
Benzo[a]pyrene-d12	102	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
N/A - Not Applicable
G - Matrix Interference

12/07/16 11:31

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-08(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-07**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	12/02/16	1000	1	1	AC

Parameter	Result
Carbazole	**9.93** J

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	68	50-130
Phenanthrene-d10	95	50-130
Benzo[a]pyrene-d12	102	50-130

J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 11:31

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-08(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-07**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	12/02/16	1000	1	1	AC

Parameter	Result	
4-Methyldibenzothiophene	**6.51**	JB
2/3-Methyldibenzothiophene	10.0	U
1-Methyldibenzothiophene	**1.62**	J
3-Methylphenanthrene	**8.32**	JB
2-Methylphenanthrene	**9.65**	JB
2-Methylanthracene	**4.15**	JB
9/4-Methylphenanthrene	**11.5**	B
1-Methylphenanthrene	**8.49**	JB

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	68	50-130
Phenanthrene-d10	95	50-130
Benzo[a]pyrene-d12	102	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
B - Found in associated blank as well as sample.
J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 11:31

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-08(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-07**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	12/02/16	1000	1	1	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	10.0	U
C28,20S-triaromatic steroid	10.0	U
C27,20R-triaromatic steroid	10.0	U
C28,20R-triaromatic steroid	10.0	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	92	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:31

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011611.D
Acq On : 2 Dec 2016 12:52 am
Operator : AC
Sample : 1611004-07
Misc : 1x
ALS Vial : 11 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:51:17 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.054	164	63737M4	500.000	ng/ml	-0.06
71) Chrysene-d12	43.509	240	99770	500.000	ng/ml	-0.08
System Monitoring Compounds						
8) Naphthalene-d8	20.069	136	185174	677.323	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 67.73%			
40) Phenanthrene-d10	32.925	188	198944	949.594	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 94.96%			
80) Benzo[b]fluoranthene-d12	47.424	264	214478	1032.061	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 103.21%			
85) Benzo[a]pyrene-d12	48.644	264	170638	1020.043	ng/ml	-0.06
Spiked Amount 1000.000	Range 50 - 130		Recovery = 102.00%			
126) 5B(H)Cholane - Surr	44.112	217	29742	917.945	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 91.79%			
Target Compounds						Qvalue
2) trans-Decalin	16.711	138	1996	36.146	ng/ml	100
3) cis-Decalin	17.916	138	144M4	3.472	ng/ml	
4) C1-Decalins	18.638	152	1726M5	31.257	ng/ml	
5) C2-Decalins	21.077	166	1121M5	20.301	ng/ml	
7) C4-Decalins	25.910	194	1652M5	29.917	ng/ml	
9) Naphthalene	20.144	128	159518	530.537	ng/ml	100
10) C1-Naphthalenes	22.839	142	3487764M5	11599.860	ng/ml	
11) C2-Naphthalenes	25.684	156	724788M5	2410.553	ng/ml	
12) C3-Naphthalenes	28.364	170	38904M5	129.390	ng/ml	
13) C4-Naphthalenes	30.577	184G	229388M5	762.915	ng/ml	
14) 2-Methylnaphthalene	22.839	142	2315853	12115.050	ng/ml	100
15) 1-Methylnaphthalene	23.260	142	1174138	6484.015	ng/ml	100
16) Benzothiophene	20.355	134	8767	32.923	ng/ml	100
17) C1-Benzo(b)thiophenes	22.387	148	16964M5	63.706	ng/ml	
18) C2-Benzo(b)thiophenes	25.398	162	12860M5	48.294	ng/ml	
19) C3-Benzo(b)thiophenes	27.084	176G	10042M5	37.711	ng	
20) C4-Benzo(b)thiophenes	30.321	190	2972M5	11.161	ng/ml	
21) Biphenyl	24.721	154	570315	2350.139	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.338	156	161631	974.260	ng/ml	100
23) Dibenzofuran	27.807	168	18999M4	74.587	ng/ml	
24) Acenaphthylene	26.437	152	112553M4	386.500	ng/ml	
25) Acenaphthene	27.174	153	84165M4	472.658	ng/ml	
26) 2,3,5-Trimethylnaphthalen	28.710	170	2311M3	16.212	ng/ml	
27) Fluorene	29.192	166	119903M4	616.776	ng/ml	
28) C1-Fluorenes	31.555	180	14663M5	75.426	ng/ml	
29) C2-Fluorenes	33.738	194	6856M5	35.267	ng/ml	
31) Dibenzothiophene	32.519	184	8001	27.892	ng/ml	94
32) 4-Methyldibenzothiophene(	34.280	198	1867M4	6.508	ng/ml	
34) 1-Methyldibenzothiophene(	35.063	198	466	1.624	ng/ml	100
35) OTP	34.702	198	28329	98.756	ng/ml	100
36) C1-Dibenzothiophenes	34.702	198	31156M5	108.611	ng/ml	
36) C1-Dibenzothiophenes BS	34.702	198	2827M5	9.855	ng/ml	
37) C2-Dibenzothiophenes	35.966	212	2801M5	9.764	ng/ml	
41) Phenanthrene	33.015	178	71567	262.628	ng/ml	100
42) 3-Methylphenanthrene(3MP)	34.973	192	2267	8.319	ng/ml	96
43) 2-Methylphenanthrene(2MP)	35.078	192	2629	9.648	ng/ml	92
44) 2-Methylanthracene(2MA)	35.244	192	1131	4.150	ng/ml#	40
45) 9/4-Methylphenanthrene(9M	35.424	192	3146	11.545	ng/ml	76
46) 1-Methylphenanthrene(1MP)	35.515	192	2314	8.492	ng/ml	87
47) C1-Phenanthrenes/Anthrace	35.078	192	11819M5	43.372	ng/ml	
48) C2-Phenanthrenes/Anthrace	36.990	206	12976M5	47.618	ng/ml	
48) C2-Phenanthrenes/Anthr BS	36.990	206	4712M5	17.292	ng/ml	
49) 5AA IS BKGD	36.990	206	8264	30.326	ng/ml	100
53) Anthracene	33.181	178	37943M4	146.712	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011611.D
Acq On : 2 Dec 2016 12:52 am
Operator : AC
Sample : 1611004-07
Misc : 1x
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Dec 07 09:51:17 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Carbazole	33.858	167	2509M4	9.930	ng/ml	
55) 1-Methylphenanthrene	35.515	192	2314	11.514	ng/ml	96
56) Fluoranthene	37.788	202	21949M4	72.571	ng/ml	
57) Benzo(b)fluorene	40.302	216	425M3	2.372	ng/ml	
58) Pyrene	38.676	202	21496	65.564	ng/ml	96
59) C1-Fluoranthenes/Pyrenes	40.062	216	6987M5	21.311	ng/ml	
60) C2-Fluoranthenes/Pyrenes	42.907	230	4164M5	12.700	ng/ml	
63) Naphthobenzothiophene	42.516	234	273	0.961	ng/ml#	1
64) Naphthobenzothiophene-2,1	42.516	234	273	0.961	ng/ml#	1
72) Benz[a]anthracene	43.449	228	6743	24.391	ng/ml	100
74) Chrysene/Triphenylene	43.615	228	6746	26.020	ng/ml	99
81) Benzo[b]fluoranthene	47.500	252	6252	22.227	ng/ml	98
82) Benzo[j]+[k]fluoranthene	47.590	252	6627	25.559	ng/ml	97
83) Benzo[a]fluoranthene	47.906	252	185M4	0.713	ng/ml	
84) Benzo[e]pyrene	48.539	252	313M3	1.197	ng/ml	
86) Benzo[a]pyrene	48.735	252	5808	23.274	ng/ml	93
88) Indeno[1,2,3-cd]pyrene	53.705	276	6549M3	20.322	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.765	278	6066	22.054	ng/ml	98
90) Benzo[g,h,i]perylene	55.060	276	6674	21.411	ng/ml	98

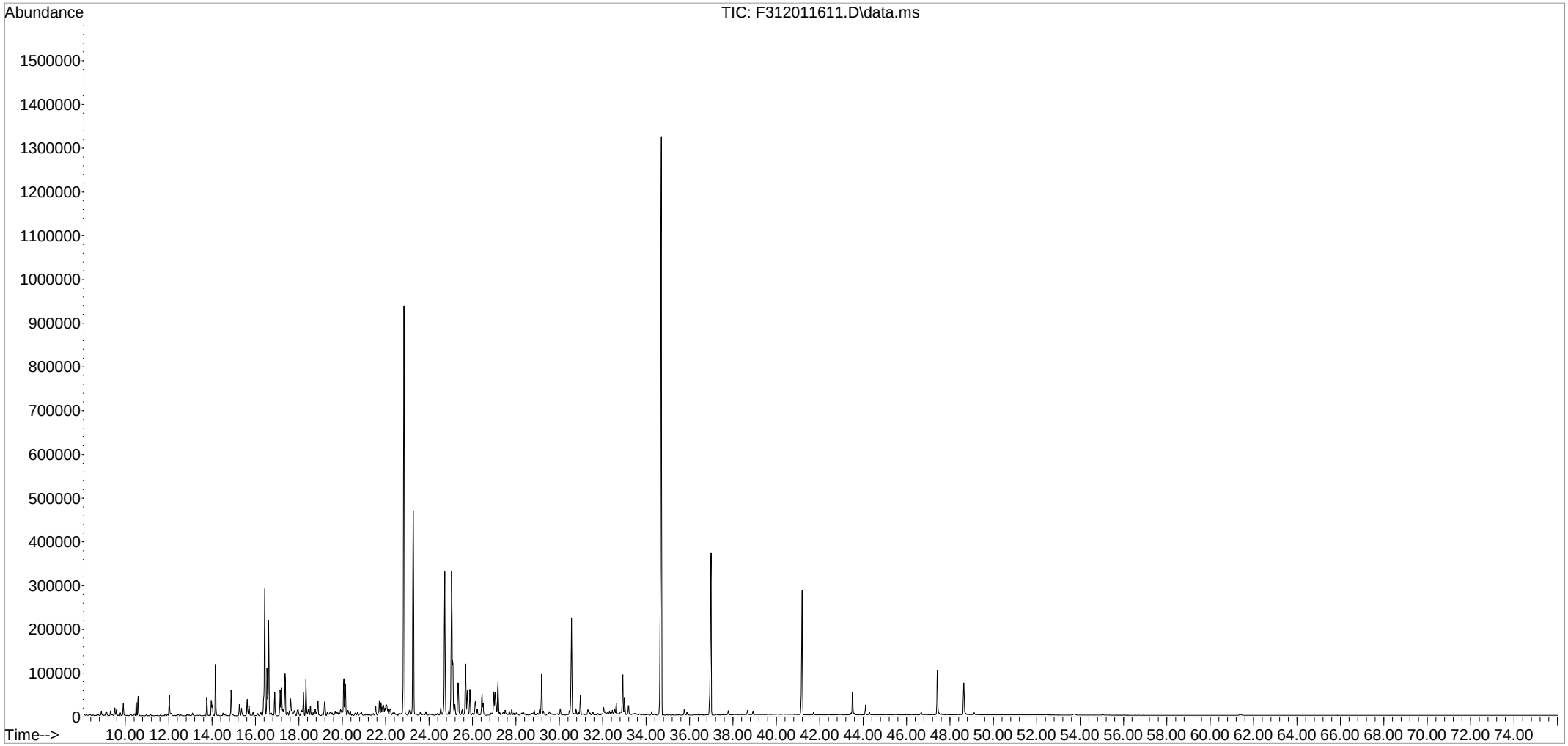
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011611.D
Acq On : 2 Dec 2016 12:52 am
Operator : AC
Sample : 1611004-07
Misc : 1x
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Dec 07 09:51:17 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-01(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-08**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/30/16	1000	1	10	AC

Parameter	Result	
cis/trans-Decalin	**190**	
C1-Decalins	**200**	
C2-Decalins	**403**	G
C3-Decalins	**390**	
C4-Decalins	**816**	
Benzothiophene	**99100**	
C1-Benzo(b)thiophenes	**38800**	
C2-Benzo(b)thiophenes	**8860**	
C3-Benzo(b)thiophenes	**2360**	
C4-Benzo(b)thiophenes	**992**	
Naphthalene	**2520000**	E
C1-Naphthalenes	**516000**	E
C2-Naphthalenes	**80600**	
C3-Naphthalenes	**12000**	
C4-Naphthalenes	**4490**	
Biphenyl	**24100**	
Dibenzofuran	**5720**	
Acenaphthylene	**3620**	
Acenaphthene	**32900**	
Fluorene	**27300**	
C1-Fluorenes	**5380**	
C2-Fluorenes	**1480**	
C3-Fluorenes	**624**	G
Anthracene	**3020**	
Phenanthrene	**29200**	
C1-Phenanthrenes/Anthracenes	**6920**	
C2-Phenanthrenes/Anthracenes	**1880**	
C3-Phenanthrenes/Anthracenes	**674**	
C4-Phenanthrenes/Anthracenes	**307**	
Retene	100	U
Dibenzothiophene	**4200**	

Parameter	Result	
C1-Dibenzothiophenes	**2580**	
C2-Dibenzothiophenes	**841**	
C3-Dibenzothiophenes	**379**	
C4-Dibenzothiophenes	**169**	
Benzo(b)fluorene	**300**	
Fluoranthene	**1610**	
Pyrene	**2190**	
C1-Fluoranthenes/Pyrenes	**1920**	
C2-Fluoranthenes/Pyrenes	**660**	
C3-Fluoranthenes/Pyrenes	**307**	
C4-Fluoranthenes/Pyrenes	100	U
Naphthobenzothiophenes	**175**	
C1-Naphthobenzothiophenes	**254**	
C2-Naphthobenzothiophenes	**113**	
C3-Naphthobenzothiophenes	100	U
C4-Naphthobenzothiophenes	100	U
Benz[a]anthracene	**484**	
Chrysene/Triphenylene	**492**	
C1-Chrysenes	**631**	
C2-Chrysenes	**361**	
C3-Chrysenes	100	U
C4-Chrysenes	100	U
Benzo[b]fluoranthene	**175**	
Benzo[j]fluoranthene/Benzo[k]fluoranthene	**243**	
Benzo[a]fluoranthene	**146**	
Benzo[e]pyrene	**212**	
Benzo[a]pyrene	**444**	
Perylene	**62.9**	J
Indeno[1,2,3-cd]pyrene	**123**	
Dibenz[ah]anthracene/Dibenz[ac]anthracene	**49.7**	J
Benzo[g,h,i]perylene	**138**	

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	71	50-130
Phenanthrene-d10	98	50-130
Benzo[a]pyrene-d12	96	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
E - Estimated value, exceeds the upper limit of calibration.
N/A - Not Applicable
G - Matrix Interference

12/07/16 12:10

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-01(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-08**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/30/16	1000	1	10	AC

Parameter	Result
Carbazole	**20400**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	71	50-130
Phenanthrene-d10	98	50-130
Benzo[a]pyrene-d12	96	50-130

N/A - Not Applicable

12/07/16 11:29

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-01(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-08**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/30/16	1000	1	10	AC

Parameter	Result
4-Methyldibenzothiophene	**545**
2/3-Methyldibenzothiophene	**1220**
1-Methyldibenzothiophene	**167**
3-Methylphenanthrene	**1870**
2-Methylphenanthrene	**1730**
2-Methylanthracene	**433**
9/4-Methylphenanthrene	**1700**
1-Methylphenanthrene	**1140**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	71	50-130
Phenanthrene-d10	98	50-130
Benzo[a]pyrene-d12	96	50-130

N/A - Not Applicable

12/07/16 11:29

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-01(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-08**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/30/16	1000	1	10	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	100	U
C28,20S-triaromatic steroid	100	U
C27,20R-triaromatic steroid	100	U
C28,20R-triaromatic steroid	100	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	83	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:29

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281632.D
Acq On : 30 Nov 2016 12:20 pm
Operator : AC
Sample : 1611004-08
Misc : 10x
ALS Vial : 32 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:42:49 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	58296M4	500.000	ng/ml	-0.01
71) Chrysene-d12	43.570	240	114090	500.000	ng/ml	-0.01
System Monitoring Compounds						
8) Naphthalene-d8	20.189	136	88293	353.098	ng/ml	0.08
Spiked Amount 1000.000	Range 50 - 130		Recovery = 35.31%#			
40) Phenanthrene-d10	32.970	188	93620	488.572	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.86%#			
80) Benzo[b]fluoranthene-d12	47.485	264	114903	483.511	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.35%#			
85) Benzo[a]pyrene-d12	48.705	264	92098	481.444	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.14%#			
126) 5B(H)Cholane - Surr	44.157	217	15412	415.966	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.60%#			
Target Compounds						Qvalue
2) trans-Decalin	16.757	138	599M4	11.860	ng/ml	
3) cis-Decalin	17.976	138	272M4	7.169	ng/ml	
4) C1-Decalins	18.699	152	1008M5	19.958	ng/ml	
5) C2-Decalins	20.325	166G	2034M5	40.272	ng/ml	
6) C3-Decalins	22.553	180	1971M5	39.025	ng/ml	
7) C4-Decalins	24.916	194	4121M5	81.594	ng/ml	
9) Naphthalene	20.280	128	69374958	252267.471	ng/ml	100
10) C1-Naphthalenes	22.914	142	14203732M5	51648.890	ng/ml	
11) C2-Naphthalenes	25.744	156	2216999M5	8061.651	ng/ml	
12) C3-Naphthalenes	28.078	170	329091M5	1196.670	ng/ml	
13) C4-Naphthalenes	29.613	184	123466M5	448.958	ng/ml	
14) 2-Methylnaphthalene	22.914	142	8186493	46823.618	ng/ml	100
15) 1-Methylnaphthalene	23.351	142	6027982	36395.669	ng/ml	100
16) Benzothiophene	20.445	134	2412748	9906.439	ng/ml	100
17) C1-Benzo(b)thiophenes	22.764	148	944886M5	3879.583	ng/ml	
18) C2-Benzo(b)thiophenes	25.458	162	215814M5	886.105	ng/ml	
19) C3-Benzo(b)thiophenes	27.551	176	57364M5	235.529	ng	
20) C4-Benzo(b)thiophenes	29.704	190	24152M5	99.165	ng/ml	
21) Biphenyl	24.781	154	534415	2407.744	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.398	156	502467	3311.391	ng/ml	100
23) Dibenzofuran	27.867	168	133173M4	571.611	ng/ml	
24) Acenaphthylene	26.497	152	96340M3	361.703	ng/ml	
25) Acenaphthene	27.235	153	535858	3290.169	ng/ml	99
26) 2,3,5-Trimethylnaphthalen	28.770	170	19803M3	151.883	ng/ml	
27) Fluorene	29.237	166	485729M4	2731.770	ng/ml	
28) C1-Fluorenes	31.465	180	95703M5	538.240	ng/ml	
29) C2-Fluorenes	33.648	194	26269M5	147.738	ng/ml	
30) C3-Fluorenes	36.313	208G	11098M5	62.416	ng/ml	
31) Dibenzothiophene	32.579	184	110140	419.787	ng/ml	97
32) 4-Methyldibenzothiophene(	34.340	198	14308M4	54.533	ng/ml	
33) 2/3-Methyldibenzothiophen	34.702	198	32036M3	122.102	ng/ml	
34) 1-Methyldibenzothiophene(	35.108	198	4389M4	16.728	ng/ml	
35) OTP	34.732	198	10269M3	39.139	ng/ml	
36) C1-Dibenzothiophenes	34.732	198	77844M5	296.694	ng/ml	
36) C1-Dibenzothiophenes BS	34.732	198	67575M5	257.555	ng/ml	
37) C2-Dibenzothiophenes	36.388	212	22075M5	84.137	ng/ml	
38) C3-Dibenzothiophenes	39.008	226	9938M5	37.878	ng/ml	
39) C4-Dibenzothiophenes	39.926	240	4441M5	16.926	ng/ml	
41) Phenanthrene	33.061	178	728961	2924.727	ng/ml	99
42) 3-Methylphenanthrene(3MP)	35.018	192	46512	186.615	ng/ml	96
43) 2-Methylphenanthrene(2MP)	35.138	192	43119	173.001	ng/ml	95
44) 2-Methylanthracene(2MA)	35.289	192	10791	43.295	ng/ml#	39
45) 9/4-Methylphenanthrene(9M	35.485	192	42376	170.020	ng/ml	85
46) 1-Methylphenanthrene(1MP)	35.575	192	28324	113.641	ng/ml	93

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281632.D
Acq On : 30 Nov 2016 12:20 pm
Operator : AC
Sample : 1611004-08
Misc : 10x
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Dec 07 09:42:49 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
47) C1-Phenanthrenes/Anthrace	35.018	192	172433M5	691.833	ng/ml	
48) C2-Phenanthrenes/Anthrace	36.990	206	51572M5	206.916	ng/ml	
48) C2-Phenanthrenes/Anthr BS	36.990	206	46818M5	187.843	ng/ml	
49) 5AA IS BKGD	37.035	206	4754M3	19.074	ng/ml	
50) C3-Phenanthrenes/Anthrace	39.128	220	16802M5	67.413	ng/ml	
51) C4-Phenanthrenes/Anthrace	40.273	234	7646M5	30.677	ng/ml	
53) Anthracene	33.241	178	71555M4	302.500	ng/ml	
54) Carbazole	33.919	167	470560M4	2036.236	ng/ml	
55) 1-Methylphenanthrene	35.575	192	28324	154.088	ng/ml	98
56) Fluoranthene	37.833	202	44614	161.276	ng/ml	94
57) Benzo(b)fluorene	40.363	216	4926M3	30.053	ng/ml	
58) Pyrene	38.722	202	65782	219.364	ng/ml	95
59) C1-Fluoranthenes/Pyrenes	40.107	216	57476M5	191.666	ng/ml	
60) C2-Fluoranthenes/Pyrenes	41.853	230	19786M5	65.981	ng/ml	
61) C3-Fluoranthenes/Pyrenes	43.660	244	9201M5	30.683	ng/ml	
63) Naphthobenzothiophene	42.576	234	2309	8.884	ng/ml#	82
64) Naphthobenzothiophene-2,1	42.576	234	2309	8.884	ng/ml#	82
65) Naphthobenzothiophene-1,2	42.922	234	1170M4	4.502	ng/ml	
66) Naphthobenzothiophene-2,3	43.209	234	1080M3	4.155	ng/ml	
67) C1-Naphthobenzothiophenes	43.961	248	6613M5	25.444	ng/ml	
68) C2-Naphthobenzothiophenes	45.467	262	2927M5	11.262	ng/ml	
72) Benz[a]anthracene	43.495	228	15291M3	48.369	ng/ml	
74) Chrysene/Triphenylene	43.660	228	14572	49.151	ng/ml	94
75) C1-Chrysenes	45.136	242	18718M5	63.135	ng/ml	
76) C2-Chrysenes	47.470	256	14544M5	49.056	ng/ml	
76) C2-Chrysenes BS	47.470	256	10699M5	36.087	ng/ml	
77) BBF-D12 Surr BKGD	47.470	256	3845	12.969	ng/ml	100
81) Benzo[b]fluoranthene	47.560	252	5629	17.501	ng/ml	99
82) Benzo[j]+[k]fluoranthene	47.636	252	7196	24.270	ng/ml	97
83) Benzo[a]fluoranthene	47.967	252	4343	14.647	ng/ml#	1
84) Benzo[e]pyrene	48.599	252	6350	21.231	ng/ml	100
86) Benzo[a]pyrene	48.795	252	12685	44.452	ng/ml	95
87) Perylene	49.111	252	1818	6.292	ng/ml	98
88) Indeno[1,2,3-cd]pyrene	53.795	276	4530M4	12.293	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.840	278	1563M4	4.969	ng/ml	
90) Benzo[g,h,i]perylene	55.150	276	4935	13.845	ng/ml	95

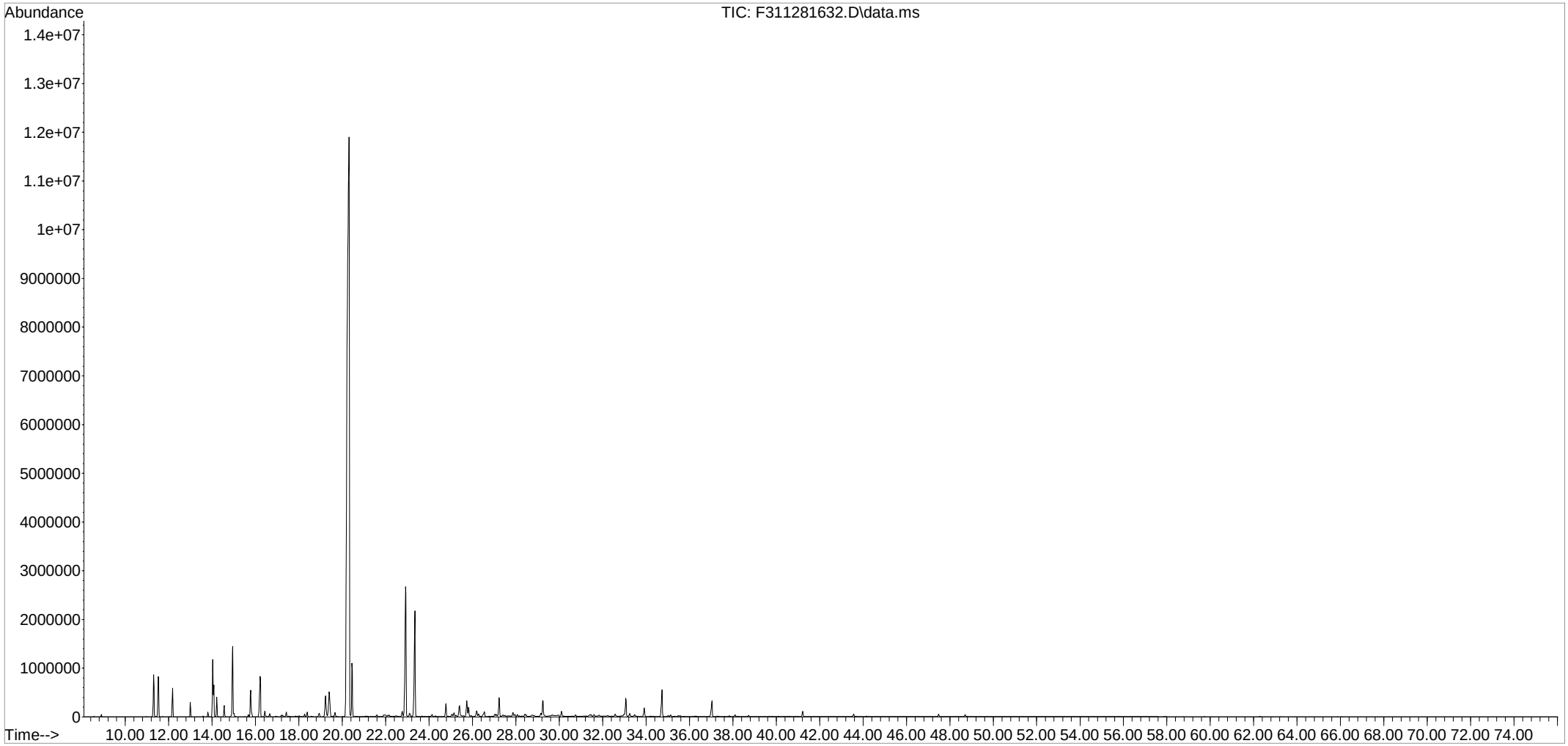
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281632.D
Acq On : 30 Nov 2016 12:20 pm
Operator : AC
Sample : 1611004-08
Misc : 10x
ALS Vial : 32 Sample Multiplier: 1

Quant Time: Dec 07 09:42:49 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-01(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-08E**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	12/02/16	1000	1	500	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	5000	U	C1-Dibenzothiophenes	5000	U
C1-Decalins	5000	U	C2-Dibenzothiophenes	5000	U
C2-Decalins	5000	U	C3-Dibenzothiophenes	5000	U
C3-Decalins	5000	U	C4-Dibenzothiophenes	5000	U
C4-Decalins	5000	U	Benzo(b)fluorene	5000	U
Benzothiophene	5000	U	Fluoranthene	5000	U
C1-Benzo(b)thiophenes	5000	U	Pyrene	5000	U
C2-Benzo(b)thiophenes	5000	U	C1-Fluoranthenes/Pyrenes	5000	U
C3-Benzo(b)thiophenes	5000	U	C2-Fluoranthenes/Pyrenes	5000	U
C4-Benzo(b)thiophenes	5000	U	C3-Fluoranthenes/Pyrenes	5000	U
Naphthalene	**4580000**		C4-Fluoranthenes/Pyrenes	5000	U
C1-Naphthalenes	**693000**		Naphthobenzothiophenes	5000	U
C2-Naphthalenes	5000	U	C1-Naphthobenzothiophenes	5000	U
C3-Naphthalenes	5000	U	C2-Naphthobenzothiophenes	5000	U
C4-Naphthalenes	5000	U	C3-Naphthobenzothiophenes	5000	U
Biphenyl	5000	U	C4-Naphthobenzothiophenes	5000	U
Dibenzofuran	5000	U	Benz[a]anthracene	5000	U
Acenaphthylene	5000	U	Chrysene/Triphenylene	5000	U
Acenaphthene	5000	U	C1-Chrysenes	5000	U
Fluorene	5000	U	C2-Chrysenes	5000	U
C1-Fluorenes	5000	U	C3-Chrysenes	5000	U
C2-Fluorenes	5000	U	C4-Chrysenes	5000	U
C3-Fluorenes	5000	U	Benzo[b]fluoranthene	5000	U
Anthracene	5000	U	Benzo[j]fluoranthene/Benzo[k]fluoranthene	5000	U
Phenanthrene	5000	U	Benzo[a]fluoranthene	5000	U
C1-Phenanthrenes/Anthracenes	5000	U	Benzo[e]pyrene	5000	U
C2-Phenanthrenes/Anthracenes	5000	U	Benzo[a]pyrene	5000	U
C3-Phenanthrenes/Anthracenes	5000	U	Perylene	5000	U
C4-Phenanthrenes/Anthracenes	5000	U	Indeno[1,2,3-cd]pyrene	5000	U
Retene	5000	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	5000	U
Dibenzothiophene	5000	U	Benzo[g,h,i]perylene	5000	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	72	50-130
Phenanthrene-d10	95	50-130
Benzo[a]pyrene-d12	80	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 12:08

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011612.D
Acq On : 2 Dec 2016 2:18 am
Operator : AC
Sample : 1611004-08-RE
Misc : 500x
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Dec 07 09:51:24 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.054	164	56508M4	500.000	ng/ml	-0.06
71) Chrysene-d12	43.510	240	88265	500.000	ng/ml	-0.08
System Monitoring Compounds						
8) Naphthalene-d8	20.069	136	1754	7.236	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.72%#			
40) Phenanthrene-d10	32.925	188	1761	9.481	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.95%#			
80) Benzo[b]fluoranthene-d12	47.440	264	1635	8.893	ng/ml	-0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.89%#			
85) Benzo[a]pyrene-d12	48.660	264	1185	8.007	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.80%#			
126) 5B(H)Cholane - Surr	44.112	217	263	9.175	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.92%#			
Target Compounds						Qvalue
9) Naphthalene	20.144	128	2444318	9169.487	ng/ml	100
10) C1-Naphthalenes	22.839	142	369360M5	1385.598	ng/ml	
14) 2-Methylnaphthalene	22.839	142	204289	1205.427	ng/ml	100
15) 1-Methylnaphthalene	23.260	142	164689	1025.820	ng/ml	100

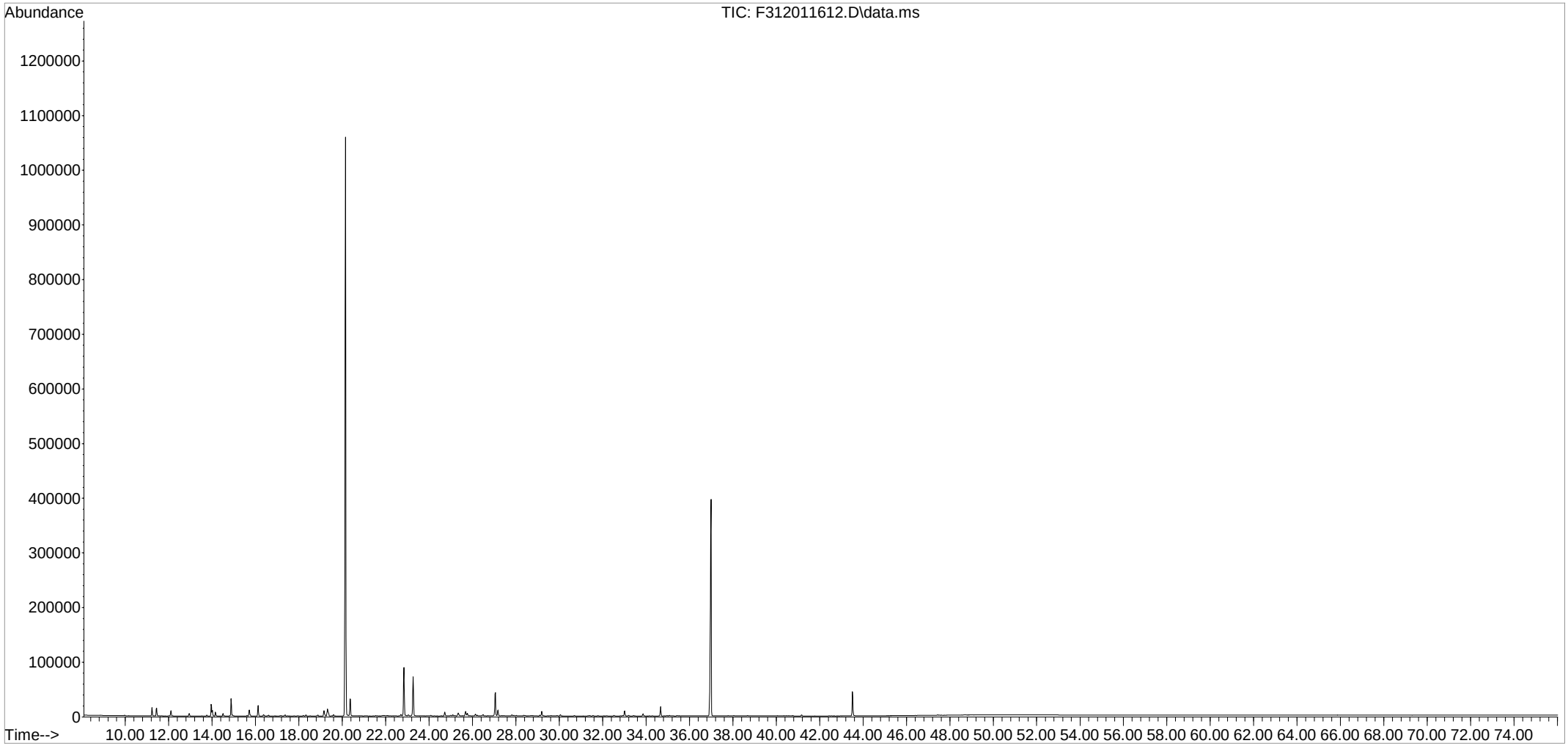
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011612.D
Acq On : 2 Dec 2016 2:18 am
Operator : AC
Sample : 1611004-08-RE
Misc : 500x
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Dec 07 09:51:24 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/30/16	1000	1	10	AC

Parameter	Result	
cis/trans-Decalin	**195**	
C1-Decalins	**185**	
C2-Decalins	**344**	G
C3-Decalins	**319**	
C4-Decalins	**674**	
Benzothiophene	**99900**	
C1-Benzo(b)thiophenes	**39800**	
C2-Benzo(b)thiophenes	**9120**	
C3-Benzo(b)thiophenes	**2290**	
C4-Benzo(b)thiophenes	**1090**	
Naphthalene	**2500000**	E
C1-Naphthalenes	**534000**	E
C2-Naphthalenes	**81900**	
C3-Naphthalenes	**11700**	
C4-Naphthalenes	**4220**	
Biphenyl	**24500**	
Dibenzofuran	**5790**	
Acenaphthylene	**3490**	
Acenaphthene	**33500**	
Fluorene	**27300**	
C1-Fluorenes	**5460**	
C2-Fluorenes	**1360**	
C3-Fluorenes	**584**	G
Anthracene	**2900**	
Phenanthrene	**28500**	
C1-Phenanthrenes/Anthracenes	**6240**	
C2-Phenanthrenes/Anthracenes	**1480**	
C3-Phenanthrenes/Anthracenes	**555**	
C4-Phenanthrenes/Anthracenes	**254**	
Retene	100	U
Dibenzothiophene	**4180**	

Parameter	Result	
C1-Dibenzothiophenes	**2470**	
C2-Dibenzothiophenes	**772**	
C3-Dibenzothiophenes	**378**	
C4-Dibenzothiophenes	**139**	
Benzo(b)fluorene	**230**	
Fluoranthene	**1370**	
Pyrene	**1910**	
C1-Fluoranthenes/Pyrenes	**1450**	
C2-Fluoranthenes/Pyrenes	**483**	
C3-Fluoranthenes/Pyrenes	**208**	
C4-Fluoranthenes/Pyrenes	100	U
Naphthobenzothiophenes	**126**	
C1-Naphthobenzothiophenes	**181**	
C2-Naphthobenzothiophenes	**92.2**	J
C3-Naphthobenzothiophenes	100	U
C4-Naphthobenzothiophenes	100	U
Benz[a]anthracene	**331**	
Chrysene/Triphenylene	**348**	
C1-Chrysenes	**419**	
C2-Chrysenes	**222**	
C3-Chrysenes	100	U
C4-Chrysenes	100	U
Benzo[b]fluoranthene	**112**	
Benzo[j]fluoranthene/Benzo[k]fluoranthene	**157**	
Benzo[a]fluoranthene	**95.7**	J
Benzo[e]pyrene	**134**	
Benzo[a]pyrene	**264**	
Perylene	**40.7**	J
Indeno[1,2,3-cd]pyrene	**73.5**	J
Dibenz[ah]anthracene/Dibenz[ac]anthracene	**34.5**	J
Benzo[g,h,i]perylene	**88.2**	J

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	75	50-130
Phenanthrene-d10	99	50-130
Benzo[a]pyrene-d12	97	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
E - Estimated value, exceeds the upper limit of calibration.
N/A - Not Applicable
G - Matrix Interference

12/07/16 12:10

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/30/16	1000	1	10	AC

Parameter	Result
Carbazole	**20500**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	75	50-130
Phenanthrene-d10	99	50-130
Benzo[a]pyrene-d12	97	50-130

N/A - Not Applicable

12/07/16 11:29

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/30/16	1000	1	10	AC

Parameter	Result
4-Methyldibenzothiophene	**480**
2/3-Methyldibenzothiophene	**1210**
1-Methyldibenzothiophene	**170**
3-Methylphenanthrene	**1680**
2-Methylphenanthrene	**1580**
2-Methylanthracene	**373**
9/4-Methylphenanthrene	**1520**
1-Methylphenanthrene	**1030**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	75	50-130
Phenanthrene-d10	99	50-130
Benzo[a]pyrene-d12	97	50-130

N/A - Not Applicable

12/07/16 11:29

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/30/16	1000	1	10	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	100	U
C28,20S-triaromatic steroid	100	U
C27,20R-triaromatic steroid	100	U
C28,20R-triaromatic steroid	100	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	86	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:29

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281633.D
Acq On : 30 Nov 2016 1:46 pm
Operator : AC
Sample : 1611004-09
Misc : 10x
ALS Vial : 33 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:42:55 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	59997M4	500.000	ng/ml	-0.01
71) Chrysene-d12	43.570	240	117373	500.000	ng/ml	-0.01
System Monitoring Compounds						
8) Naphthalene-d8	20.189	136	96325	374.298	ng/ml	0.08
Spiked Amount 1000.000	Range 50 - 130		Recovery = 37.43%#			
40) Phenanthrene-d10	32.970	188	97970	496.778	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.68%#			
80) Benzo[b]fluoranthene-d12	47.485	264	120134	491.383	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.14%#			
85) Benzo[a]pyrene-d12	48.705	264	95893	487.261	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.73%#			
126) 5B(H)Cholane - Surr	44.157	217	16297	427.549	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.75%#			
Target Compounds						Qvalue
2) trans-Decalin	16.757	138	623M4	11.985	ng/ml	
3) cis-Decalin	17.976	138	295M4	7.555	ng/ml	
4) C1-Decalins	18.699	152	962M5	18.507	ng/ml	
5) C2-Decalins	20.325	166G	1786M5	34.360	ng/ml	
6) C3-Decalins	22.553	180	1658M5	31.897	ng/ml	
7) C4-Decalins	24.916	194	3506M5	67.449	ng/ml	
9) Naphthalene	20.265	128	70627879M4	249542.147	ng/ml	
10) C1-Naphthalenes	22.914	142	15115800M5	53407.086	ng/ml	
11) C2-Naphthalenes	25.744	156	2317304M5	8187.489	ng/ml	
12) C3-Naphthalenes	28.409	170	331877M5	1172.587	ng/ml	
13) C4-Naphthalenes	29.613	184	119438M5	421.998	ng/ml	
14) 2-Methylnaphthalene	22.914	142	8735694	48548.264	ng/ml	100
15) 1-Methylnaphthalene	23.351	142	6393117	37505.903	ng/ml	100
16) Benzothiophene	20.460	134	2503259	9986.668	ng/ml	100
17) C1-Benzo(b)thiophenes	22.764	148	997935M5	3981.228	ng/ml	
18) C2-Benzo(b)thiophenes	25.458	162	228697M5	912.379	ng/ml	
19) C3-Benzo(b)thiophenes	27.551	176	57434M5	229.131	ng	
20) C4-Benzo(b)thiophenes	29.689	190	27296M5	108.896	ng/ml	
21) Biphenyl	24.781	154	558954	2446.904	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.398	156	524574	3359.069	ng/ml	100
23) Dibenzofuran	27.867	168	138933M4	579.427	ng/ml	
24) Acenaphthylene	26.497	152	95548M3	348.559	ng/ml	
25) Acenaphthene	27.220	153	560835	3345.899	ng/ml	99
26) 2,3,5-Trimethylnaphthalen	28.770	170	19847M3	147.905	ng/ml	
27) Fluorene	29.237	166	499950M4	2732.033	ng/ml	
28) C1-Fluorenes	31.465	180	99985M5	546.379	ng/ml	
29) C2-Fluorenes	33.648	194	24829M5	135.681	ng/ml	
30) C3-Fluorenes	36.313	208G	10684M5	58.384	ng/ml	
31) Dibenzothiophene	32.579	184	112973	418.377	ng/ml	96
32) 4-Methyldibenzothiophene(	34.340	198	12949M3	47.955	ng/ml	
33) 2/3-Methyldibenzothiophen	34.717	198	32620M3	120.803	ng/ml	
34) 1-Methyldibenzothiophene(	35.108	198	4589M4	16.995	ng/ml	
35) OTP	34.732	198	11377M3	42.133	ng/ml	
36) C1-Dibenzothiophenes	34.732	198	78036M5	288.994	ng/ml	
36) C1-Dibenzothiophenes BS	34.732	198	66659M5	246.861	ng/ml	
37) C2-Dibenzothiophenes	36.478	212	20833M5	77.152	ng/ml	
38) C3-Dibenzothiophenes	39.008	226	10200M5	37.774	ng/ml	
39) C4-Dibenzothiophenes	39.911	240	3757M5	13.913	ng/ml	
41) Phenanthrene	33.061	178	731041	2849.915	ng/ml	99
42) 3-Methylphenanthrene(3MP)	35.018	192	43180	168.334	ng/ml	96
43) 2-Methylphenanthrene(2MP)	35.138	192	40441	157.657	ng/ml	94
44) 2-Methylanthracene(2MA)	35.289	192	9577	37.335	ng/ml#	40
45) 9/4-Methylphenanthrene(9M	35.485	192	38996	152.023	ng/ml	85
46) 1-Methylphenanthrene(1MP)	35.575	192	26323	102.618	ng/ml	93

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281633.D
Acq On : 30 Nov 2016 1:46 pm
Operator : AC
Sample : 1611004-09
Misc : 10x
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Dec 07 09:42:55 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
47) C1-Phenanthrenes/Anthrace	35.018	192	160107M5	624.167	ng/ml	
48) C2-Phenanthrenes/Anthrace	36.990	206	42608M5	166.104	ng/ml	
48) C2-Phenanthrenes/Anthr BS	36.990	206	38024M5	148.234	ng/ml	
49) 5AA IS BKGD	37.035	206	4584M3	17.870	ng/ml	
50) C3-Phenanthrenes/Anthrace	39.023	220	14242M5	55.522	ng/ml	
51) C4-Phenanthrenes/Anthrace	40.257	234	6511M5	25.383	ng/ml	
53) Anthracene	33.241	178	70548M4	289.787	ng/ml	
54) Carbazole	33.919	167	486736M4	2046.519	ng/ml	
55) 1-Methylphenanthrene	35.575	192	26323	139.142	ng/ml	98
56) Fluoranthene	37.833	202	39001M4	136.988	ng/ml	
57) Benzo(b)fluorene	40.363	216	3879M3	22.994	ng/ml	
58) Pyrene	38.722	202	58843	190.662	ng/ml	95
59) C1-Fluoranthenes/Pyrenes	40.107	216	44805M5	145.176	ng/ml	
60) C2-Fluoranthenes/Pyrenes	41.778	230	14915M5	48.327	ng/ml	
61) C3-Fluoranthenes/Pyrenes	43.841	244	6408M5	20.763	ng/ml	
63) Naphthobenzothiophene	42.576	234	1695	6.337	ng/ml#	82
64) Naphthobenzothiophene-2,1	42.576	234	1695	6.337	ng/ml#	82
65) Naphthobenzothiophene-1,2	42.922	234	933M4	3.488	ng/ml	
66) Naphthobenzothiophene-2,3	43.208	234	741M3	2.770	ng/ml	
67) C1-Naphthobenzothiophenes	43.961	248	4833M5	18.068	ng/ml	
68) C2-Naphthobenzothiophenes	45.467	262	2465M5	9.215	ng/ml	
72) Benz[a]anthracene	43.495	228	10751M3	33.057	ng/ml	
74) Chrysene/Triphenylene	43.660	228	10606	34.773	ng/ml	96
75) C1-Chrysenes	45.136	242	12792M5	41.940	ng/ml	
76) C2-Chrysenes	47.485	256	10894M5	35.717	ng/ml	
76) C2-Chrysenes BS	47.485	256	6777M5	22.219	ng/ml	
77) BBF-D12 Surr BKGD	47.485	256	4117	13.498	ng/ml	100
81) Benzo[b]fluoranthene	47.560	252	3705	11.197	ng/ml	92
82) Benzo[j]+[k]fluoranthene	47.635	252	4792	15.710	ng/ml	97
83) Benzo[a]fluoranthene	47.967	252	2920	9.573	ng/ml#	1
84) Benzo[e]pyrene	48.599	252	4124	13.403	ng/ml	99
86) Benzo[a]pyrene	48.795	252	7740M4	26.364	ng/ml	
87) Perylene	49.111	252	1211M4	4.074	ng/ml	
88) Indeno[1,2,3-cd]pyrene	53.795	276	2788M3	7.354	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.855	278	1116M4	3.449	ng/ml	
90) Benzo[g,h,i]perylene	55.150	276	3235	8.822	ng/ml	93

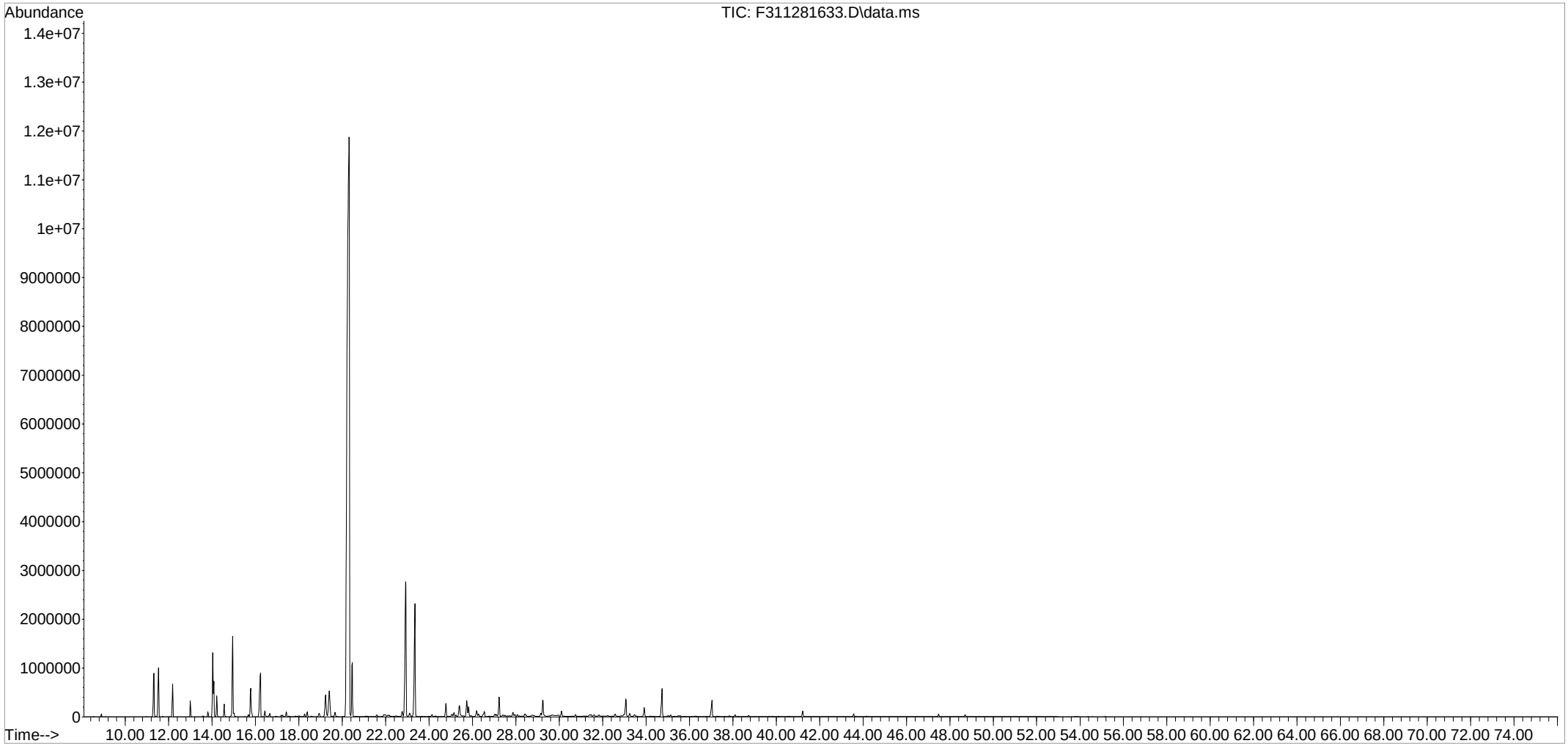
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281633.D
Acq On : 30 Nov 2016 1:46 pm
Operator : AC
Sample : 1611004-09
Misc : 10x
ALS Vial : 33 Sample Multiplier: 1

Quant Time: Dec 07 09:42:55 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09E**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	12/02/16	1000	1	500	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	5000	U	C1-Dibenzothiophenes	5000	U
C1-Decalins	5000	U	C2-Dibenzothiophenes	5000	U
C2-Decalins	5000	U	C3-Dibenzothiophenes	5000	U
C3-Decalins	5000	U	C4-Dibenzothiophenes	5000	U
C4-Decalins	5000	U	Benzo(b)fluorene	5000	U
Benzothiophene	5000	U	Fluoranthene	5000	U
C1-Benzo(b)thiophenes	5000	U	Pyrene	5000	U
C2-Benzo(b)thiophenes	5000	U	C1-Fluoranthenes/Pyrenes	5000	U
C3-Benzo(b)thiophenes	5000	U	C2-Fluoranthenes/Pyrenes	5000	U
C4-Benzo(b)thiophenes	5000	U	C3-Fluoranthenes/Pyrenes	5000	U
Naphthalene	**4520000**		C4-Fluoranthenes/Pyrenes	5000	U
C1-Naphthalenes	**697000**		Naphthobenzothiophenes	5000	U
C2-Naphthalenes	5000	U	C1-Naphthobenzothiophenes	5000	U
C3-Naphthalenes	5000	U	C2-Naphthobenzothiophenes	5000	U
C4-Naphthalenes	5000	U	C3-Naphthobenzothiophenes	5000	U
Biphenyl	5000	U	C4-Naphthobenzothiophenes	5000	U
Dibenzofuran	5000	U	Benz[a]anthracene	5000	U
Acenaphthylene	5000	U	Chrysene/Triphenylene	5000	U
Acenaphthene	5000	U	C1-Chrysenes	5000	U
Fluorene	5000	U	C2-Chrysenes	5000	U
C1-Fluorenes	5000	U	C3-Chrysenes	5000	U
C2-Fluorenes	5000	U	C4-Chrysenes	5000	U
C3-Fluorenes	5000	U	Benzo[b]fluoranthene	5000	U
Anthracene	5000	U	Benzo[j]fluoranthene/Benzo[k]fluoranthene	5000	U
Phenanthrene	5000	U	Benzo[a]fluoranthene	5000	U
C1-Phenanthrenes/Anthracenes	5000	U	Benzo[e]pyrene	5000	U
C2-Phenanthrenes/Anthracenes	5000	U	Benzo[a]pyrene	5000	U
C3-Phenanthrenes/Anthracenes	5000	U	Perylene	5000	U
C4-Phenanthrenes/Anthracenes	5000	U	Indeno[1,2,3-cd]pyrene	5000	U
Retene	5000	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	5000	U
Dibenzothiophene	5000	U	Benzo[g,h,i]perylene	5000	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	69	50-130
Phenanthrene-d10	94	50-130
Benzo[a]pyrene-d12	80	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 12:09

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011613.D
Acq On : 2 Dec 2016 3:44 am
Operator : AC
Sample : 1611004-09-RE
Misc : 500x
ALS Vial : 13 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:51:30 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.039	164	53085M4	500.000	ng/ml	-0.08
71) Chrysene-d12	43.509	240	82079	500.000	ng/ml	-0.08
System Monitoring Compounds						
8) Naphthalene-d8	20.069	136	1567	6.882	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.69%#			
40) Phenanthrene-d10	32.925	188	1634	9.364	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.94%#			
80) Benzo[b]fluoranthene-d12	47.439	264	1477	8.639	ng/ml	-0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.86%#			
85) Benzo[a]pyrene-d12	48.659	264	1099	7.986	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.80%#			
126) 5B(H)Cholane - Surr	44.112	217	174	6.528	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.65%#			
Target Compounds						Qvalue
9) Naphthalene	20.144	128	2263756	9039.722	ng/ml	100
10) C1-Naphthalenes	22.839	142	349241M5	1394.603	ng/ml	
14) 2-Methylnaphthalene	22.839	142	193649	1216.324	ng/ml	100
15) 1-Methylnaphthalene	23.260	142	155583	1031.589	ng/ml	100

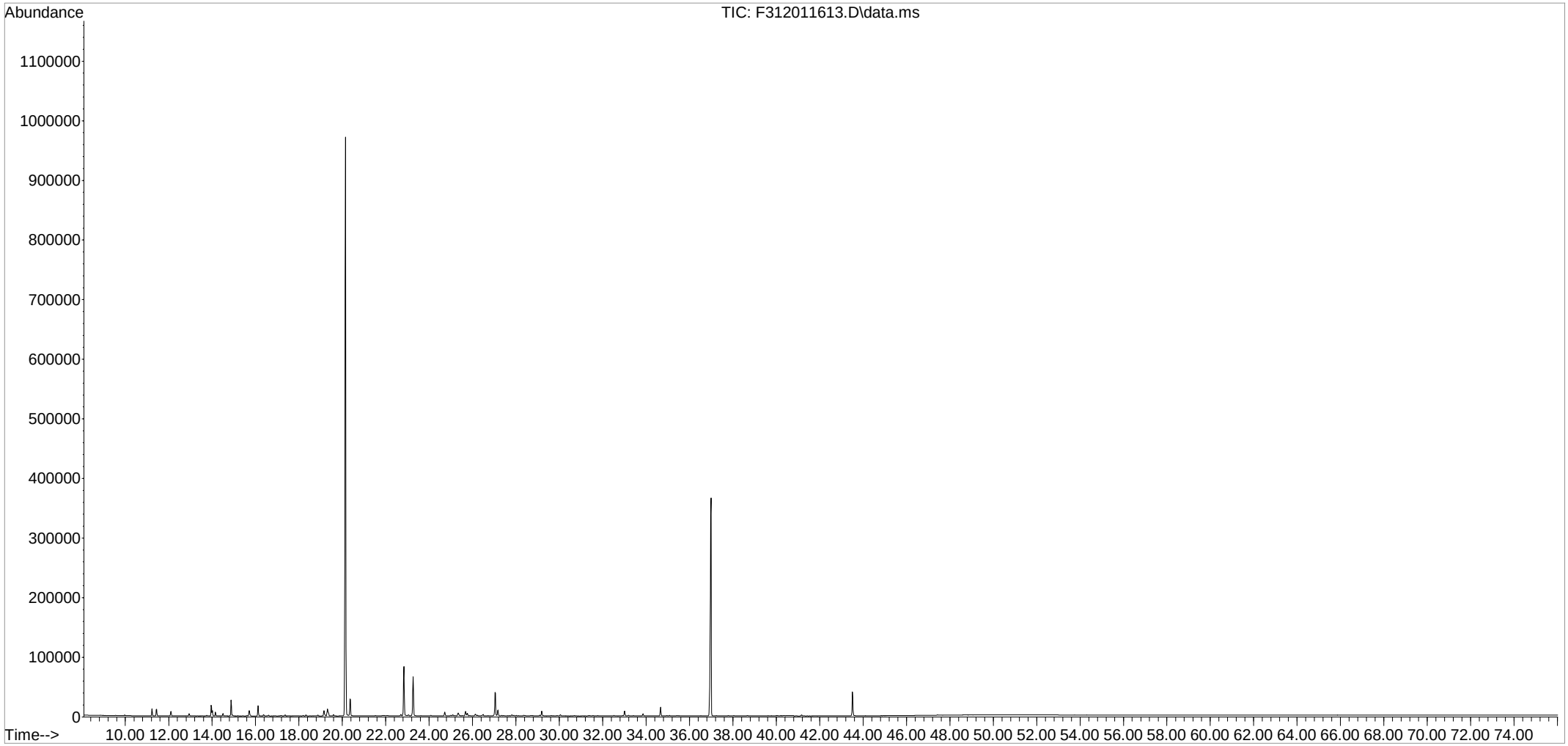
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011613.D
Acq On : 2 Dec 2016 3:44 am
Operator : AC
Sample : 1611004-09-RE
Misc : 500x
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Dec 07 09:51:30 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Duplicate
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09 D**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/30/16	1000	1	10	AC

Parameter	Result	
cis/trans-Decalin	**164**	
C1-Decalins	**146**	
C2-Decalins	**343**	G
C3-Decalins	**327**	
C4-Decalins	**703**	
Benzothiophene	**93200**	
C1-Benzo(b)thiophenes	**37700**	
C2-Benzo(b)thiophenes	**8690**	
C3-Benzo(b)thiophenes	**2220**	
C4-Benzo(b)thiophenes	**1020**	
Naphthalene	**2400000**	E
C1-Naphthalenes	**502000**	E
C2-Naphthalenes	**77900**	
C3-Naphthalenes	**11100**	
C4-Naphthalenes	**4090**	
Biphenyl	**23500**	
Dibenzofuran	**5580**	
Acenaphthylene	**3310**	
Acenaphthene	**32500**	
Fluorene	**26500**	
C1-Fluorenes	**5220**	
C2-Fluorenes	**1180**	
C3-Fluorenes	**551**	G
Anthracene	**2730**	
Phenanthrene	**27800**	
C1-Phenanthrenes/Anthracenes	**5840**	
C2-Phenanthrenes/Anthracenes	**1390**	
C3-Phenanthrenes/Anthracenes	**460**	
C4-Phenanthrenes/Anthracenes	**264**	
Retene	100	U
Dibenzothiophene	**4070**	

Parameter	Result	
C1-Dibenzothiophenes	**2400**	
C2-Dibenzothiophenes	**720**	
C3-Dibenzothiophenes	**310**	
C4-Dibenzothiophenes	**149**	
Benzo(b)fluorene	**202**	
Fluoranthene	**1280**	
Pyrene	**1770**	
C1-Fluoranthenes/Pyrenes	**1270**	
C2-Fluoranthenes/Pyrenes	**432**	
C3-Fluoranthenes/Pyrenes	**205**	
C4-Fluoranthenes/Pyrenes	100	U
Naphthobenzothiophenes	**102**	
C1-Naphthobenzothiophenes	**137**	
C2-Naphthobenzothiophenes	**82.6**	J
C3-Naphthobenzothiophenes	100	U
C4-Naphthobenzothiophenes	100	U
Benz[a]anthracene	**275**	
Chrysene/Triphenylene	**277**	
C1-Chrysenes	**329**	
C2-Chrysenes	**157**	
C3-Chrysenes	100	U
C4-Chrysenes	100	U
Benzo[b]fluoranthene	**91.5**	J
Benzo[j]fluoranthene/Benzo[k]fluoranthene	**120**	
Benzo[a]fluoranthene	**77.4**	J
Benzo[e]pyrene	**102**	
Benzo[a]pyrene	**206**	
Perylene	**33.4**	J
Indeno[1,2,3-cd]pyrene	**57.1**	J
Dibenz[ah]anthracene/Dibenz[ac]anthracene	**24.8**	J
Benzo[g,h,i]perylene	**62.4**	J

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	64	50-130
Phenanthrene-d10	96	50-130
Benzo[a]pyrene-d12	93	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
E - Estimated value, exceeds the upper limit of calibration.
N/A - Not Applicable
G - Matrix Interference

12/07/16 12:11

Form I
Duplicate
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09 D**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/30/16	1000	1	10	AC

Parameter	Result
Carbazole	**20000**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	64	50-130
Phenanthrene-d10	96	50-130
Benzo[a]pyrene-d12	93	50-130

N/A - Not Applicable

12/07/16 11:29

Form I
Duplicate
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09 D**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/30/16	1000	1	10	AC

Parameter	Result
4-Methyldibenzothiophene	**471**
2/3-Methyldibenzothiophene	**1150**
1-Methyldibenzothiophene	**155**
3-Methylphenanthrene	**1610**
2-Methylphenanthrene	**1460**
2-Methylanthracene	**332**
9/4-Methylphenanthrene	**1420**
1-Methylphenanthrene	**988**

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	64	50-130
Phenanthrene-d10	96	50-130
Benzo[a]pyrene-d12	93	50-130

N/A - Not Applicable

12/07/16 11:29

Form I
Duplicate
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09 D**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/30/16	1000	1	10	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	100	U
C28,20S-triaromatic steroid	100	U
C27,20R-triaromatic steroid	100	U
C28,20R-triaromatic steroid	100	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	83	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:30

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281634.D
Acq On : 30 Nov 2016 3:12 pm
Operator : AC
Sample : 1611004-09d
Misc : 10x
ALS Vial : 34 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:43:00 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	59292M4	500.000	ng/ml	-0.02
71) Chrysene-d12	43.570	240	116389	500.000	ng/ml	-0.02
System Monitoring Compounds						
8) Naphthalene-d8	20.189	136	81202	319.285	ng/ml	0.08
Spiked Amount 1000.000	Range 50 - 130		Recovery = 31.93%#			
40) Phenanthrene-d10	32.970	188	93580	480.160	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.02%#			
80) Benzo[b]fluoranthene-d12	47.485	264	114093	470.619	ng/ml	0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.06%#			
85) Benzo[a]pyrene-d12	48.705	264	90431	463.392	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 46.34%#			
126) 5B(H)Cholane - Surr	44.157	217	15594	412.565	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 41.26%#			
Target Compounds						Qvalue
2) trans-Decalin	16.757	138	498M4	9.695	ng/ml	
3) cis-Decalin	17.946	138	260M4	6.738	ng/ml	
4) C1-Decalins	18.699	152	750M5	14.600	ng/ml	
5) C2-Decalins	20.310	166G	1762M5	34.301	ng/ml	
6) C3-Decalins	22.538	180	1681M5	32.724	ng/ml	
7) C4-Decalins	24.916	194	3609M5	70.256	ng/ml	
9) Naphthalene	20.264	128	67257893	240460.882	ng/ml	100
10) C1-Naphthalenes	22.914	142	14040915M5	50199.176	ng/ml	
11) C2-Naphthalenes	25.729	156	2179199M5	7791.087	ng/ml	
12) C3-Naphthalenes	28.409	170	311387M5	1113.273	ng/ml	
13) C4-Naphthalenes	29.613	184	114428M5	409.104	ng/ml	
14) 2-Methylnaphthalene	22.914	142	8050230	45270.784	ng/ml	100
15) 1-Methylnaphthalene	23.351	142	6002188	35631.164	ng/ml	100
16) Benzothiophene	20.445	134	2309929	9324.958	ng/ml	100
17) C1-Benzo(b)thiophenes	22.763	148	933386M5	3767.988	ng/ml	
18) C2-Benzo(b)thiophenes	25.458	162	215185M5	868.681	ng/ml	
19) C3-Benzo(b)thiophenes	27.551	176	55123M5	222.526	ng	
20) C4-Benzo(b)thiophenes	29.689	190	25353M5	102.348	ng/ml	
21) Biphenyl	24.781	154	529327	2344.760	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.398	156	488629	3166.101	ng/ml	100
23) Dibenzofuran	27.867	168	132211M4	557.949	ng/ml	
24) Acenaphthylene	26.497	152	89643M3	330.906	ng/ml	
25) Acenaphthene	27.220	153	538145	3248.706	ng/ml	99
26) 2,3,5-Trimethylnaphthalen	28.770	170	18588M3	140.170	ng/ml	
27) Fluorene	29.237	166	479425M4	2651.022	ng/ml	
28) C1-Fluorenes	31.465	180	94429M5	522.153	ng/ml	
29) C2-Fluorenes	33.648	194	21266M5	117.592	ng/ml	
30) C3-Fluorenes	36.313	208G	9957M5	55.058	ng/ml	
31) Dibenzothiophene	32.579	184	108614	407.017	ng/ml	96
32) 4-Methyldibenzothiophene(	34.340	198	12576M4	47.127	ng/ml	
33) 2/3-Methyldibenzothiophen	34.717	198	30775M3	115.325	ng/ml	
34) 1-Methyldibenzothiophene(	35.108	198	4140M4	15.514	ng/ml	
35) OTP	34.732	198	10535M3	39.479	ng/ml	
36) C1-Dibenzothiophenes	34.732	198	74639M5	279.700	ng/ml	
36) C1-Dibenzothiophenes BS	34.732	198	64104M5	240.221	ng/ml	
37) C2-Dibenzothiophenes	36.478	212	19213M5	71.998	ng/ml	
38) C3-Dibenzothiophenes	38.993	226	8271M5	30.995	ng/ml	
39) C4-Dibenzothiophenes	39.926	240	3965M5	14.858	ng/ml	
41) Phenanthrene	33.061	178	704707	2779.920	ng/ml	99
42) 3-Methylphenanthrene(3MP)	35.018	192	40733	160.683	ng/ml	97
43) 2-Methylphenanthrene(2MP)	35.138	192	37049	146.150	ng/ml	94
44) 2-Methylanthracene(2MA)	35.289	192	8413M3	33.188	ng/ml	
45) 9/4-Methylphenanthrene(9M	35.484	192	35982	141.941	ng/ml	84
46) 1-Methylphenanthrene(1MP)	35.575	192	25046	98.801	ng/ml	93

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281634.D
Acq On : 30 Nov 2016 3:12 pm
Operator : AC
Sample : 1611004-09d
Misc : 10x
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Dec 07 09:43:00 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
47) C1-Phenanthrenes/Anthrace	35.018	192	147915M5	583.493	ng/ml	
48) C2-Phenanthrenes/Anthrace	37.005	206	39583M5	156.147	ng/ml	
48) C2-Phenanthrenes/Anthr BS	37.005	206	35263M5	139.105	ng/ml	
49) 5AA IS BKGD	37.035	206	4320M3	17.041	ng/ml	
50) C3-Phenanthrenes/Anthrace	39.023	220	11657M5	45.984	ng/ml	
51) C4-Phenanthrenes/Anthrace	40.272	234	6687M5	26.379	ng/ml	
53) Anthracene	33.241	178	65674M4	272.974	ng/ml	
54) Carbazole	33.919	167	471172M4	2004.635	ng/ml	
55) 1-Methylphenanthrene	35.575	192	25046	133.966	ng/ml	97
56) Fluoranthene	37.833	202	36158M4	128.513	ng/ml	
57) Benzo(b)fluorene	40.363	216	3369M3	20.209	ng/ml	
58) Pyrene	38.721	202	54105	177.394	ng/ml	95
59) C1-Fluoranthenes/Pyrenes	40.107	216	38684M5	126.833	ng/ml	
60) C2-Fluoranthenes/Pyrenes	41.853	230	13166M5	43.167	ng/ml	
61) C3-Fluoranthenes/Pyrenes	43.946	244	6255M5	20.508	ng/ml	
63) Naphthobenzothiophene	42.576	234	1492	5.644	ng/ml#	82
64) Naphthobenzothiophene-2,1	42.576	234	1492	5.644	ng/ml#	82
65) Naphthobenzothiophene-1,2	42.922	234	752M3	2.845	ng/ml	
66) Naphthobenzothiophene-2,3	43.208	234	457M3	1.729	ng/ml	
67) C1-Naphthobenzothiophenes	43.976	248	3627M5	13.721	ng/ml	
68) C2-Naphthobenzothiophenes	46.024	262	2184M5	8.262	ng/ml	
72) Benz[a]anthracene	43.494	228	8872M3	27.510	ng/ml	
74) Chrysene/Triphenylene	43.660	228	8366	27.661	ng/ml	90
75) C1-Chrysenes	45.135	242	9961M5	32.934	ng/ml	
76) C2-Chrysenes	47.485	256	8501M5	28.107	ng/ml	
76) C2-Chrysenes BS	47.485	256	4737M5	15.662	ng/ml	
77) BBF-D12 Surr BKGD	47.485	256	3764	12.445	ng/ml	100
81) Benzo[b]fluoranthene	47.560	252	3003	9.152	ng/ml	91
82) Benzo[j]+[k]fluoranthene	47.620	252	3642	12.041	ng/ml	94
83) Benzo[a]fluoranthene	47.967	252	2340	7.736	ng/ml#	1
84) Benzo[e]pyrene	48.599	252	3117	10.216	ng/ml	93
86) Benzo[a]pyrene	48.795	252	5983	20.552	ng/ml	91
87) Perylene	49.111	252	983M3	3.335	ng/ml	
88) Indeno[1,2,3-cd]pyrene	53.795	276	2145M4	5.706	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.840	278	794M4	2.475	ng/ml	
90) Benzo[g,h,i]perylene	55.150	276	2269	6.240	ng/ml#	82

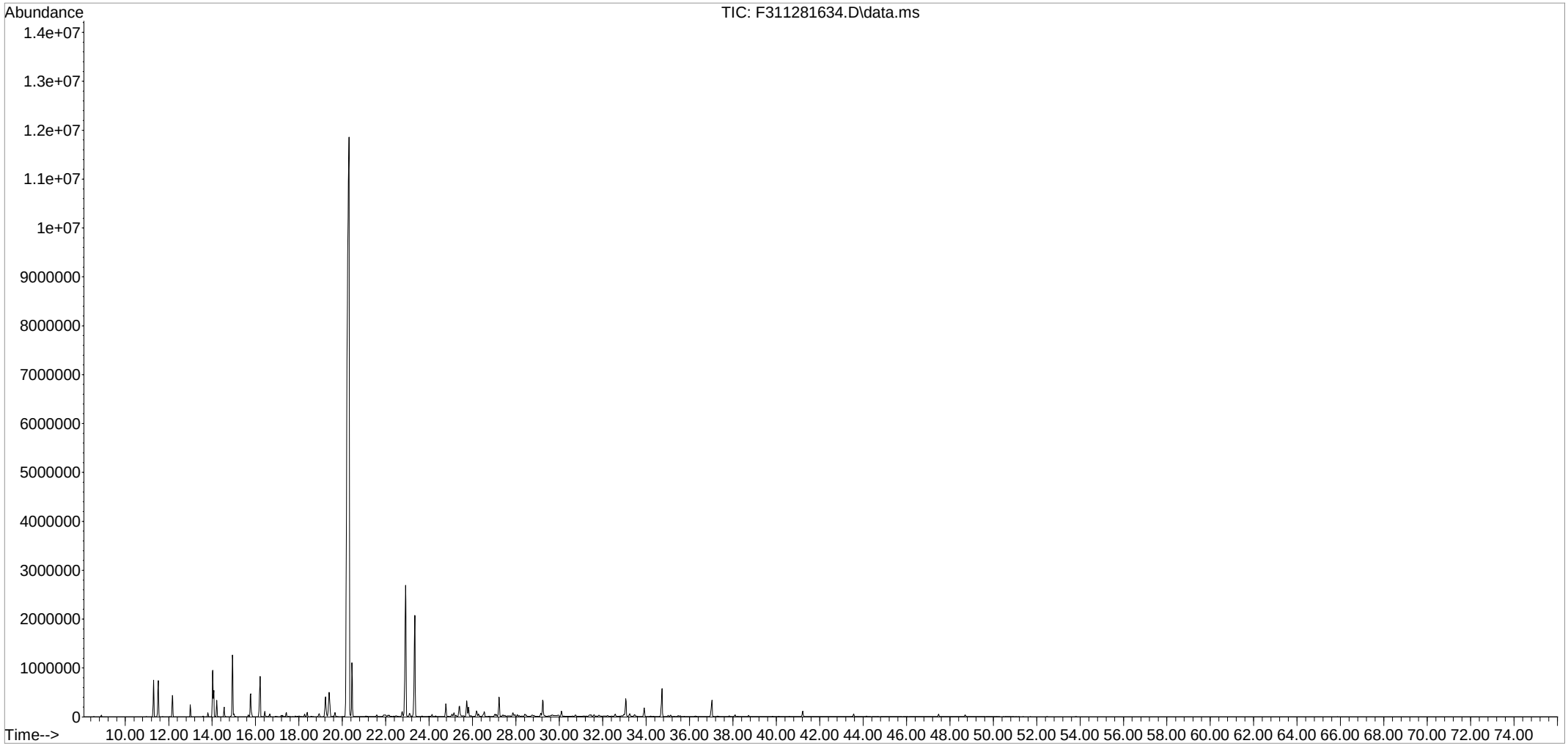
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281634.D
Acq On : 30 Nov 2016 3:12 pm
Operator : AC
Sample : 1611004-09d
Misc : 10x
ALS Vial : 34 Sample Multiplier: 1

Quant Time: Dec 07 09:43:00 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Duplicate
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09E D**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	12/02/16	1000	1	500	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	5000	U	C1-Dibenzothiophenes	5000	U
C1-Decalins	5000	U	C2-Dibenzothiophenes	5000	U
C2-Decalins	5000	U	C3-Dibenzothiophenes	5000	U
C3-Decalins	5000	U	C4-Dibenzothiophenes	5000	U
C4-Decalins	5000	U	Benzo(b)fluorene	5000	U
Benzothiophene	5000	U	Fluoranthene	5000	U
C1-Benzo(b)thiophenes	5000	U	Pyrene	5000	U
C2-Benzo(b)thiophenes	5000	U	C1-Fluoranthenes/Pyrenes	5000	U
C3-Benzo(b)thiophenes	5000	U	C2-Fluoranthenes/Pyrenes	5000	U
C4-Benzo(b)thiophenes	5000	U	C3-Fluoranthenes/Pyrenes	5000	U
Naphthalene	**5030000**		C4-Fluoranthenes/Pyrenes	5000	U
C1-Naphthalenes	**737000**		Naphthobenzothiophenes	5000	U
C2-Naphthalenes	5000	U	C1-Naphthobenzothiophenes	5000	U
C3-Naphthalenes	5000	U	C2-Naphthobenzothiophenes	5000	U
C4-Naphthalenes	5000	U	C3-Naphthobenzothiophenes	5000	U
Biphenyl	5000	U	C4-Naphthobenzothiophenes	5000	U
Dibenzofuran	5000	U	Benz[a]anthracene	5000	U
Acenaphthylene	5000	U	Chrysene/Triphenylene	5000	U
Acenaphthene	5000	U	C1-Chrysenes	5000	U
Fluorene	5000	U	C2-Chrysenes	5000	U
C1-Fluorenes	5000	U	C3-Chrysenes	5000	U
C2-Fluorenes	5000	U	C4-Chrysenes	5000	U
C3-Fluorenes	5000	U	Benzo[b]fluoranthene	5000	U
Anthracene	5000	U	Benzo[j]fluoranthene/Benzo[k]fluoranthene	5000	U
Phenanthrene	5000	U	Benzo[a]fluoranthene	5000	U
C1-Phenanthrenes/Anthracenes	5000	U	Benzo[e]pyrene	5000	U
C2-Phenanthrenes/Anthracenes	5000	U	Benzo[a]pyrene	5000	U
C3-Phenanthrenes/Anthracenes	5000	U	Perylene	5000	U
C4-Phenanthrenes/Anthracenes	5000	U	Indeno[1,2,3-cd]pyrene	5000	U
Retene	5000	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	5000	U
Dibenzothiophene	5000	U	Benzo[g,h,i]perylene	5000	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	81	50-130
Phenanthrene-d10	93	50-130
Benzo[a]pyrene-d12	75	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 12:09

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011614.D
Acq On : 2 Dec 2016 5:10 am
Operator : AC
Sample : 1611004-09d-RE
Misc : 500x
ALS Vial : 14 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:51:36 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.054	164	51336M4	500.000	ng/ml	-0.06
71) Chrysene-d12	43.510	240	78925	500.000	ng/ml	-0.08
System Monitoring Compounds						
8) Naphthalene-d8	20.069	136	1784	8.102	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.81%#			
40) Phenanthrene-d10	32.925	188	1569	9.298	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.93%#			
80) Benzo[b]fluoranthene-d12	47.440	264	1358	8.261	ng/ml	-0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.83%#			
85) Benzo[a]pyrene-d12	48.660	264	989	7.474	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.75%#			
126) 5B(H)Cholane - Surr	44.112	217	210	8.193	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.82%#			
Target Compounds						Qvalue
9) Naphthalene	20.144	128	2436698	10061.830	ng/ml	100
10) C1-Naphthalenes	22.839	142	357022M5	1474.247	ng/ml	
14) 2-Methylnaphthalene	22.839	142	198517	1289.382	ng/ml	100
15) 1-Methylnaphthalene	23.260	142	157590	1080.496	ng/ml	100

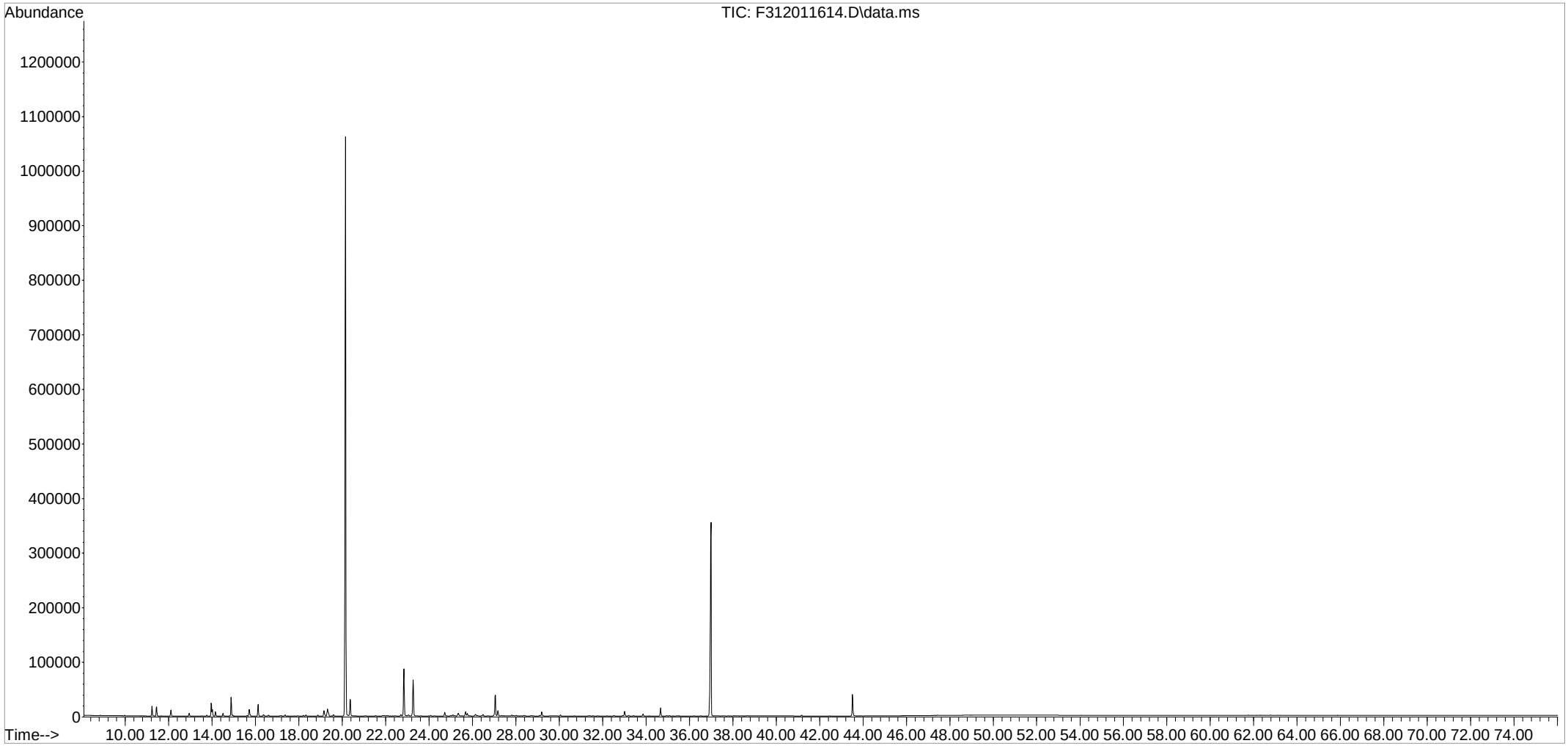
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011614.D
Acq On : 2 Dec 2016 5:10 am
Operator : AC
Sample : 1611004-09d-RE
Misc : 500x
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Dec 07 09:51:36 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Duplicate
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Analyst
11/01/16	11/02/16	11/07/16	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
cis/trans-Decalin	**195**	**164**	17	30
C1-Decalins	**185**	**146**	24	30
C2-Decalins	**344** G	**343** G	0	30
C3-Decalins	**319**	**327**	3	30
C4-Decalins	**674**	**703**	4	30
Benzothiophene	**99900**	**93200**	7	30
C1-Benzo(b)thiophenes	**39800**	**37700**	6	30
C2-Benzo(b)thiophenes	**9120**	**8690**	5	30
C3-Benzo(b)thiophenes	**2290**	**2220**	3	30
C4-Benzo(b)thiophenes	**1090**	**1020**	6	30
Naphthalene	**2500000** E	**2400000** E	4	30
C1-Naphthalenes	**534000** E	**502000** E	6	30
C2-Naphthalenes	**81900**	**77900**	5	30
C3-Naphthalenes	**11700**	**11100**	5	30
C4-Naphthalenes	**4220**	**4090**	3	30
Biphenyl	**24500**	**23500**	4	30
Dibenzofuran	**5790**	**5580**	4	30
Acenaphthylene	**3490**	**3310**	5	30
Acenaphthene	**33500**	**32500**	3	30
Fluorene	**27300**	**26500**	3	30
C1-Fluorenes	**5460**	**5220**	5	30
C2-Fluorenes	**1360**	**1180**	14	30
C3-Fluorenes	**584** G	**551** G	6	30
Anthracene	**2900**	**2730**	6	30
Phenanthrene	**28500**	**27800**	2	30
C1-Phenanthrenes/Anthracenes	**6240**	**5840**	7	30
C2-Phenanthrenes/Anthracenes	**1480**	**1390**	6	30
C3-Phenanthrenes/Anthracenes	**555**	**460**	19	30
C4-Phenanthrenes/Anthracenes	**254**	**264**	4	30
Retene	100 U	100 U	N/A	30
Dibenzothiophene	**4180**	**4070**	3	30
C1-Dibenzothiophenes	**2470**	**2400**	3	30
C2-Dibenzothiophenes	**772**	**720**	7	30
C3-Dibenzothiophenes	**378**	**310**	20	30
C4-Dibenzothiophenes	**139**	**149**	7	30

U - The analyte was analyzed for but not detected at the sample specific level reported.
E - Estimated value, exceeds the upper limit of calibration.
N/A - Not Applicable
G - Matrix Interference

12/07/16 12:11

Duplicate
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Analyst
11/01/16	11/02/16	11/07/16	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
Benzo(b)fluorene	**230**	**202**	13	30
Fluoranthene	**1370**	**1280**	6	30
Pyrene	**1910**	**1770**	7	30
C1-Fluoranthenes/Pyrenes	**1450**	**1270**	13	30
C2-Fluoranthenes/Pyrenes	**483**	**432**	11	30
C3-Fluoranthenes/Pyrenes	**208**	**205**	1	30
C4-Fluoranthenes/Pyrenes	100 U	100 U	N/A	30
Naphthobenzothiophenes	**126**	**102**	21	30
C1-Naphthobenzothiophenes	**181**	**137**	27	30
C2-Naphthobenzothiophenes	**92.2** J	**82.6** J	11	30
C3-Naphthobenzothiophenes	100 U	100 U	N/A	30
C4-Naphthobenzothiophenes	100 U	100 U	N/A	30
Benz[a]anthracene	**331**	**275**	18	30
Chrysene/Triphenylene	**348**	**277**	23	30
C1-Chrysenes	**419**	**329**	24	30
C2-Chrysenes	**222**	**157**	35[a]	30
C3-Chrysenes	100 U	100 U	N/A	30
C4-Chrysenes	100 U	100 U	N/A	30
Benzo[b]fluoranthene	**112**	**91.5** J	20	30
Benzo[j]fluoranthene/Benzo[k]fluoranthene	**157**	**120**	26	30
Benzo[a]fluoranthene	**95.7** J	**77.4** J	21	30
Benzo[e]pyrene	**134**	**102**	27	30
Benzo[a]pyrene	**264**	**206**	25	30
Perylene	**40.7** J	**33.4** J	20	30
Indeno[1,2,3-cd]pyrene	**73.5** J	**57.1** J	25	30
Dibenz[ah]anthracene/Dibenz[ac]anthracene	**34.5** J	**24.8** J	33[a]	30
Benzo[g,h,i]perylene	**88.2** J	**62.4** J	34[a]	30

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	75	64	50-130
Phenanthrene-d10	99	96	50-130
Benzo[a]pyrene-d12	97	93	50-130

[a] - Value outside of QC Limits.
U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 12:11

Duplicate
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Analyst
11/01/16	11/02/16	11/07/16	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
Carbazole	**20500**	**20000**	2	30

N/A - Not Applicable

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	75	64	50-130
Phenanthrene-d10	99	96	50-130
Benzo[a]pyrene-d12	97	93	50-130

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 11:33

Duplicate
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Analyst
11/01/16	11/02/16	11/07/16	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
4-Methyldibenzothiophene	**480**	**471**	2	30
2/3-Methyldibenzothiophene	**1210**	**1150**	5	30
1-Methyldibenzothiophene	**170**	**155**	9	30
3-Methylphenanthrene	**1680**	**1610**	5	30
2-Methylphenanthrene	**1580**	**1460**	8	30
2-Methylanthracene	**373**	**332**	12	30
9/4-Methylphenanthrene	**1520**	**1420**	7	30
1-Methylphenanthrene	**1030**	**988**	4	30

N/A - Not Applicable

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	75	64	50-130
Phenanthrene-d10	99	96	50-130
Benzo[a]pyrene-d12	97	93	50-130

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 11:33

Duplicate
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Analyst
11/01/16	11/02/16	11/07/16	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
C26,20R- +C27,20S- triaromatic steroid	100 U	100 U	N/A	30
C28,20S-triaromatic steroid	100 U	100 U	N/A	30
C27,20R-triaromatic steroid	100 U	100 U	N/A	30
C28,20R-triaromatic steroid	100 U	100 U	N/A	30

Surrogate	% Recovery		Acceptance Range (%)
5B(H)Cholane	86	83	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 12:14

Duplicate
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09E**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Analyst
11/01/16	11/02/16	11/07/16	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
cis/trans-Decalin	5000 U	5000 U	N/A	30
C1-Decalins	5000 U	5000 U	N/A	30
C2-Decalins	5000 U	5000 U	N/A	30
C3-Decalins	5000 U	5000 U	N/A	30
C4-Decalins	5000 U	5000 U	N/A	30
Benzothiophene	5000 U	5000 U	N/A	30
C1-Benzo(b)thiophenes	5000 U	5000 U	N/A	30
C2-Benzo(b)thiophenes	5000 U	5000 U	N/A	30
C3-Benzo(b)thiophenes	5000 U	5000 U	N/A	30
C4-Benzo(b)thiophenes	5000 U	5000 U	N/A	30
Naphthalene	**4520000**	**5030000**	11	30
C1-Naphthalenes	**697000**	**737000**	6	30
C2-Naphthalenes	5000 U	5000 U	N/A	30
C3-Naphthalenes	5000 U	5000 U	N/A	30
C4-Naphthalenes	5000 U	5000 U	N/A	30
Biphenyl	5000 U	5000 U	N/A	30
Dibenzofuran	5000 U	5000 U	N/A	30
Acenaphthylene	5000 U	5000 U	N/A	30
Acenaphthene	5000 U	5000 U	N/A	30
Fluorene	5000 U	5000 U	N/A	30
C1-Fluorenes	5000 U	5000 U	N/A	30
C2-Fluorenes	5000 U	5000 U	N/A	30
C3-Fluorenes	5000 U	5000 U	N/A	30
Anthracene	5000 U	5000 U	N/A	30
Phenanthrene	5000 U	5000 U	N/A	30
C1-Phenanthrenes/Anthracenes	5000 U	5000 U	N/A	30
C2-Phenanthrenes/Anthracenes	5000 U	5000 U	N/A	30
C3-Phenanthrenes/Anthracenes	5000 U	5000 U	N/A	30
C4-Phenanthrenes/Anthracenes	5000 U	5000 U	N/A	30
Retene	5000 U	5000 U	N/A	30
Dibenzothiophene	5000 U	5000 U	N/A	30
C1-Dibenzothiophenes	5000 U	5000 U	N/A	30
C2-Dibenzothiophenes	5000 U	5000 U	N/A	30
C3-Dibenzothiophenes	5000 U	5000 U	N/A	30
C4-Dibenzothiophenes	5000 U	5000 U	N/A	30

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 12:09

Duplicate
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09E**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Analyst
11/01/16	11/02/16	11/07/16	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
Benzo(b)fluorene	5000 U	5000 U	N/A	30
Fluoranthene	5000 U	5000 U	N/A	30
Pyrene	5000 U	5000 U	N/A	30
C1-Fluoranthenes/Pyrenes	5000 U	5000 U	N/A	30
C2-Fluoranthenes/Pyrenes	5000 U	5000 U	N/A	30
C3-Fluoranthenes/Pyrenes	5000 U	5000 U	N/A	30
C4-Fluoranthenes/Pyrenes	5000 U	5000 U	N/A	30
Naphthobenzothiophenes	5000 U	5000 U	N/A	30
C1-Naphthobenzothiophenes	5000 U	5000 U	N/A	30
C2-Naphthobenzothiophenes	5000 U	5000 U	N/A	30
C3-Naphthobenzothiophenes	5000 U	5000 U	N/A	30
C4-Naphthobenzothiophenes	5000 U	5000 U	N/A	30
Benz[a]anthracene	5000 U	5000 U	N/A	30
Chrysene/Triphenylene	5000 U	5000 U	N/A	30
C1-Chrysenes	5000 U	5000 U	N/A	30
C2-Chrysenes	5000 U	5000 U	N/A	30
C3-Chrysenes	5000 U	5000 U	N/A	30
C4-Chrysenes	5000 U	5000 U	N/A	30
Benzo[b]fluoranthene	5000 U	5000 U	N/A	30
Benzo[j]fluoranthene/Benzo[k]fluoranthene	5000 U	5000 U	N/A	30
Benzo[a]fluoranthene	5000 U	5000 U	N/A	30
Benzo[e]pyrene	5000 U	5000 U	N/A	30
Benzo[a]pyrene	5000 U	5000 U	N/A	30
Perylene	5000 U	5000 U	N/A	30
Indeno[1,2,3-cd]pyrene	5000 U	5000 U	N/A	30
Dibenz[ah]anthracene/Dibenz[ac]anthracene	5000 U	5000 U	N/A	30
Benzo[g,h,i]perylene	5000 U	5000 U	N/A	30

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	69	81	50-130
Phenanthrene-d10	94	93	50-130
Benzo[a]pyrene-d12	80	75	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 12:09

Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016B02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/29/16	100	0.10	20	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	2.00	U	C1-Dibenzothiophenes	2.00	U
C1-Decalins	2.00	U	C2-Dibenzothiophenes	2.00	U
C2-Decalins	2.00	U	C3-Dibenzothiophenes	2.00	U
C3-Decalins	2.00	U	C4-Dibenzothiophenes	2.00	U
C4-Decalins	2.00	U	Benzo(b)fluorene	**0.222**	J
Benzothiophene	2.00	U	Fluoranthene	**0.125**	J
C1-Benzo(b)thiophenes	2.00	U	Pyrene	**0.207**	J
C2-Benzo(b)thiophenes	2.00	U	C1-Fluoranthenes/Pyrenes	**1.44**	J
C3-Benzo(b)thiophenes	2.00	U	C2-Fluoranthenes/Pyrenes	2.00	U
C4-Benzo(b)thiophenes	2.00	U	C3-Fluoranthenes/Pyrenes	2.00	U
Naphthalene	**0.273**	J	C4-Fluoranthenes/Pyrenes	2.00	U
C1-Naphthalenes	**0.512**	J	Naphthobenzothiophenes	2.00	U
C2-Naphthalenes	**0.991**	J	C1-Naphthobenzothiophenes	2.00	U
C3-Naphthalenes	**1.22**	J	C2-Naphthobenzothiophenes	2.00	U
C4-Naphthalenes	2.00	U	C3-Naphthobenzothiophenes	2.00	U
Biphenyl	**0.149**	J	C4-Naphthobenzothiophenes	2.00	U
Dibenzofuran	**0.120**	J	Benz[a]anthracene	2.00	U
Acenaphthylene	**2.70**		Chrysene/Triphenylene	**0.149**	J
Acenaphthene	**0.464**	J	C1-Chrysenes	2.00	U
Fluorene	**0.341**	J	C2-Chrysenes	2.00	U
C1-Fluorenes	2.00	U	C3-Chrysenes	2.00	U
C2-Fluorenes	2.00	U	C4-Chrysenes	2.00	U
C3-Fluorenes	2.00	U	Benzo[b]fluoranthene	2.00	U
Anthracene	**0.143**	J	Benzo[j]fluoranthene/Benzo[k]fluoranthene	2.00	U
Phenanthrene	**0.357**	J	Benzo[a]fluoranthene	2.00	U
C1-Phenanthrenes/Anthracenes	**0.704**	J	Benzo[e]pyrene	2.00	U
C2-Phenanthrenes/Anthracenes	2.00	U	Benzo[a]pyrene	2.00	U
C3-Phenanthrenes/Anthracenes	2.00	U	Perylene	2.00	U
C4-Phenanthrenes/Anthracenes	2.00	U	Indeno[1,2,3-cd]pyrene	2.00	U
Retene	2.00	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	2.00	U
Dibenzothiophene	**0.178**	J	Benzo[g,h,i]perylene	2.00	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	103	50-130
Phenanthrene-d10	110	50-130
Benzo[a]pyrene-d12	108	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 11:28

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016B02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/29/16	100	0.10	20	1	AC

Parameter	Result
Carbazole	2.00 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	103	50-130
Phenanthrene-d10	110	50-130
Benzo[a]pyrene-d12	108	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:28

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016B02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/29/16	100	0.10	20	1	AC

Parameter	Result	
4-Methyldibenzothiophene	2.00	U
2/3-Methyldibenzothiophene	2.00	U
1-Methyldibenzothiophene	2.00	U
3-Methylphenanthrene	**0.141**	J
2-Methylphenanthrene	**0.140**	J
2-Methylanthracene	**0.115**	J
9/4-Methylphenanthrene	**0.161**	J
1-Methylphenanthrene	**0.117**	J

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	103	50-130
Phenanthrene-d10	110	50-130
Benzo[a]pyrene-d12	108	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 11:28

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016B02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/29/16	100	0.10	20	1	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	2.00	U
C28,20S-triaromatic steroid	2.00	U
C27,20R-triaromatic steroid	2.00	U
C28,20R-triaromatic steroid	2.00	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	96	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:28

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281617.D
Acq On : 29 Nov 2016 11:49 am
Operator : AC
Sample : so111016b02
Misc : 1x
ALS Vial : 17 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:42:19 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	57689M4	500.000	ng/ml	-0.02
71) Chrysene-d12	43.570	240	90179	500.000	ng/ml	-0.02
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	255717	1033.413	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 103.34%			
40) Phenanthrene-d10	32.970	188	208937	1101.846	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 110.18%			
80) Benzo[b]fluoranthene-d12	47.485	264	209205	1113.753	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 111.38%			
85) Benzo[a]pyrene-d12	48.705	264	162817	1076.805	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.68%			
126) 5B(H)Cholane - Surr	44.157	217	27993	955.851	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 95.59%			
Target Compounds						Qvalue
9) Naphthalene	20.204	128	371	1.363	ng/ml	100
10) C1-Naphthalenes	22.899	142	697M5	2.561	ng/ml	
11) C2-Naphthalenes	25.744	156	1348M5	4.953	ng/ml	
12) C3-Naphthalenes	29.207	170	1663M5	6.111	ng/ml	
14) 2-Methylnaphthalene	22.899	142	391	2.260	ng/ml	100
15) 1-Methylnaphthalene	23.320	142	230	1.403	ng/ml	100
21) Biphenyl	24.781	154	164M4	0.747	ng/ml	
22) 2,6-Dimethylnaphthalene	25.398	156	201	1.339	ng/ml	100
23) Dibenzofuran	27.867	168	138M4	0.599	ng/ml	
24) Acenaphthylene	26.497	152	3558M4	13.499	ng/ml	
25) Acenaphthene	27.220	153	374	2.321	ng/ml	95
27) Fluorene	29.252	166	300M3	1.705	ng/ml	
31) Dibenzothiophene	32.579	184	231	0.890	ng/ml#	78
41) Phenanthrene	33.061	178	440	1.784	ng/ml#	76
42) 3-Methylphenanthrene(3MP)	35.018	192	174M3	0.705	ng/ml	
43) 2-Methylphenanthrene(2MP)	35.138	192	173	0.701	ng/ml	98
44) 2-Methylanthracene(2MA)	35.289	192	142M3	0.576	ng/ml	
45) 9/4-Methylphenanthrene(9M	35.484	192	199	0.807	ng/ml	79
46) 1-Methylphenanthrene(1MP)	35.575	192	144M3	0.584	ng/ml	
47) C1-Phenanthrenes/Anthrace	35.138	192	868M5	3.519	ng/ml	
53) Anthracene	33.241	178	167	0.713	ng/ml#	59
55) 1-Methylphenanthrene	35.575	192	144M3	0.792	ng/ml	
56) Fluoranthene	37.848	202	171M4	0.625	ng/ml	
57) Benzo(b)fluorene	40.363	216	180M4	1.110	ng/ml	
58) Pyrene	38.737	202	307M4	1.035	ng/ml	
59) C1-Fluoranthenes/Pyrenes	40.122	216	2140M5	7.211	ng/ml	
74) Chrysene/Triphenylene	43.630	228	174M4	0.743	ng/ml	

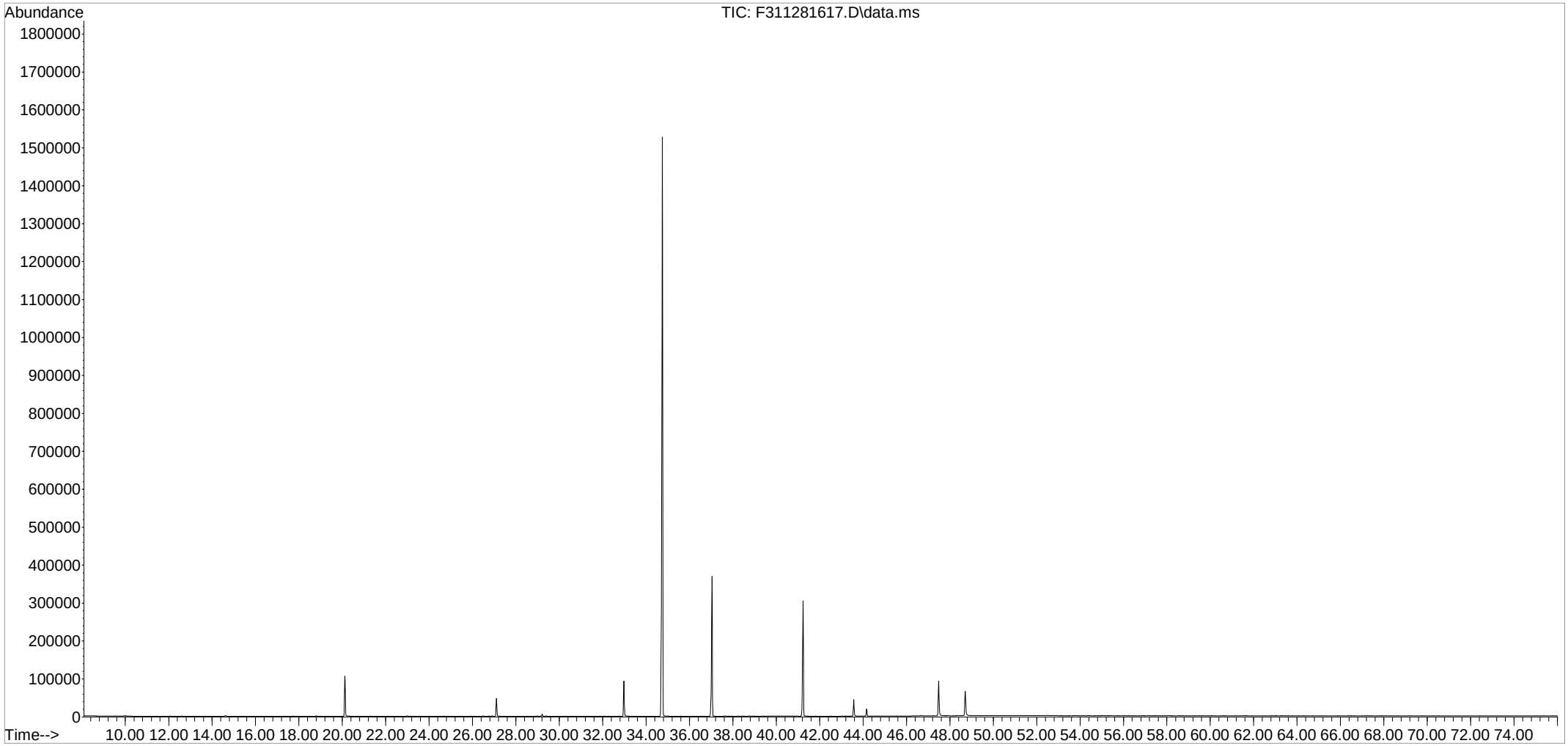
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281617.D
Acq On : 29 Nov 2016 11:49 am
Operator : AC
Sample : so111016b02
Misc : 1x
ALS Vial : 17 Sample Multiplier: 1

Quant Time: Dec 07 09:42:19 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116B03**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/28/16	100	0.0040	1	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	2.50	U	C1-Dibenzothiophenes	2.50	U
C1-Decalins	2.50	U	C2-Dibenzothiophenes	2.50	U
C2-Decalins	2.50	U	C3-Dibenzothiophenes	2.50	U
C3-Decalins	2.50	U	C4-Dibenzothiophenes	2.50	U
C4-Decalins	2.50	U	Benzo(b)fluorene	2.50	U
Benzothiophene	2.50	U	Fluoranthene	**0.295**	J
C1-Benzo(b)thiophenes	2.50	U	Pyrene	**0.386**	J
C2-Benzo(b)thiophenes	2.50	U	C1-Fluoranthenes/Pyrenes	**0.635**	J
C3-Benzo(b)thiophenes	2.50	U	C2-Fluoranthenes/Pyrenes	2.50	U
C4-Benzo(b)thiophenes	2.50	U	C3-Fluoranthenes/Pyrenes	2.50	U
Naphthalene	**3.07**		C4-Fluoranthenes/Pyrenes	2.50	U
C1-Naphthalenes	**1.85**	J	Naphthobenzothiophenes	2.50	U
C2-Naphthalenes	**1.10**	J	C1-Naphthobenzothiophenes	2.50	U
C3-Naphthalenes	2.50	U	C2-Naphthobenzothiophenes	2.50	U
C4-Naphthalenes	2.50	U	C3-Naphthobenzothiophenes	2.50	U
Biphenyl	**0.195**	J	C4-Naphthobenzothiophenes	2.50	U
Dibenzofuran	**0.0778**	J	Benz[a]anthracene	**0.208**	J
Acenaphthylene	**0.152**	J	Chrysene/Triphenylene	**0.289**	J
Acenaphthene	**0.423**	J	C1-Chrysenes	2.50	U
Fluorene	**0.276**	J	C2-Chrysenes	2.50	U
C1-Fluorenes	2.50	U	C3-Chrysenes	2.50	U
C2-Fluorenes	2.50	U	C4-Chrysenes	2.50	U
C3-Fluorenes	2.50	U	Benzo[b]fluoranthene	2.50	U
Anthracene	**0.220**	J	Benzo[j]fluoranthene/Benzo[k]fluoranthene	2.50	U
Phenanthrene	**0.847**	J	Benzo[a]fluoranthene	2.50	U
C1-Phenanthrenes/Anthracenes	**0.559**	J	Benzo[e]pyrene	**0.209**	J
C2-Phenanthrenes/Anthracenes	2.50	U	Benzo[a]pyrene	**0.199**	J
C3-Phenanthrenes/Anthracenes	2.50	U	Perylene	2.50	U
C4-Phenanthrenes/Anthracenes	2.50	U	Indeno[1,2,3-cd]pyrene	**0.134**	J
Retene	2.50	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	2.50	U
Dibenzothiophene	**0.152**	J	Benzo[g,h,i]perylene	**0.165**	J

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	106	50-130
Phenanthrene-d10	111	50-130
Benzo[a]pyrene-d12	112	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 11:27

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116B03**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/28/16	100	0.0040	1	1	AC

Parameter	Result
Carbazole	**0.0830** J

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	106	50-130
Phenanthrene-d10	111	50-130
Benzo[a]pyrene-d12	112	50-130

J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 11:27

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116B03**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/28/16	100	0.0040	1	1	AC

Parameter	Result	
4-Methyldibenzothiophene	2.50	U
2/3-Methyldibenzothiophene	2.50	U
1-Methyldibenzothiophene	2.50	U
3-Methylphenanthrene	**0.0920**	J
2-Methylphenanthrene	**0.107**	J
2-Methylanthracene	**0.0660**	J
9/4-Methylphenanthrene	**0.147**	J
1-Methylphenanthrene	**0.116**	J

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	106	50-130
Phenanthrene-d10	111	50-130
Benzo[a]pyrene-d12	112	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 11:27

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116B03**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/28/16	100	0.0040	1	1	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	2.50	U
C28,20S-triaromatic steroid	2.50	U
C27,20R-triaromatic steroid	2.50	U
C28,20R-triaromatic steroid	2.50	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	104	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:27

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281606.D
Acq On : 28 Nov 2016 5:52 pm
Operator : AC
Sample : so111116b03
Misc : 1x
ALS Vial : 6 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Dec 07 09:41:11 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	27.099	164	70003M4	500.000 ng/ml	-0.01
71) Chrysene-d12	43.570	240	105523	500.000 ng/ml	-0.01
System Monitoring Compounds					
8) Naphthalene-d8	20.114	136	318142	1059.527 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 105.95%		
40) Phenanthrene-d10	32.970	188	256173	1113.308 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 111.33%		
80) Benzo[b]fluoranthene-d12	47.470	264	251319	1143.406 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 114.34%		
85) Benzo[a]pyrene-d12	48.705	264	198501	1121.911 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 112.19%		
126) 5B(H)Cholane - Surr	44.157	217	35740	1042.927 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.29%		
Target Compounds					Qvalue
9) Naphthalene	20.189	128	4060	12.294 ng/ml	100
10) C1-Naphthalenes	22.884	142	2438M5	7.383 ng/ml	
11) C2-Naphthalenes	25.729	156	1454M5	4.403 ng/ml	
14) 2-Methylnaphthalene	22.884	142	1499	7.140 ng/ml	100
15) 1-Methylnaphthalene	23.321	142	954	4.797 ng/ml	100
21) Biphenyl	24.766	154	208	0.780 ng/ml	100
22) 2,6-Dimethylnaphthalene	25.383	156	297	1.630 ng/ml	100
23) Dibenzofuran	27.867	168	87M2	0.311 ng/ml	
24) Acenaphthylene	26.497	152	194	0.607 ng/ml	100
25) Acenaphthene	27.220	153	331	1.692 ng/ml	89
27) Fluorene	29.237	166	236M4	1.105 ng/ml	
31) Dibenzothiophene	32.564	184	191M4	0.606 ng/ml	
41) Phenanthrene	33.061	178	1014	3.388 ng/ml	91
42) 3-Methylphenanthrene(3MP)	35.003	192	110M3	0.368 ng/ml	
43) 2-Methylphenanthrene(2MP)	35.138	192	128M3	0.428 ng/ml	
44) 2-Methylanthracene(2MA)	35.289	192	79M3	0.264 ng/ml	
45) 9/4-Methylphenanthrene(9M	35.485	192	176M4	0.588 ng/ml	
46) 1-Methylphenanthrene(1MP)	35.575	192	139M3	0.464 ng/ml	
47) C1-Phenanthrenes/Anthrace	35.485	192	669M5	2.235 ng/ml	
53) Anthracene	33.241	178	250M3	0.880 ng/ml	
54) Carbazole	33.919	167	92M3	0.332 ng/ml	
55) 1-Methylphenanthrene	35.575	192	145M3	0.657 ng/ml	
56) Fluoranthene	37.833	202	392	1.180 ng/ml#	74
58) Pyrene	38.722	202	556	1.544 ng/ml#	72
59) C1-Fluoranthenes/Pyrenes	40.107	216	915M5	2.541 ng/ml	
72) Benz[a]anthracene	43.495	228	243	0.831 ng/ml#	28
74) Chrysene/Triphenylene	43.660	228	317	1.156 ng/ml#	60
84) Benzo[e]pyrene	48.599	252	231	0.835 ng/ml#	53
86) Benzo[a]pyrene	48.780	252	210	0.796 ng/ml#	28
88) Indeno[1,2,3-cd]pyrene	53.765	276	182	0.534 ng/ml#	55
90) Benzo[g,h,i]perylene	55.135	276	218M4	0.661 ng/ml	

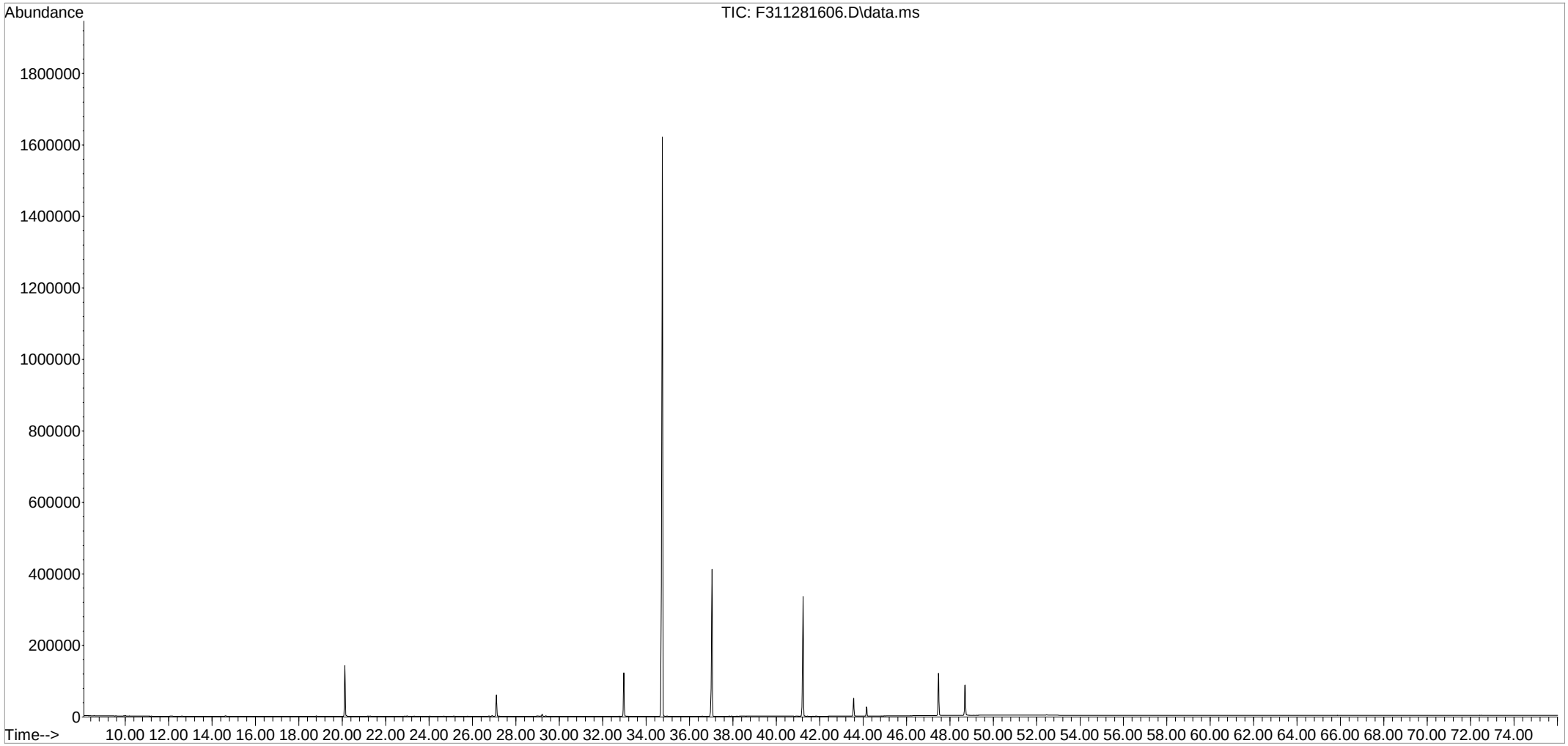
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281606.D
Acq On : 28 Nov 2016 5:52 pm
Operator : AC
Sample : so111116b03
Misc : 1x
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Dec 07 09:41:11 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716B01**
Associated Blank: **N/A**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	12/01/16	1000	1	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	10.0	U	C1-Dibenzothiophenes	**1.91**	J
C1-Decalins	10.0	U	C2-Dibenzothiophenes	**2.02**	J
C2-Decalins	10.0	U	C3-Dibenzothiophenes	10.0	U
C3-Decalins	10.0	U	C4-Dibenzothiophenes	10.0	U
C4-Decalins	10.0	U	Benzo(b)fluorene	10.0	U
Benzothiophene	**0.627**	J	Fluoranthene	**1.90**	J
C1-Benzo(b)thiophenes	10.0	U	Pyrene	**2.39**	J
C2-Benzo(b)thiophenes	**2.55**	J	C1-Fluoranthenes/Pyrenes	**2.37**	J
C3-Benzo(b)thiophenes	**4.76**	J	C2-Fluoranthenes/Pyrenes	10.0	U
C4-Benzo(b)thiophenes	10.0	U	C3-Fluoranthenes/Pyrenes	10.0	U
Naphthalene	**15.1**		C4-Fluoranthenes/Pyrenes	10.0	U
C1-Naphthalenes	**12.6**		Naphthobenzothiophenes	10.0	U
C2-Naphthalenes	**19.6**		C1-Naphthobenzothiophenes	10.0	U
C3-Naphthalenes	**19.2**		C2-Naphthobenzothiophenes	10.0	U
C4-Naphthalenes	**22.4**	G	C3-Naphthobenzothiophenes	10.0	U
Biphenyl	**2.63**	J	C4-Naphthobenzothiophenes	10.0	U
Dibenzofuran	**1.56**	J	Benz[a]anthracene	10.0	U
Acenaphthylene	**0.766**	J	Chrysene/Triphenylene	**0.567**	J
Acenaphthene	**4.70**	J	C1-Chrysenes	10.0	U
Fluorene	**5.93**	J	C2-Chrysenes	10.0	U
C1-Fluorenes	**4.46**	J	C3-Chrysenes	10.0	U
C2-Fluorenes	10.0	U	C4-Chrysenes	10.0	U
C3-Fluorenes	10.0	U	Benzo[b]fluoranthene	10.0	U
Anthracene	**3.16**	J	Benzo[j]fluoranthene/Benzo[k]fluoranthene	10.0	U
Phenanthrene	**13.4**		Benzo[a]fluoranthene	10.0	U
C1-Phenanthrenes/Anthracenes	**6.13**	J	Benzo[e]pyrene	10.0	U
C2-Phenanthrenes/Anthracenes	10.0	U	Benzo[a]pyrene	10.0	U
C3-Phenanthrenes/Anthracenes	10.0	U	Perylene	10.0	U
C4-Phenanthrenes/Anthracenes	10.0	U	Indeno[1,2,3-cd]pyrene	10.0	U
Retene	10.0	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	10.0	U
Dibenzothiophene	**2.47**	J	Benzo[g,h,i]perylene	10.0	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	63	50-130
Phenanthrene-d10	96	50-130
Benzo[a]pyrene-d12	94	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
N/A - Not Applicable
G - Matrix Interference

12/07/16 11:30

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716B01**
Associated Blank: **N/A**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	12/01/16	1000	1	1	AC

Parameter	Result
Carbazole	10.0 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	63	50-130
Phenanthrene-d10	96	50-130
Benzo[a]pyrene-d12	94	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:30

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716B01**
Associated Blank: **N/A**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	12/01/16	1000	1	1	AC

Parameter	Result	
4-Methyldibenzothiophene	**0.944**	J
2/3-Methyldibenzothiophene	10.0	U
1-Methyldibenzothiophene	10.0	U
3-Methylphenanthrene	**1.49**	J
2-Methylphenanthrene	**1.48**	J
2-Methylanthracene	**0.564**	J
9/4-Methylphenanthrene	**1.37**	J
1-Methylphenanthrene	**1.10**	J

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	63	50-130
Phenanthrene-d10	96	50-130
Benzo[a]pyrene-d12	94	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 11:30

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716B01**
Associated Blank: **N/A**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	12/01/16	1000	1	1	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	10.0	U
C28,20S-triaromatic steroid	10.0	U
C27,20R-triaromatic steroid	10.0	U
C28,20R-triaromatic steroid	10.0	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	90	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:31

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011608.D
Acq On : 1 Dec 2016 8:34 pm
Operator : AC
Sample : sw110716b01
Misc : 1x
ALS Vial : 8 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:51:00 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.054	164	62605M4	500.000	ng/ml	-0.06
71) Chrysene-d12	43.509	240	101770	500.000	ng/ml	-0.08
System Monitoring Compounds						
8) Naphthalene-d8	20.069	136	168556	627.686	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 62.77%			
40) Phenanthrene-d10	32.925	188	197282	958.688	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 95.87%			
80) Benzo[b]fluoranthene-d12	47.424	264	208691	984.479	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 98.45%			
85) Benzo[a]pyrene-d12	48.644	264	159722	936.026	ng/ml	-0.06
Spiked Amount 1000.000	Range 50 - 130		Recovery = 93.60%			
126) 5B(H)Cholane - Surr	44.112	217	29744	899.966	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 90.00%			
Target Compounds						Qvalue
9) Naphthalene	20.144	128	4457	15.091	ng/ml	100
10) C1-Naphthalenes	22.839	142	3730M5	12.630	ng/ml	
11) C2-Naphthalenes	25.684	156	5804M5	19.652	ng/ml	
12) C3-Naphthalenes	28.017	170	5675M5	19.216	ng/ml	
13) C4-Naphthalenes	29.162	184G	6630M5	22.449	ng/ml	
14) 2-Methylnaphthalene	22.839	142	2310	12.303	ng/ml	100
15) 1-Methylnaphthalene	23.275	142	1290	7.253	ng/ml	100
16) Benzothiophene	20.370	134	164	0.627	ng/ml	100
18) C2-Benzo(b)thiophenes	24.991	162	668M5	2.554	ng/ml	
19) C3-Benzo(b)thiophenes	26.858	176	1245M5	4.760	ng	
21) Biphenyl	24.721	154	627	2.630	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.338	156	1550	9.512	ng/ml	100
23) Dibenzofuran	27.822	168	389	1.555	ng/ml#	76
24) Acenaphthylene	26.437	152	219M4	0.766	ng/ml	
25) Acenaphthene	27.174	153	823M4	4.705	ng/ml	
26) 2,3,5-Trimethylnaphthalen	28.725	170	374M3	2.671	ng/ml	
27) Fluorene	29.192	166	1133M4	5.933	ng/ml	
28) C1-Fluorenes	31.555	180	851M5	4.457	ng/ml	
31) Dibenzothiophene	32.519	184	696	2.470	ng/ml#	78
32) 4-Methyldibenzothiophene(	34.280	198	266	0.944	ng/ml	100
35) OTP	34.702	198	32402	114.997	ng/ml	100
36) C1-Dibenzothiophenes	34.702	198	32941M5	116.910	ng/ml	
36) C1-Dibenzothiophenes BS	34.702	198	539M5	1.913	ng/ml	
37) C2-Dibenzothiophenes	35.966	212	570M5	2.023	ng/ml	
41) Phenanthrene	33.015	178	3594	13.427	ng/ml	97
42) 3-Methylphenanthrene(3MP)	34.973	192	398M4	1.487	ng/ml	
43) 2-Methylphenanthrene(2MP)	35.078	192	396	1.479	ng/ml	94
44) 2-Methylanthracene(2MA)	35.244	192	151	0.564	ng/ml#	59
45) 9/4-Methylphenanthrene(9M	35.424	192	367M3	1.371	ng/ml	
46) 1-Methylphenanthrene(1MP)	35.515	192	293M4	1.095	ng/ml	
47) C1-Phenanthrenes/Anthrace	35.078	192	1640M5	6.127	ng/ml	
53) Anthracene	33.196	178	802	3.157	ng/ml	93
55) 1-Methylphenanthrene	35.515	192	293M3	1.484	ng/ml	
56) Fluoranthene	37.788	202	563M4	1.895	ng/ml	
58) Pyrene	38.676	202	771	2.394	ng/ml#	91
59) C1-Fluoranthenes/Pyrenes	40.062	216	762M5	2.366	ng/ml	
74) Chrysene/Triphenylene	43.585	228	150M4	0.567	ng/ml	

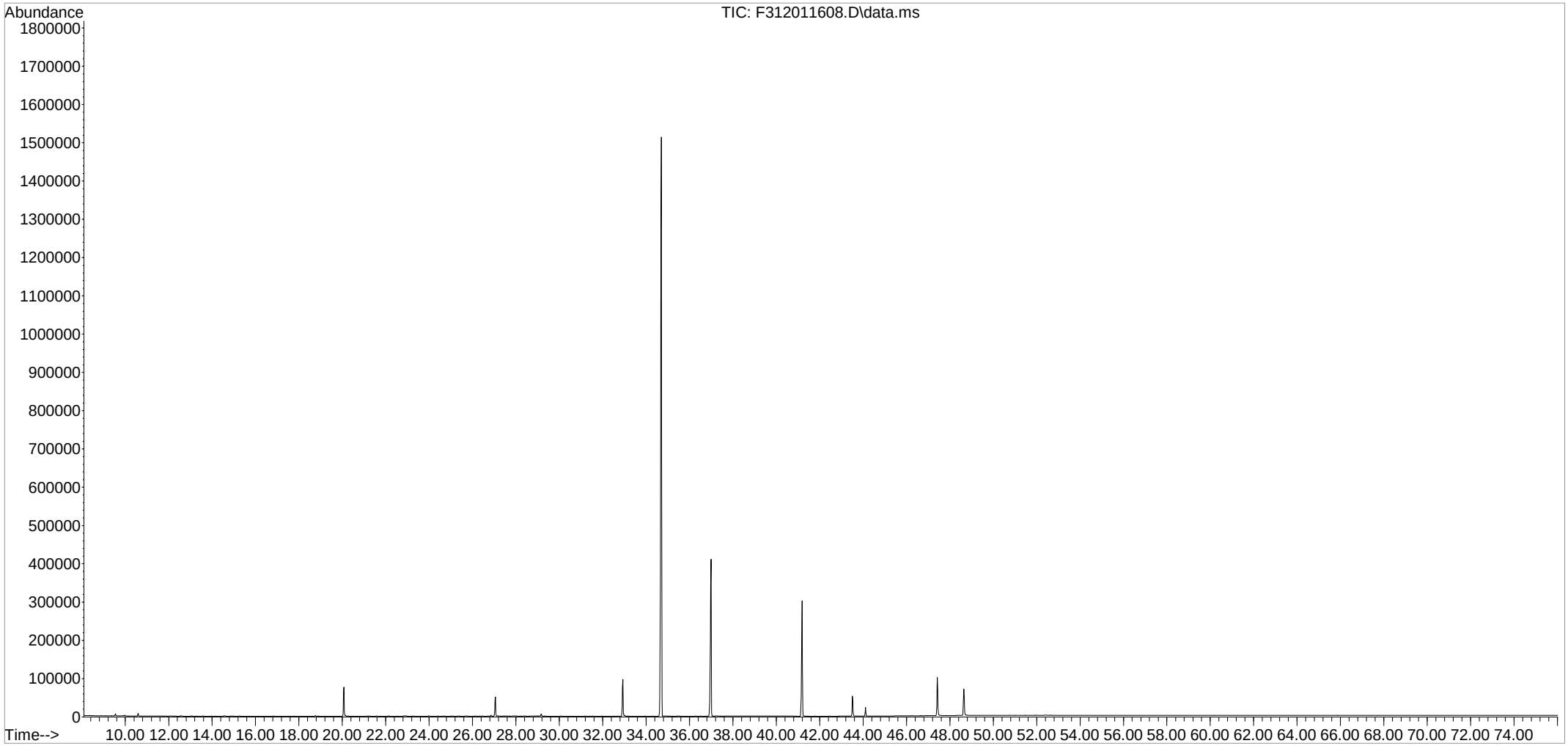
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011608.D
Acq On : 1 Dec 2016 8:34 pm
Operator : AC
Sample : sw110716b01
Misc : 1x
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Dec 07 09:51:00 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **See Below**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	11/10/16	100	AC

Lab ID:	SO111016B02		SO111016LCS02		SO111016LCSD02				
Parameter	**Blank Conc.**		**LCS Conc.**	**LCS % Recovery**	**LCSD Conc.**	**LCSD % Recovery**	**% RPD**	**RPD Limit**	**% Recovery Limits**
Naphthalene	0.273		194	97	194	97	0	30	50-130
Acenaphthylene	2.70		202	101	200	100	1	30	50-130
Acenaphthene	0.464		208	104	208	104	0	30	50-130
Fluorene	0.341		206	103	205	103	0	30	50-130
Anthracene	0.143		218	109	218	109	0	30	50-130
Phenanthrene	0.357		207	103	206	103	0	30	50-130
Fluoranthene	0.125		168	84	166	83	1	30	50-130
Pyrene	0.207		169	85	170	85	0	30	50-130
Benz[a]anthracene	2.00	U	185	93	189	94	2	30	50-130
Chrysene/Triphenylene	0.149		190	95	192	96	1	30	50-130
Benzo[b]fluoranthene	2.00	U	201	101	204	102	1	30	50-130
Benzo[j]fluoranthene/ Benzo[k]fluoranthene	2.00	U	217	109	225	112	3	30	50-130
Benzo[a]pyrene	2.00	U	223	112	228	114	2	30	50-130
Indeno[1,2,3-cd]pyrene	2.00	U	198	99	200	100	2	30	50-130
Dibenz[ah]anthracene/ Dibenz[ac]anthracene	2.00	U	220	110	223	111	1	30	50-130
Benzo[g,h,i]perylene	2.00	U	202	101	204	102	1	30	50-130

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	108	108	50-130
Phenanthrene-d10	109	107	50-130
Benzo[a]pyrene-d12	108	109	50-130
5B(H)Cholane	98	99	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

12/07/16 11:33

Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016LCS02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/29/16	100	0.10	20	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	2.00	U	C1-Dibenzothiophenes	2.00	U
C1-Decalins	2.00	U	C2-Dibenzothiophenes	2.00	U
C2-Decalins	2.00	U	C3-Dibenzothiophenes	2.00	U
C3-Decalins	2.00	U	C4-Dibenzothiophenes	2.00	U
C4-Decalins	2.00	U	Benzo(b)fluorene	2.00	U
Benzothiophene	2.00	U	Fluoranthene	**168**	S
C1-Benzo(b)thiophenes	2.00	U	Pyrene	**169**	S
C2-Benzo(b)thiophenes	2.00	U	C1-Fluoranthenes/Pyrenes	2.00	U
C3-Benzo(b)thiophenes	2.00	U	C2-Fluoranthenes/Pyrenes	2.00	U
C4-Benzo(b)thiophenes	2.00	U	C3-Fluoranthenes/Pyrenes	2.00	U
Naphthalene	**194**	S	C4-Fluoranthenes/Pyrenes	2.00	U
C1-Naphthalenes	2.00	U	Naphthobenzothiophenes	2.00	U
C2-Naphthalenes	2.00	U	C1-Naphthobenzothiophenes	2.00	U
C3-Naphthalenes	2.00	U	C2-Naphthobenzothiophenes	2.00	U
C4-Naphthalenes	2.00	U	C3-Naphthobenzothiophenes	2.00	U
Biphenyl	2.00	U	C4-Naphthobenzothiophenes	2.00	U
Dibenzofuran	2.00	U	Benz[a]anthracene	**185**	S
Acenaphthylene	**202**	S	Chrysene/Triphenylene	**190**	S
Acenaphthene	**208**	S	C1-Chrysenes	2.00	U
Fluorene	**206**	S	C2-Chrysenes	2.00	U
C1-Fluorenes	2.00	U	C3-Chrysenes	2.00	U
C2-Fluorenes	2.00	U	C4-Chrysenes	2.00	U
C3-Fluorenes	2.00	U	Benzo[b]fluoranthene	**201**	S
Anthracene	**218**	S	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**217**	S
Phenanthrene	**207**	S	Benzo[a]fluoranthene	2.00	U
C1-Phenanthrenes/Anthracenes	2.00	U	Benzo[e]pyrene	2.00	U
C2-Phenanthrenes/Anthracenes	2.00	U	Benzo[a]pyrene	**223**	S
C3-Phenanthrenes/Anthracenes	2.00	U	Perylene	2.00	U
C4-Phenanthrenes/Anthracenes	2.00	U	Indeno[1,2,3-cd]pyrene	**198**	S
Retene	2.00	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**220**	S
Dibenzothiophene	2.00	U	Benzo[g,h,i]perylene	**202**	S

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	108	50-130
Phenanthrene-d10	109	50-130
Benzo[a]pyrene-d12	108	50-130

S - Spike compound.
U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:28

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016LCS02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/29/16	100	0.10	20	1	AC

Parameter	Result
Carbazole	2.00 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	108	50-130
Phenanthrene-d10	109	50-130
Benzo[a]pyrene-d12	108	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:28

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016LCS02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/29/16	100	0.10	20	1	AC

Parameter	Result	
4-Methyldibenzothiophene	2.00	U
2/3-Methyldibenzothiophene	2.00	U
1-Methyldibenzothiophene	2.00	U
3-Methylphenanthrene	2.00	U
2-Methylphenanthrene	2.00	U
2-Methylanthracene	2.00	U
9/4-Methylphenanthrene	2.00	U
1-Methylphenanthrene	2.00	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	108	50-130
Phenanthrene-d10	109	50-130
Benzo[a]pyrene-d12	108	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:28

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016LCS02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/29/16	100	0.10	20	1	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	2.00	U
C28,20S-triaromatic steroid	2.00	U
C27,20R-triaromatic steroid	2.00	U
C28,20R-triaromatic steroid	2.00	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	98	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:28

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281618.D
Acq On : 29 Nov 2016 1:15 pm
Operator : AC
Sample : so111016lcs02
Misc : 1x
ALS Vial : 18 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:42:25 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	61106M4	500.000	ng/ml	-0.02
71) Chrysene-d12	43.570	240	98468	500.000	ng/ml	-0.02
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	284236	1084.433	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 108.44%			
40) Phenanthrene-d10	32.970	188	219328	1091.965	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 109.20%			
80) Benzo[b]fluoranthene-d12	47.485	264	220520	1075.165	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.52%			
85) Benzo[a]pyrene-d12	48.705	264	178564	1081.537	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 108.15%			
126) 5B(H)Cholane - Surr	44.157	217	31393	981.712	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 98.17%			
Target Compounds						Qvalue
9) Naphthalene	20.189	128	279077	968.138	ng/ml	100
14) 2-Methylnaphthalene	22.884	142	199013	1085.934	ng/ml	100
24) Acenaphthylene	26.497	152	281575M4	1008.543	ng/ml	
25) Acenaphthene	27.220	153	177542	1039.979	ng/ml	99
27) Fluorene	29.237	166	191912M4	1029.691	ng/ml	
41) Phenanthrene	33.061	178	270132	1033.980	ng/ml	100
53) Anthracene	33.241	178	270154M4	1089.562	ng/ml	
56) Fluoranthene	37.833	202	243050M4	838.203	ng/ml	
58) Pyrene	38.722	202	265854	845.780	ng/ml	93
72) Benz[a]anthracene	43.509	228	252794	926.519	ng/ml	100
74) Chrysene/Triphenylene	43.660	228	242760	948.726	ng/ml	99
81) Benzo[b]fluoranthene	47.560	252	279603	1007.197	ng/ml	96
82) Benzo[j]+[k]fluoranthene	47.650	252	278253	1087.336	ng/ml	96
86) Benzo[a]pyrene	48.795	252	275081	1116.891	ng/ml	94
88) Indeno[1,2,3-cd]pyrene	53.795	276	314037M3	987.373	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.855	278	298989	1101.400	ng/ml	98
90) Benzo[g,h,i]perylene	55.150	276	309980	1007.611	ng/ml	100

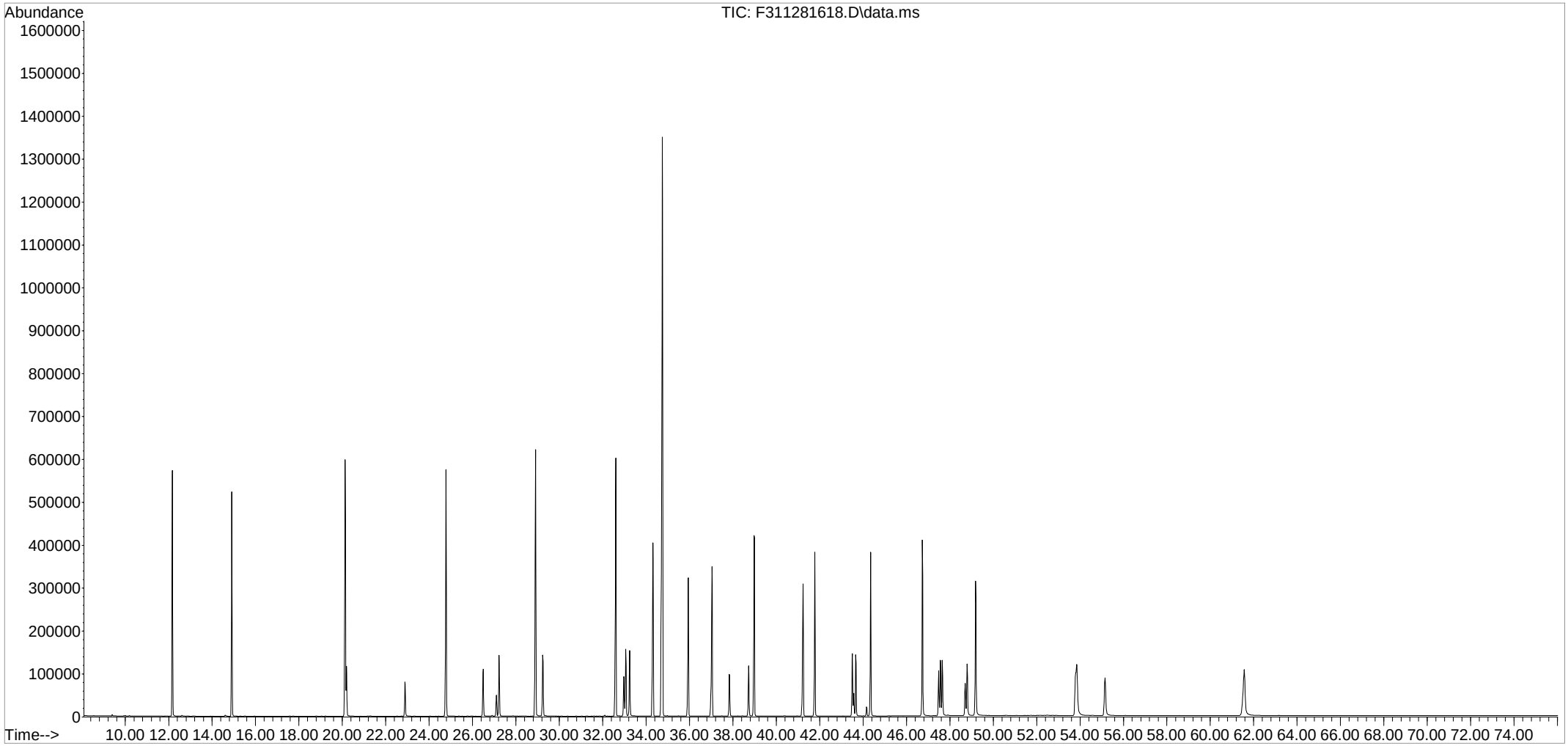
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281618.D
Acq On : 29 Nov 2016 1:15 pm
Operator : AC
Sample : so111016lcs02
Misc : 1x
ALS Vial : 18 Sample Multiplier: 1

Quant Time: Dec 07 09:42:25 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016LCSD02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/29/16	100	0.10	20	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	2.00	U	C1-Dibenzothiophenes	2.00	U
C1-Decalins	2.00	U	C2-Dibenzothiophenes	2.00	U
C2-Decalins	2.00	U	C3-Dibenzothiophenes	2.00	U
C3-Decalins	2.00	U	C4-Dibenzothiophenes	2.00	U
C4-Decalins	2.00	U	Benzo(b)fluorene	2.00	U
Benzothiophene	2.00	U	Fluoranthene	**166**	S
C1-Benzo(b)thiophenes	2.00	U	Pyrene	**170**	S
C2-Benzo(b)thiophenes	2.00	U	C1-Fluoranthenes/Pyrenes	2.00	U
C3-Benzo(b)thiophenes	2.00	U	C2-Fluoranthenes/Pyrenes	2.00	U
C4-Benzo(b)thiophenes	2.00	U	C3-Fluoranthenes/Pyrenes	2.00	U
Naphthalene	**194**	S	C4-Fluoranthenes/Pyrenes	2.00	U
C1-Naphthalenes	2.00	U	Naphthobenzothiophenes	2.00	U
C2-Naphthalenes	2.00	U	C1-Naphthobenzothiophenes	2.00	U
C3-Naphthalenes	2.00	U	C2-Naphthobenzothiophenes	2.00	U
C4-Naphthalenes	2.00	U	C3-Naphthobenzothiophenes	2.00	U
Biphenyl	2.00	U	C4-Naphthobenzothiophenes	2.00	U
Dibenzofuran	2.00	U	Benz[a]anthracene	**189**	S
Acenaphthylene	**200**	S	Chrysene/Triphenylene	**192**	S
Acenaphthene	**208**	S	C1-Chrysenes	2.00	U
Fluorene	**205**	S	C2-Chrysenes	2.00	U
C1-Fluorenes	2.00	U	C3-Chrysenes	2.00	U
C2-Fluorenes	2.00	U	C4-Chrysenes	2.00	U
C3-Fluorenes	2.00	U	Benzo[b]fluoranthene	**204**	S
Anthracene	**218**	S	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**225**	S
Phenanthrene	**206**	S	Benzo[a]fluoranthene	2.00	U
C1-Phenanthrenes/Anthracenes	2.00	U	Benzo[e]pyrene	2.00	U
C2-Phenanthrenes/Anthracenes	2.00	U	Benzo[a]pyrene	**228**	S
C3-Phenanthrenes/Anthracenes	2.00	U	Perylene	2.00	U
C4-Phenanthrenes/Anthracenes	2.00	U	Indeno[1,2,3-cd]pyrene	**200**	S
Retene	2.00	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**223**	S
Dibenzothiophene	2.00	U	Benzo[g,h,i]perylene	**204**	S

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	108	50-130
Phenanthrene-d10	107	50-130
Benzo[a]pyrene-d12	109	50-130

S - Spike compound.
U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:28

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016LCSD02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/29/16	100	0.10	20	1	AC

Parameter	Result
Carbazole	2.00 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	108	50-130
Phenanthrene-d10	107	50-130
Benzo[a]pyrene-d12	109	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:28

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016LCSD02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/29/16	100	0.10	20	1	AC

Parameter	Result	
4-Methyldibenzothiophene	2.00	U
2/3-Methyldibenzothiophene	2.00	U
1-Methyldibenzothiophene	2.00	U
3-Methylphenanthrene	2.00	U
2-Methylphenanthrene	2.00	U
2-Methylanthracene	2.00	U
9/4-Methylphenanthrene	2.00	U
1-Methylphenanthrene	2.00	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	108	50-130
Phenanthrene-d10	107	50-130
Benzo[a]pyrene-d12	109	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:28

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016LCSD02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/29/16	100	0.10	20	1	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	2.00	U
C28,20S-triaromatic steroid	2.00	U
C27,20R-triaromatic steroid	2.00	U
C28,20R-triaromatic steroid	2.00	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	99	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:28

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281619.D
Acq On : 29 Nov 2016 2:41 pm
Operator : AC
Sample : so111016lcsd02
Misc : 1x
ALS Vial : 19 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:42:28 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	62175M4	500.000	ng/ml	-0.02
71) Chrysene-d12	43.570	240	98035	500.000	ng/ml	-0.02
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	288099	1080.273	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 108.03%			
40) Phenanthrene-d10	32.970	188	219517	1074.116	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.41%			
80) Benzo[b]fluoranthene-d12	47.485	264	221411	1084.278	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 108.43%			
85) Benzo[a]pyrene-d12	48.705	264	179443	1091.662	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 109.17%			
126) 5B(H)Cholane - Surr	44.157	217	31385	985.797	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 98.58%			
Target Compounds						Qvalue
9) Naphthalene	20.189	128	285253	972.549	ng/ml	100
14) 2-Methylnaphthalene	22.884	142	203002	1088.655	ng/ml	100
24) Acenaphthylene	26.497	152	284834M4	1002.675	ng/ml	
25) Acenaphthene	27.220	153	180875	1041.286	ng/ml	100
27) Fluorene	29.237	166	194393M4	1025.070	ng/ml	
41) Phenanthrene	33.061	178	273717	1029.688	ng/ml	100
53) Anthracene	33.241	178	274977M4	1089.946	ng/ml	
56) Fluoranthene	37.833	202	245302M4	831.424	ng/ml	
58) Pyrene	38.722	202	271721	849.582	ng/ml	93
72) Benz[a]anthracene	43.510	228	256165	943.021	ng/ml	99
74) Chrysene/Triphenylene	43.660	228	244565	960.002	ng/ml	100
81) Benzo[b]fluoranthene	47.560	252	282426	1021.860	ng/ml	96
82) Benzo[j]+[k]fluoranthene	47.650	252	286076	1122.844	ng/ml	96
86) Benzo[a]pyrene	48.795	252	279441	1139.605	ng/ml	94
88) Indeno[1,2,3-cd]pyrene	53.780	276	317413M3	1002.396	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.855	278	301173	1114.346	ng/ml	98
90) Benzo[g,h,i]perylene	55.150	276	312549	1020.449	ng/ml	100

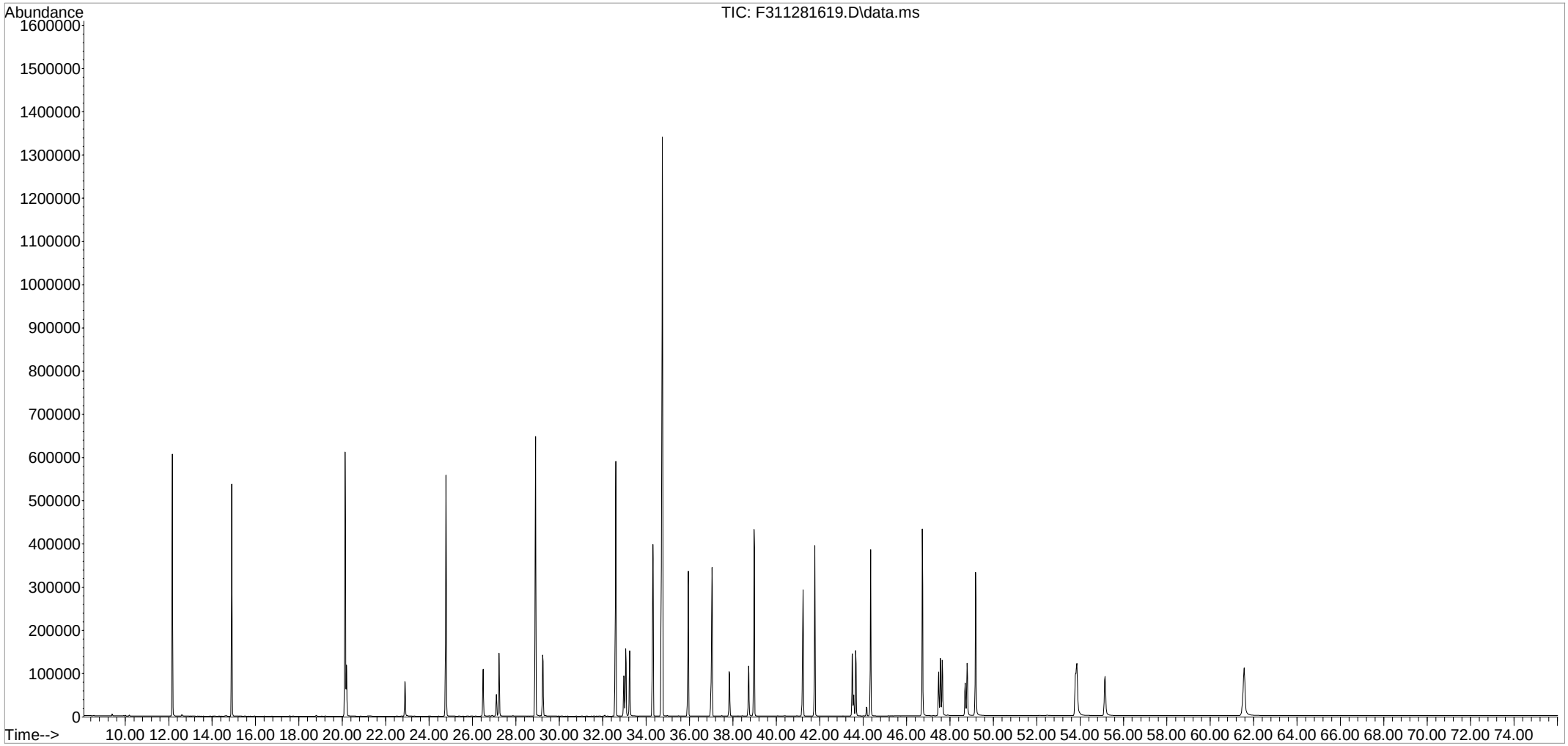
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281619.D
Acq On : 29 Nov 2016 2:41 pm
Operator : AC
Sample : so111016lcsd02
Misc : 1x
ALS Vial : 19 Sample Multiplier: 1

Quant Time: Dec 07 09:42:28 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **See Below**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	11/11/16	100	AC

Lab ID:	SO111116B03		SO111116LCS02		SO111116LCSD02				
Parameter	**Blank Conc.**		**LCS Conc.**	**LCS % Recovery**	**LCSD Conc.**	**LCSD % Recovery**	**% RPD**	**RPD Limit**	**% Recovery Limits**
Naphthalene	3.07		239	96	244	98	2	30	50-130
Acenaphthylene	0.152		244	97	250	100	3	30	50-130
Acenaphthene	0.423		255	102	261	104	2	30	50-130
Fluorene	0.276		249	100	256	103	3	30	50-130
Anthracene	0.220		260	104	270	108	4	30	50-130
Phenanthrene	0.847		249	100	256	103	3	30	50-130
Fluoranthene	0.295		194	78	202	81	4	30	50-130
Pyrene	0.386		199	80	208	83	4	30	50-130
Benz[a]anthracene	0.208		229	92	234	93	2	30	50-130
Chrysene/Triphenylene	0.289		232	93	239	95	3	30	50-130
Benzo[b]fluoranthene	2.50	U	259	103	261	105	1	30	50-130
Benzo[j]fluoranthene/ Benzo[k]fluoranthene	2.50	U	261	104	270	108	4	30	50-130
Benzo[a]pyrene	0.199		278	111	286	114	3	30	50-130
Indeno[1,2,3-cd]pyrene	0.134		259	104	264	106	2	30	50-130
Dibenz[ah]anthracene/ Dibenz[ac]anthracene	2.50	U	277	111	283	113	2	30	50-130
Benzo[g,h,i]perylene	0.165		256	103	262	105	2	30	50-130

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	105	105	50-130
Phenanthrene-d10	107	107	50-130
Benzo[a]pyrene-d12	111	111	50-130
5B(H)Cholane	100	99	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

12/07/16 11:32

Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116LCS02**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/28/16	100	0.0040	1	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	2.50	U	C1-Dibenzothiophenes	2.50	U
C1-Decalins	2.50	U	C2-Dibenzothiophenes	2.50	U
C2-Decalins	2.50	U	C3-Dibenzothiophenes	2.50	U
C3-Decalins	2.50	U	C4-Dibenzothiophenes	2.50	U
C4-Decalins	2.50	U	Benzo(b)fluorene	2.50	U
Benzothiophene	2.50	U	Fluoranthene	**194**	S
C1-Benzo(b)thiophenes	2.50	U	Pyrene	**199**	S
C2-Benzo(b)thiophenes	2.50	U	C1-Fluoranthenes/Pyrenes	2.50	U
C3-Benzo(b)thiophenes	2.50	U	C2-Fluoranthenes/Pyrenes	2.50	U
C4-Benzo(b)thiophenes	2.50	U	C3-Fluoranthenes/Pyrenes	2.50	U
Naphthalene	**239**	S	C4-Fluoranthenes/Pyrenes	2.50	U
C1-Naphthalenes	2.50	U	Naphthobenzothiophenes	2.50	U
C2-Naphthalenes	2.50	U	C1-Naphthobenzothiophenes	2.50	U
C3-Naphthalenes	2.50	U	C2-Naphthobenzothiophenes	2.50	U
C4-Naphthalenes	2.50	U	C3-Naphthobenzothiophenes	2.50	U
Biphenyl	2.50	U	C4-Naphthobenzothiophenes	2.50	U
Dibenzofuran	2.50	U	Benz[a]anthracene	**229**	S
Acenaphthylene	**244**	S	Chrysene/Triphenylene	**232**	S
Acenaphthene	**255**	S	C1-Chrysenes	2.50	U
Fluorene	**249**	S	C2-Chrysenes	2.50	U
C1-Fluorenes	2.50	U	C3-Chrysenes	2.50	U
C2-Fluorenes	2.50	U	C4-Chrysenes	2.50	U
C3-Fluorenes	2.50	U	Benzo[b]fluoranthene	**259**	S
Anthracene	**260**	S	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**261**	S
Phenanthrene	**249**	S	Benzo[a]fluoranthene	2.50	U
C1-Phenanthrenes/Anthracenes	2.50	U	Benzo[e]pyrene	2.50	U
C2-Phenanthrenes/Anthracenes	2.50	U	Benzo[a]pyrene	**278**	S
C3-Phenanthrenes/Anthracenes	2.50	U	Perylene	2.50	U
C4-Phenanthrenes/Anthracenes	2.50	U	Indeno[1,2,3-cd]pyrene	**259**	S
Retene	2.50	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**277**	S
Dibenzothiophene	2.50	U	Benzo[g,h,i]perylene	**256**	S

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	105	50-130
Phenanthrene-d10	107	50-130
Benzo[a]pyrene-d12	111	50-130

S - Spike compound.
U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:27

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116LCS02**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/28/16	100	0.0040	1	1	AC

Parameter	Result
Carbazole	2.50 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	105	50-130
Phenanthrene-d10	107	50-130
Benzo[a]pyrene-d12	111	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:27

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116LCS02**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/28/16	100	0.0040	1	1	AC

Parameter	Result	
4-Methyldibenzothiophene	2.50	U
2/3-Methyldibenzothiophene	2.50	U
1-Methyldibenzothiophene	2.50	U
3-Methylphenanthrene	2.50	U
2-Methylphenanthrene	2.50	U
2-Methylanthracene	2.50	U
9/4-Methylphenanthrene	2.50	U
1-Methylphenanthrene	2.50	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	105	50-130
Phenanthrene-d10	107	50-130
Benzo[a]pyrene-d12	111	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:27

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116LCS02**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/28/16	100	0.0040	1	1	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	2.50	U
C28,20S-triaromatic steroid	2.50	U
C27,20R-triaromatic steroid	2.50	U
C28,20R-triaromatic steroid	2.50	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	100	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:27

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281607.D
Acq On : 28 Nov 2016 7:18 pm
Operator : AC
Sample : so111116lcs02
Misc : 1x
ALS Vial : 7 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:41:16 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	70906M4	500.000	ng/ml	-0.02
71) Chrysene-d12	43.570	240	108981	500.000	ng/ml	-0.02
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	319091	1049.154	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.92%			
40) Phenanthrene-d10	32.970	188	248635	1066.787	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 106.68%			
80) Benzo[b]fluoranthene-d12	47.470	264	247752	1091.412	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 109.14%			
85) Benzo[a]pyrene-d12	48.705	264	202347	1107.360	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 110.74%			
126) 5B(H)Cholane - Surr	44.157	217	35486	1002.658	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 100.27%			
Target Compounds						Qvalue
9) Naphthalene	20.189	128	319683	955.727	ng/ml	100
14) 2-Methylnaphthalene	22.884	142	225776	1061.697	ng/ml	100
24) Acenaphthylene	26.482	152	315859M4	974.977	ng/ml	
25) Acenaphthene	27.220	153	201910	1019.253	ng/ml	99
27) Fluorene	29.237	166	215740	997.554	ng/ml	99
41) Phenanthrene	33.061	178	302311	997.219	ng/ml	100
53) Anthracene	33.241	178	299296M4	1040.261	ng/ml	
56) Fluoranthene	37.833	202	260968M4	775.607	ng/ml	
58) Pyrene	38.722	202	290384	796.137	ng/ml	94
72) Benz[a]anthracene	43.494	228	277041	917.437	ng/ml	99
74) Chrysene/Triphenylene	43.660	228	263234	929.501	ng/ml	99
81) Benzo[b]fluoranthene	47.560	252	317758	1034.222	ng/ml	96
82) Benzo[j]+[k]fluoranthene	47.650	252	295267	1042.517	ng/ml	96
86) Benzo[a]pyrene	48.795	252	303628	1113.875	ng/ml	94
88) Indeno[1,2,3-cd]pyrene	53.780	276	364862M3	1036.510	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.840	278	333310	1109.386	ng/ml	98
90) Benzo[g,h,i]perylene	55.135	276	349359	1026.066	ng/ml	99

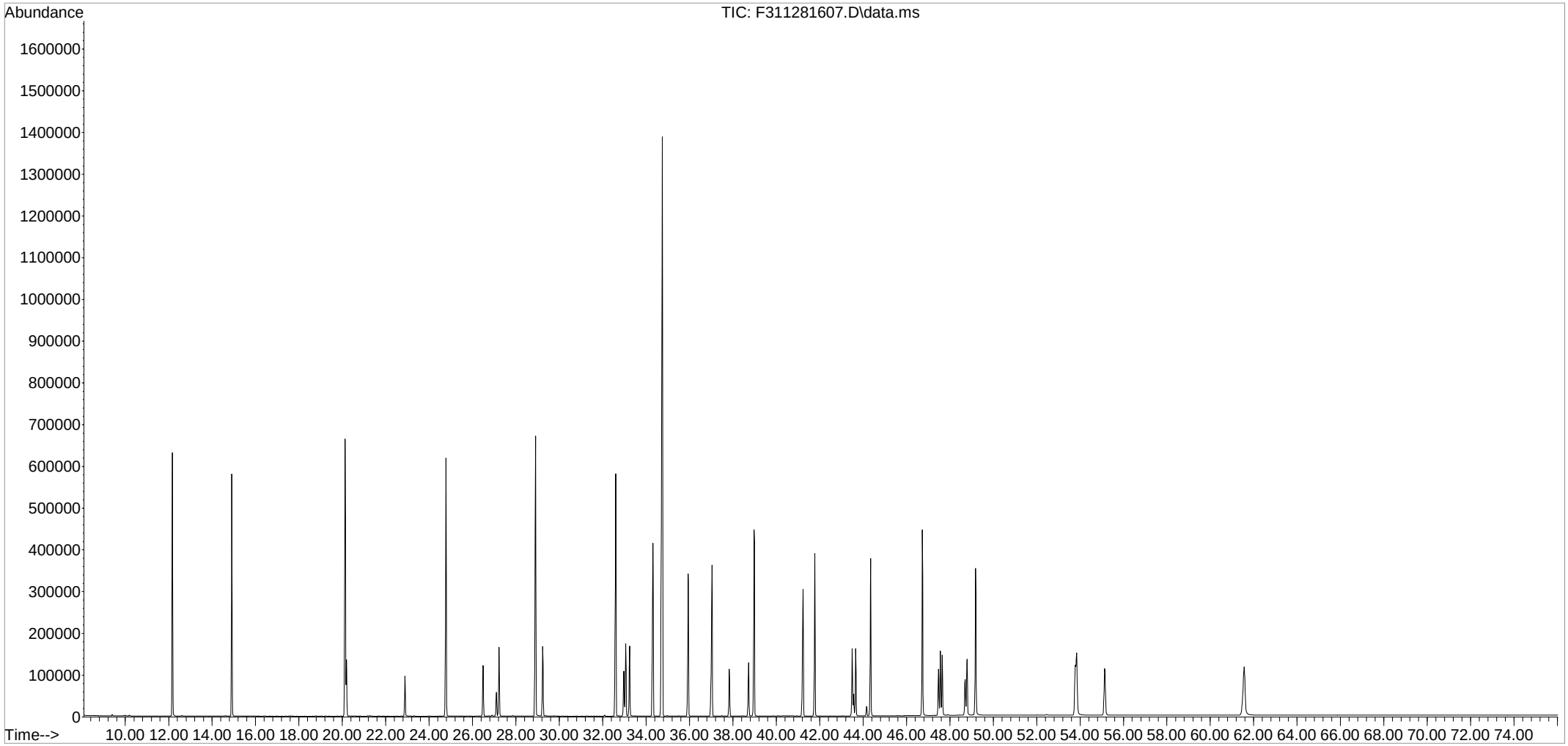
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281607.D
Acq On : 28 Nov 2016 7:18 pm
Operator : AC
Sample : so111116lcs02
Misc : 1x
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Dec 07 09:41:16 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116LCSD02**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/28/16	100	0.0040	1	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	2.50	U	C1-Dibenzothiophenes	2.50	U
C1-Decalins	2.50	U	C2-Dibenzothiophenes	2.50	U
C2-Decalins	2.50	U	C3-Dibenzothiophenes	2.50	U
C3-Decalins	2.50	U	C4-Dibenzothiophenes	2.50	U
C4-Decalins	2.50	U	Benzo(b)fluorene	2.50	U
Benzothiophene	2.50	U	Fluoranthene	**202**	S
C1-Benzo(b)thiophenes	2.50	U	Pyrene	**208**	S
C2-Benzo(b)thiophenes	2.50	U	C1-Fluoranthenes/Pyrenes	2.50	U
C3-Benzo(b)thiophenes	2.50	U	C2-Fluoranthenes/Pyrenes	2.50	U
C4-Benzo(b)thiophenes	2.50	U	C3-Fluoranthenes/Pyrenes	2.50	U
Naphthalene	**244**	S	C4-Fluoranthenes/Pyrenes	2.50	U
C1-Naphthalenes	2.50	U	Naphthobenzothiophenes	2.50	U
C2-Naphthalenes	2.50	U	C1-Naphthobenzothiophenes	2.50	U
C3-Naphthalenes	2.50	U	C2-Naphthobenzothiophenes	2.50	U
C4-Naphthalenes	2.50	U	C3-Naphthobenzothiophenes	2.50	U
Biphenyl	2.50	U	C4-Naphthobenzothiophenes	2.50	U
Dibenzofuran	2.50	U	Benz[a]anthracene	**234**	S
Acenaphthylene	**250**	S	Chrysene/Triphenylene	**239**	S
Acenaphthene	**261**	S	C1-Chrysenes	2.50	U
Fluorene	**256**	S	C2-Chrysenes	2.50	U
C1-Fluorenes	2.50	U	C3-Chrysenes	2.50	U
C2-Fluorenes	2.50	U	C4-Chrysenes	2.50	U
C3-Fluorenes	2.50	U	Benzo[b]fluoranthene	**261**	S
Anthracene	**270**	S	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**270**	S
Phenanthrene	**256**	S	Benzo[a]fluoranthene	2.50	U
C1-Phenanthrenes/Anthracenes	2.50	U	Benzo[e]pyrene	2.50	U
C2-Phenanthrenes/Anthracenes	2.50	U	Benzo[a]pyrene	**286**	S
C3-Phenanthrenes/Anthracenes	2.50	U	Perylene	2.50	U
C4-Phenanthrenes/Anthracenes	2.50	U	Indeno[1,2,3-cd]pyrene	**264**	S
Retene	2.50	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**283**	S
Dibenzothiophene	2.50	U	Benzo[g,h,i]perylene	**262**	S

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	105	50-130
Phenanthrene-d10	107	50-130
Benzo[a]pyrene-d12	111	50-130

S - Spike compound.
U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:27

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116LCSD02**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/28/16	100	0.0040	1	1	AC

Parameter	Result
Carbazole	2.50 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	105	50-130
Phenanthrene-d10	107	50-130
Benzo[a]pyrene-d12	111	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:27

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116LCSD02**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/28/16	100	0.0040	1	1	AC

Parameter	Result	
4-Methyldibenzothiophene	2.50	U
2/3-Methyldibenzothiophene	2.50	U
1-Methyldibenzothiophene	2.50	U
3-Methylphenanthrene	2.50	U
2-Methylphenanthrene	2.50	U
2-Methylanthracene	2.50	U
9/4-Methylphenanthrene	2.50	U
1-Methylphenanthrene	2.50	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	105	50-130
Phenanthrene-d10	107	50-130
Benzo[a]pyrene-d12	111	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:27

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116LCSD02**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/28/16	100	0.0040	1	1	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	2.50	U
C28,20S-triaromatic steroid	2.50	U
C27,20R-triaromatic steroid	2.50	U
C28,20R-triaromatic steroid	2.50	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	99	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:27

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281608.D
Acq On : 28 Nov 2016 8:43 pm
Operator : AC
Sample : so111116lcsd02
Misc : 1x
ALS Vial : 8 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Dec 07 09:41:21 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	67887M4	500.000	ng/ml	-0.02
71) Chrysene-d12	43.570	240	104929	500.000	ng/ml	-0.02
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	306987	1054.243	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 105.42%			
40) Phenanthrene-d10	32.970	188	238022	1066.668	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 106.67%			
80) Benzo[b]fluoranthene-d12	47.470	264	238274	1090.193	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 109.02%			
85) Benzo[a]pyrene-d12	48.705	264	194808	1107.271	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 110.73%			
126) 5B(H)Cholane - Surr	44.157	217	33875	994.100	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 99.41%			
Target Compounds						Qvalue
9) Naphthalene	20.189	128	313104	977.686	ng/ml	100
14) 2-Methylnaphthalene	22.884	142	220997	1085.439	ng/ml	100
24) Acenaphthylene	26.497	152	310243M4	1000.229	ng/ml	
25) Acenaphthene	27.220	153	198081	1044.392	ng/ml	100
27) Fluorene	29.237	166	212332M4	1025.458	ng/ml	
41) Phenanthrene	33.061	178	297642	1025.480	ng/ml	99
53) Anthracene	33.241	178	296998M4	1078.180	ng/ml	
56) Fluoranthene	37.833	202	260044M4	807.230	ng/ml	
58) Pyrene	38.722	202	289908	830.178	ng/ml	94
72) Benz[a]anthracene	43.494	228	271835	934.959	ng/ml	99
74) Chrysene/Triphenylene	43.660	228	260181	954.199	ng/ml	99
81) Benzo[b]fluoranthene	47.560	252	309181	1045.166	ng/ml	97
82) Benzo[j]+[k]fluoranthene	47.650	252	294534	1080.088	ng/ml	96
86) Benzo[a]pyrene	48.795	252	300435	1144.723	ng/ml	94
88) Indeno[1,2,3-cd]pyrene	53.780	276	357857M3	1055.868	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.840	278	326958	1130.268	ng/ml	98
90) Benzo[g,h,i]perylene	55.135	276	343048	1046.438	ng/ml	99

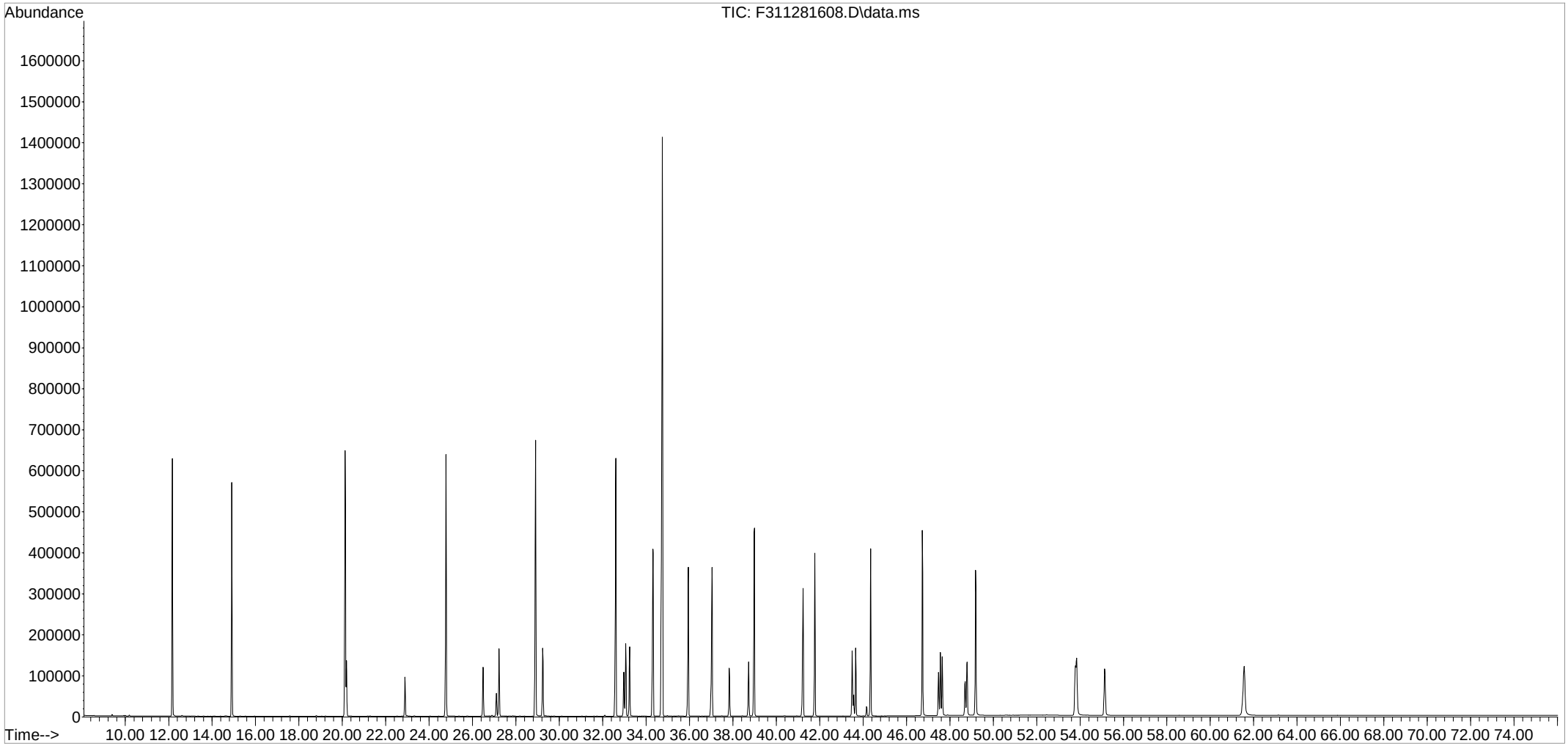
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281608.D
Acq On : 28 Nov 2016 8:43 pm
Operator : AC
Sample : so111116lcsd02
Misc : 1x
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Dec 07 09:41:21 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **See Below**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Analyst
N/A	N/A	11/07/16	AC

Lab ID: SW110716B01 SW110716LCS01 SW110716LCSD01

Parameter	Blank Conc.		LCS Conc.	LCS % Recovery	LCSD Conc.	LCSD % Recovery	% RPD	RPD Limit	% Recovery Limits
Naphthalene	15.1		542	54	637	64	16	30	50-130
Acenaphthylene	0.766		627	63	724	72	14	30	50-130
Acenaphthene	4.70		644	64	735	74	13	30	50-130
Fluorene	5.93		755	75	838	84	10	30	50-130
Anthracene	3.16		891	89	985	98	10	30	50-130
Phenanthrene	13.4		879	88	954	95	8	30	50-130
Fluoranthene	1.90		757	76	798	80	5	30	50-130
Pyrene	2.39		774	77	805	81	4	30	50-130
Benz[a]anthracene	10.0	U	828	83	886	89	7	30	50-130
Chrysene/Triphenylene	0.567		839	84	902	90	7	30	50-130
Benzo[b]fluoranthene	10.0	U	897	90	1010	101	12	30	50-130
Benzo[j]fluoranthene/ Benzo[k]fluoranthene	10.0	U	983	98	1000	100	2	30	50-130
Benzo[a]pyrene	10.0	U	948	95	1050	105	11	30	50-130
Indeno[1,2,3-cd]pyrene	10.0	U	895	89	988	99	10	30	50-130
Dibenz[ah]anthracene/ Dibenz[ac]anthracene	10.0	U	969	97	1030	103	7	30	50-130
Benzo[g,h,i]perylene	10.0	U	893	89	960	96	7	30	50-130

Surrogate	% Recovery		Acceptance Range (%)
Naphthalene-d8	62	70	50-130
Phenanthrene-d10	94	100	50-130
Benzo[a]pyrene-d12	94	101	50-130
5B(H)Cholane	88	94	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

12/07/16 11:33

Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716LCS01**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	12/01/16	1000	1	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	10.0	U	C1-Dibenzothiophenes	10.0	U
C1-Decalins	10.0	U	C2-Dibenzothiophenes	10.0	U
C2-Decalins	10.0	U	C3-Dibenzothiophenes	10.0	U
C3-Decalins	10.0	U	C4-Dibenzothiophenes	10.0	U
C4-Decalins	10.0	U	Benzo(b)fluorene	10.0	U
Benzothiophene	10.0	U	Fluoranthene	**757**	S
C1-Benzo(b)thiophenes	10.0	U	Pyrene	**774**	S
C2-Benzo(b)thiophenes	10.0	U	C1-Fluoranthenes/Pyrenes	10.0	U
C3-Benzo(b)thiophenes	10.0	U	C2-Fluoranthenes/Pyrenes	10.0	U
C4-Benzo(b)thiophenes	10.0	U	C3-Fluoranthenes/Pyrenes	10.0	U
Naphthalene	**542**	S	C4-Fluoranthenes/Pyrenes	10.0	U
C1-Naphthalenes	10.0	U	Naphthobenzothiophenes	10.0	U
C2-Naphthalenes	10.0	U	C1-Naphthobenzothiophenes	10.0	U
C3-Naphthalenes	10.0	U	C2-Naphthobenzothiophenes	10.0	U
C4-Naphthalenes	10.0	U	C3-Naphthobenzothiophenes	10.0	U
Biphenyl	10.0	U	C4-Naphthobenzothiophenes	10.0	U
Dibenzofuran	10.0	U	Benz[a]anthracene	**828**	S
Acenaphthylene	**627**	S	Chrysene/Triphenylene	**839**	S
Acenaphthene	**644**	S	C1-Chrysenes	10.0	U
Fluorene	**755**	S	C2-Chrysenes	10.0	U
C1-Fluorenes	10.0	U	C3-Chrysenes	10.0	U
C2-Fluorenes	10.0	U	C4-Chrysenes	10.0	U
C3-Fluorenes	10.0	U	Benzo[b]fluoranthene	**897**	S
Anthracene	**891**	S	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**983**	S
Phenanthrene	**879**	S	Benzo[a]fluoranthene	10.0	U
C1-Phenanthrenes/Anthracenes	10.0	U	Benzo[e]pyrene	10.0	U
C2-Phenanthrenes/Anthracenes	10.0	U	Benzo[a]pyrene	**948**	S
C3-Phenanthrenes/Anthracenes	10.0	U	Perylene	10.0	U
C4-Phenanthrenes/Anthracenes	10.0	U	Indeno[1,2,3-cd]pyrene	**895**	S
Retene	10.0	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**969**	S
Dibenzothiophene	10.0	U	Benzo[g,h,i]perylene	**893**	S

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	62	50-130
Phenanthrene-d10	94	50-130
Benzo[a]pyrene-d12	94	50-130

S - Spike compound.
U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:31

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716LCS01**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	12/01/16	1000	1	1	AC

Parameter	Result
Carbazole	10.0 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	62	50-130
Phenanthrene-d10	94	50-130
Benzo[a]pyrene-d12	94	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:31

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716LCS01**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	12/01/16	1000	1	1	AC

Parameter	Result	
4-Methyldibenzothiophene	10.0	U
2/3-Methyldibenzothiophene	10.0	U
1-Methyldibenzothiophene	10.0	U
3-Methylphenanthrene	10.0	U
2-Methylphenanthrene	10.0	U
2-Methylanthracene	10.0	U
9/4-Methylphenanthrene	10.0	U
1-Methylphenanthrene	10.0	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	62	50-130
Phenanthrene-d10	94	50-130
Benzo[a]pyrene-d12	94	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:31

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716LCS01**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	12/01/16	1000	1	1	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	10.0	U
C28,20S-triaromatic steroid	10.0	U
C27,20R-triaromatic steroid	10.0	U
C28,20R-triaromatic steroid	10.0	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	88	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:31

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011609.D
Acq On : 1 Dec 2016 10:00 pm
Operator : AC
Sample : sw110716lcs01
Misc : 1x
ALS Vial : 9 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:51:06 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.054	164	62323M4	500.000	ng/ml	-0.06
71) Chrysene-d12	43.510	240	103874	500.000	ng/ml	-0.08
System Monitoring Compounds						
8) Naphthalene-d8	20.069	136	164432	615.100	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 61.51%			
40) Phenanthrene-d10	32.925	188	193395	944.051	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 94.41%			
80) Benzo[b]fluoranthene-d12	47.425	264	210386	972.372	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 97.24%			
85) Benzo[a]pyrene-d12	48.644	264	163226	937.185	ng/ml	-0.06
Spiked Amount 1000.000	Range 50 - 130		Recovery = 93.72%			
126) 5B(H)Cholane - Surr	44.112	217	29817	883.901	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 88.39%			
Target Compounds						Qvalue
9) Naphthalene	20.144	128	159443	542.318	ng/ml	100
14) 2-Methylnaphthalene	22.839	142	102375	547.711	ng/ml	100
24) Acenaphthylene	26.437	152	178476M4	626.780	ng/ml	
25) Acenaphthene	27.175	153	112100	643.820	ng/ml	99
27) Fluorene	29.192	166	143500M4	754.905	ng/ml	
41) Phenanthrene	33.016	178	234305	879.332	ng/ml	100
53) Anthracene	33.196	178	225296	890.901	ng/ml	100
56) Fluoranthene	37.788	202	223772M4	756.649	ng/ml	
58) Pyrene	38.676	202	248003	773.582	ng/ml	95
72) Benz[a]anthracene	43.449	228	238192	827.567	ng/ml	99
74) Chrysene/Triphenylene	43.615	228	226544	839.276	ng/ml	100
81) Benzo[b]fluoranthene	47.515	252	262605	896.735	ng/ml	96
82) Benzo[j]+[k]fluoranthene	47.590	252	265332	982.883	ng/ml	96
86) Benzo[a]pyrene	48.735	252	246223	947.692	ng/ml	94
88) Indeno[1,2,3-cd]pyrene	53.705	276	300210M3	894.775	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.765	278	277390	968.655	ng/ml	99
90) Benzo[g,h,i]perylene	55.060	276	289646	892.514	ng/ml	100

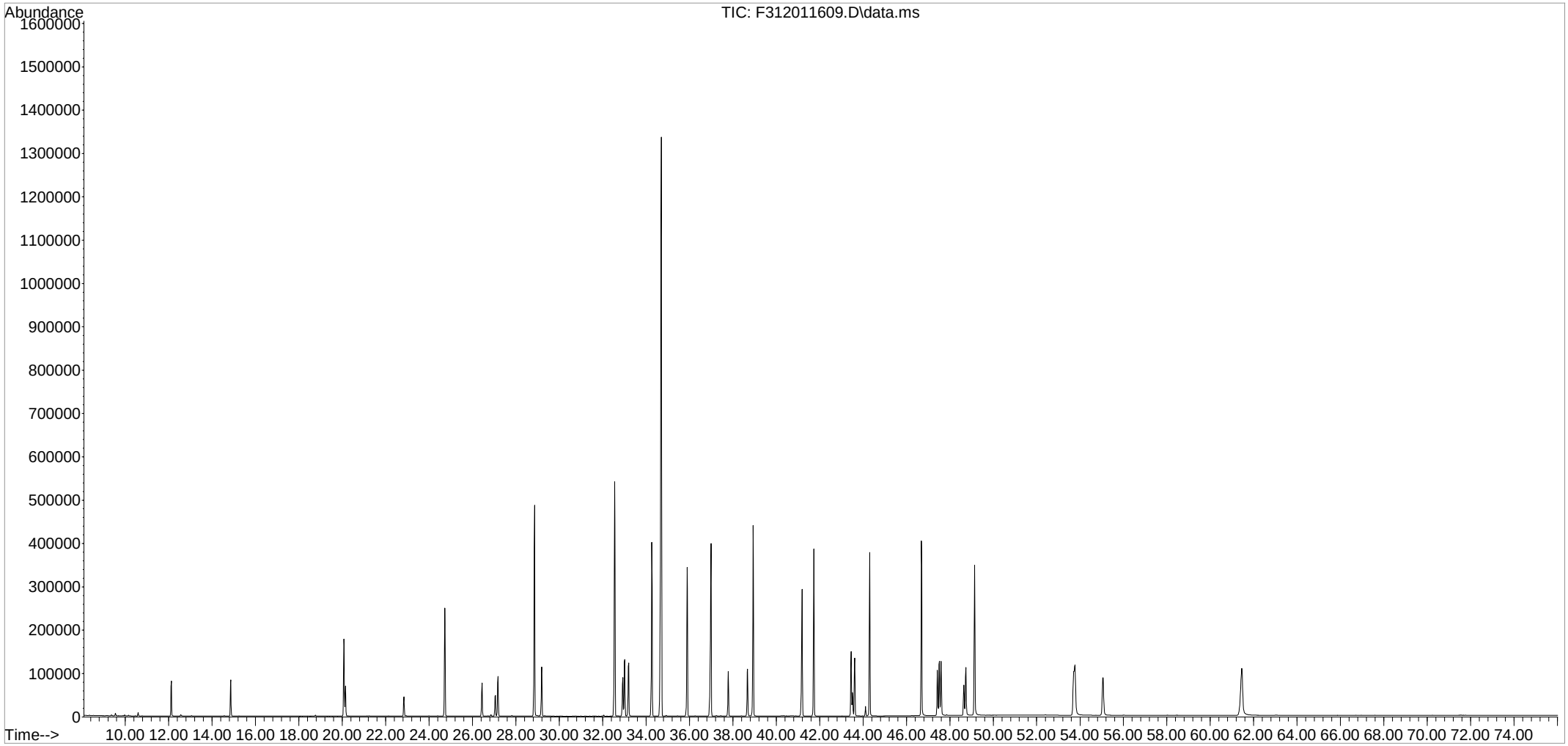
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011609.D
Acq On : 1 Dec 2016 10:00 pm
Operator : AC
Sample : sw110716lcs01
Misc : 1x
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Dec 07 09:51:06 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form I
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716LCSD01**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	12/01/16	1000	1	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	10.0	U	C1-Dibenzothiophenes	10.0	U
C1-Decalins	10.0	U	C2-Dibenzothiophenes	10.0	U
C2-Decalins	10.0	U	C3-Dibenzothiophenes	10.0	U
C3-Decalins	10.0	U	C4-Dibenzothiophenes	10.0	U
C4-Decalins	10.0	U	Benzo(b)fluorene	10.0	U
Benzothiophene	10.0	U	Fluoranthene	**798**	S
C1-Benzo(b)thiophenes	10.0	U	Pyrene	**805**	S
C2-Benzo(b)thiophenes	10.0	U	C1-Fluoranthenes/Pyrenes	10.0	U
C3-Benzo(b)thiophenes	10.0	U	C2-Fluoranthenes/Pyrenes	10.0	U
C4-Benzo(b)thiophenes	10.0	U	C3-Fluoranthenes/Pyrenes	10.0	U
Naphthalene	**637**	S	C4-Fluoranthenes/Pyrenes	10.0	U
C1-Naphthalenes	10.0	U	Naphthobenzothiophenes	10.0	U
C2-Naphthalenes	10.0	U	C1-Naphthobenzothiophenes	10.0	U
C3-Naphthalenes	10.0	U	C2-Naphthobenzothiophenes	10.0	U
C4-Naphthalenes	10.0	U	C3-Naphthobenzothiophenes	10.0	U
Biphenyl	10.0	U	C4-Naphthobenzothiophenes	10.0	U
Dibenzofuran	10.0	U	Benz[a]anthracene	**886**	S
Acenaphthylene	**724**	S	Chrysene/Triphenylene	**902**	S
Acenaphthene	**735**	S	C1-Chrysenes	10.0	U
Fluorene	**838**	S	C2-Chrysenes	10.0	U
C1-Fluorenes	10.0	U	C3-Chrysenes	10.0	U
C2-Fluorenes	10.0	U	C4-Chrysenes	10.0	U
C3-Fluorenes	10.0	U	Benzo[b]fluoranthene	**1010**	S
Anthracene	**985**	S	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**1000**	S
Phenanthrene	**954**	S	Benzo[a]fluoranthene	10.0	U
C1-Phenanthrenes/Anthracenes	10.0	U	Benzo[e]pyrene	10.0	U
C2-Phenanthrenes/Anthracenes	10.0	U	Benzo[a]pyrene	**1050**	S
C3-Phenanthrenes/Anthracenes	10.0	U	Perylene	10.0	U
C4-Phenanthrenes/Anthracenes	10.0	U	Indeno[1,2,3-cd]pyrene	**988**	S
Retene	10.0	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**1030**	S
Dibenzothiophene	10.0	U	Benzo[g,h,i]perylene	**960**	S

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	50-130
Phenanthrene-d10	100	50-130
Benzo[a]pyrene-d12	101	50-130

S - Spike compound.
U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:31

Form I
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716LCSD01**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	12/01/16	1000	1	1	AC

Parameter	Result
Carbazole	10.0 U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	50-130
Phenanthrene-d10	100	50-130
Benzo[a]pyrene-d12	101	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:31

Form I
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716LCSD01**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	12/01/16	1000	1	1	AC

Parameter	Result	
4-Methyldibenzothiophene	10.0	U
2/3-Methyldibenzothiophene	10.0	U
1-Methyldibenzothiophene	10.0	U
3-Methylphenanthrene	10.0	U
2-Methylphenanthrene	10.0	U
2-Methylanthracene	10.0	U
9/4-Methylphenanthrene	10.0	U
1-Methylphenanthrene	10.0	U

Surrogate	% Recovery	Acceptance Range (%)
Naphthalene-d8	70	50-130
Phenanthrene-d10	100	50-130
Benzo[a]pyrene-d12	101	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:31

Form I
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716LCSD01**
Associated Blank: **SW110716B01**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	12/01/16	1000	1	1	AC

Parameter	Result	
C26,20R- +C27,20S- triaromatic steroid	10.0	U
C28,20S-triaromatic steroid	10.0	U
C27,20R-triaromatic steroid	10.0	U
C28,20R-triaromatic steroid	10.0	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	94	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 11:31

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011610.D
Acq On : 1 Dec 2016 11:26 pm
Operator : AC
Sample : sw110716lcsd01
Misc : 1x
ALS Vial : 10 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Dec 07 09:51:11 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.054	164	62647M4	500.000	ng/ml	-0.06
71) Chrysene-d12	43.509	240	101532	500.000	ng/ml	-0.08
System Monitoring Compounds						
8) Naphthalene-d8	20.069	136	188140	700.146	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 70.01%			
40) Phenanthrene-d10	32.925	188	205105	996.035	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 99.60%			
80) Benzo[b]fluoranthene-d12	47.424	264	214250	1013.072	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 101.31%			
85) Benzo[a]pyrene-d12	48.644	264	172369	1012.509	ng/ml	-0.06
Spiked Amount 1000.000	Range 50 - 130		Recovery = 101.25%			
126) 5B(H)Cholane - Surr	44.112	217	30992	939.925	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 93.99%			
Target Compounds						Qvalue
9) Naphthalene	20.144	128	188249	636.986	ng/ml	100
14) 2-Methylnaphthalene	22.839	142	118562	631.032	ng/ml	100
24) Acenaphthylene	26.437	152	207331	724.349	ng/ml	100
25) Acenaphthene	27.174	153	128669	735.158	ng/ml	99
27) Fluorene	29.192	166	160104M4	837.897	ng/ml	
41) Phenanthrene	33.015	178	255568	954.170	ng/ml	100
53) Anthracene	33.196	178	250366	984.917	ng/ml	99
56) Fluoranthene	37.788	202	237210M4	797.939	ng/ml	
58) Pyrene	38.676	202	259474	805.177	ng/ml	95
72) Benz[a]anthracene	43.449	228	249307	886.165	ng/ml	99
74) Chrysene/Triphenylene	43.615	228	237999	902.051	ng/ml	99
81) Benzo[b]fluoranthene	47.515	252	289131	1010.089	ng/ml	96
82) Benzo[j]+[k]fluoranthene	47.590	252	265184	1004.994	ng/ml	96
86) Benzo[a]pyrene	48.735	252	267484	1053.271	ng/ml	95
88) Indeno[1,2,3-cd]pyrene	53.704	276	323850M3	987.499	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.765	278	289464	1034.134	ng/ml	99
90) Benzo[g,h,i]perylene	55.060	276	304662	960.439	ng/ml	100

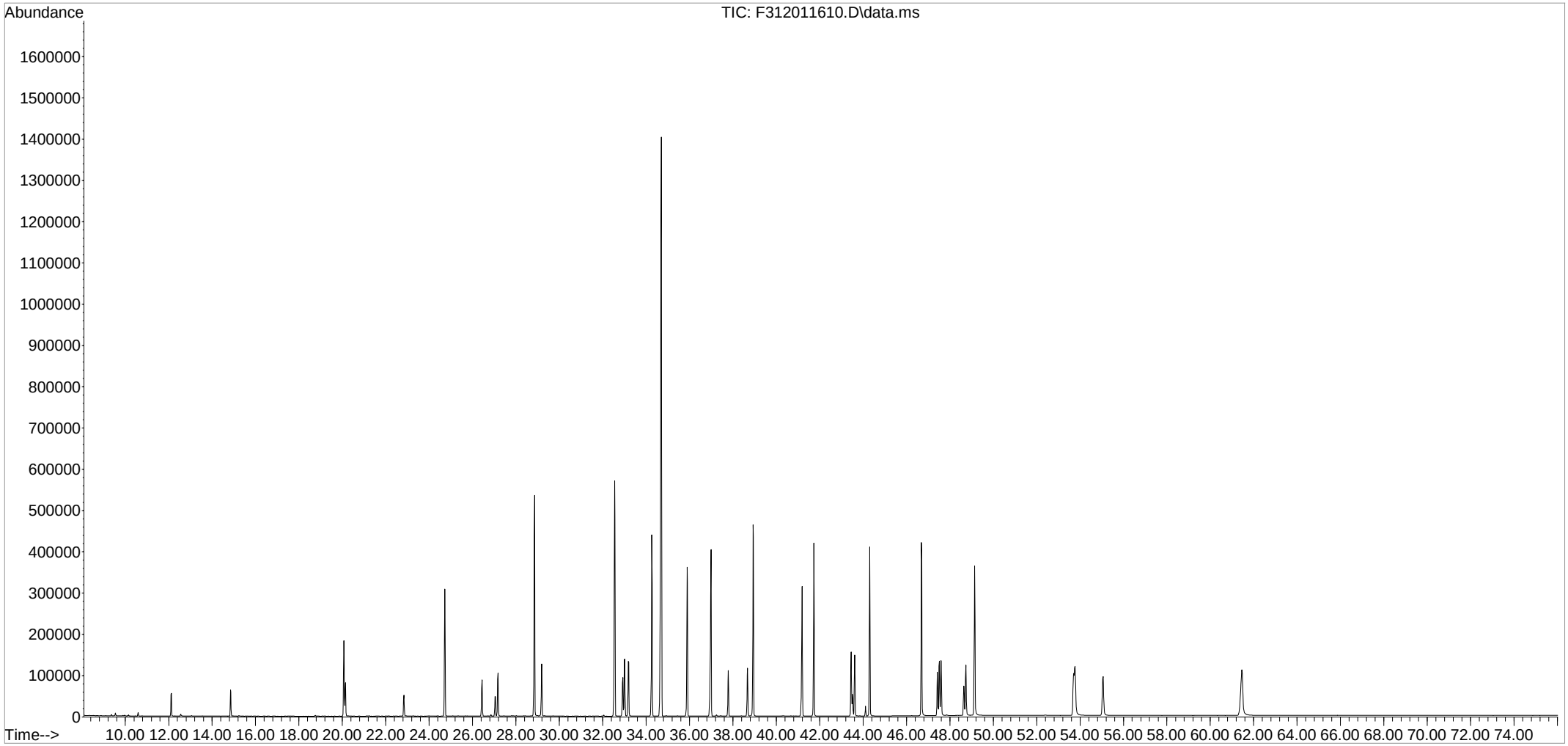
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011610.D
Acq On : 1 Dec 2016 11:26 pm
Operator : AC
Sample : sw110716lcsd01
Misc : 1x
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Dec 07 09:51:11 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : POITAS_ALTNEW_REV2 - PAHs,optionals,isomers.TAS



Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SS112816ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
cis/trans-Decalin	479.2	574	120	65-135
C1-Decalins	728.9	905	124	65-135
C2-Decalins	635.5	760	120	65-135
C3-Decalins	329.8	412	125	65-135
C4-Decalins	326.5	397	122	65-135
Benzothiophene	5.4	5.29	98	65-135
C1-Benzo(b)thiophenes	28.9	28.6	99	65-135
C2-Benzo(b)thiophenes	49.6	45.8	92	65-135
C3-Benzo(b)thiophenes	99.0	86.8	88	65-135
C4-Benzo(b)thiophenes	87.1	74.4	85	65-135
Naphthalene	555.8	589	106	65-135
C1-Naphthalenes	1167.3	1200	103	65-135
C2-Naphthalenes	1409.7	1370	97	65-135
C3-Naphthalenes	1035.9	961	93	65-135
C4-Naphthalenes	561.1	542	97	65-135
Biphenyl	145.7	152	105	65-135
Dibenzofuran	51.2	47.6	93	65-135
Acenaphthylene	6.5	7.61	117	65-135
Acenaphthene	18.7	14.3	76	65-135
Fluorene	74.6	62.0	83	65-135
C1-Fluorenes	170.2	143	84	65-135
C2-Fluorenes	255.4	224	88	65-135
C3-Fluorenes	238.5	211	88	65-135
Phenanthrene	212.2	164	77	65-135
C1-Phenanthrenes/Anthracenes	432.7	315	73	65-135
C2-Phenanthrenes/Anthracenes	465.9	406	87	65-135
C3-Phenanthrenes/Anthracenes	317.4	292	92	65-135
C4-Phenanthrenes/Anthracenes	129	125	97	65-135
Dibenzothiophene	138.9	121	87	65-135
C1-Dibenzothiophenes	278.6	238	85	65-135
C2-Dibenzothiophenes	377.5	301	80	65-135
C3-Dibenzothiophenes	341.4	289	85	65-135
C4-Dibenzothiophenes	183.4	166	91	65-135

12/07/16 12:17

Form III
Spike Recovery Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SS112816ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
Fluoranthene	4.00	3.23	81	65-135
Pyrene	13.0	9.38	72	65-135
C1-Fluoranthenes/Pyrenes	63.1	45.0	71	65-135
C2-Fluoranthenes/Pyrenes	102.2	75.1	73	65-135
C3-Fluoranthenes/Pyrenes	119.6	97.9	82	65-135
C4-Fluoranthenes/Pyrenes	104	82.8	80	65-135
Naphthobenzothiophenes	43.8	35.0	80	65-135
C1-Naphthobenzothiophenes	117.2	91.4	78	65-135
C2-Naphthobenzothiophenes	163.3	126	77	65-135
C3-Naphthobenzothiophenes	128.7	108	84	65-135
C4-Naphthobenzothiophenes	89.0	76.5	86	65-135
Benz[a]anthracene	2.1	1.58	75	65-135
Chrysene/Triphenylene	35.2	29.8	85	65-135
C1-Chrysenes	62.8	56.8	90	65-135
C2-Chrysenes	86.0	69.6	81	65-135
C3-Chrysenes	97.6	91.1	93	65-135
C4-Chrysenes	59.4	58.0	98	65-135
Benzo[b]fluoranthene	5.2	4.53	87	65-135
Benzo[e]pyrene	9.8	9.22	94	65-135
Benzo[a]pyrene	1.9	1.57	82	65-135
Perylene	2.8	3.30	118	65-135
Benzo[g,h,i]perylene	3.1	3.72	120	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

12/07/16 12:17

Form III
Spike Recovery Summary
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SS112816ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
Carbazole	6.00	4.54	76	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

12/07/16 12:17

Form III
Spike Recovery Summary
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SS112816ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
4-Methyldibenzothiophene	131.8	113	86	65-135
2/3-Methyldibenzothiophene	97.5	92.0	94	65-135
1-Methyldibenzothiophene	44.2	29.0	66	65-135
3-Methylphenanthrene	89.4	62.8	70	65-135
2-Methylphenanthrene	97.7	65.5	67	65-135
2-Methylanthracene	3.2	2.08	65	65-135
9/4-Methylphenanthrene	141.2	111	78	65-135
1-Methylphenanthrene	97.4	67.8	70	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

12/07/16 12:18

Form III
Spike Recovery Summary
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SS112816ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
C26,20R- +C27,20S- triaromatic steroid	293.9	296	101	65-135
C28,20S-triaromatic steroid	187.6	183	97	65-135
C27,20R-triaromatic steroid	180.2	170	95	65-135
C28,20R-triaromatic steroid	150.5	148	98	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

12/07/16 12:18

Form I
Alaska North Slope Crude
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SS112816ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/10/16	100	0.0502	10	1	AC

Parameter	Result		Parameter	Result	
cis/trans-Decalin	**574**		C1-Dibenzothiophenes	**238**	
C1-Decalins	**905**		C2-Dibenzothiophenes	**301**	
C2-Decalins	**760**		C3-Dibenzothiophenes	**289**	
C3-Decalins	**412**		C4-Dibenzothiophenes	**166**	
C4-Decalins	**397**		Benzo(b)fluorene	**5.43**	
Benzothiophene	**5.29**		Fluoranthene	**3.23**	
C1-Benzo(b)thiophenes	**28.6**		Pyrene	**9.38**	
C2-Benzo(b)thiophenes	**45.8**		C1-Fluoranthenes/Pyrenes	**45.0**	
C3-Benzo(b)thiophenes	**86.8**		C2-Fluoranthenes/Pyrenes	**75.1**	
C4-Benzo(b)thiophenes	**74.4**		C3-Fluoranthenes/Pyrenes	**97.9**	
Naphthalene	**589**		C4-Fluoranthenes/Pyrenes	**82.8**	
C1-Naphthalenes	**1200**		Naphthobenzothiophenes	**35.0**	
C2-Naphthalenes	**1370**		C1-Naphthobenzothiophenes	**91.4**	
C3-Naphthalenes	**961**		C2-Naphthobenzothiophenes	**126**	
C4-Naphthalenes	**542**		C3-Naphthobenzothiophenes	**108**	
Biphenyl	**152**		C4-Naphthobenzothiophenes	**76.5**	
Dibenzofuran	**47.6**		Benz[a]anthracene	**1.58**	J
Acenaphthylene	**7.61**		Chrysene/Triphenylene	**29.8**	
Acenaphthene	**14.3**		C1-Chrysenes	**56.8**	
Fluorene	**62.0**		C2-Chrysenes	**69.6**	
C1-Fluorenes	**143**		C3-Chrysenes	**91.1**	
C2-Fluorenes	**224**		C4-Chrysenes	**58.0**	
C3-Fluorenes	**211**		Benzo[b]fluoranthene	**4.53**	
Anthracene	1.99	U	Benzo[j]fluoranthene/Benzo[k]fluoranthene	**0.563**	J
Phenanthrene	**164**		Benzo[a]fluoranthene	1.99	U
C1-Phenanthrenes/Anthracenes	**315**		Benzo[e]pyrene	**9.22**	
C2-Phenanthrenes/Anthracenes	**406**		Benzo[a]pyrene	**1.57**	J
C3-Phenanthrenes/Anthracenes	**292**		Perylene	**3.30**	
C4-Phenanthrenes/Anthracenes	**125**		Indeno[1,2,3-cd]pyrene	**0.807**	J
Retene	1.99	U	Dibenz[ah]anthracene/Dibenz[ac]anthracene	**1.50**	J
Dibenzothiophene	**121**		Benzo[g,h,i]perylene	**3.72**	

U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 12:18

Form I
Alaska North Slope Crude
Carbazole

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SS112816ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/10/16	100	0.0502	10	1	AC

Parameter	Result
Carbazole	**4.54**

N/A - Not Applicable

12/07/16 12:18

Form I
Alaska North Slope Crude
Polynuclear Aromatic Hydrocarbons Isomers

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SS112816ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/10/16	100	0.0502	10	1	AC

Parameter	Result
4-Methyldibenzothiophene	**113**
2/3-Methyldibenzothiophene	**92.0**
1-Methyldibenzothiophene	**29.0**
3-Methylphenanthrene	**62.8**
2-Methylphenanthrene	**65.5**
2-Methylanthracene	**2.08**
9/4-Methylphenanthrene	**111**
1-Methylphenanthrene	**67.8**

N/A - Not Applicable

12/07/16 12:18

Form I
Alaska North Slope Crude
Triaromatic Steroids

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SS112816ANC01**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/10/16	100	0.0502	10	1	AC

Parameter	Result
C26,20R- +C27,20S- triaromatic steroid	**296**
C28,20S-triaromatic steroid	**183**
C27,20R-triaromatic steroid	**170**
C28,20R-triaromatic steroid	**148**

N/A - Not Applicable

12/07/16 12:18

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091613.D
Acq On : 10 Nov 2016 9:46 am
Operator : AC
Sample : SS112816ANC01
Misc : FRAX36 5.02
ALS Vial : 13 Sample Multiplier: 1

MAL
11/28/16

Quant Time: Nov 20 19:47:34 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:15:38 2016
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	27.235	164	59009M4	500.000 ng/ml	0.00
71) Chrysene-d12	43.750	240	92645	500.000 ng/ml	0.00
System Monitoring Compounds					
8) Naphthalene-d8	20.234	136	274354	1083.928 ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 108.39%		
40) Phenanthrene-d10	33.121	188	169294	872.814 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 87.28%		
80) Benzo[b]fluoranthene-d12	47.726	264	211601	1096.524 ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 109.65%		
85) Benzo[a]pyrene-d12	48.976	264	178030	1146.077 ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 114.61%		
126) 5B(H)Cholane - Surr	44.353	217	31055	1032.181 ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 103.22%		
Target Compounds					Qvalue
2) trans-Decalin	16.877	138	138960	2718.109 ng/ml	100
3) cis-Decalin	18.097	138	6317	164.494 ng/ml	100
4) C1-Decalins	18.804	152	232279M5	4543.463 ng/ml	
5) C2-Decalins	20.144	166	195091M5	3816.052 ng/ml	
6) C3-Decalins	22.613	180	105619M5	2065.947 ng/ml	
7) C4-Decalins	26.015	194	101940M5	1993.984 ng/ml	
9) Naphthalene	20.310	128	822601	2955.073 ng/ml	100
10) C1-Naphthalenes	23.019	142	1677812M5	6027.293 ng/ml	
11) C2-Naphthalenes	25.865	156	1918458M5	6891.779 ng/ml	
12) C3-Naphthalenes	28.198	170	1343419M5	4826.035 ng/ml	
13) C4-Naphthalenes	30.968	184	757566M5	2721.445 ng/ml	
14) 2-Methylnaphthalene	23.019	142	993410	5613.272 ng/ml	100
15) 1-Methylnaphthalene	23.441	142	684147	4080.822 ng/ml	100
16) Benzothiophene	20.505	134	6542M4	26.536 ng/ml	
17) C1-Benzo(b)thiophenes	22.568	148	35412M5	143.640 ng/ml	
18) C2-Benzo(b)thiophenes	26.061	162	56641M5	229.751 ng/ml	
19) C3-Benzo(b)thiophenes	28.033	176	107359M5	435.476 ng	
20) C4-Benzo(b)thiophenes	30.140	190	92062M5	373.428 ng/ml	
21) Biphenyl	24.901	154	171948	765.331 ng/ml	100
22) 2,6-Dimethylnaphthalene	25.519	156	484538	3154.650 ng/ml	100
23) Dibenzofuran	27.987	168	56409	239.195 ng/ml#	72
24) Acenaphthylene	26.602	152	10295M4	38.185 ng/ml	
25) Acenaphthene	27.355	153	11804M4	71.601 ng/ml	
26) 2,3,5-Trimethylnaphthalen	28.906	170	95247M3	721.689 ng/ml	
27) Fluorene	29.372	166	56025M4	311.281 ng/ml	
28) C1-Fluorenes	31.751	180	129165M5	717.655 ng/ml	
29) C2-Fluorenes	33.783	194	202432M5	1124.734 ng/ml	
30) C3-Fluorenes	35.771	208	190606M5	1059.027 ng/ml	
31) Dibenzothiophene	32.714	184	161260	607.199 ng/ml#	79
32) 4-Methyldibenzothiophene(	34.476	198	151217	569.384 ng/ml	100
33) 2/3-Methyldibenzothiophen	34.837	198	122674M3	461.910 ng/ml	
34) 1-Methyldibenzothiophene(	35.259	198	38601	145.346 ng/ml	100
35) OTP	34.867	198	11448M3	43.106 ng/ml	
36) C1-Dibenzothiophenes	34.476	198	328619M5	1237.363 ng/ml	
36) C1-Dibenzothiophenes BS	34.476	198	317171M5	1194.257 ng/ml	
37) C2-Dibenzothiophenes	36.538	212	400948M5	1509.706 ng/ml	
38) C3-Dibenzothiophenes	37.984	226	385426M5	1451.261 ng/ml	
39) C4-Dibenzothiophenes	39.670	240	221630M5	834.513 ng/ml	
41) Phenanthrene	33.196	178	207274	821.573 ng/ml	93
42) 3-Methylphenanthrene(3MP)	35.168	192	79469	314.992 ng/ml	97
43) 2-Methylphenanthrene(2MP)	35.289	192	82942	328.758 ng/ml	98
44) 2-Methylanthracene(2MA)	35.424	192	2641	10.468 ng/ml	88
45) 9/4-Methylphenanthrene(9M	35.620	192	140321	556.191 ng/ml	99
46) 1-Methylphenanthrene(1MP)	35.710	192	85886	340.427 ng/ml	99

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Sample : SS112816ANC01
Misc : FRAX36 5.02
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Nov 20 19:47:34 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:15:38 2016
Response via : Initial Calibration

Sub List : Default - All compounds listed

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
47)	C1-Phenanthrenes/Anthrace	35.620	192	398424M5	1579.236	ng/ml	
48)	C2-Phenanthrenes/Anthrace	37.442	206	514679M5	2040.037	ng/ml	
48)	C2-Phenanthrenes/Anthr BS	37.442	206	514679M5	2040.037	ng/ml	
50)	C3-Phenanthrenes/Anthrace	39.279	220	369262M5	1463.646	ng/ml	
51)	C4-Phenanthrenes/Anthrace	41.477	234	158893M5	629.805	ng/ml	
54)	Carbazole	34.024	167	5331M4	22.790	ng/ml	
55)	1-Methylphenanthrene	35.710	192	86419	464.454	ng/ml	92
56)	Fluoranthene	37.999	202	4546M3	16.235	ng/ml	
57)	Benzo(b)fluorene	40.528	216	4526M3	27.279	ng/ml	
58)	Pyrene	38.887	202	14301M4	47.114	ng/ml	
59)	C1-Fluoranthenes/Pyrenes	40.272	216	68517M5	225.724	ng/ml	
60)	C2-Fluoranthenes/Pyrenes	42.410	230	114379M5	376.813	ng/ml	
61)	C3-Fluoranthenes/Pyrenes	44.127	244	149234M5	491.640	ng/ml	
62)	C4-Fluoranthenes/Pyrenes	45.482	258	126093M5	415.404	ng/ml	
63)	Naphthobenzothiophene	42.757	234	34092	129.587	ng/ml#	94
64)	Naphthobenzothiophene-2,1	42.757	234	34092	129.587	ng/ml#	94
65)	Naphthobenzothiophene-1,2	43.103	234	7637	29.029	ng/ml#	100
66)	Naphthobenzothiophene-2,3	43.404	234	4459	16.949	ng/ml#	100
67)	C1-Naphthobenzothiophenes	44.157	248	120682M5	458.722	ng/ml	
68)	C2-Naphthobenzothiophenes	46.190	262	166451M5	632.694	ng/ml	
69)	C3-Naphthobenzothiophenes	47.831	276	143039M5	543.703	ng/ml	
70)	C4-Naphthobenzothiophenes	48.961	290	101058M5	384.130	ng/ml	
72)	Benz[a]anthracene	43.690	228	2039M3	7.943	ng/ml	
73)	Chrysene	43.826	228	35823M4	148.799	ng/mL	
74)	Chrysene/Triphenylene	43.826	228	36063M4	149.795	ng/ml	
75)	C1-Chrysenes	45.331	242	68593M5	284.916	ng/ml	
76)	C2-Chrysenes	46.777	256	90286M5	375.022	ng/ml	
76)	C2-Chrysenes BS	46.777	256	84168M5	349.610	ng/ml	
77)	BBF-D12 Surr BKGD	47.711	256	6118	25.412	ng/ml	100
78)	C3-Chrysenes	48.885	270	110087M5	457.270	ng/ml	
79)	C4-Chrysenes	50.406	284	70110M5	291.217	ng/ml	
81)	Benzo[b]fluoranthene	47.801	252	5941M4	22.746	ng/ml	
82)	Benzo[j]+[k]fluoranthene	47.861	252	681M3	2.828	ng/ml	
84)	Benzo[e]pyrene	48.870	252	11247M4	46.308	ng/ml	
86)	Benzo[a]pyrene	49.066	252	1822M3	7.863	ng/ml	
87)	Perylene	49.382	252	3886	16.562	ng/ml#	25
88)	Indeno[1,2,3-cd]pyrene	54.202	276	1212M3	4.050	ng/ml	
89)	Dibenz[ah]+[ac]anthracene	54.262	278	1919M4	7.513	ng/ml	
90)	Benzo[g,h,i]perylene	55.617	276	5407	18.681	ng/ml#	67
91)	Hopane (T19)	53.178	191	41211	778.272	ng/mL	93
92)	17a(H),21B(H)-hopane - C3	53.178	191	41211	778.272	ng/mL	93
93)	C23 Tricyclic Terpane (T4	41.357	191	20802M4	392.847	ng/ml	
94)	C24 Tricyclic Terpane (T5	42.079	191	9541	180.182	ng/ml	100
95)	C25 Tricyclic Terpane (T6	43.570	191	10222	193.043	ng/ml	100
96)	C24 Tetracyclic Terpane (	44.910	191	3620M4	68.364	ng/ml	
97)	C26 Tricyclic Terpane-22S	44.639	191	4173M4	78.807	ng/ml	
98)	C26 Tricyclic Terpane-22R	44.729	191	3806	71.877	ng/ml	100
99)	C28 Tricyclic Terpane-22S	47.048	191	3692M4	69.724	ng/ml	
100)	C28 Tricyclic Terpane-22R	47.214	191	3905M4	73.746	ng/ml	
101)	C29 Tricyclic Terpane-22S	47.756	191	4747	89.647	ng/ml	100
102)	C29 Tricyclic Terpane-22R	47.967	191	4989M4	94.218	ng/ml	
103)	18a-22,29,30-Trisnorneoho	49.156	191	6882	129.967	ng/ml	100
104)	C30 Tricyclic Terpane-22S	49.262	191	3076M4	58.090	ng/mL	
105)	C30 Tricyclic Terpane-22R	49.518	191	3776M4	71.310	ng/mL	
106)	17a(H)-22,29,30-Trisnorho	49.729	191	8113	153.214	ng/ml	100
107)	17a/b,21b/a 28,30-Bisnorh	50.994	191	1807M4	34.125	ng/ml	
108)	17a(H),21b(H)-25-Norhopan	50.798	191	2104	39.734	ng/ml	100
109)	30-Norhopane (T15)	51.717	191	23003	434.413	ng/ml	100
110)	18a(H)-30-Norneohopane-C2	51.822	191	5479M4	103.471	ng/ml	
111)	17a(H)-Diahopane (X)	51.958	191	2990M4	56.466	ng/ml	
112)	30-Normoretane (T17)	52.560	191	2340M4	44.191	ng/ml	

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Operator : AC
Sample : SS112816ANC01
Misc : FRAX36 5.02
ALS Vial : 13 Sample Multiplier: 1

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Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:15:38 2016
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
114) Moretane (T20)	53.915	191	3906M4	73.765	ng/ml	
115) 30-Homohopane-22S (T21)	55.105	191	17947	338.930	ng/ml	100
116) 30-Homohopane-22R (T22)	55.361	191	15191	286.883	ng/ml	100
117) Gammacerane/C32-diahopane	55.933	191	3206	60.545	ng/mL	100
118) 30,31-Bishomohopane-22S (	56.792	191	13560	256.081	ng/ml	100
119) 30,31-Bishomohopane-22R (	57.213	191	9690	182.996	ng/ml	100
120) 30,31-Trishomohopane-22S	59.111	191	11031	208.321	ng/ml	100
121) 30,31-Trishomohopane-22R	59.788	191	8096	152.893	ng/ml	100
122) Tetrakishomohopane-22S (T	61.987	191	8166	154.215	ng/ml	100
123) Tetrakishomohopane-22R (T	62.981	191	5823	109.968	ng/ml	100
124) Pentakishomohopane-22S (T	65.435	191	9938	187.680	ng/ml	100
125) Pentakishomohopane-22R (T	66.851	191	6981M4	131.837	ng/ml	
127) 13b(H),17a(H)-20S-Diachol	45.858	217	6660M4	221.360	ng/ml	
128) 13b(H),17a(H)-20R-Diachol	46.295	217	3349	111.311	ng/ml	100
129) 13b,17a-20S-Methyldiachol	47.003	217	3130M3	104.032	ng/ml	
130) 14a,17a-20S-Chol/13b,17a-	47.906	217	7586	252.137	ng/ml	100
131) 14a,17a-20R-Chol/13b,17a-	48.449	217	9028M4	300.065	ng/ml	
132) Unknown Sterane (S18)	48.735	217	2219	73.753	ng/ml	100
133) 13a,17b-20S-Ethyldiachole	49.021	217	444	14.757	ng/ml	100
134) 14a,17a-20S-Methylcholest	49.187	217	4270M4	141.923	ng/ml	
135) 14a,17a-20R-Methylcholest	49.955	217	4746	157.744	ng/ml	100
136) 14a(H),17a(H)-20S-Ethylch	50.331	217	9031	300.165	ng/ml	100
137) 14a(H),17a(H)-20R-Ethylch	51.295	217	5978M4	198.692	ng/ml	
138) 14b(H),17b(H)-20R-Cholest	47.997	218	6103	202.847	ng/ml	100
139) 14b(H),17b(H)-20S-Cholest	48.087	218	5437	180.711	ng/ml	100
140) 14b,17b-20R-Methylcholest	49.367	218	6347	210.956	ng/ml	100
141) 14b,17b-20S-Methylcholest	49.458	218	7107M4	236.217	ng/ml	
142) 14b(H),17b(H)-20R-Ethylch	50.587	218	9268M3	308.042	ng/ml	
143) 14b(H),17b(H)-20S-Ethylch	50.632	218	4847M3	161.101	ng/ml	
144) C26,20R- +C27,20S- triaro	50.286	231	44713	1486.135	ng/mL	100
145) C28,20S-triaromatic stero	51.220	231	27606	917.546	ng/mL	100
146) C27,20R-triaromatic stero	51.702	231	25747	855.758	ng/mL	100
147) C28,20R-triaromatic stero	52.997	231	22293M4	740.957	ng/mL	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

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Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
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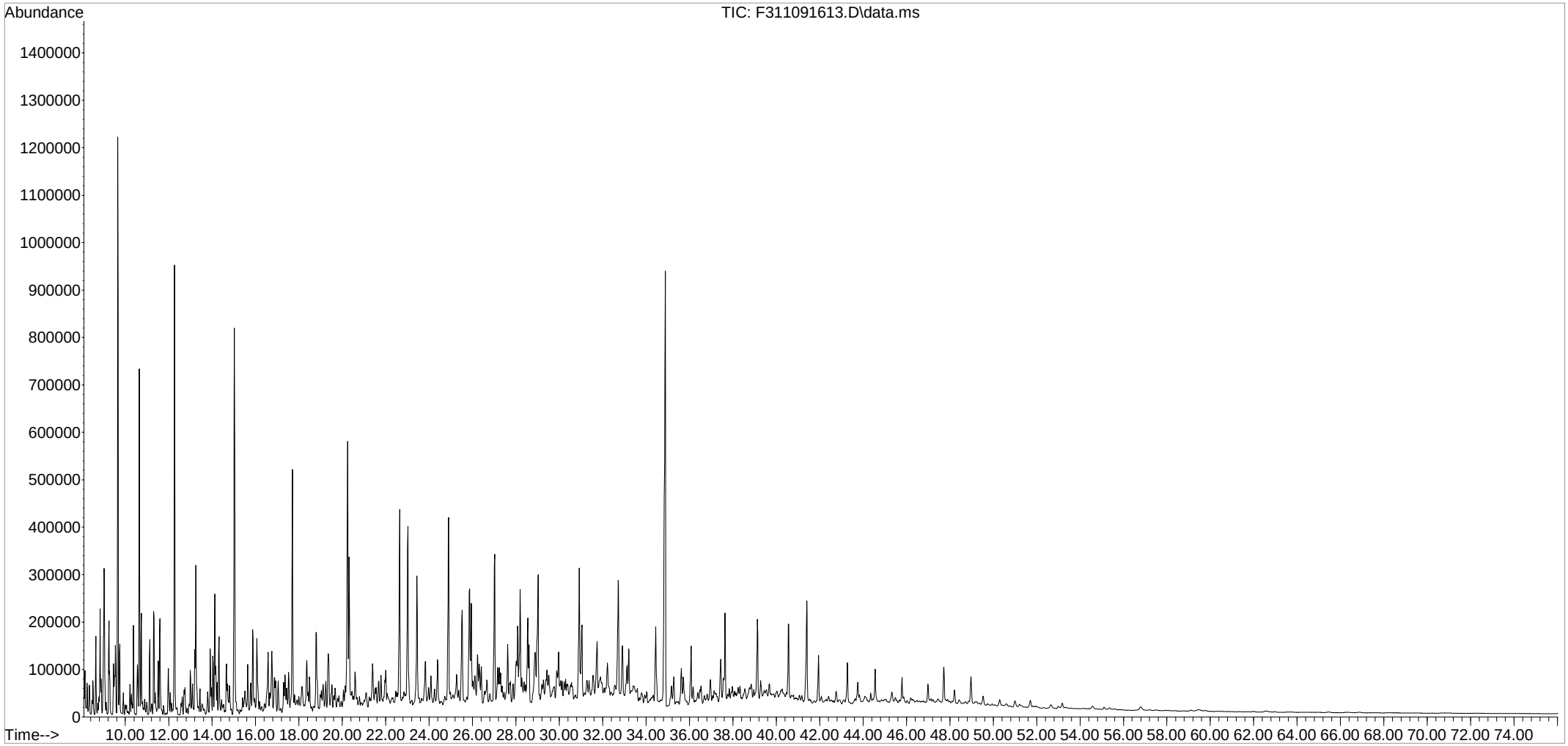

Analysis log File

Total Files Reported in Log : 42
Log Generated From Directory: O:\Forensics\Data\PAH3\2016\NOV16\NOV28\

No.	DATA FILE	INJ METH	SAMPLE NAME	MISC	DATE INJ'D
1	F311281601.D	FRNC3A.M	PRIME	1X	11/28/2016 9:21 am
2	F311281602.D	FRNC3A.M	✓C311281601 pass	CC FRAX92 500NG/ML	11/28/2016 10:47 am
3	F311281603.D	FRNC3A.M	ans311281601	CC FRAX56 5.02	11/28/2016 1:33 pm
4	F311281604.D	FRNC3A.M	dcm	dcm	11/28/2016 3:00 pm
5	F311281605.D	FRNC3A.M	dcm	dcm	11/28/2016 4:26 pm
6	F311281606.D	FRNC3A.M	✓ so111116b03	1x	11/28/2016 5:52 pm
7	F311281607.D	FRNC3A.M	✓ so111116lcs02	1x	11/28/2016 7:18 pm
8	F311281608.D	FRNC3A.M	✓ so111116lcsd02	1x	11/28/2016 8:43 pm
9	F311281609.D	FRNC3A.M	1611004-04 — use dil	1x	11/28/2016 10:09 pm
10	F311281610.D	FRNC3A.M	✓ 1611004-05	1x	11/28/2016 11:35 pm
11	F311281611.D	FRNC3A.M	✓ 1611004-05d	1x	11/29/2016 1:00 am
12	F311281612.D	FRNC3A.M	1611004-06 — use dil	1x	11/29/2016 2:26 am
13	F311281613.D	FRNC3A.M	✓c311281602 pass	CC FRAX92 500NG/ML	11/29/2016 3:51 am
14	F311281614.D	FRNC3A.M	pp31128160	what91 1207ug/ml	11/29/2016 5:16 am
15	F311281615.D	FRNC3A.M	dcm	dcm	11/29/2016 6:42 am
16	F311281616.D	FRNC3A.M	dcm	dcm	11/29/2016 8:08 am
17	F311281617.D	FRNC3A.M	✓ so111016b02	1x	11/29/2016 11:49 am
18	F311281618.D	FRNC3A.M	✓ so111016lcs02	1x	11/29/2016 1:15 pm
19	F311281619.D	FRNC3A.M	✓ so111016lcsd02	1x	11/29/2016 2:41 pm
20	F311281620.D	FRNC3A.M	1611004-01	1x	11/29/2016 4:08 pm
21	F311281621.D	FRNC3A.M	1611004-02	1x	11/29/2016 5:34 pm
22	F311281622.D	FRNC3A.M	1611004-02d use dil	1x	11/29/2016 7:00 pm
23	F311281623.D	FRNC3A.M	1611004-03	1x	11/29/2016 8:27 pm
24	F311281623a.D	FRNC3A.M	✓ 1611004-04	10x	11/29/2016 9:53 pm
25	F311281623b.D	FRNC3A.M	✓ 1611004-06	2x	11/29/2016 11:20 pm
26	F311281624.D	FRNC3A.M	✓ c311281603 pass	cc frax92 500ng/ml	11/30/2016 12:47 am
27	F311281625.D	FRNC3A.M	dcm	dcm	11/30/2016 2:14 am
28	F311281626.D	FRNC3A.M	dcm	dcm	11/30/2016 3:40 am
29	F311281627.D	FRNC3A.M	sw110716b01	1x	11/30/2016 5:06 am
30	F311281628.D	FRNC3A.M	sw110716lcs01 >RL, ra	1x	11/30/2016 6:33 am
31	F311281629.D	FRNC3A.M	sw110716lcsd01	1x	11/30/2016 8:00 am
32	F311281630.D	FRNC3A.M	1611004-02d		11/30/2016 9:27 am
33	F311281631.D	FRNC3A.M	1611004-07 ra	10x	11/30/2016 10:53 am
34	F311281632.D	FRNC3A.M	✓ 1611004-08	10x	11/30/2016 12:20 pm
35	F311281633.D	FRNC3A.M	✓ 1611004-09	10x	11/30/2016 1:46 pm
36	F311281634.D	FRNC3A.M	✓ 1611004-09d	10x	11/30/2016 3:12 pm
37	F311281635.D	FRNC3A.M	c311281604 conc	cc frax92 500ng/ml	11/30/2016 4:38 pm
38	F311281636.D	FRNC3A.M	✓ 1611004-01	10x	11/30/2016 6:05 pm
39	F311281637.D	FRNC3A.M	✓ 1611004-02	10x	11/30/2016 7:31 pm
40	F311281638.D	FRNC3A.M	✓ 1611004-02d	10x	11/30/2016 8:57 pm
41	F311281639.D	FRNC3A.M	✓ 1611004-03	10x	11/30/2016 10:23 pm
42	F311281640.D	FRNC3A.M	✓c311281605 pass	cc frax92 500ng/ml	11/30/2016 11:49 pm

MAL
12/7/16

PAH3110916.M

SeqLog 1.0 - (c) 2009 Abacus Database Applications

Analysis log File

Total Files Reported in Log : 18
Log Generated From Directory: O:\Forensics\Data\PAH3\2016\DEC16\DEC01\

No.	DATA FILE	INJ METH	SAMPLE NAME	MISC	DATE INJ'D
1	F312011601.D	FRNC3A.M	PRIME	1X	12/1/2016 8:55 am
2	F312011602.D	FRNC3A.M	✓ c312011601 pass	cc frax92 500ng/ml	12/1/2016 11:30 am
3	F312011603.D	FRNC3A.M	ANS312011601	ans	12/1/2016 1:24 pm
4	F312011604.D	FRNC3A.M	dcm	dcm	12/1/2016 2:50 pm
5	F312011605.D	FRNC3A.M	dcm	dcm	12/1/2016 4:17 pm
6	F312011606.D	FRNC3A.M	gpc 3 blk	1x	12/1/2016 5:42 pm
7	F312011607.D	FRNC3A.M	gpc 3 lcs	1x	12/1/2016 7:08 pm
8	F312011608.D	FRNC3A.M	✓ sw110716b01	1x	12/1/2016 8:34 pm
9	F312011609.D	FRNC3A.M	✓ sw110716lcs01	1x	12/1/2016 10:00 pm
10	F312011610.D	FRNC3A.M	✓ sw110716lcsd01	1x	12/1/2016 11:26 pm
11	F312011611.D	FRNC3A.M	✓ 1611004-07	1x	12/2/2016 12:52 am
12	F312011612.D	FRNC3A.M	✓ 1611004-08-RE	500x	12/2/2016 2:18 am
13	F312011613.D	FRNC3A.M	✓ 1611004-09-RE	500x	12/2/2016 3:44 am
14	F312011614.D	FRNC3A.M	✓ 1611004-09d-RE	500x	12/2/2016 5:10 am
15	F312011615.D	FRNC3A.M	✓ 1611004-03-RE	50x	12/2/2016 6:36 am
16	F312011616.D	FRNC3A.M	✓ c312011602 pass	cc frax92 500ng/ml	12/2/2016 8:01 am
17	F312011617.D	FRNC3A.M	dcm	cc frax92 500ng/ml	12/2/2016 9:28 am
18	F312011618.D	FRNC3A.M	naso 148533	cc frax92 500ng/ml	12/2/2016 10:54 am

PAH3110916.M

NAL
12/7/16

SeqLog 1.0 - (c) 2009 Abacus Database Applications

Supporting Quality Control Results

Form IV
Method Blank Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116B03**
Date Analyzed: **11/28/16 17:52**

Client ID	Lab ID	Date/Time Analyzed
LCS	SO111116LCS02	11/28/16 19:18
LCSD	SO111116LCSD02	11/28/16 20:43
NFNP-02	1611004-05	11/28/16 23:35
NFNP-02	1611004-05 D	11/29/16 01:00
NFNP-01	1611004-04	11/29/16 21:53
NFNP-03	1611004-06	11/29/16 23:20

N/A - Not Applicable

320 Forbes Blvd, Mansfield, MA 02048, (508) 822-9300, Fax (508) 822-3288

Form IV
Method Blank Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016B02**
Date Analyzed: **11/29/16 11:49**

Client ID	Lab ID	Date/Time Analyzed
LCS	SO111016LCS02	11/29/16 13:15
LCSD	SO111016LCSD02	11/29/16 14:41
NFSB-02(MW)	1611004-01	11/30/16 18:05
ENV-9MW	1611004-02	11/30/16 19:31
ENV-9MW	1611004-02 D	11/30/16 20:57
ENV-3MW	1611004-03	11/30/16 22:23
ENV-3MW	1611004-03E	12/02/16 06:36

N/A - Not Applicable

320 Forbes Blvd, Mansfield, MA 02048, (508) 822-9300, Fax (508) 822-3288

Form IV
Method Blank Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716B01**
Date Analyzed: **12/01/16 20:34**

Client ID	Lab ID	Date/Time Analyzed
NFSB-01(MW)	1611004-08	11/30/16 12:20
DUP-1	1611004-09	11/30/16 13:46
DUP-1	1611004-09 D	11/30/16 15:12
LCS	SW110716LCS01	12/01/16 22:00
LCSD	SW110716LCSD01	12/01/16 23:26
NFSB-08(MW)	1611004-07	12/02/16 00:52
NFSB-01(MW)	1611004-08E	12/02/16 02:18
DUP-1	1611004-09E	12/02/16 03:44
DUP-1	1611004-09E D	12/02/16 05:10

N/A - Not Applicable

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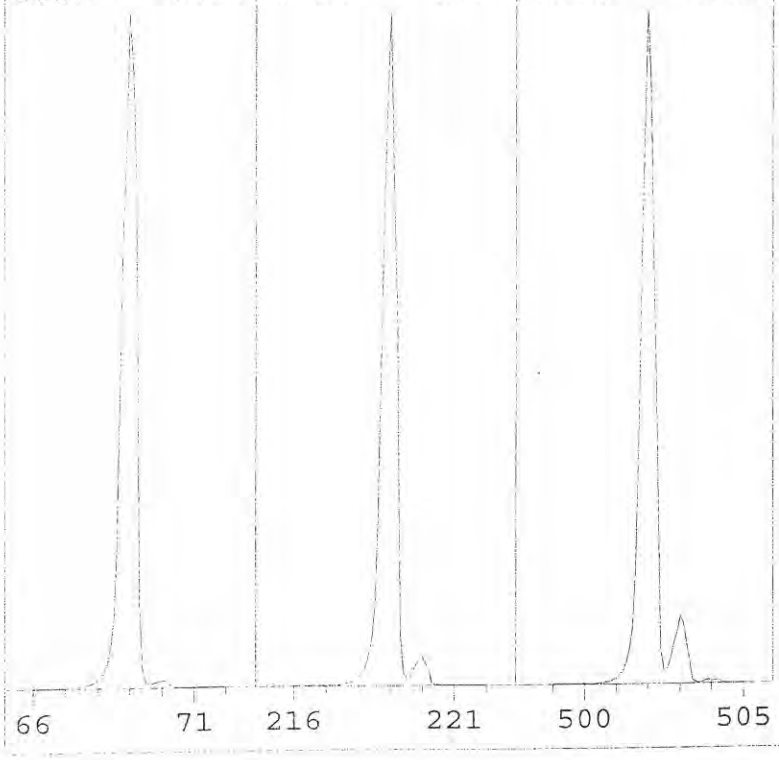
5973 Tune

Wed Nov 09 16:01:41 2016 Instrument: PAH 3

C:\MSDCHEM\1\5973N\PFTBA.U

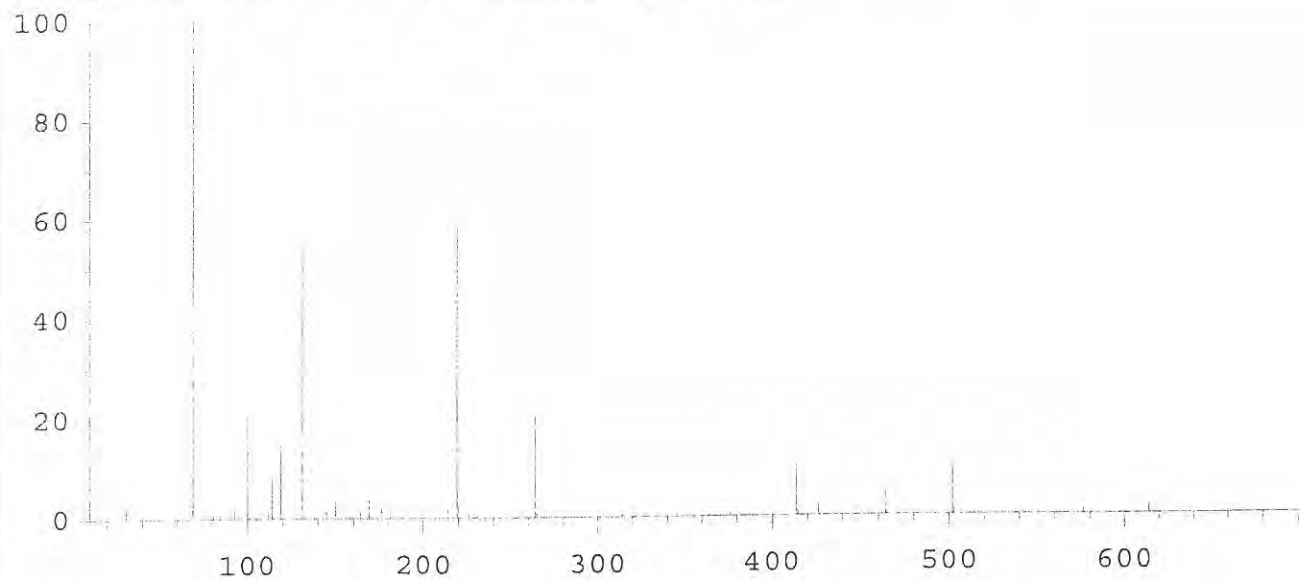
Mass	69.00	Mass	219.00	Mass	502.00
Ab	617907	Ab	380391	Ab	66607
Pw50	0.52	Pw50	0.50	Pw50	0.49



Ion Pol	POS	MassGain	61
		MassOffs	-13
Emission	34.6	AmuGain	2469
ElEnrgy	69.9	AmuOffs	144
Filament	1	Wid219	-0.032
		DC Pol	POS
Repeller	34.81		
IonFcus	86.4	HEDEnab	ON
EntLens	0.0	EMVolts	1941
EntOffs	VAR		
		Samples	8
PFTBA	OPEN	Averages	3
		Stepsize	0.10
Zones:			
MS Source	230	Foreline	53
MS Quad	150		

Scan: 10.00 - 700.00 Samples: 8 Thresh: 100 Step: 0.10

155 peaks Base: 69.00 Abundance: 523584



Mass	Abund	Rel Abund	Iso Mass	Iso Abund	Iso Ratio
69.00	523584	100.00	70.00	6334	1.21
219.00	305216	58.29	219.90	13501	4.42
502.00	53576	10.23	503.00	5425	10.13

TARGET MASS:	50	69	131	219	414	502
DYNAMIC ENT OFFSET:	12.0	16.3	18.6	19.8	24.3	25.1
TARGET ABUND(%):	1.0	100.0	50.0	52.0	9.0	9.0
ACTUAL TUNE ABUND(%):	1.0	100.0	54.2	58.3	10.5	10.2

Analysis log File

Total Files Reported in Log : 31
Log Generated From Directory: O:\Forensics\Data\PAH3\2016\NOV16\NOV09\

NAL
11/28/16

No.	DATA FILE	INJ METH	SAMPLE NAME	MISC	DATE INJ'D
1	F311091601.D	FRNC3A.M	DCM	DCM	11/9/2016 4:06 pm
2	F311091602.D	FRNC3A.M	DCM	DCM	11/9/2016 5:35 pm
3	F311091603.D	FRNC3A.M	I311081601	FRAX34	11/9/2016 7:03 pm
4	F311091604.D	FRNC3A.M	I311081602	FRAX33	11/9/2016 8:32 pm
5	F311091605.D	FRNC3A.M	I311081603	FRAX32	11/9/2016 10:01 pm
6	F311091606.D	FRNC3A.M	I311081604	FRAX31	11/9/2016 11:30 pm
7	F311091607.D	FRNC3A.M	I311081605	FRAX30	11/10/2016 12:58 am
8	F311091608.D	FRNC3A.M	I311081606	FRAX29	11/10/2016 2:26 am
9	F311091609.D	FRNC3A.M	I311081607	FRAX28	11/10/2016 3:55 am
10	F311091610.D	FRNC3A.M	DCM	DCM	11/10/2016 5:22 am
11	F311091611.D	FRNC3A.M	QC311081601	FRAX54	11/10/2016 6:49 am
12	F311091612.D	FRNC3A.M	DCM	DCM	11/10/2016 8:18 am
13	F311091613.D	FRNC3A.M	SS112816ANC01	FRAX36 5.02	11/10/2016 9:46 am
14	F311091614.D	FRNC3A.M	ANS311081602	FRAX36 5.02	11/10/2016 11:26 am
15	F311091615.D	FRNC3A.M	DCM	DCM	11/11/2016 8:53 am
16	F311091616.D	FRNC3A.M	DCM CHECK DC341	DCM SN75023	11/11/2016 10:21 am
17	F311091617.D	FRNC3A.M	DCM CHECK DC341	DCM SN75036	11/11/2016 11:47 am
18	F311091618.D	FRNC3A.M	DCM CHECK RECHECK	DCM SN75036	11/11/2016 1:13 pm
19	F311091619.D	FRNC3A.M	DCM	DCM	11/14/2016 8:28 am
20	F311091620.D	FRNC3A.M	DCM	DCM	11/14/2016 9:56 am
21	F311091621.D	FRNC3A.M	NASO 144042	DCM	11/14/2016 2:54 pm
22	F311091622.D	FRNC3A.M	GPC 3 BLK	1X	11/14/2016 4:23 pm
23	F311091623.D	FRNC3A.M	GPC 3 LCS	1X	11/14/2016 5:49 pm
24	F311091624.D	FRNC3A.M	DCM	1X	11/15/2016 11:07 am
25	F311091625.D	FRNC3A.M	GPC 3 BLK	11/24/16	11/15/2016 12:37 pm
26	F311091626.D	FRNC3A.M	DCM	DCM	11/17/2016 12:11 pm
27	F311091627.D	FRNC3A.M	DCM	DCM	11/17/2016 1:40 pm
28	F311091628.D	FRNC3A.M	SILICA LOT	BCBR9427V	11/17/2016 3:08 pm
29	F311091629.D	FRNC3A.M	PRIME	BCBR9427V	11/21/2016 9:20 am
30	F311091630.D	FRNC3A.M	CC	BCBR9427V	11/21/2016 10:45 am
31	F311091631.D	FRNC3A.M	ANS311081603	FRAX36 5.02	11/21/2016 12:11 pm

SeqLog 1.0 - (c) 2009 Abacus Database Applications

Response Factor Report PAH 3

Method Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Method File : PAH3110916.M
Title : Decalins & Alkylated PAH's
Last Update : Sun Nov 20 16:15:38 2016
Response Via : Initial Calibration

Calibration Files
10 =F311091603.D 25 =F311091604.D 100 =F311091605.D 500 =F311091606.D 5000=F311091607.D 1E3 =F311091608.D 2E3 =F311091609.D

		Compound	10	25	100	500	5000	1E3	2E3	Avg	%RSD
1)	i	Acenaphthene-d10	----------ISTD----------								
2)	A1	trans-Decalin	0.437	0.417	0.415	0.412	0.432	0.448	0.472	0.433	4.95
3)	t	cis-Decalin	0.316	0.320	0.301	0.306	0.328	0.343	0.362	0.325	6.56
4)	A2	C1-Decalins	0.437	0.417	0.415	0.412	0.432	0.448	0.472	0.433	4.95
5)	A2	C2-Decalins	0.437	0.417	0.415	0.412	0.432	0.448	0.472	0.433	4.95
6)	A2	C3-Decalins	0.437	0.417	0.415	0.412	0.432	0.448	0.472	0.433	4.95
7)	A2	C4-Decalins	0.437	0.417	0.415	0.412	0.432	0.448	0.472	0.433	4.95
8)	s	Naphthalene-d8	2.211	2.150	2.104	2.087	2.136	2.135	2.189	2.145	2.03
9)	A1	Naphthalene	2.447	2.418	2.377	2.375	2.330	2.279	2.284	2.359	2.71
10)	A2	C1-Naphthalenes	2.447	2.418	2.377	2.375	2.330	2.279	2.284	2.359	2.71
11)	A2	C2-Naphthalenes	2.447	2.418	2.377	2.375	2.330	2.279	2.284	2.359	2.71
12)	A2	C3-Naphthalenes	2.447	2.418	2.377	2.375	2.330	2.279	2.284	2.359	2.71
13)	A2	C4-Naphthalenes	2.447	2.418	2.377	2.375	2.330	2.279	2.284	2.359	2.71
14)	t	2-Methylnaphth...	1.468	1.502	1.451	1.478	1.530	1.526	1.541	1.500	2.31
15)	t	1-Methylnaphth...	1.414	1.449	1.394	1.419	1.440	1.420	1.408	1.421	1.32
16)	A1	Benzothiophene	2.049	2.098	2.118	2.128	2.102	2.068	2.060	2.089	1.45
17)	A2	C1-Benzo(b)thi...	2.049	2.098	2.118	2.128	2.102	2.068	2.060	2.089	1.45
18)	A2	C2-Benzo(b)thi...	2.049	2.098	2.118	2.128	2.102	2.068	2.060	2.089	1.45
19)	A2	C3-Benzo(b)thi...	2.049	2.098	2.118	2.128	2.102	2.068	2.060	2.089	1.45
20)	A2	C4-Benzo(b)thi...	2.049	2.098	2.118	2.128	2.102	2.068	2.060	2.089	1.45
21)	t	Biphenyl	1.907	1.951	1.923	1.879	1.946	1.887	1.834	1.904	2.16
22)	t	2,6-Dimethylna...	1.276	1.317	1.284	1.279	1.354	1.325	1.275	1.301	2.38
23)	t	Dibenzofuran	1.957	2.051	2.109	2.052	2.090	1.960	1.767	1.998	5.89
24)	t	Acenaphthylene	2.260	2.334	2.308	2.303	2.394	2.279	2.112	2.284	3.82
25)	t	Acenaphthene	1.406	1.449	1.441	1.402	1.447	1.367	1.266	1.397	4.64
26)	t	2,3,5-Trimethy...	1.128	1.099	1.097	1.109	1.182	1.142	1.071	1.118	3.21
27)	A1	Fluorene	1.592	1.574	1.550	1.550	1.599	1.482	1.328	1.525	6.24
28)	A2	C1-Fluorenes	1.592	1.574	1.550	1.550	1.599	1.482	1.328	1.525	6.24
29)	A2	C2-Fluorenes	1.592	1.574	1.550	1.550	1.599	1.482	1.328	1.525	6.24
30)	A2	C3-Fluorenes	1.592	1.574	1.550	1.550	1.599	1.482	1.328	1.525	6.24
31)	A1	Dibenzothiophene	2.247	2.305	2.271	2.298	2.343	2.204	2.085	2.250	3.80
32)	A2	4-Methyldibenz...	2.247	2.305	2.271	2.298	2.343	2.204	2.085	2.250	3.80
33)	A2	2/3-Methyldibe...	2.247	2.305	2.271	2.298	2.343	2.204	2.085	2.250	3.80
34)	A2	1-Methyldibenz...	2.247	2.305	2.271	2.298	2.343	2.204	2.085	2.250	3.80
35)	A2	OTP	2.247	2.305	2.271	2.298	2.343	2.204	2.085	2.250	3.80
36)	A2	C1-Dibenzothio...	2.247	2.305	2.271	2.298	2.343	2.204	2.085	2.250	3.80
37)	A2	C2-Dibenzothio...	2.247	2.305	2.271	2.298	2.343	2.204	2.085	2.250	3.80
38)	A2	C3-Dibenzothio...	2.247	2.305	2.271	2.298	2.343	2.204	2.085	2.250	3.80
39)	A2	C4-Dibenzothio...	2.247	2.305	2.271	2.298	2.343	2.204	2.085	2.250	3.80
40)	s	Phenanthrene-d10	1.614	1.591	1.603	1.579	1.728	1.722	1.667	1.644	3.80
41)	A1	Phenanthrene	2.207	2.265	2.266	2.245	2.215	2.013	1.752	2.138	8.94
42)	A2	3-Methylphenan...	2.207	2.265	2.266	2.245	2.215	2.013	1.752	2.138	8.94

Method Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Method File : PAH3110916.M
Title : Decalins & Alkylated PAH's
Last Update : Sun Nov 20 16:15:38 2016
Response Via : Initial Calibration

Calibration Files
10 =F311091603.D 25 =F311091604.D 100 =F311091605.D 500 =F311091606.D 5000=F311091607.D 1E3 =F311091608.D 2E3 =F311091609.D

		Compound	10	25	100	500	5000	1E3	2E3	Avg	%RSD
43)	A2	2-Methylphenan...	2.207	2.265	2.266	2.245	2.215	2.013	1.752	2.138	8.94
44)	A2	2-Methylanthra...	2.207	2.265	2.266	2.245	2.215	2.013	1.752	2.138	8.94
45)	A2	9/4-Methylphen...	2.207	2.265	2.266	2.245	2.215	2.013	1.752	2.138	8.94
46)	A2	1-Methylphenan...	2.207	2.265	2.266	2.245	2.215	2.013	1.752	2.138	8.94
47)	A2	C1-Phenanthren...	2.207	2.265	2.266	2.245	2.215	2.013	1.752	2.138	8.94
48)	A2	C2-Phenanthren...	2.207	2.265	2.266	2.245	2.215	2.013	1.752	2.138	8.94
49)	A2	5AA IS BKGD	2.207	2.265	2.266	2.245	2.215	2.013	1.752	2.138	8.94
50)	A2	C3-Phenanthren...	2.207	2.265	2.266	2.245	2.215	2.013	1.752	2.138	8.94
51)	A2	C4-Phenanthren...	2.207	2.265	2.266	2.245	2.215	2.013	1.752	2.138	8.94
52)	t	Retene	0.545	0.549	0.535	0.549	0.640	0.666	0.679	0.595	10.72
53)	t	Anthracene	2.169	2.209	2.148	2.084	2.149	1.898	1.545	2.029	11.65
54)	t	Carbazole	2.112	2.070	2.028	2.032	2.091	1.891	1.649	1.982	8.24
55)	t	1-Methylphenan...	1.655	1.633	1.530	1.561	1.653	1.547	1.458	1.577	4.67
56)	A1	Fluoranthene	2.302	2.341	2.361	2.431	2.527	2.387	2.259	2.373	3.70
57)	t	Benzo(b)fluorene	1.482	1.383	1.380	1.375	1.503	1.425	1.292	1.406	5.09
58)	A1	Pyrene	2.582	2.594	2.580	2.637	2.709	2.538	2.364	2.572	4.14
59)	A2	C1-Fluoranthen...	2.582	2.594	2.580	2.637	2.709	2.538	2.364	2.572	4.14
60)	A2	C2-Fluoranthen...	2.582	2.594	2.580	2.637	2.709	2.538	2.364	2.572	4.14
61)	A2	C3-Fluoranthen...	2.582	2.594	2.580	2.637	2.709	2.538	2.364	2.572	4.14
62)	A2	C4-Fluoranthen...	2.582	2.594	2.580	2.637	2.709	2.538	2.364	2.572	4.14
63)	A1	Naphthobenzoth...	2.216	2.254	2.222	2.230	2.383	2.233	2.067	2.229	4.12
64)	A2	Naphthobenzoth...	2.216	2.254	2.222	2.230	2.383	2.233	2.067	2.229	4.12
65)	A2	Naphthobenzoth...	2.216	2.254	2.222	2.230	2.383	2.233	2.067	2.229	4.12
66)	A2	Naphthobenzoth...	2.216	2.254	2.222	2.230	2.383	2.233	2.067	2.229	4.12
67)	A2	C1-Naphthobenz...	2.216	2.254	2.222	2.230	2.383	2.233	2.067	2.229	4.12
68)	A2	C2-Naphthobenz...	2.216	2.254	2.222	2.230	2.383	2.233	2.067	2.229	4.12
69)	A2	C3-Naphthobenz...	2.216	2.254	2.222	2.230	2.383	2.233	2.067	2.229	4.12
70)	A2	C4-Naphthobenz...	2.216	2.254	2.222	2.230	2.383	2.233	2.067	2.229	4.12
71)	i	Chrysene-d12	----------ISTD----------								
72)	t	Benz[a]anthracene	1.426	1.471	1.401	1.366	1.452	1.346	1.235	1.385	5.77
73)	A1	Chrysene	1.374	1.369	1.382	1.323	1.338	1.218	1.091	1.299	8.26
74)	A2	Chrysene/Triph...	1.374	1.369	1.382	1.323	1.338	1.218	1.091	1.299	8.26
75)	A2	C1-Chrysenes	1.374	1.369	1.382	1.323	1.338	1.218	1.091	1.299	8.26
76)	A2	C2-Chrysenes	1.374	1.369	1.382	1.323	1.338	1.218	1.091	1.299	8.26
77)	A2	BBF-D12 Surr BKGD	1.374	1.369	1.382	1.323	1.338	1.218	1.091	1.299	8.26
78)	A2	C3-Chrysenes	1.374	1.369	1.382	1.323	1.338	1.218	1.091	1.299	8.26
79)	A2	C4-Chrysenes	1.374	1.369	1.382	1.323	1.338	1.218	1.091	1.299	8.26
80)	s	Benzo[b]fluora...	0.951	0.965	0.963	1.006	1.098	1.135	1.172	1.041	8.79
81)	t	Benzo[b]fluora...	1.339	1.403	1.429	1.468	1.491	1.431	1.306	1.410	4.72
82)	A1	Benzo[j]+[k]fl...	1.422	1.419	1.360	1.271	1.360	1.211	1.054	1.299	10.20
83)	A2	Benzo[a]fluora...	1.422	1.419	1.360	1.271	1.360	1.211	1.054	1.299	10.20
84)	t	Benzo[e]pyrene	1.409	1.356	1.319	1.311	1.368	1.266	1.147	1.311	6.53

Method Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Method File : PAH3110916.M
Title : Decalins & Alkylated PAH's
Last Update : Sun Nov 20 16:15:38 2016
Response Via : Initial Calibration

Calibration Files
10 =F311091603.D 25 =F311091604.D 100 =F311091605.D 500 =F311091606.D 5000=F311091607.D 1E3 =F311091608.D 2E3 =F311091609.D

		Compound	10	25	100	500	5000	1E3	2E3	Avg	%RSD
85)	s	Benzo[a]pyrene...	0.822	0.803	0.794	0.853	0.885	0.880	0.833	0.838	4.26
86)	t	Benzo[a]pyrene	1.294	1.376	1.337	1.312	1.320	1.164	0.951	1.251	11.81
87)	t	Perylene	1.397	1.335	1.344	1.308	1.331	1.165	0.983	1.266	11.37
88)	t	Indeno[1,2,3-c...	1.587	1.575	1.486	1.574	1.714	1.672	1.698	1.615	5.09
89)	t	Dibenz[ah]+[ac...	1.370	1.342	1.360	1.355	1.446	1.395	1.380	1.378	2.50
90)	t	Benzo[g,h,i]pe...	1.654	1.584	1.565	1.517	1.627	1.533	1.456	1.562	4.31
91)	A1	Hopane (T19)	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
92)	A2	17a(H),21B(H)-...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
93)	A2	C23 Tricyclic ...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
94)	A2	C24 Tricyclic ...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
95)	A2	C25 Tricyclic ...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
96)	A2	C24 Tetracycli...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
97)	A2	C26 Tricyclic ...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
98)	A2	C26 Tricyclic ...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
99)	A2	C28 Tricyclic ...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
100)	A2	C28 Tricyclic ...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
101)	A2	C29 Tricyclic ...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
102)	A2	C29 Tricyclic ...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
103)	A2	18a-22,29,30-T...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
104)	A2	C30 Tricyclic ...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
105)	A2	C30 Tricyclic ...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
106)	A2	17a(H)-22,29,3...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
107)	A2	17a/b,21b/a 28...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
108)	A2	17a(H),21b(H)-...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
109)	A2	30-Norhopane (...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
110)	A2	18a(H)-30-Norn...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
111)	A2	17a(H)-Diahopa...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
112)	A2	30-Normoretane...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
113)	A2	18a(H)&18b(H)-...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
114)	A2	Moretane (T20)	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
115)	A2	30-Homohopane-...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
116)	A2	30-Homohopane-...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
117)	A2	Gammacerane/C3...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
118)	A2	30,31-Bishomoh...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
119)	A2	30,31-Bishomoh...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
120)	A2	30,31-Trishomo...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
121)	A2	30,31-Trishomo...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
122)	A2	Tetrakishomoho...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
123)	A2	Tetrakishomoho...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
124)	A2	Pentakishomoho...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
125)	A2	Pentakishomoho...	0.345	0.276	0.301	0.290	0.258	0.244		0.286	12.50
126)	SA1	5B(H)Cholane -...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
127)	A2	13b(H),17a(H)-...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60

Method Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Method File : PAH3110916.M
Title : Decalins & Alkylated PAH's
Last Update : Sun Nov 20 16:15:38 2016
Response Via : Initial Calibration

Calibration Files
10 =F311091603.D 25 =F311091604.D 100 =F311091605.D 500 =F311091606.D 5000=F311091607.D 1E3 =F311091608.D 2E3 =F311091609.D

	Compound	10	25	100	500	5000	1E3	2E3	Avg	%RSD
128) A2	13b(H),17a(H)-...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
129) A2	13b,17a-20S-Me...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
130) A2	14a,17a-20S-Ch...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
131) A2	14a,17a-20R-Ch...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
132) A2	Unknown Steran...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
133) A2	13a,17b-20S-Et...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
134) A2	14a,17a-20S-Me...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
135) A2	14a,17a-20R-Me...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
136) A2	14a(H),17a(H)-...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
137) A2	14a(H),17a(H)-...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
138) A2	14b(H),17b(H)-...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
139) A2	14b(H),17b(H)-...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
140) A2	14b,17b-20R-Me...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
141) A2	14b,17b-20S-Me...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
142) A2	14b(H),17b(H)-...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
143) A2	14b(H),17b(H)-...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
144) A2	C26,20R- +C27,...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
145) A2	C28,20S-triaro...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
146) A2	C27,20R-triaro...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60
147) A2	C28,20R-triaro...	0.164	0.163	0.156	0.152	0.168	0.167	0.167	0.162	3.60

(#) = Out of Range

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091603.D
Acq On : 9 Nov 2016 7:03 pm
Operator : AC
Sample : I311081601
Misc : FRAX34
ALS Vial : 3 Sample Multiplier: 1

NAL
11/28/16

Quant Time: Nov 20 19:46:40 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:00:51 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.250	164	68941	500.000	ng/ml	0.02
71) Chrysene-d12	43.750	240	102897	500.000	ng/ml	0.00
System Monitoring Compounds						
8) Naphthalene-d8	20.295	136	3048	11.455	ng/ml	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1.15%#			
40) Phenanthrene-d10	33.151	188	2225	9.395	ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.94%#			
80) Benzo[b]fluoranthene-d12	47.726	264	1958	7.986	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.80%#			
85) Benzo[a]pyrene-d12	48.976	264	1691	8.532	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.85%#			
126) 5B(H)Cholane - Surr	44.338	217	337	10.608	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1.06%#			
Target Compounds						Qvalue
2) trans-Decalin	16.862	138	301	4.885	ng/ml	100
3) cis-Decalin	18.097	138	218	4.618	ng/ml	100
9) Naphthalene	20.385	128	3374	13.233	ng/ml	100
14) 2-Methylnaphthalene	23.080	142	2024	11.921	ng/ml	100
15) 1-Methylnaphthalene	23.501	142	1949	12.029	ng/ml	100
16) Benzothiophene	20.596	134	2825	13.138	ng/ml	100
21) Biphenyl	24.947	154	2629	11.984	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.549	156	1759	11.316	ng/ml	100
23) Dibenzofuran	28.048	168	2699	11.694	ng/ml#	86
24) Acenaphthylene	26.633	152	3116M4	12.792	ng/ml	
25) Acenaphthene	27.370	153	1938	12.014	ng/ml	96
26) 2,3,5-Trimethylnaphthalen	28.951	170	1555	10.878	ng/ml	93
27) Fluorene	29.418	166	2195	11.998	ng/ml	86
31) Dibenzothiophene	32.745	184	3098	12.019	ng/ml	96
41) Phenanthrene	33.241	178	3043M4	11.330	ng/ml	
52) Retene	40.212	234	752	8.043	ng/ml	99
53) Anthracene	33.422	178	2991M4	12.189	ng/ml	
54) Carbazole	34.084	167	2912	12.357	ng/ml	97
55) 1-Methylphenanthrene	35.741	192	2282	10.975	ng/ml	95
56) Fluoranthene	38.014	202	3174	10.393	ng/ml	100
57) Benzo(b)fluorene	40.528	216	2044	10.529	ng/ml	95
58) Pyrene	38.902	202	3560	10.669	ng/ml	99
63) Naphthobenzothiophene	42.757	234	3055	10.109	ng/ml#	91
64) Naphthobenzothiophene-2,1	42.757	234	3055	10.109	ng/ml#	91
72) Benz[a]anthracene	43.690	228	2935M3	12.440	ng/ml	
73) Chrysene	43.856	228	2827	11.938	ng/mL	98
74) Chrysene/Triphenylene	43.856	228	2827	11.938	ng/ml	98
81) Benzo[b]fluoranthene	47.801	252	2756M3	10.337	ng/ml	
82) Benzo[j]+[k]fluoranthene	47.891	252	2926	11.758	ng/ml	100
84) Benzo[e]pyrene	48.870	252	2900	11.575	ng/ml	90
86) Benzo[a]pyrene	49.066	252	2663	11.290	ng/ml	97
87) Perylene	49.397	252	2875	12.121	ng/ml	93
88) Indeno[1,2,3-cd]pyrene	54.217	276	3266M4	10.462	ng/ml	
89) Dibenz[ah]+[ac]anthracene	54.277	278	2820	10.157	ng/ml	95
90) Benzo[g,h,i]perylene	55.617	276	3403	11.010	ng/ml	95
91) Hopane (T19)	53.178	191	711	13.023	ng/mL#	73
92) 17a(H),21B(H)-hopane - C3	53.178	191	711	13.023	ng/mL#	73

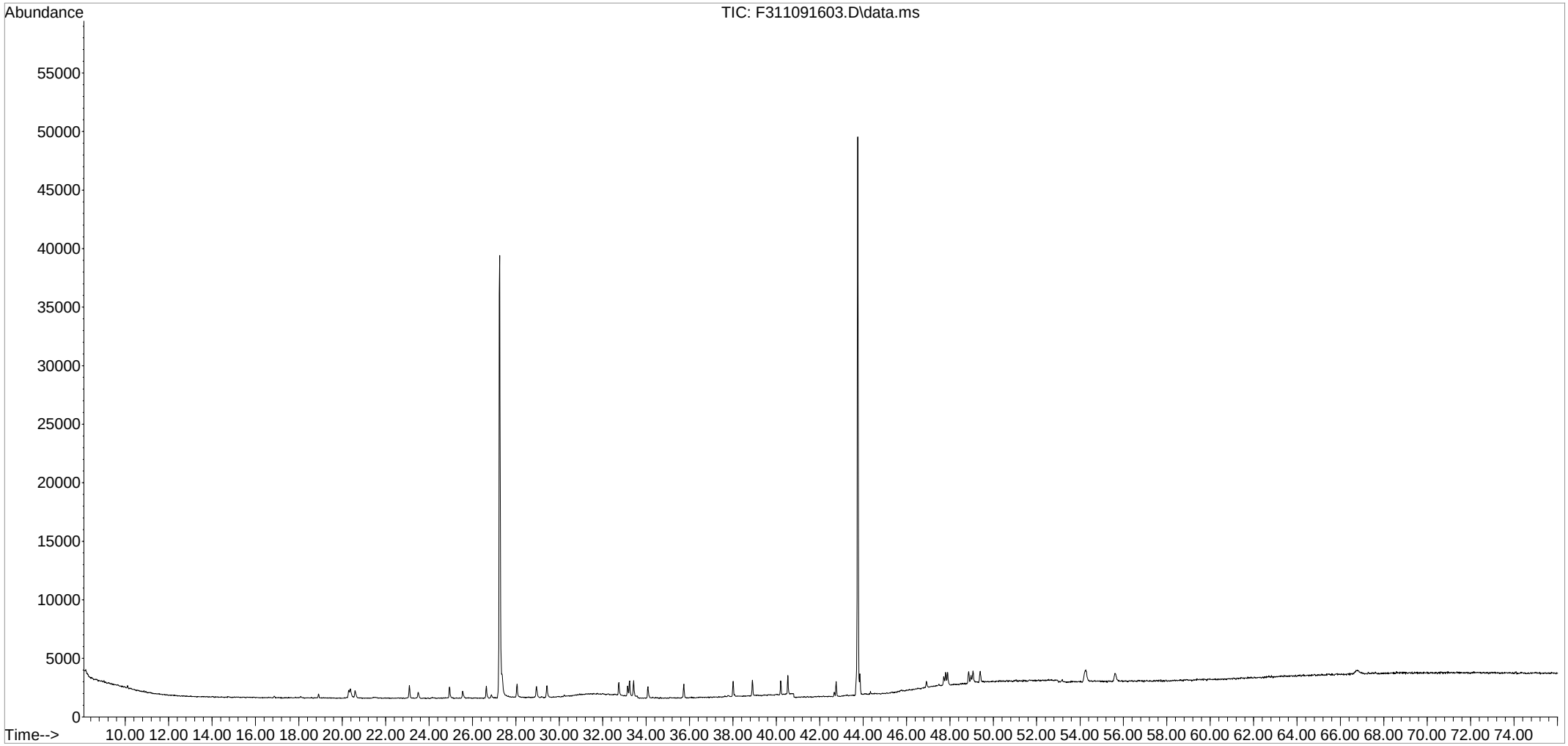
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091603.D
Acq On : 9 Nov 2016 7:03 pm
Operator : AC
Sample : I311081601
Misc : FRAX34
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 20 19:46:40 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:00:51 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091604.D
Acq On : 9 Nov 2016 8:32 pm
Operator : AC
Sample : I311081602
Misc : FRAX33
ALS Vial : 4 Sample Multiplier: 1

MAL
11/28/16

Quant Time: Nov 20 19:46:46 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:00:51 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.250	164	70245	500.000	ng/ml	0.02
71) Chrysene-d12	43.750	240	101493	500.000	ng/ml	0.00
System Monitoring Compounds						
8) Naphthalene-d8	20.280	136	7552	27.855	ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2.79%#			
40) Phenanthrene-d10	33.151	188	5587	23.152	ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2.32%#			
80) Benzo[b]fluoranthene-d12	47.711	264	4897	20.249	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2.02%#			
85) Benzo[a]pyrene-d12	48.976	264	4074	20.840	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2.08%#			
126) 5B(H)Cholane - Surr	44.338	217	827	26.392	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 2.64%#			
Target Compounds						Qvalue
2) trans-Decalin	16.862	138	732	11.659	ng/ml	100
3) cis-Decalin	18.097	138	562	11.684	ng/ml	100
9) Naphthalene	20.370	128	8494	32.696	ng/ml	100
14) 2-Methylnaphthalene	23.080	142	5277	30.503	ng/ml	100
15) 1-Methylnaphthalene	23.486	142	5091	30.837	ng/ml	100
16) Benzothiophene	20.581	134	7370	33.639	ng/ml	100
21) Biphenyl	24.931	154	6851	30.650	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.549	156	4626	29.208	ng/ml	100
23) Dibenzofuran	28.048	168	7205	30.638	ng/ml	92
24) Acenaphthylene	26.633	152	8199M4	33.035	ng/ml	
25) Acenaphthene	27.370	153	5091	30.974	ng/ml	99
26) 2,3,5-Trimethylnaphthalen	28.951	170	3861	26.508	ng/ml	97
27) Fluorene	29.418	166	5527	29.651	ng/ml	99
31) Dibenzothiophene	32.745	184	8095	30.824	ng/ml	98
41) Phenanthrene	33.226	178	7956	29.074	ng/ml	97
52) Retene	40.212	234	1929	20.249	ng/ml	98
53) Anthracene	33.422	178	7757M4	31.025	ng/ml	
54) Carbazole	34.084	167	7271	30.281	ng/ml	99
55) 1-Methylphenanthrene	35.741	192	5734	27.064	ng/ml	97
56) Fluoranthene	38.014	202	8223	26.425	ng/ml	97
57) Benzo(b)fluorene	40.528	216	4857	24.555	ng/ml	98
58) Pyrene	38.902	202	9110	26.794	ng/ml	99
63) Naphthobenzothiophene	42.757	234	7916	25.708	ng/ml	97
64) Naphthobenzothiophene-2,1	42.757	234	7916	25.708	ng/ml	97
72) Benz[a]anthracene	43.690	228	7467	32.086	ng/ml	99
73) Chrysene	43.856	228	6947	29.742	ng/mL	99
74) Chrysene/Triphenylene	43.856	228	6947	29.742	ng/ml	99
81) Benzo[b]fluoranthene	47.801	252	7119	27.072	ng/ml	98
82) Benzo[j]+[k]fluoranthene	47.891	252	7200	29.334	ng/ml	92
84) Benzo[e]pyrene	48.855	252	6880	27.842	ng/ml	91
86) Benzo[a]pyrene	49.066	252	6983	30.014	ng/ml	98
87) Perylene	49.397	252	6775	28.958	ng/ml	91
88) Indeno[1,2,3-cd]pyrene	54.232	276	7992M4	25.956	ng/ml	
89) Dibenz[ah]+[ac]anthracene	54.277	278	6811	24.871	ng/ml	99
90) Benzo[g,h,i]perylene	55.602	276	8037	26.361	ng/ml	96
91) Hopane (T19)	53.163	191	1402	26.035	ng/mL#	84
92) 17a(H),21B(H)-hopane - C3	53.163	191	1402	26.035	ng/mL#	84

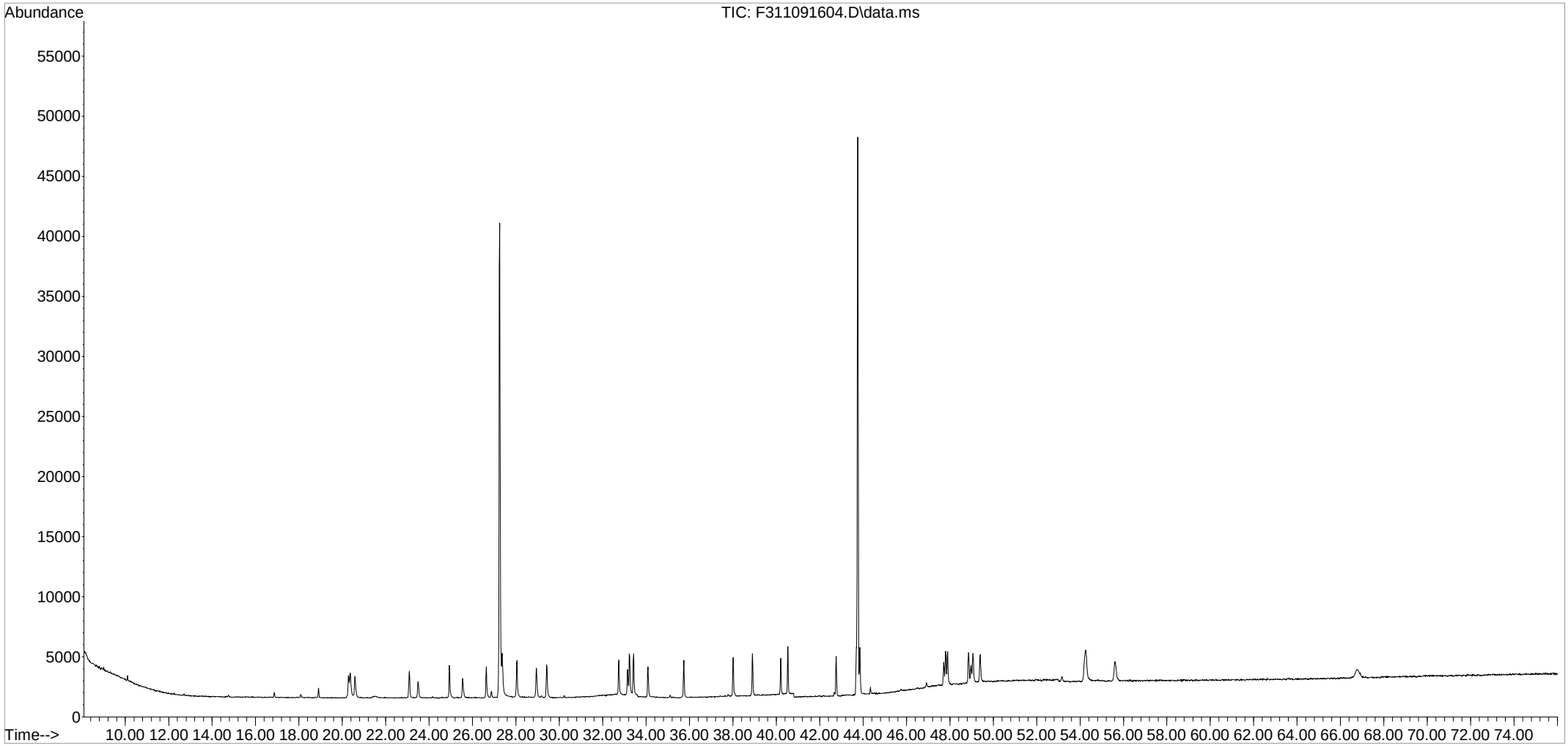
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091604.D
Acq On : 9 Nov 2016 8:32 pm
Operator : AC
Sample : I311081602
Misc : FRAX33
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 20 19:46:46 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:00:51 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091605.D
Acq On : 9 Nov 2016 10:01 pm
Operator : AC
Sample : I311081603
Misc : FRAX32
ALS Vial : 5 Sample Multiplier: 1

MAL
11/28/16

Quant Time: Nov 20 19:46:54 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:00:51 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.250	164	67596	500.000	ng/ml	0.02
71) Chrysene-d12	43.750	240	98833	500.000	ng/ml	0.00
System Monitoring Compounds						
8) Naphthalene-d8	20.265	136	28451	109.054	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.91%#			
40) Phenanthrene-d10	33.136	188	21669	93.313	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 9.33%#			
80) Benzo[b]fluoranthene-d12	47.711	264	19032	80.816	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 8.08%#			
85) Benzo[a]pyrene-d12	48.961	264	15694	82.440	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 8.24%#			
126) 5B(H)Cholane - Surr	44.338	217	3090	101.265	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 10.13%#			
Target Compounds						Qvalue
2) trans-Decalin	16.862	138	2807	46.461	ng/ml	100
3) cis-Decalin	18.097	138	2038	44.029	ng/ml	100
9) Naphthalene	20.340	128	32129	128.522	ng/ml	100
14) 2-Methylnaphthalene	23.065	142	19617	117.838	ng/ml	100
15) 1-Methylnaphthalene	23.486	142	18846	118.627	ng/ml	100
16) Benzothiophene	20.566	134	28627	135.783	ng/ml	100
21) Biphenyl	24.931	154	25992	120.840	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.534	156	17352	113.853	ng/ml	100
23) Dibenzofuran	28.033	168	28518	126.022	ng/ml	93
24) Acenaphthylene	26.633	152	31200M4	130.636	ng/ml	
25) Acenaphthene	27.370	153	19484	123.188	ng/ml	99
26) 2,3,5-Trimethylnaphthalen	28.936	170	14836	105.851	ng/ml	94
27) Fluorene	29.403	166	20960	116.852	ng/ml	99
31) Dibenzothiophene	32.730	184	30702	121.486	ng/ml	98
41) Phenanthrene	33.226	178	30640	116.356	ng/ml	100
52) Retene	40.212	234	7229	78.858	ng/ml	96
53) Anthracene	33.407	178	29040M4	120.699	ng/ml	
54) Carbazole	34.069	167	27421	118.674	ng/ml	100
55) 1-Methylphenanthrene	35.725	192	20682	101.444	ng/ml	98
56) Fluoranthene	37.999	202	31919	106.591	ng/ml	98
57) Benzo(b)fluorene	40.528	216	18655	98.007	ng/ml	100
58) Pyrene	38.887	202	34885	106.623	ng/ml	99
63) Naphthobenzothiophene	42.757	234	30044	101.395	ng/ml	97
64) Naphthobenzothiophene-2,1	42.757	234	30044	101.395	ng/ml	97
72) Benz[a]anthracene	43.690	228	27702	122.242	ng/ml	99
73) Chrysene	43.856	228	27310	120.067	ng/mL	98
74) Chrysene/Triphenylene	43.856	228	27310	120.067	ng/ml	98
81) Benzo[b]fluoranthene	47.801	252	28241	110.285	ng/ml	98
82) Benzo[j]+[k]fluoranthene	47.891	252	26886	112.487	ng/ml	100
84) Benzo[e]pyrene	48.855	252	26073	108.351	ng/ml	99
86) Benzo[a]pyrene	49.066	252	26423	116.626	ng/ml	100
87) Perylene	49.382	252	26572	116.633	ng/ml	99
88) Indeno[1,2,3-cd]pyrene	54.217	276	29373M3	97.964	ng/ml	
89) Dibenz[ah]+[ac]anthracene	54.262	278	26890	100.834	ng/ml	98
90) Benzo[g,h,i]perylene	55.602	276	30927	104.171	ng/ml	99
91) Hopane (T19)	53.163	191	5943	113.330	ng/mL	93
92) 17a(H),21B(H)-hopane - C3	53.163	191	5943	113.330	ng/mL	93

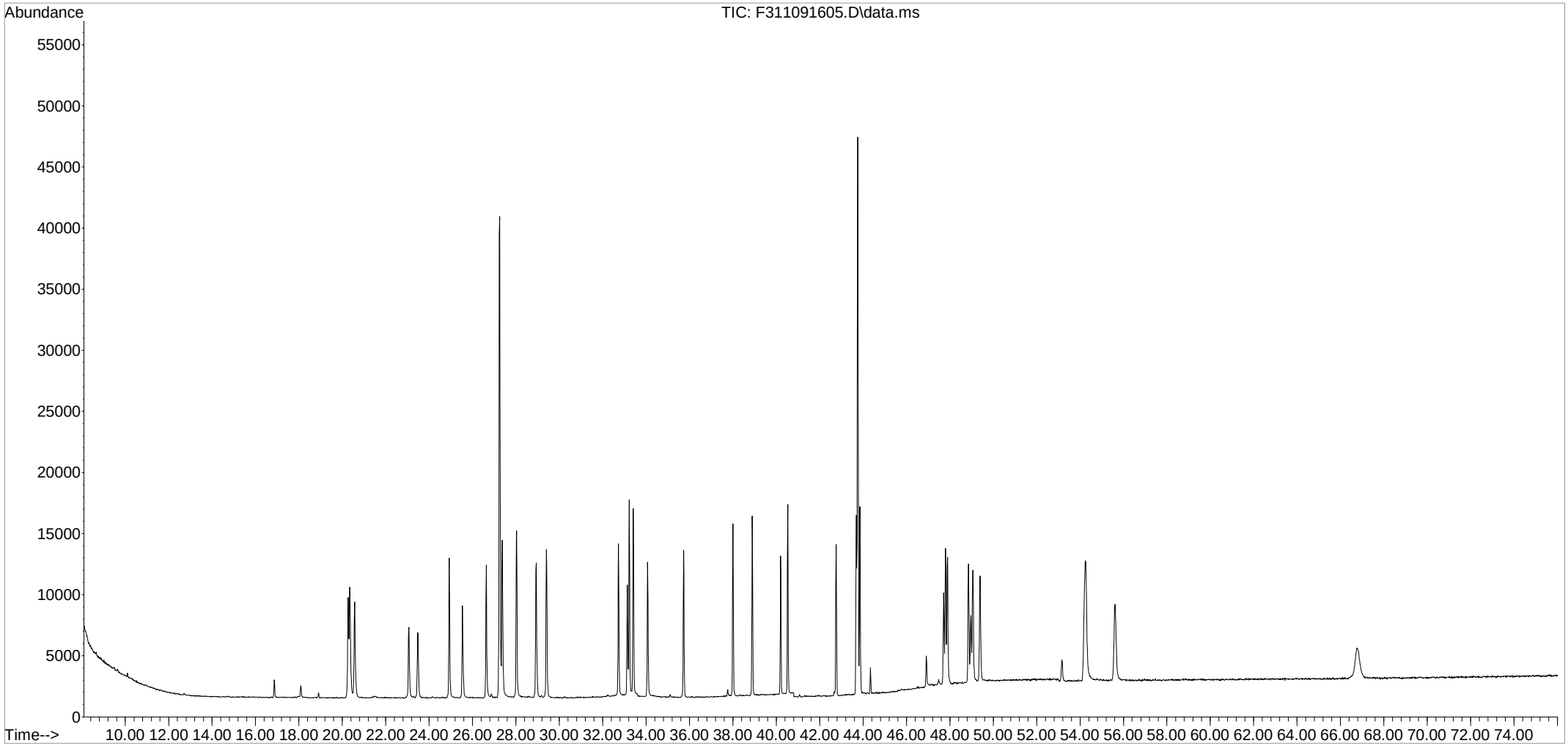
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091605.D
Acq On : 9 Nov 2016 10:01 pm
Operator : AC
Sample : I311081603
Misc : FRAX32
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 20 19:46:54 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:00:51 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091606.D
Acq On : 9 Nov 2016 11:30 pm
Operator : AC
Sample : I311081604
Misc : FRAX31
ALS Vial : 6 Sample Multiplier: 1

MAL
11/28/16

Quant Time: Nov 20 19:47:02 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:00:51 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.235	164	71009	500.000	ng/ml	0.00
71) Chrysene-d12	43.750	240	105735	500.000	ng/ml	0.00
System Monitoring Compounds						
8) Naphthalene-d8	20.249	136	148229	540.858	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 54.09%			
40) Phenanthrene-d10	33.121	188	112149	459.734	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.97%#			
80) Benzo[b]fluoranthene-d12	47.711	264	106393	422.287	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 42.23%#			
85) Benzo[a]pyrene-d12	48.961	264	90159	442.686	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 44.27%#			
126) 5B(H)Cholane - Surr	44.337	217	16117	493.705	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.37%#			
Target Compounds						Qvalue
2) trans-Decalin	16.862	138	14628	230.483	ng/ml	100
3) cis-Decalin	18.096	138	10882	223.797	ng/ml	100
9) Naphthalene	20.325	128	168634	642.143	ng/ml	100
14) 2-Methylnaphthalene	23.034	142	104961	600.189	ng/ml	100
15) 1-Methylnaphthalene	23.456	142	100760	603.753	ng/ml	100
16) Benzothiophene	20.550	134	151122	682.346	ng/ml	100
21) Biphenyl	24.916	154	133408	590.421	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.518	156	90831	567.331	ng/ml	100
23) Dibenzofuran	28.017	168	145721	612.995	ng/ml	93
24) Acenaphthylene	26.632	152	163560M4	651.916	ng/ml	
25) Acenaphthene	27.355	153	99564	599.240	ng/ml	99
26) 2,3,5-Trimethylnaphthalen	28.921	170	78722	534.664	ng/ml	93
27) Fluorene	29.387	166	110059	584.087	ng/ml	100
31) Dibenzothiophene	32.714	184	163199	614.732	ng/ml	98
41) Phenanthrene	33.211	178	159397	576.221	ng/ml	100
52) Retene	40.197	234	39002	405.008	ng/ml	96
53) Anthracene	33.392	178	147996M4	585.553	ng/ml	
54) Carbazole	34.054	167	144318	594.568	ng/ml	100
55) 1-Methylphenanthrene	35.725	192	110817	517.427	ng/ml	99
56) Fluoranthene	37.999	202	172646	548.828	ng/ml	99
57) Benzo(b)fluorene	40.528	216	97659	488.405	ng/ml	100
58) Pyrene	38.887	202	187226	544.734	ng/ml	99
63) Naphthobenzothiophene	42.757	234	158339	508.689	ng/ml	97
64) Naphthobenzothiophene-2,1	42.757	234	158339	508.689	ng/ml	97
72) Benz[a]anthracene	43.690	228	144387	595.554	ng/ml	100
73) Chrysene	43.856	228	139900	574.916	ng/mL	100
74) Chrysene/Triphenylene	43.856	228	139900	574.916	ng/ml	100
81) Benzo[b]fluoranthene	47.801	252	155262	566.741	ng/ml	98
82) Benzo[j]+[k]fluoranthene	47.876	252	134342	525.377	ng/ml	99
84) Benzo[e]pyrene	48.855	252	138666	538.636	ng/ml	98
86) Benzo[a]pyrene	49.051	252	138739	572.395	ng/ml	98
87) Perylene	49.382	252	138347	567.609	ng/ml	97
88) Indeno[1,2,3-cd]pyrene	54.201	276	166396M3	518.734	ng/ml	
89) Dibenz[ah]+[ac]anthracene	54.262	278	143314	502.331	ng/ml	99
90) Benzo[g,h,i]perylene	55.602	276	160424	505.081	ng/ml	100
91) Hopane (T19)	53.162	191	30657	546.451	ng/mL	97
92) 17a(H),21B(H)-hopane - C3	53.162	191	30657	546.451	ng/mL	97

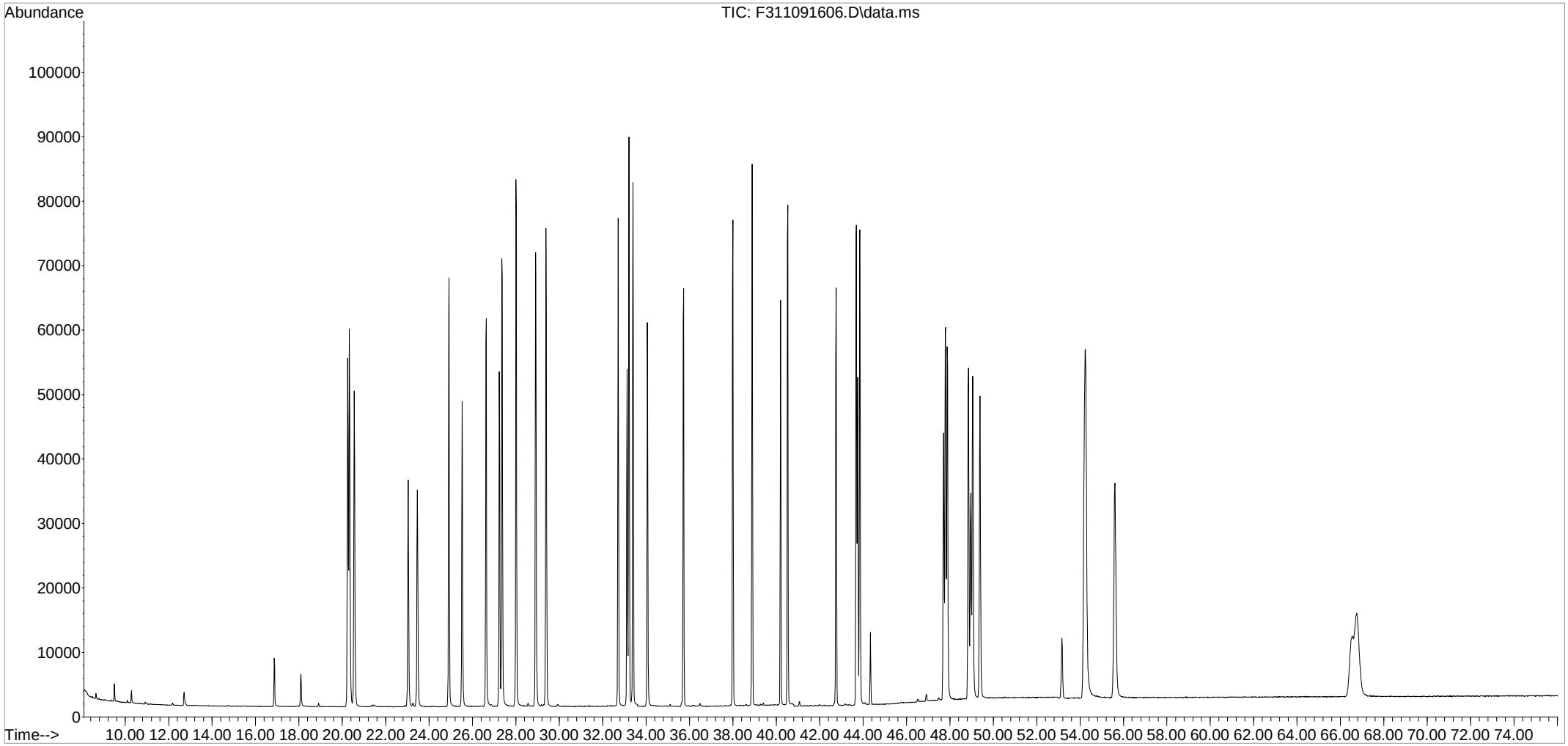
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091606.D
Acq On : 9 Nov 2016 11:30 pm
Operator : AC
Sample : I311081604
Misc : FRAX31
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 20 19:47:02 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:00:51 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091607.D
Acq On : 10 Nov 2016 12:58 am
Operator : AC
Sample : I311081605
Misc : FRAX30
ALS Vial : 7 Sample Multiplier: 1

NAL
11/28/16

Quant Time: Nov 20 19:47:08 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:00:51 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.220	164	66002	500.000	ng/ml	-0.01
71) Chrysene-d12	43.750	240	101520	500.000	ng/ml	0.00
System Monitoring Compounds						
8) Naphthalene-d8	20.234	136	1409653	5533.741	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 553.37%#			
40) Phenanthrene-d10	33.121	188	1140748	5031.036	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 503.10%#			
80) Benzo[b]fluoranthene-d12	47.711	264	1114903	4608.916	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 460.89%#			
85) Benzo[a]pyrene-d12	48.976	264	898093	4592.779	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 459.28%#			
126) 5B(H)Cholane - Surr	44.338	217	170406	5436.701	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 543.67%#			
Target Compounds						Qvalue
2) trans-Decalin	16.862	138	142586	2417.060	ng/ml	100
3) cis-Decalin	18.097	138	108211	2394.266	ng/ml	100
9) Naphthalene	20.310	128	1538171	6301.554	ng/ml	100
14) 2-Methylnaphthalene	23.019	142	1009949	6213.207	ng/ml	100
15) 1-Methylnaphthalene	23.441	142	950295	6126.124	ng/ml	100
16) Benzothiophene	20.535	134	1387424	6739.729	ng/ml	100
21) Biphenyl	24.901	154	1284708	6117.032	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.503	156	893845	6006.492	ng/ml	100
23) Dibenzofuran	27.987	168	1379531	6243.423	ng/ml	93
24) Acenaphthylene	26.618	152	1580323M4	6776.673	ng/ml	
25) Acenaphthene	27.355	153	954796	6182.522	ng/ml	98
26) 2,3,5-Trimethylnaphthalen	28.906	170	779822	5698.188	ng/ml	95
27) Fluorene	29.372	166	1055490	6026.458	ng/ml	99
31) Dibenzothiophene	32.714	184	1546306	6266.429	ng/ml	98
41) Phenanthrene	33.196	178	1462131	5686.585	ng/ml	100
52) Retene	40.197	234	422501	4720.209	ng/ml	92
53) Anthracene	33.392	178	1418586M4	6038.488	ng/ml	
54) Carbazole	34.054	167	1380151	6117.361	ng/ml	99
55) 1-Methylphenanthrene	35.710	192	1090970	5480.389	ng/ml	99
56) Fluoranthene	37.999	202	1667743M4	5703.809	ng/ml	
57) Benzo(b)fluorene	40.528	216	991982	5337.380	ng/ml	99
58) Pyrene	38.887	202	1788172	5597.367	ng/ml	99
63) Naphthobenzothiophene	42.757	234	1572635	5435.614	ng/ml	97
64) Naphthobenzothiophene-2,1	42.757	234	1572635	5435.614	ng/ml	97
72) Benz[a]anthracene	43.690	228	1474462	6334.228	ng/ml	100
73) Chrysene	43.856	228	1358783	5815.729	ng/mL	99
74) Chrysene/Triphenylene	43.856	228	1358783	5815.729	ng/ml	99
81) Benzo[b]fluoranthene	47.801	252	1513453	5753.809	ng/ml	99
82) Benzo[j]+[k]fluoranthene	47.891	252	1380376	5622.427	ng/ml	99
84) Benzo[e]pyrene	48.855	252	1388413	5617.088	ng/ml	99
86) Benzo[a]pyrene	49.066	252	1340412	5759.742	ng/ml	99
87) Perylene	49.397	252	1351119	5773.515	ng/ml	99
88) Indeno[1,2,3-cd]pyrene	54.202	276	1740170M3	5650.161	ng/ml	
89) Dibenz[ah]+[ac]anthracene	54.262	278	1468438	5360.728	ng/ml	96
90) Benzo[g,h,i]perylene	55.617	276	1651361	5415.033	ng/ml	98
91) Hopane (T19)	53.163	191	261837	4860.935	ng/mL	93
92) 17a(H),21B(H)-hopane - C3	53.163	191	261837	4860.935	ng/mL	93

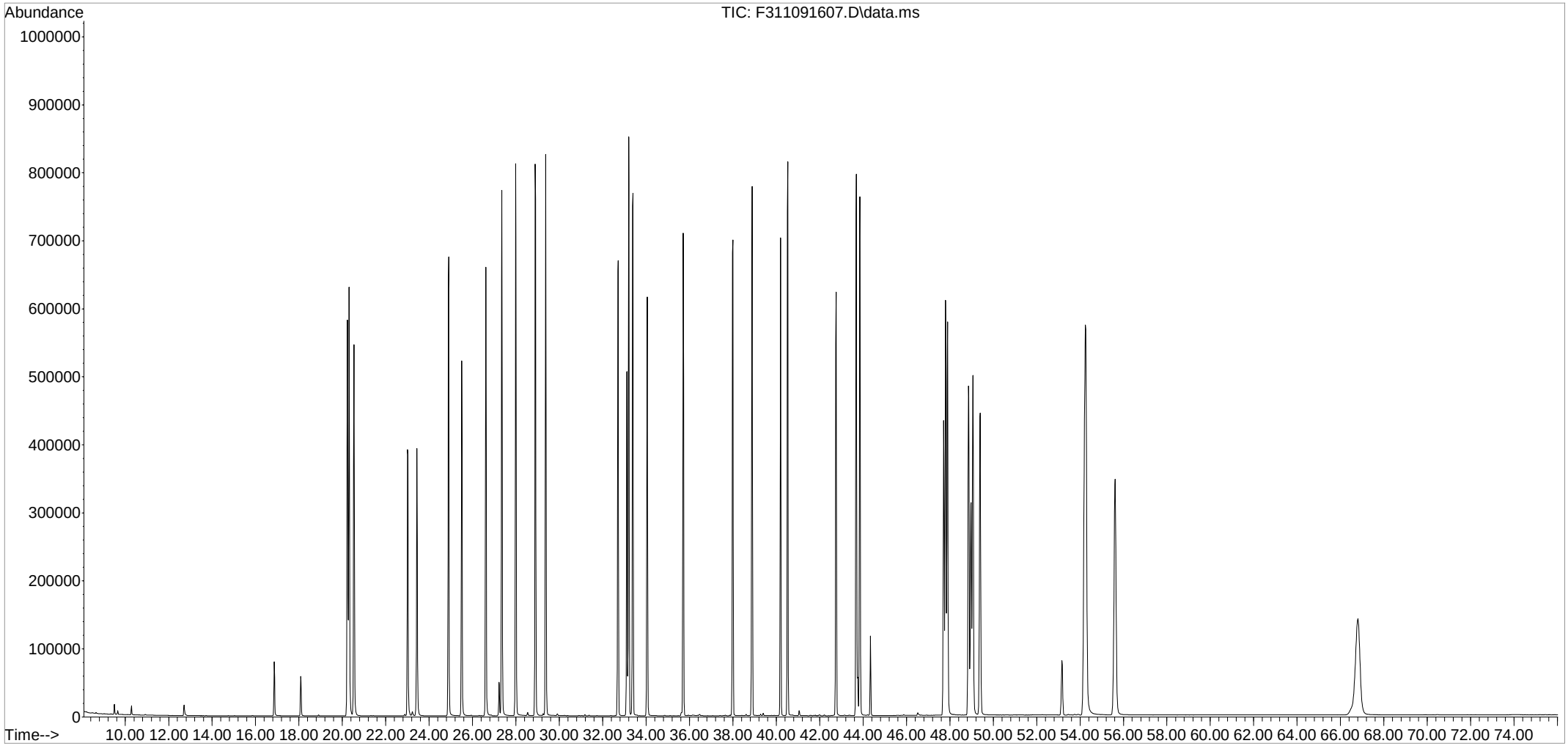
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091607.D
Acq On : 10 Nov 2016 12:58 am
Operator : AC
Sample : I311081605
Misc : FRAX30
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 20 19:47:08 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:00:51 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091608.D
Acq On : 10 Nov 2016 2:26 am
Operator : AC
Sample : I311081606
Misc : FRAX29
ALS Vial : 8 Sample Multiplier: 1

NAL
11/28/16

Quant Time: Nov 20 19:47:15 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:00:51 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	27.220	164	65535	500.000 ng/ml	-0.01
71) Chrysene-d12	43.751	240	102938	500.000 ng/ml	0.00
System Monitoring Compounds					
8) Naphthalene-d8	20.235	136	2798723	11064.972 ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1106.50%#	
40) Phenanthrene-d10	33.121	188	2257327	10026.422 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1002.64%#	
80) Benzo[b]fluoranthene-d12	47.726	264	2336514	9525.900 ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 952.59%#	
85) Benzo[a]pyrene-d12	48.991	264	1812022	9138.893 ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 913.89%#	
126) 5B(H)Cholane - Surr	44.338	217	343391	10804.766 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1080.48%#	
Target Compounds					Qvalue
2) trans-Decalin	16.862	138	293329	5007.827 ng/ml	100
3) cis-Decalin	18.082	138	224960	5012.913 ng/ml	100
9) Naphthalene	20.310	128	2987707	12327.212 ng/ml	100
14) 2-Methylnaphthalene	23.005	142	2000666	12395.805 ng/ml	100
15) 1-Methylnaphthalene	23.441	142	1861156	12083.532 ng/ml	100
16) Benzothiophene	20.536	134	2710488	13260.642 ng/ml	100
21) Biphenyl	24.901	154	2472802	11857.946 ng/ml	100
22) 2,6-Dimethylnaphthalene	25.504	156	1736811	11754.253 ng/ml	100
23) Dibenzofuran	27.988	168	2569107	11710.010 ng/ml	93
24) Acenaphthylene	26.618	152	2987044M4	12900.189 ng/ml	
25) Acenaphthene	27.355	153	1791460	11682.775 ng/ml	97
26) 2,3,5-Trimethylnaphthalen	28.906	170	1496886	11015.743 ng/ml	98
27) Fluorene	29.373	166	1942741	11171.378 ng/ml	99
31) Dibenzothiophene	32.715	184	2888889	11790.693 ng/ml	98
41) Phenanthrene	33.211	178	2639006	10336.879 ng/ml	99
52) Retene	40.212	234	872295	9814.781 ng/ml	86
53) Anthracene	33.392	178	2487472M4	10663.862 ng/ml	
54) Carbazole	34.054	167	2478628	11064.522 ng/ml	99
55) 1-Methylphenanthrene	35.711	192	2027791	10259.013 ng/ml	99
56) Fluoranthene	37.999	202	3128227	10775.015 ng/ml	99
57) Benzo(b)fluorene	40.529	216	1868386	10124.526 ng/ml	98
58) Pyrene	38.887	202	3326505	10486.883 ng/ml	97
63) Naphthobenzothiophene	42.757	234	2926419	10186.875 ng/ml	98
64) Naphthobenzothiophene-2,1	42.757	234	2926419	10186.875 ng/ml	98
72) Benz[a]anthracene	43.690	228	2771522	11742.331 ng/ml	100
73) Chrysene	43.856	228	2507421	10584.180 ng/mL	99
74) Chrysene/Triphenylene	43.856	228	2507421	10584.180 ng/ml	99
81) Benzo[b]fluoranthene	47.816	252	2945887	11045.325 ng/ml	100
82) Benzo[j]+[k]fluoranthene	47.907	252	2493170	10015.075 ng/ml	99
84) Benzo[e]pyrene	48.870	252	2605789	10396.992 ng/ml	100
86) Benzo[a]pyrene	49.081	252	2396101	10154.201 ng/ml	99
87) Perylene	49.398	252	2399158	10110.705 ng/ml	100
88) Indeno[1,2,3-cd]pyrene	54.232	276	3441638M3	11020.727 ng/ml	
89) Dibenz[ah]+[ac]anthracene	54.292	278	2871202	10337.317 ng/ml#	95
90) Benzo[g,h,i]perylene	55.647	276	3156827	10209.059 ng/ml	98
91) Hopane (T19)	53.178	191	503137	9211.936 ng/mL	93
92) 17a(H),21B(H)-hopane - C3	53.178	191	503137	9211.936 ng/mL	93

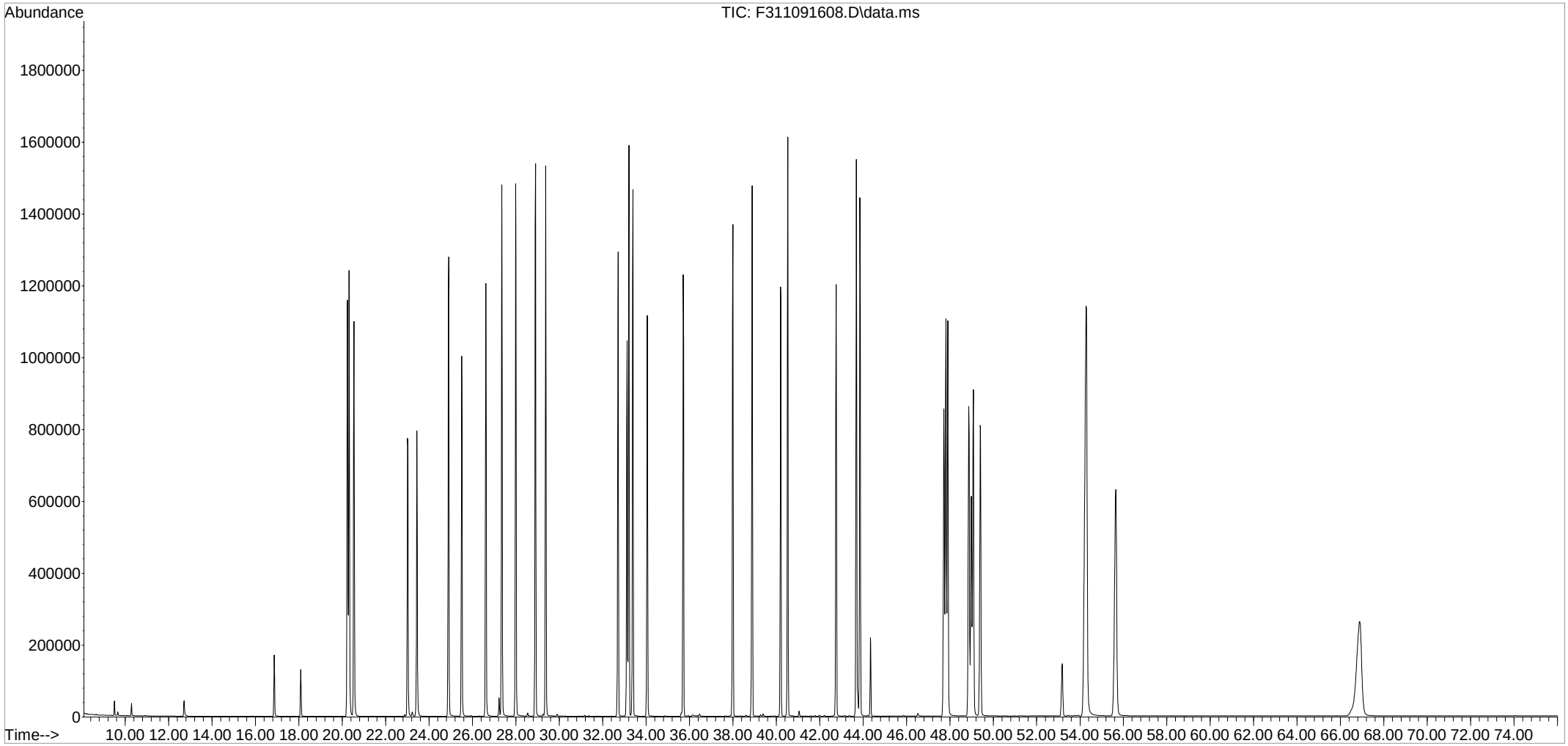
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091608.D
Acq On : 10 Nov 2016 2:26 am
Operator : AC
Sample : I311081606
Misc : FRAX29
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Nov 20 19:47:15 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:00:51 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091609.D
Acq On : 10 Nov 2016 3:55 am
Operator : AC
Sample : I311081607
Misc : FRAX28
ALS Vial : 9 Sample Multiplier: 1

MAL
11/28/16

Quant Time: Nov 20 19:47:23 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:00:51 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Acenaphthene-d10	27.220	164	60876	500.000 ng/ml	-0.02
71) Chrysene-d12	43.765	240	97005	500.000 ng/ml	0.02
System Monitoring Compounds					
8) Naphthalene-d8	20.249	136	5330222	22686.260 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 2268.63%#	
40) Phenanthrene-d10	33.121	188	4060061	19413.832 ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1941.38%#	
80) Benzo[b]fluoranthene-d12	47.741	264	4546396	19669.190 ng/ml	0.03
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1966.92%#	
85) Benzo[a]pyrene-d12	49.006	264	3230321	17288.504 ng/ml	0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 1728.85%#	
126) 5B(H)Cholane - Surr	44.353	217	646098	21572.798 ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery	= 2157.28%#	
Target Compounds					Qvalue
2) trans-Decalin	16.862	138	574608	10560.712 ng/ml	100
3) cis-Decalin	18.097	138	441201	10583.968 ng/ml	100
9) Naphthalene	20.325	128	5561998	24705.001 ng/ml	100
14) 2-Methylnaphthalene	23.019	142	3751853	25024.947 ng/ml	100
15) 1-Methylnaphthalene	23.441	142	3428522	23963.225 ng/ml	100
16) Benzothiophene	20.535	134	5015127	26413.514 ng/ml	100
21) Biphenyl	24.901	154	4466320	23056.700 ng/ml	100
22) 2,6-Dimethylnaphthalene	25.518	156	3105426	22625.119 ng/ml	100
23) Dibenzofuran	28.002	168	4302644	21112.404 ng/ml	92
24) Acenaphthylene	26.617	152	5143979M4	23915.575 ng/ml	
25) Acenaphthene	27.355	153	3083832	21649.945 ng/ml	97
26) 2,3,5-Trimethylnaphthalen	28.906	170	2608767	20667.482 ng/ml	99
27) Fluorene	29.387	166	3233707	20017.954 ng/ml	99
31) Dibenzothiophene	32.714	184	5075922	22302.349 ng/ml	98
41) Phenanthrene	33.211	178	4266142	17989.189 ng/ml	99
52) Retene	40.212	234	1654007	20034.651 ng/ml	81
53) Anthracene	33.392	178	3761247M4	17358.627 ng/ml	
54) Carbazole	34.069	167	4016572	19302.077 ng/ml	99
55) 1-Methylphenanthrene	35.725	192	3550370	19336.737 ng/ml	98
56) Fluoranthene	38.014	202	5501934	20401.504 ng/ml	98
57) Benzo(b)fluorene	40.543	216	3146081	18352.921 ng/ml	97
58) Pyrene	38.902	202	5756596	19536.700 ng/ml	97
63) Naphthobenzothiophene	42.772	234	5033595	18862.964 ng/ml	98
64) Naphthobenzothiophene-2,1	42.772	234	5033595	18862.964 ng/ml	98
72) Benz[a]anthracene	43.705	228	4791450	21541.928 ng/ml	100
73) Chrysene	43.871	228	4234698	18968.545 ng/mL	99
74) Chrysene/Triphenylene	43.871	228	4234698	18968.545 ng/ml	99
81) Benzo[b]fluoranthene	47.846	252	5069309	20169.391 ng/ml	99
82) Benzo[j]+[k]fluoranthene	47.921	252	4089333	17431.567 ng/ml	98
84) Benzo[e]pyrene	48.900	252	4449592	18839.538 ng/ml	100
86) Benzo[a]pyrene	49.111	252	3690732	16597.197 ng/ml	100
87) Perylene	49.427	252	3814161	17057.022 ng/ml	100
88) Indeno[1,2,3-cd]pyrene	54.277	276	6587099M3	22383.131 ng/ml	
89) Dibenz[ah]+[ac]anthracene	54.352	278	5353461	20453.156 ng/ml#	94
90) Benzo[g,h,i]perylene	55.692	276	5648360	19383.800 ng/ml	97

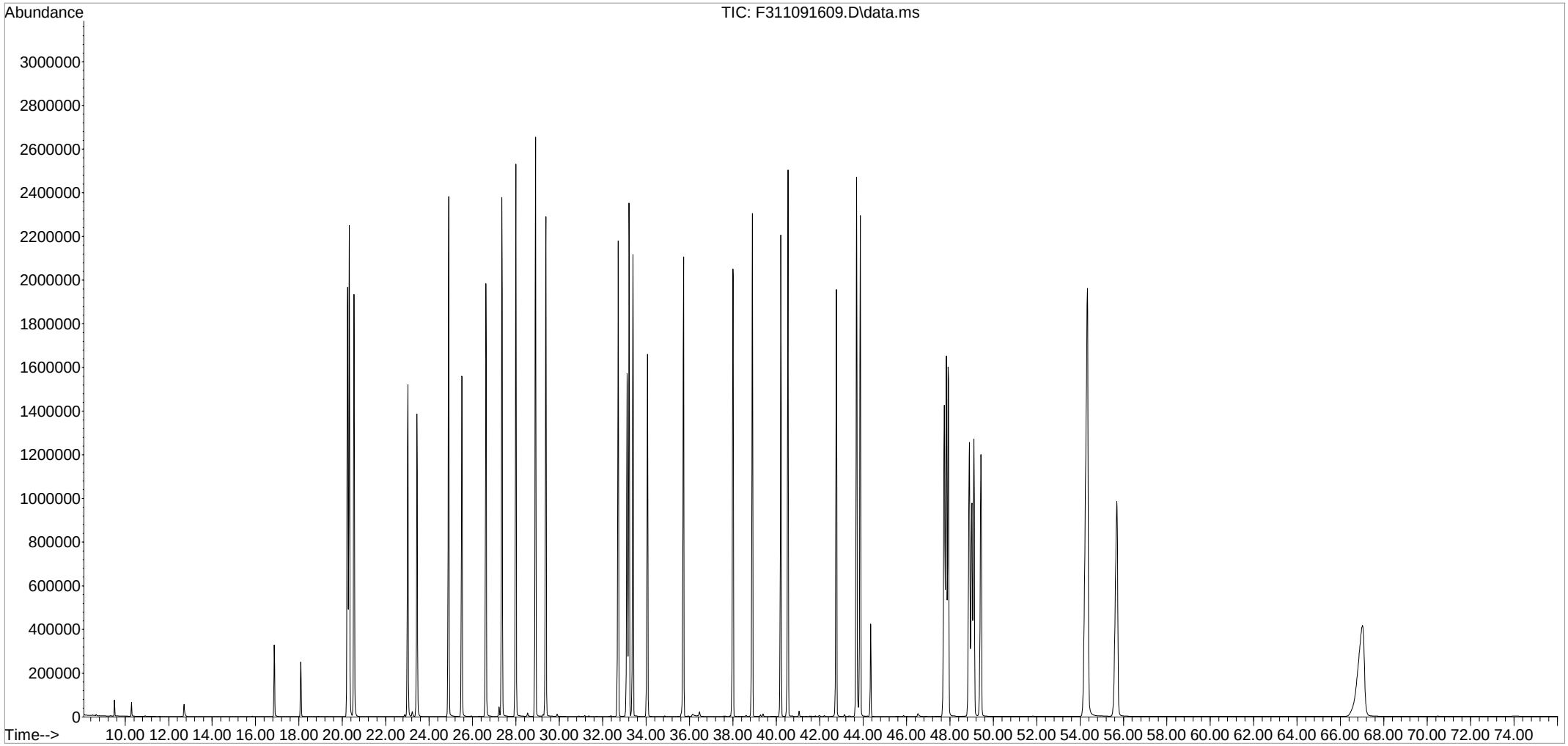
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091609.D
Acq On : 10 Nov 2016 3:55 am
Operator : AC
Sample : I311081607
Misc : FRAX28
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Nov 20 19:47:23 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:00:51 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091611.D
Acq On : 10 Nov 2016 6:49 am
Operator : AC
Sample : QC311081601
Misc : FRAX54
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 20 19:47:28 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:15:38 2016
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	122	0.00
2	A1	trans-Decalin	0.433	0.410	5.3	122	0.00
3	t	cis-Decalin	0.325	0.318	2.2	127	0.00
8	s	Naphthalene-d8	2.145	0.000#	100.0#	0#	-20.25#
9	A1	Naphthalene	2.359	2.392	-1.4	123	0.00
14	t	2-Methylnaphthalene	1.500	1.555	-3.7	129	-0.01
15	t	1-Methylnaphthalene	1.421	1.461	-2.8	126	0.00
16	A1	Benzothiophene	2.089	2.148	-2.8	124	0.00
21	t	Biphenyl	1.904	1.993	-4.7	130	-0.01
22	t	2,6-Dimethylnaphthalene	1.301	1.357	-4.3	130	0.00
23	t	Dibenzofuran	1.998	2.188	-9.5	131	-0.01
24	t	Acenaphthylene	2.284	2.431	-6.4	129	-0.01
25	t	Acenaphthene	1.397	1.479	-5.9	129	0.00
26	t	2,3,5-Trimethylnaphthalene	1.118	1.163	-4.0	128	-0.01
27	A1	Fluorene	1.525	1.657	-8.7	131	0.00
31	A1	Dibenzothiophene	2.250	2.491	-10.7	133	0.00
40	s	Phenanthrene-d10	1.644	0.000#	100.0#	0#	-33.12#
41	A1	Phenanthrene	2.138	2.373	-11.0	129	0.00
52	t	Retene	0.595	0.580	2.5	129	0.00
53	t	Anthracene	2.029	2.212	-9.0	130	0.00
54	t	Carbazole	1.982	2.136	-7.8	129	0.00
55	t	1-Methylphenanthrene	1.577	1.663	-5.5	130	0.00
56	A1	Fluoranthene	2.373	2.557	-7.8	129	0.00
57	t	Benzo(b)fluorene	1.406	1.456	-3.6	130	0.00
58	A1	Pyrene	2.572	2.765	-7.5	128	0.00
63	A1	Naphthobenzothiophene	2.229	2.372	-6.4	130	0.00
64	A2	Naphthobenzothiophene-2,1-D	2.229	2.372	-6.4	130	0.00
71	i	Chrysene-d12	1.000	1.000	0.0	121	0.00
72	t	Benz[a]anthracene	1.385	1.462	-5.6	129	-0.01
73	A1	Chrysene	1.299	1.406	-8.2	128	0.00
74	A2	Chrysene/Triphenylene	1.299	1.406	-8.2	128	0.00
80	s	Benzo[b]fluoranthene-d12	1.041	0.000#	100.0#	0#	-47.71#
81	t	Benzo[b]fluoranthene	1.410	1.572	-11.5	129	0.00
82	A1	Benzo[j]+[k]fluoranthene	1.299	1.404	-8.1	133	0.00
84	t	Benzo[e]pyrene	1.311	1.417	-8.1	130	0.00
85	s	Benzo[a]pyrene-d12	0.838	0.000#	100.0#	0#	-48.96#
86	t	Benzo[a]pyrene	1.251	1.444	-15.4	133	0.00
87	t	Perylene	1.266	1.424	-12.5	131	0.00
88	t	Indeno[1,2,3-cd]pyrene	1.615	1.695	-5.0	130	0.00
89	t	Dibenz[ah]+[ac]anthracene	1.378	1.471	-6.7	131	0.00
90	t	Benzo[g,h,i]perylene	1.562	1.593	-2.0	127	0.00
91	A1	Hopane (T19)	0.286	0.000#	100.0#	0#	-53.16#
92	A2	17a(H),21B(H)-hopane - C30H	0.286	0.000#	100.0#	0#	-53.16#
126	SA1	5B(H)Cholane - Surr	0.162	0.000#	100.0#	0#	-44.34#

* Evaluation of CC level amount vs concentration.
(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	0.92	0.70 - 1.30

Mass Discrimination (Response)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	0.99	0.70 - 2.00

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091611.D
Acq On : 10 Nov 2016 6:49 am
Operator : AC
Sample : QC311081601
Misc : FRAX54
ALS Vial : 11 Sample Multiplier: 1

NAL
11/28/16

Quant Time: Nov 20 19:47:28 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:15:38 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.235	164	86949	500.000	ng/ml	0.00
71) Chrysene-d12	43.750	240	127633	500.000	ng/ml	0.00
System Monitoring Compounds						
8) Naphthalene-d8	0.000	136	0d	0.000	ng/ml	
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.00%#			
40) Phenanthrene-d10	0.000	188	0d	0.000	ng/ml	
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.00%#			
80) Benzo[b]fluoranthene-d12	0.000	264	0d	0.000	ng/ml	
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.00%#			
85) Benzo[a]pyrene-d12	0.000	264	0d	0.000	ng/ml	
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.00%#			
126) 5B(H)Cholane - Surr	0.000	217	0	0.000	ng/ml	
Spiked Amount 1000.000	Range 50 - 130		Recovery = 0.00%#			
Target Compounds						Qvalue
2) trans-Decalin	16.862	138	17841	236.837	ng/ml	100
3) cis-Decalin	18.097	138	13826	244.337	ng/ml	100
9) Naphthalene	20.325	128	207983	507.061	ng/ml	100
14) 2-Methylnaphthalene	23.020	142	135224	518.555	ng/ml	100
15) 1-Methylnaphthalene	23.456	142	127002	514.118	ng/ml	100
16) Benzothiophene	20.551	134	186724	514.020	ng/ml	100
21) Biphenyl	24.901	154	173317	523.536	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.519	156	118006	521.412	ng/ml	100
23) Dibenzofuran	28.003	168	190227	547.432	ng/ml	93
24) Acenaphthylene	26.618	152	211367M4	532.055	ng/ml	
25) Acenaphthene	27.355	153	128634	529.540	ng/ml	100
26) 2,3,5-Trimethylnaphthalen	28.906	170	101151	520.143	ng/ml	93
27) Fluorene	29.388	166	144052	543.180	ng/ml	100
31) Dibenzothiophene	32.714	184	216560	553.396	ng/ml	98
41) Phenanthrene	33.211	178	206308	554.972	ng/ml	99
52) Retene	40.197	234	50417	487.441	ng/ml	96
53) Anthracene	33.392	178	192345M4	545.181	ng/ml	
54) Carbazole	34.054	167	185687	538.727	ng/ml	100
55) 1-Methylphenanthrene	35.725	192	144610	527.455	ng/ml	99
56) Fluoranthene	37.999	202	222328M4	538.849	ng/ml	
57) Benzo(b)fluorene	40.528	216	126563	517.694	ng/ml	100
58) Pyrene	38.887	202	240375	537.431	ng/ml	99
63) Naphthobenzothiophene	42.757	234	206232	532.007	ng/ml	97
64) Naphthobenzothiophene-2,1	42.757	234	206232	532.007	ng/ml	97
72) Benz[a]anthracene	43.675	228	186658	527.797	ng/ml	100
73) Chrysene	43.856	228	179483	541.152	ng/mL	99
74) Chrysene/Triphenylene	43.856	228	179483	541.152	ng/ml	99
81) Benzo[b]fluoranthene	47.801	252	200579	557.430	ng/ml	98
82) Benzo[j]+[k]fluoranthene	47.876	252	179182	540.195	ng/ml	99
84) Benzo[e]pyrene	48.855	252	180823	540.417	ng/ml	98
86) Benzo[a]pyrene	49.051	252	184340	577.433	ng/ml	97
87) Perylene	49.382	252	181707	562.142	ng/ml	97
88) Indeno[1,2,3-cd]pyrene	54.202	276	216355M3	524.807	ng/ml	
89) Dibenz[ah]+[ac]anthracene	54.262	278	187788	533.691	ng/ml	99
90) Benzo[g,h,i]perylene	55.602	276	203312	509.864	ng/ml	100

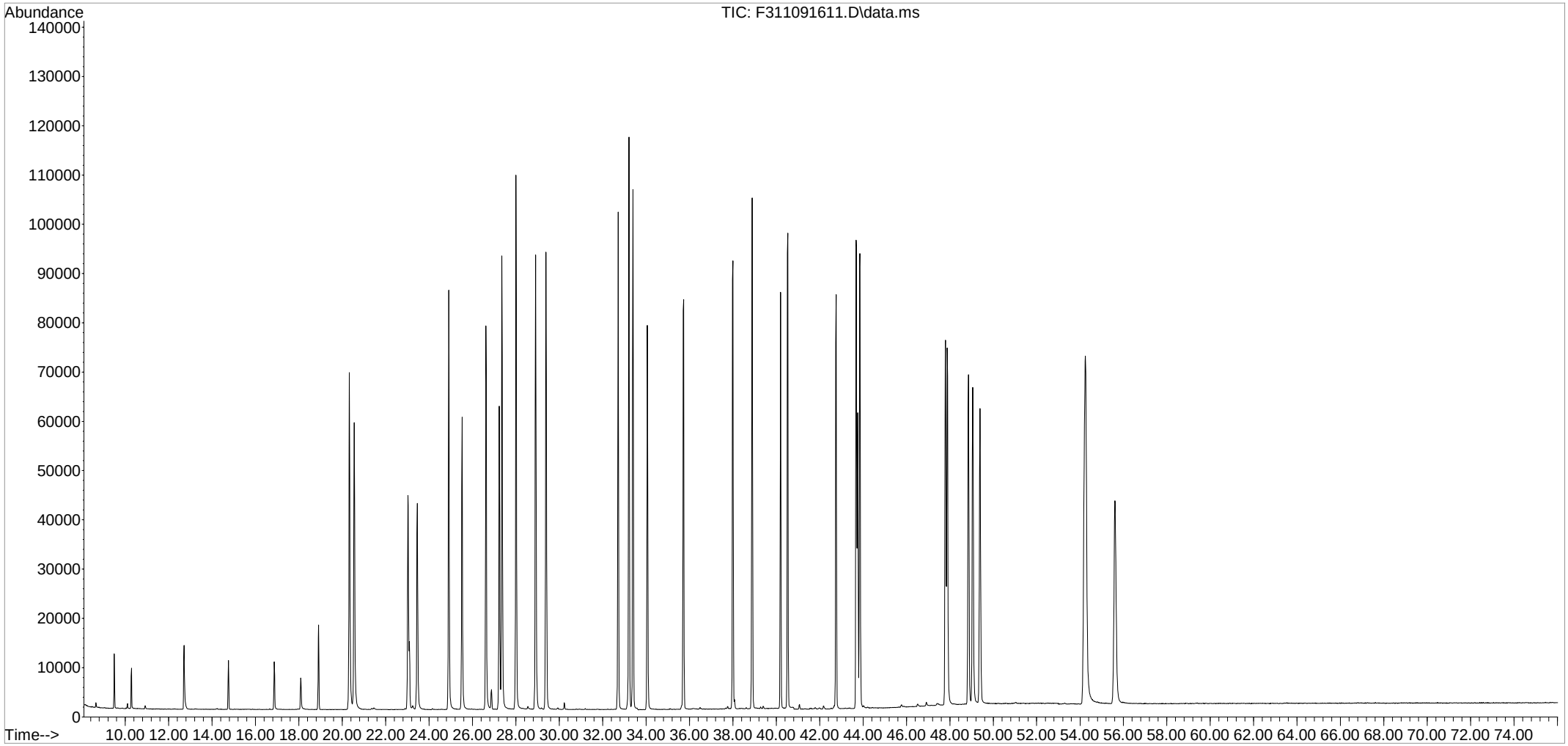
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV09\
Data File : F311091611.D
Acq On : 10 Nov 2016 6:49 am
Operator : AC
Sample : QC311081601
Misc : FRAX54
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Nov 20 19:47:28 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Sun Nov 20 16:15:38 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281602.D
Acq On : 28 Nov 2016 10:47 am
Operator : AC
Sample : C311281601
Misc : CC FRAX92 500NG/ML
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 07 09:41:05 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	96	-0.02
2	A1	trans-Decalin	0.433	0.438	-1.2	102	0.00
3	t	cis-Decalin	0.325	0.335	-3.1	105	0.00
8	s	Naphthalene-d8	2.145	2.175	-1.4	100	0.00
9	A1	Naphthalene	2.359	2.378	-0.8	96	0.00
14	t	2-Methylnaphthalene	1.500	1.497	0.2	97	0.00
15	t	1-Methylnaphthalene	1.421	1.458	-2.6	99	0.00
16	A1	Benzothiophene	2.089	2.167	-3.7	98	0.00
21	t	Biphenyl	1.904	1.932	-1.5	99	0.00
22	t	2,6-Dimethylnaphthalene	1.301	1.334	-2.5	100	0.00
23	t	Dibenzofuran	1.998	2.119	-6.1	99	0.00
24	t	Acenaphthylene	2.284	2.370	-3.8	99	0.00
25	t	Acenaphthene	1.397	1.431	-2.4	98	0.00
26	t	2,3,5-Trimethylnaphthalene	1.118	1.178	-5.4	102	0.00
27	A1	Fluorene	1.525	1.606	-5.3	100	0.00
31	A1	Dibenzothiophene	2.250	2.334	-3.7	98	0.00
40	s	Phenanthrene-d10	1.644	1.713	-4.2	104	0.00
41	A1	Phenanthrene	2.138	2.288	-7.0	98	0.00
52	t	Retene	0.595	0.617	-3.7	108	0.00
53	t	Anthracene	2.029	2.144	-5.7	99	0.00
54	t	Carbazole	1.982	2.098	-5.9	99	0.00
55	t	1-Methylphenanthrene	1.577	1.648	-4.5	102	0.00
56	A1	Fluoranthene	2.373	2.517	-6.1	100	0.00
57	t	Benzo(b)fluorene	1.406	1.504	-7.0	105	0.00
58	A1	Pyrene	2.572	2.730	-6.1	100	0.00
63	A1	Naphthobenzothiophene	2.229	2.375	-6.6	102	0.00
64	A2	Naphthobenzothiophene-2,1-D	2.229	2.375	-6.6	102	0.00
71	i	Chrysene-d12	1.000	1.000	0.0	102	-0.02
72	t	Benz[a]anthracene	1.385	1.419	-2.5	106	0.00
73	A1	Chrysene	1.299	1.372	-5.6	106	0.00
74	A2	Chrysene/Triphenylene	1.299	1.372	-5.6	106	0.00
80	s	Benzo[b]fluoranthene-d12	1.041	1.051	-1.0	107	0.00
81	t	Benzo[b]fluoranthene	1.410	1.452	-3.0	101	0.00
82	A1	Benzo[j]+[k]fluoranthene	1.299	1.379	-6.2	111	0.00
84	t	Benzo[e]pyrene	1.311	1.353	-3.2	105	0.00
85	s	Benzo[a]pyrene-d12	0.838	0.867	-3.5	104	0.00
86	t	Benzo[a]pyrene	1.251	1.345	-7.5	105	0.00
87	t	Perylene	1.266	1.344	-6.2	105	0.00
88	t	Indeno[1,2,3-cd]pyrene	1.615	1.579	2.2	103	0.00
89	t	Dibenz[ah]+[ac]anthracene	1.378	1.443	-4.7	109	0.00
90	t	Benzo[g,h,i]perylene	1.562	1.580	-1.2	106	0.00
91	A1	Hopane (T19)	0.286	0.257	10.1	91	0.00
92	A2	17a(H),21B(H)-hopane - C30H	0.286	0.257	10.1	91	0.00
126	SA1	5B(H)Cholane - Surr	0.162	0.170	-4.9	114	0.00

* Evaluation of CC level amount vs concentration.
(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	0.94	0.70 - 1.30

Mass Discrimination (Response)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	1.09	0.70 - 2.00

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281602.D
Acq On : 28 Nov 2016 10:47 am
Operator : AC
Sample : C311281601
Misc : CC FRAX92 500NG/ML
ALS Vial : 2 Sample Multiplier: 1

MAL 12/7/16

Quant Time: Dec 07 09:41:05 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	68272	500.000	ng/ml	-0.02
71) Chrysene-d12	43.570	240	108053	500.000	ng/ml	-0.02
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	148515	507.149	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.71%			
40) Phenanthrene-d10	32.970	188	116941	521.102	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.11%			
80) Benzo[b]fluoranthene-d12	47.470	264	113552	504.522	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.45%			
85) Benzo[a]pyrene-d12	48.705	264	93693	517.146	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.71%			
126) 5B(H)Cholane - Surr	44.157	217	18339	522.619	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.26%			
Target Compounds						Qvalue
2) trans-Decalin	16.757	138	14959	252.904	ng/ml	100
3) cis-Decalin	17.976	138	11441	257.501	ng/ml	100
9) Naphthalene	20.189	128	162338	504.051	ng/ml	100
14) 2-Methylnaphthalene	22.884	142	102191	499.087	ng/ml	100
15) 1-Methylnaphthalene	23.321	142	99535	513.156	ng/ml	100
16) Benzothiophene	20.415	134	147929	518.627	ng/ml	100
21) Biphenyl	24.781	154	131881	507.353	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.383	156	91098	512.635	ng/ml	100
23) Dibenzofuran	27.867	168	144695	530.315	ng/ml	97
24) Acenaphthylene	26.497	152	161797	518.695	ng/ml	100
25) Acenaphthene	27.220	153	97700	512.223	ng/ml	100
26) 2,3,5-Trimethylnaphthalen	28.770	170	80399	526.532	ng/ml	97
27) Fluorene	29.237	166	109624M4	526.444	ng/ml	
31) Dibenzothiophene	32.564	184	159337	518.557	ng/ml	99
41) Phenanthrene	33.061	178	156222	535.204	ng/ml	100
52) Retene	40.047	234	42107	518.468	ng/ml	95
53) Anthracene	33.241	178	146403M4	528.484	ng/ml	
54) Carbazole	33.904	167	143250	529.303	ng/ml	99
55) 1-Methylphenanthrene	35.560	192	112507	522.623	ng/ml	99
56) Fluoranthene	37.833	202	171855M4	530.465	ng/ml	
57) Benzo(b)fluorene	40.363	216	102694	534.975	ng/ml	98
58) Pyrene	38.722	202	186389	530.732	ng/ml	100
63) Naphthobenzothiophene	42.576	234	162155	532.738	ng/ml	96
64) Naphthobenzothiophene-2,1	42.576	234	162155	532.738	ng/ml	96
72) Benz[a]anthracene	43.494	228	153312	512.062	ng/ml	100
73) Chrysene	43.660	228	148197	527.790	ng/mL	100
74) Chrysene/Triphenylene	43.660	228	148197	527.790	ng/ml	100
81) Benzo[b]fluoranthene	47.560	252	156937	515.177	ng/ml	96
82) Benzo[j]+[k]fluoranthene	47.650	252	148959	530.456	ng/ml	95
84) Benzo[e]pyrene	48.599	252	146198	516.111	ng/ml	96
86) Benzo[a]pyrene	48.795	252	145356	537.826	ng/ml	95
87) Perylene	49.111	252	145180	530.526	ng/ml	96
88) Indeno[1,2,3-cd]pyrene	53.780	276	170659M3	488.976	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.840	278	155929	523.450	ng/ml	99
90) Benzo[g,h,i]perylene	55.135	276	170728	505.734	ng/ml	100
91) Hopane (T19)	52.831	191	27756	449.428	ng/mL#	89
92) 17a(H),21B(H)-hopane - C3	52.831	191	27756	449.428	ng/mL#	89

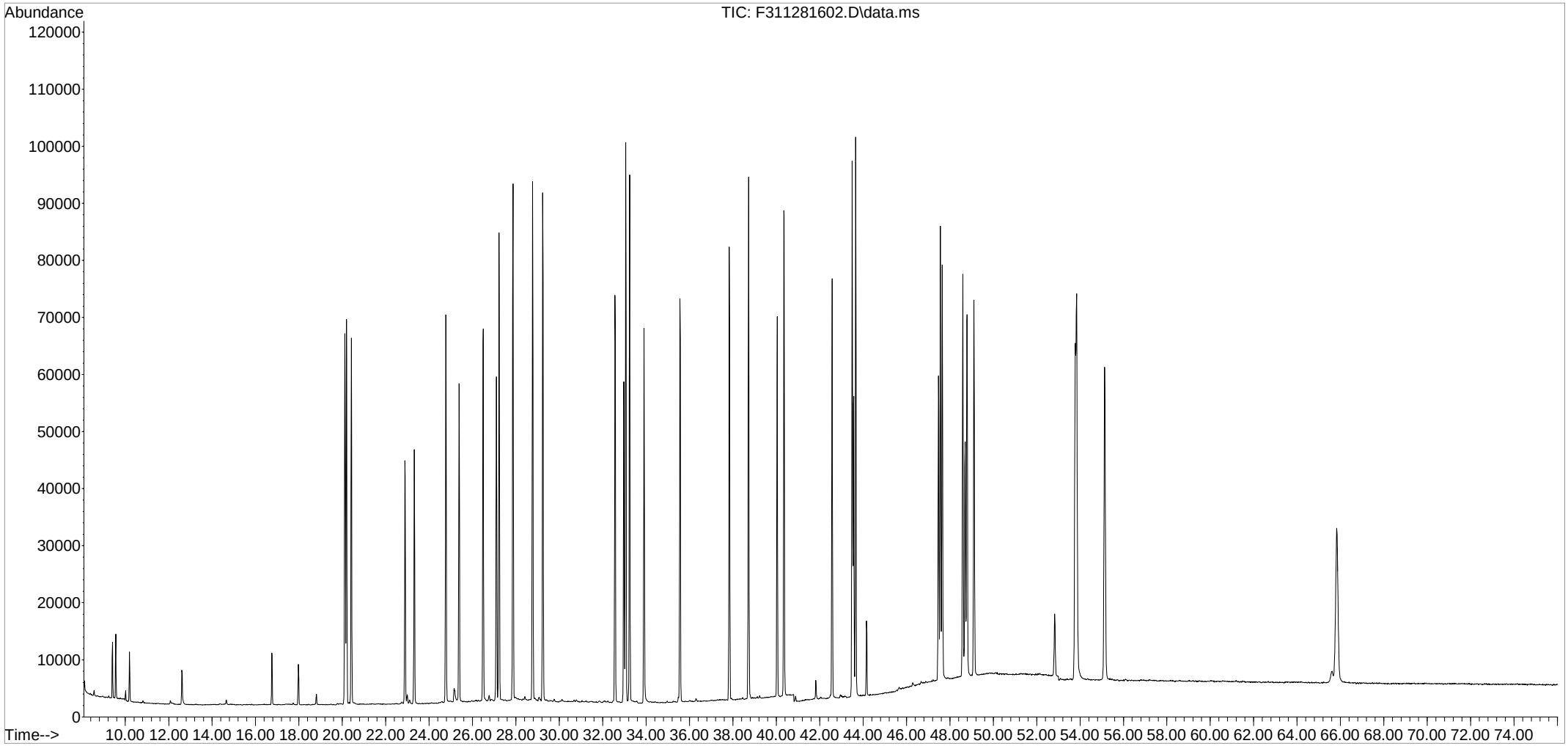
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281602.D
Acq On : 28 Nov 2016 10:47 am
Operator : AC
Sample : C311281601
Misc : CC FRAX92 500NG/ML
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 07 09:41:05 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281613.D
Acq On : 29 Nov 2016 3:51 am
Operator : AC
Sample : c311281602
Misc : CC FRAX92 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Dec 07 09:41:39 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	101	-0.02
2	A1	trans-Decalin	0.433	0.429	0.9	105	0.00
3	t	cis-Decalin	0.325	0.335	-3.1	111	0.00
8	s	Naphthalene-d8	2.145	2.040	4.9	99	0.00
9	A1	Naphthalene	2.359	2.153	8.7	92	0.02
14	t	2-Methylnaphthalene	1.500	1.405	6.3	96	0.02
15	t	1-Methylnaphthalene	1.421	1.364	4.0	97	0.00
16	A1	Benzothiophene	2.089	1.960	6.2	93	0.00
21	t	Biphenyl	1.904	1.813	4.8	98	0.00
22	t	2,6-Dimethylnaphthalene	1.301	1.257	3.4	100	0.00
23	t	Dibenzofuran	1.998	2.000	-0.1	99	0.00
24	t	Acenaphthylene	2.284	2.369	-3.7	104	0.00
25	t	Acenaphthene	1.397	1.383	1.0	100	0.00
26	t	2,3,5-Trimethylnaphthalene	1.118	1.108	0.9	101	0.00
27	A1	Fluorene	1.525	1.509	1.0	99	0.02
31	A1	Dibenzothiophene	2.250	2.234	0.7	98	0.02
40	s	Phenanthrene-d10	1.644	1.755	-6.8	113	0.02
41	A1	Phenanthrene	2.138	2.110	1.3	95	0.02
52	t	Retene	0.595	0.629	-5.7	116	0.00
53	t	Anthracene	2.029	2.078	-2.4	101	0.02
54	t	Carbazole	1.982	1.973	0.5	98	0.02
55	t	1-Methylphenanthrene	1.577	1.588	-0.7	103	0.02
56	A1	Fluoranthene	2.373	2.411	-1.6	100	0.02
57	t	Benzo(b)fluorene	1.406	1.485	-5.6	109	0.00
58	A1	Pyrene	2.572	2.640	-2.6	101	0.02
63	A1	Naphthobenzothiophene	2.229	2.376	-6.6	108	0.00
64	A2	Naphthobenzothiophene-2,1-D	2.229	2.376	-6.6	108	0.00
71	i	Chrysene-d12	1.000	1.000	0.0	115	-0.02
72	t	Benz[a]anthracene	1.385	1.282	7.4	108	0.02
73	A1	Chrysene	1.299	1.305	-0.5	114	0.00
74	A2	Chrysene/Triphenylene	1.299	1.305	-0.5	114	0.00
80	s	Benzo[b]fluoranthene-d12	1.041	1.027	1.3	118	0.02
81	t	Benzo[b]fluoranthene	1.410	1.244	11.8	98	0.00
82	A1	Benzo[j]+[k]fluoranthene	1.299	1.329	-2.3	121	0.00
84	t	Benzo[e]pyrene	1.311	1.199	8.5	105	0.00
85	s	Benzo[a]pyrene-d12	0.838	0.833	0.6	113	0.00
86	t	Benzo[a]pyrene	1.251	1.206	3.6	106	0.00
87	t	Perylene	1.266	1.216	3.9	107	0.00
88	t	Indeno[1,2,3-cd]pyrene	1.615	1.342	16.9	98	0.02
89	t	Dibenz[ah]+[ac]anthracene	1.378	1.320	4.2	112	0.02
90	t	Benzo[g,h,i]perylene	1.562	1.366	12.5	104	0.02
91	A1	Hopane (T19)	0.286	0.223	22.0	89	0.00
92	A2	17a(H),21B(H)-hopane - C30H	0.286	0.223	22.0	89	0.00
126	SA1	5B(H)Cholane - Surr	0.162	0.155	4.3	117	0.00

* Evaluation of CC level amount vs concentration.
(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	0.89	0.70 - 1.30

Mass Discrimination (Response)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	1.10	0.70 - 2.00

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281613.D
Acq On : 29 Nov 2016 3:51 am
Operator : AC
Sample : c311281602
Misc : CC FRAX92 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Dec 07 09:41:39 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	71930M4	500.000	ng/ml	-0.02
71) Chrysene-d12	43.570	240	122029	500.000	ng/ml	-0.02
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	146703	475.485	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.55%#			
40) Phenanthrene-d10	32.985	188	126204	533.779	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.38%			
80) Benzo[b]fluoranthene-d12	47.485	264	125267	492.829	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.28%#			
85) Benzo[a]pyrene-d12	48.705	264	101674	496.924	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.69%#			
126) 5B(H)Cholane - Surr	44.157	217	18937	477.853	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.79%#			
Target Compounds						Qvalue
2) trans-Decalin	16.757	138	15416	247.376	ng/ml	100
3) cis-Decalin	17.976	138	12063	257.693	ng/ml	100
9) Naphthalene	20.204	128	154886	456.456	ng/ml	100
14) 2-Methylnaphthalene	22.899	142	101055	468.440	ng/ml	100
15) 1-Methylnaphthalene	23.320	142	98133	480.199	ng/ml	100
16) Benzothiophene	20.415	134	140990	469.162	ng/ml	100
21) Biphenyl	24.781	154	130390	476.107	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.383	156	90450	483.103	ng/ml	100
23) Dibenzofuran	27.867	168	143829	500.333	ng/ml	98
24) Acenaphthylene	26.497	152	170369M4	518.399	ng/ml	
25) Acenaphthene	27.220	153	99515	495.206	ng/ml	100
26) 2,3,5-Trimethylnaphthalen	28.770	170	79703	495.429	ng/ml	94
27) Fluorene	29.252	166	108540M4	494.730	ng/ml	
31) Dibenzothiophene	32.579	184	160687	496.356	ng/ml	98
41) Phenanthrene	33.076	178	151750	493.445	ng/ml	100
52) Retene	40.047	234	45264	528.997	ng/ml	99
53) Anthracene	33.256	178	149494M4	512.198	ng/ml	
54) Carbazole	33.919	167	141922	497.727	ng/ml	99
55) 1-Methylphenanthrene	35.575	192	114238	503.677	ng/ml	100
56) Fluoranthene	37.848	202	173423	508.082	ng/ml	97
57) Benzo(b)fluorene	40.363	216	106814	528.140	ng/ml	100
58) Pyrene	38.737	202	189912	513.263	ng/ml	98
63) Naphthobenzothiophene	42.576	234	170884	532.865	ng/ml	97
64) Naphthobenzothiophene-2,1	42.576	234	170884	532.865	ng/ml	97
72) Benz[a]anthracene	43.509	228	156472	462.761	ng/ml	98
73) Chrysene	43.660	228	159229	502.132	ng/mL	99
74) Chrysene/Triphenylene	43.660	228	159229	502.132	ng/ml	99
81) Benzo[b]fluoranthene	47.560	252	151820	441.300	ng/ml	96
82) Benzo[j]+[k]fluoranthene	47.650	252	162157	511.319	ng/ml	96
84) Benzo[e]pyrene	48.599	252	146262	457.200	ng/ml	95
86) Benzo[a]pyrene	48.795	252	147205	482.286	ng/ml	94
87) Perylene	49.111	252	148332	479.964	ng/ml	94
88) Indeno[1,2,3-cd]pyrene	53.795	276	163735M4	415.407	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.855	278	161137	478.980	ng/ml	98
90) Benzo[g,h,i]perylene	55.150	276	166633	437.071	ng/ml	100
91) Hopane (T19)	52.831	191	27232	390.442	ng/mL#	90
92) 17a(H),21B(H)-hopane - C3	52.831	191	27232	390.442	ng/mL#	90

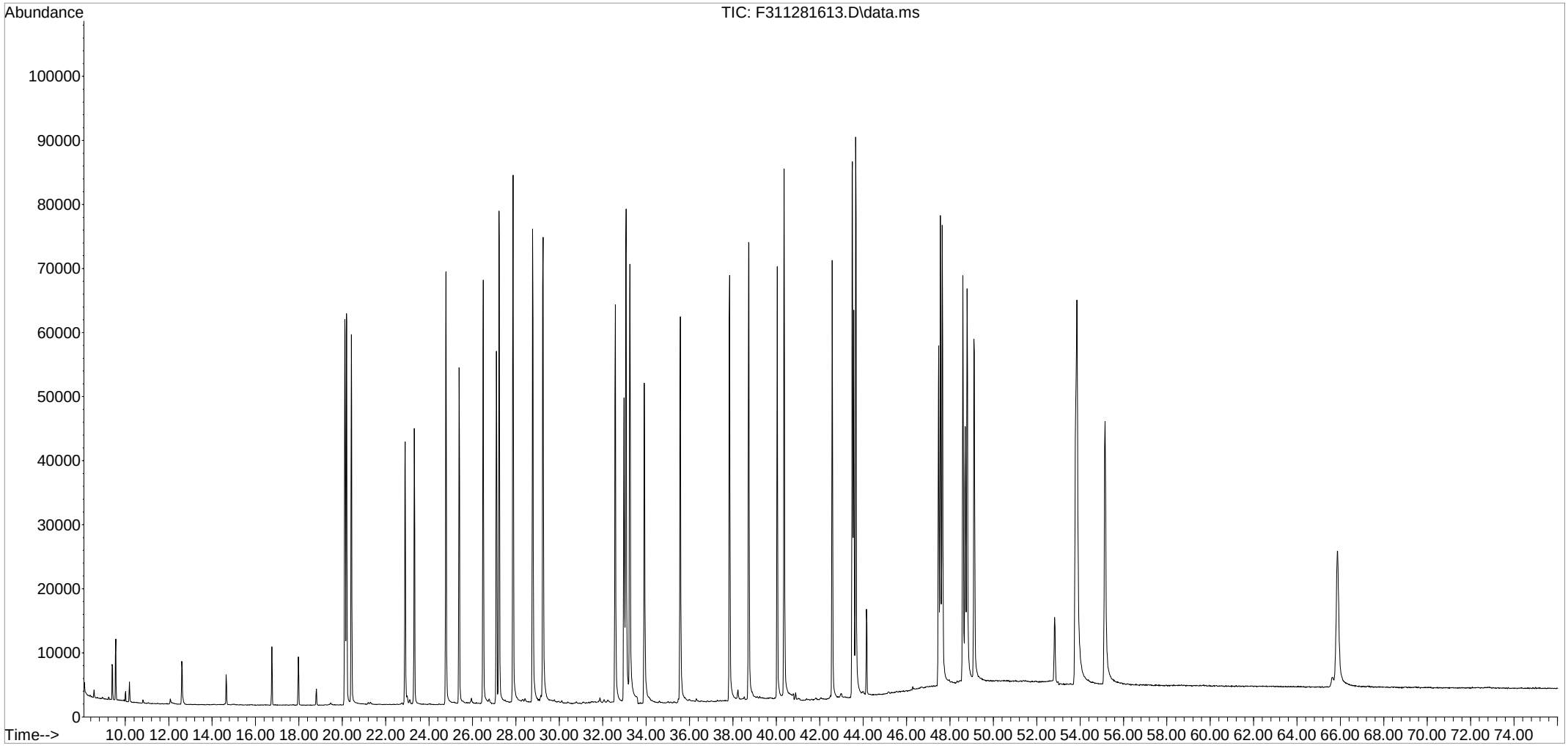
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281613.D
Acq On : 29 Nov 2016 3:51 am
Operator : AC
Sample : c311281602
Misc : CC FRAX92 500NG/ML
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Dec 07 09:41:39 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281624.D
Acq On : 30 Nov 2016 12:47 am
Operator : AC
Sample : c311281603
Misc : cc frax92 500ng/ml
ALS Vial : 24 Sample Multiplier: 1

Quant Time: Dec 07 09:42:43 2016
Quant Method : O:\FORENSICS\DATA\PAH3\2016\NOV16\NOV28\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	88	-0.01
2	A1	trans-Decalin	0.433	0.447	-3.2	96	0.00
3	t	cis-Decalin	0.325	0.345	-6.2	99	0.00
8	s	Naphthalene-d8	2.145	2.113	1.5	89	0.02
9	A1	Naphthalene	2.359	2.267	3.9	84	0.02
14	t	2-Methylnaphthalene	1.500	1.440	4.0	86	0.02
15	t	1-Methylnaphthalene	1.421	1.395	1.8	87	0.00
16	A1	Benzothiophene	2.089	2.032	2.7	84	0.00
21	t	Biphenyl	1.904	1.843	3.2	87	0.00
22	t	2,6-Dimethylnaphthalene	1.301	1.285	1.2	89	0.00
23	t	Dibenzofuran	1.998	2.045	-2.4	88	0.00
24	t	Acenaphthylene	2.284	2.416	-5.8	93	0.00
25	t	Acenaphthene	1.397	1.413	-1.1	89	0.02
26	t	2,3,5-Trimethylnaphthalene	1.118	1.118	0.0	89	0.02
27	A1	Fluorene	1.525	1.561	-2.4	89	0.02
31	A1	Dibenzothiophene	2.250	2.235	0.7	86	0.02
40	s	Phenanthrene-d10	1.644	1.747	-6.3	98	0.02
41	A1	Phenanthrene	2.138	2.137	0.0	84	0.02
52	t	Retene	0.595	0.594	0.2	95	0.00
53	t	Anthracene	2.029	2.172	-7.0	92	0.02
54	t	Carbazole	1.982	1.995	-0.7	87	0.02
55	t	1-Methylphenanthrene	1.577	1.582	-0.3	90	0.02
56	A1	Fluoranthene	2.373	2.407	-1.4	87	0.02
57	t	Benzo(b)fluorene	1.406	1.450	-3.1	93	0.00
58	A1	Pyrene	2.572	2.649	-3.0	89	0.02
63	A1	Naphthobenzothiophene	2.229	2.349	-5.4	93	0.00
64	A2	Naphthobenzothiophene-2,1-D	2.229	2.349	-5.4	93	0.00
71	i	Chrysene-d12	1.000	1.000	0.0	98	-0.01
72	t	Benz[a]anthracene	1.385	1.291	6.8	93	0.02
73	A1	Chrysene	1.299	1.340	-3.2	99	0.02
74	A2	Chrysene/Triphenylene	1.299	1.340	-3.2	99	0.02
80	s	Benzo[b]fluoranthene-d12	1.041	1.007	3.3	98	0.02
81	t	Benzo[b]fluoranthene	1.410	1.248	11.5	83	0.00
82	A1	Benzo[j]+[k]fluoranthene	1.299	1.454	-11.9	112	0.00
84	t	Benzo[e]pyrene	1.311	1.255	4.3	94	0.00
85	s	Benzo[a]pyrene-d12	0.838	0.817	2.5	94	0.00
86	t	Benzo[a]pyrene	1.251	1.232	1.5	92	0.00
87	t	Perylene	1.266	1.269	-0.2	95	0.02
88	t	Indeno[1,2,3-cd]pyrene	1.615	1.400	13.3	87	0.03
89	t	Dibenz[ah]+[ac]anthracene	1.378	1.314	4.6	95	0.03
90	t	Benzo[g,h,i]perylene	1.562	1.414	9.5	91	0.03
91	A1	Hopane (T19)	0.286	0.231	19.2	78	0.00
92	A2	17a(H),21B(H)-hopane - C30H	0.286	0.231	19.2	78	0.00
126	SA1	5B(H)Cholane - Surr	0.162	0.157	3.1	101	0.00

* Evaluation of CC level amount vs concentration.
(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	0.90	0.70 - 1.30

Mass Discrimination (Response)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	1.09	0.70 - 2.00

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281624.D
Acq On : 30 Nov 2016 12:47 am
Operator : AC
Sample : c311281603
Misc : cc frax92 500ng/ml
ALS Vial : 24 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Dec 07 09:42:43 2016
Quant Method : O:\FORENSICS\DATA\PAH3\2016\NOV16\NOV28\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	62705M4	500.000	ng/ml	-0.01
71) Chrysene-d12	43.570	240	103642	500.000	ng/ml	-0.01
System Monitoring Compounds						
8) Naphthalene-d8	20.129	136	132510	492.668	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.27%#			
40) Phenanthrene-d10	32.986	188	109528	531.400	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.14%			
80) Benzo[b]fluoranthene-d12	47.485	264	104381	483.513	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.35%#			
85) Benzo[a]pyrene-d12	48.705	264	84673	487.250	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.73%#			
126) 5B(H)Cholane - Surr	44.157	217	16293	484.074	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.41%#			
Target Compounds						Qvalue
2) trans-Decalin	16.757	138	14004	257.778	ng/ml	100
3) cis-Decalin	17.976	138	10809	264.875	ng/ml	100
9) Naphthalene	20.204	128	142174	480.635	ng/ml	100
14) 2-Methylnaphthalene	22.899	142	90277	480.044	ng/ml	100
15) 1-Methylnaphthalene	23.321	142	87479	491.041	ng/ml	100
16) Benzothiophene	20.415	134	127417	486.373	ng/ml	100
21) Biphenyl	24.781	154	115568	484.067	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.383	156	80607	493.870	ng/ml	100
23) Dibenzofuran	27.867	168	128202	511.582	ng/ml	97
24) Acenaphthylene	26.497	152	151479M4	528.730	ng/ml	
25) Acenaphthene	27.235	153	88609	505.805	ng/ml	100
26) 2,3,5-Trimethylnaphthalen	28.785	170	70129	500.049	ng/ml	96
27) Fluorene	29.252	166	97876M4	511.756	ng/ml	
31) Dibenzothiophene	32.579	184	140130	496.537	ng/ml	98
41) Phenanthrene	33.076	178	134028	499.935	ng/ml	100
52) Retene	40.047	234	37232	499.142	ng/ml	95
53) Anthracene	33.256	178	136221M4	535.385	ng/ml	
54) Carbazole	33.919	167	125110	503.317	ng/ml	98
55) 1-Methylphenanthrene	35.575	192	99228	501.862	ng/ml	100
56) Fluoranthene	37.848	202	150949M4	507.301	ng/ml	
57) Benzo(b)fluorene	40.363	216	90950	515.860	ng/ml	99
58) Pyrene	38.737	202	166089	514.916	ng/ml	98
63) Naphthobenzothiophene	42.576	234	147321	526.973	ng/ml	97
64) Naphthobenzothiophene-2,1	42.576	234	147321	526.973	ng/ml	97
72) Benz[a]anthracene	43.510	228	133828	466.009	ng/ml	98
73) Chrysene	43.675	228	138837	515.500	ng/mL	100
74) Chrysene/Triphenylene	43.675	228	138837	515.500	ng/ml	100
81) Benzo[b]fluoranthene	47.560	252	129356	442.709	ng/ml	96
82) Benzo[j]+[k]fluoranthene	47.651	252	150699	559.492	ng/ml	95
84) Benzo[e]pyrene	48.599	252	130065	478.699	ng/ml	95
86) Benzo[a]pyrene	48.795	252	127668	492.483	ng/ml	94
87) Perylene	49.126	252	131475	500.892	ng/ml	93
88) Indeno[1,2,3-cd]pyrene	53.810	276	145133M4	433.537	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.870	278	136147	476.494	ng/ml	99
90) Benzo[g,h,i]perylene	55.165	276	146498	452.429	ng/ml	100
91) Hopane (T19)	52.831	191	23971	404.660	ng/mL#	90
92) 17a(H),21B(H)-hopane - C3	52.831	191	23971	404.660	ng/mL#	90

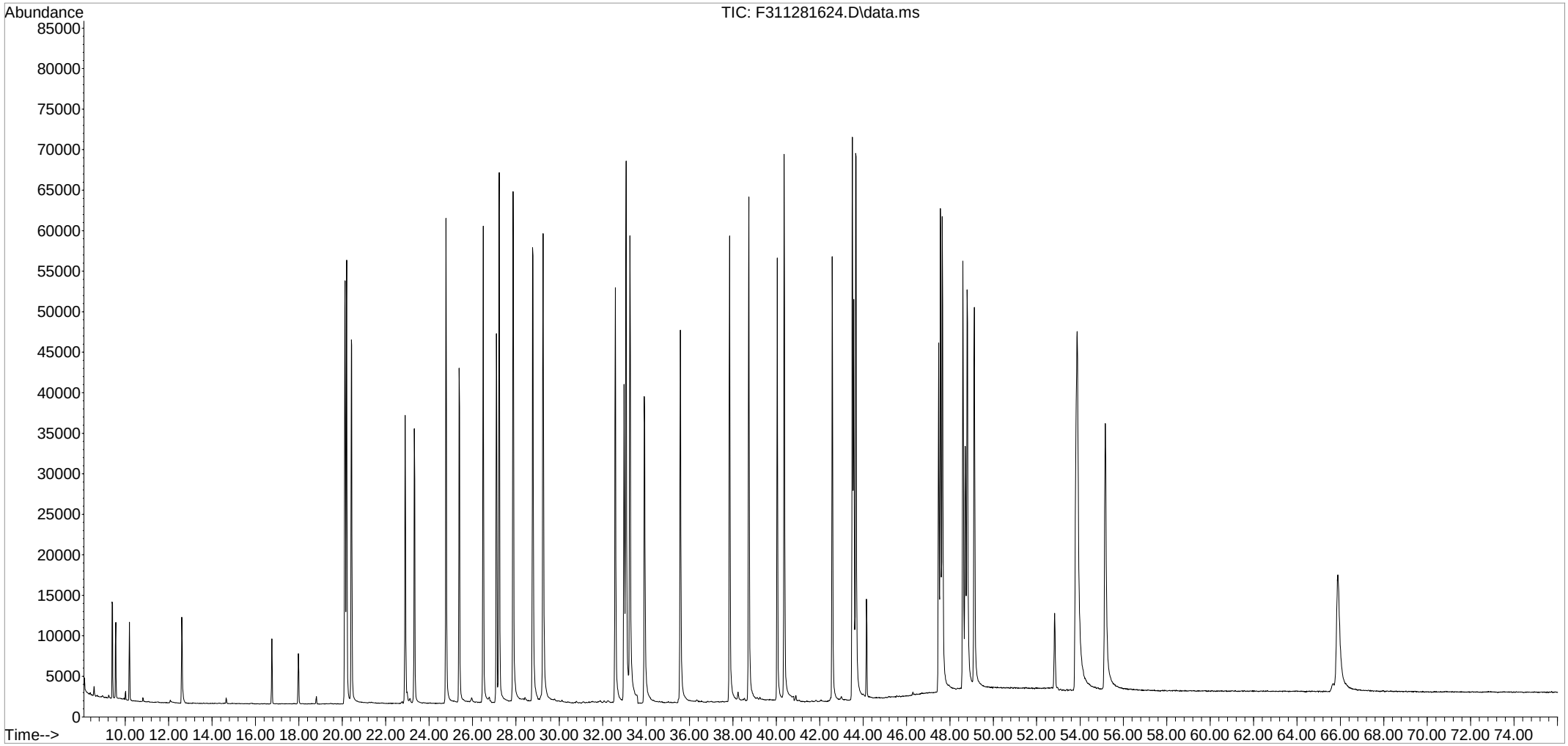
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281624.D
Acq On : 30 Nov 2016 12:47 am
Operator : AC
Sample : c311281603
Misc : cc frax92 500ng/ml
ALS Vial : 24 Sample Multiplier: 1

Quant Time: Dec 07 09:42:43 2016
Quant Method : O:\FORENSICS\DATA\PAH3\2016\NOV16\NOV28\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281640.D
Acq On : 30 Nov 2016 11:49 pm
Operator : AC
Sample : c311281605
Misc : cc frax92 500ng/ml
ALS Vial : 40 Sample Multiplier: 1

Quant Time: Dec 07 09:43:28 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	121	-0.02
2	A1	trans-Decalin	0.433	0.449	-3.7	132	0.00
3	t	cis-Decalin	0.325	0.351	-8.0	138	0.00
8	s	Naphthalene-d8	2.145	2.190	-2.1	127	0.00
9	A1	Naphthalene	2.359	2.278	3.4	116	0.02
14	t	2-Methylnaphthalene	1.500	1.517	-1.1	124	0.02
15	t	1-Methylnaphthalene	1.421	1.372	3.4	117	0.00
16	A1	Benzothiophene	2.089	2.032	2.7	115	0.00
21	t	Biphenyl	1.904	1.917	-0.7	123	0.00
22	t	2,6-Dimethylnaphthalene	1.301	1.323	-1.7	125	0.00
23	t	Dibenzofuran	1.998	2.062	-3.2	121	0.00
24	t	Acenaphthylene	2.284	2.358	-3.2	124	0.00
25	t	Acenaphthene	1.397	1.388	0.6	120	0.00
26	t	2,3,5-Trimethylnaphthalene	1.118	1.193	-6.7	130	0.00
27	A1	Fluorene	1.525	1.587	-4.1	124	0.02
31	A1	Dibenzothiophene	2.250	2.304	-2.4	121	0.02
40	s	Phenanthrene-d10	1.644	1.815	-10.4	139	0.02
41	A1	Phenanthrene	2.138	2.191	-2.5	118	0.00
52	t	Retene	0.595	0.649	-9.1	143	0.00
53	t	Anthracene	2.029	1.986	2.1	115	0.00
54	t	Carbazole	1.982	1.940	2.1	115	0.02
55	t	1-Methylphenanthrene	1.577	1.691	-7.2	131	0.02
56	A1	Fluoranthene	2.373	2.565	-8.1	127	0.00
57	t	Benzo(b)fluorene	1.406	1.445	-2.8	127	0.00
58	A1	Pyrene	2.572	2.749	-6.9	126	0.00
63	A1	Naphthobenzothiophene	2.229	2.386	-7.0	129	0.00
64	A2	Naphthobenzothiophene-2,1-D	2.229	2.386	-7.0	129	0.00
71	i	Chrysene-d12	1.000	1.000	0.0	138	-0.02
72	t	Benz[a]anthracene	1.385	1.327	4.2	134	0.02
73	A1	Chrysene	1.299	1.301	-0.2	136	0.00
74	A2	Chrysene/Triphenylene	1.299	1.301	-0.2	136	0.00
80	s	Benzo[b]fluoranthene-d12	1.041	1.040	0.1	143	0.02
81	t	Benzo[b]fluoranthene	1.410	1.352	4.1	127	0.00
82	A1	Benzo[j]+[k]fluoranthene	1.299	1.376	-5.9	150	0.00
84	t	Benzo[e]pyrene	1.311	1.314	-0.2	138	0.00
85	s	Benzo[a]pyrene-d12	0.838	0.830	1.0	135	0.00
86	t	Benzo[a]pyrene	1.251	1.288	-3.0	136	0.00
87	t	Perylene	1.266	1.280	-1.1	135	0.02
88	t	Indeno[1,2,3-cd]pyrene	1.615	1.540	4.6	135	0.02
89	t	Dibenz[ah]+[ac]anthracene	1.378	1.406	-2.0	143	0.02
90	t	Benzo[g,h,i]perylene	1.562	1.588	-1.7	145	0.02
91	A1	Hopane (T19)	0.286	0.270	5.6	129	0.00
92	A2	17a(H),21B(H)-hopane - C30H	0.286	0.270	5.6	129	0.00
126	SA1	5B(H)Cholane - Surr	0.162	0.160	1.2	145	0.00

* Evaluation of CC level amount vs concentration.
(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	0.99	0.70 - 1.30

Mass Discrimination (Response)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	1.23	0.70 - 2.00

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281640.D
Acq On : 30 Nov 2016 11:49 pm
Operator : AC
Sample : c311281605
Misc : cc frax92 500ng/ml
ALS Vial : 40 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 07 09:43:28 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.099	164	85804M4	500.000	ng/ml	-0.02
71) Chrysene-d12	43.570	240	146135	500.000	ng/ml	-0.02
System Monitoring Compounds						
8) Naphthalene-d8	20.114	136	187948	510.667	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.07%			
40) Phenanthrene-d10	32.985	188	155725	552.140	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 55.21%			
80) Benzo[b]fluoranthene-d12	47.485	264	151946	499.180	ng/ml	0.02
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.92%#			
85) Benzo[a]pyrene-d12	48.705	264	121340	495.213	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.52%#			
126) 5B(H)Cholane - Surr	44.157	217	23335	491.700	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.17%#			
Target Compounds						Qvalue
2) trans-Decalin	16.757	138	19253	258.992	ng/ml	100
3) cis-Decalin	17.976	138	15046	269.445	ng/ml	100
9) Naphthalene	20.204	128	195453	482.872	ng/ml	100
14) 2-Methylnaphthalene	22.899	142	130161	505.800	ng/ml	100
15) 1-Methylnaphthalene	23.321	142	117686	482.763	ng/ml	100
16) Benzothiophene	20.415	134	174320	486.277	ng/ml	100
21) Biphenyl	24.781	154	164489	503.500	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.383	156	113493	508.163	ng/ml	100
23) Dibenzofuran	27.867	168	176962	516.054	ng/ml	96
24) Acenaphthylene	26.497	152	202297M4	516.019	ng/ml	
25) Acenaphthene	27.220	153	119118	496.909	ng/ml	100
26) 2,3,5-Trimethylnaphthalen	28.770	170	102356	533.363	ng/ml	96
27) Fluorene	29.252	166	136206M4	520.448	ng/ml	
31) Dibenzothiophene	32.579	184	197730	512.021	ng/ml	98
41) Phenanthrene	33.061	178	187997	512.464	ng/ml	100
52) Retene	40.047	234	55673	545.440	ng/ml	95
53) Anthracene	33.241	178	170415M4	489.468	ng/ml	
54) Carbazole	33.919	167	166417	489.263	ng/ml	99
55) 1-Methylphenanthrene	35.575	192	145064	536.172	ng/ml	98
56) Fluoranthene	37.833	202	220071M4	540.496	ng/ml	
57) Benzo(b)fluorene	40.363	216	123994	513.954	ng/ml	99
58) Pyrene	38.722	202	235880	534.418	ng/ml	97
63) Naphthobenzothiophene	42.576	234	204760	535.258	ng/ml	97
64) Naphthobenzothiophene-2,1	42.576	234	204760	535.258	ng/ml	97
72) Benz[a]anthracene	43.509	228	193954	478.991	ng/ml	100
73) Chrysene	43.660	228	190049	500.461	ng/mL	100
74) Chrysene/Triphenylene	43.660	228	190049	500.461	ng/ml	100
81) Benzo[b]fluoranthene	47.560	252	197585	479.587	ng/ml	96
82) Benzo[j]+[k]fluoranthene	47.650	252	201108	529.535	ng/ml	97
84) Benzo[e]pyrene	48.599	252	191950	501.040	ng/ml	96
86) Benzo[a]pyrene	48.795	252	188214	514.924	ng/ml	95
87) Perylene	49.126	252	187015	505.312	ng/ml	94
88) Indeno[1,2,3-cd]pyrene	53.795	276	224988M3	476.651	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.855	278	205427	509.904	ng/ml	99
90) Benzo[g,h,i]perylene	55.150	276	232094	508.351	ng/ml	100
91) Hopane (T19)	52.831	191	39512	473.059	ng/mL#	90
92) 17a(H),21B(H)-hopane - C3	52.831	191	39512	473.059	ng/mL#	90

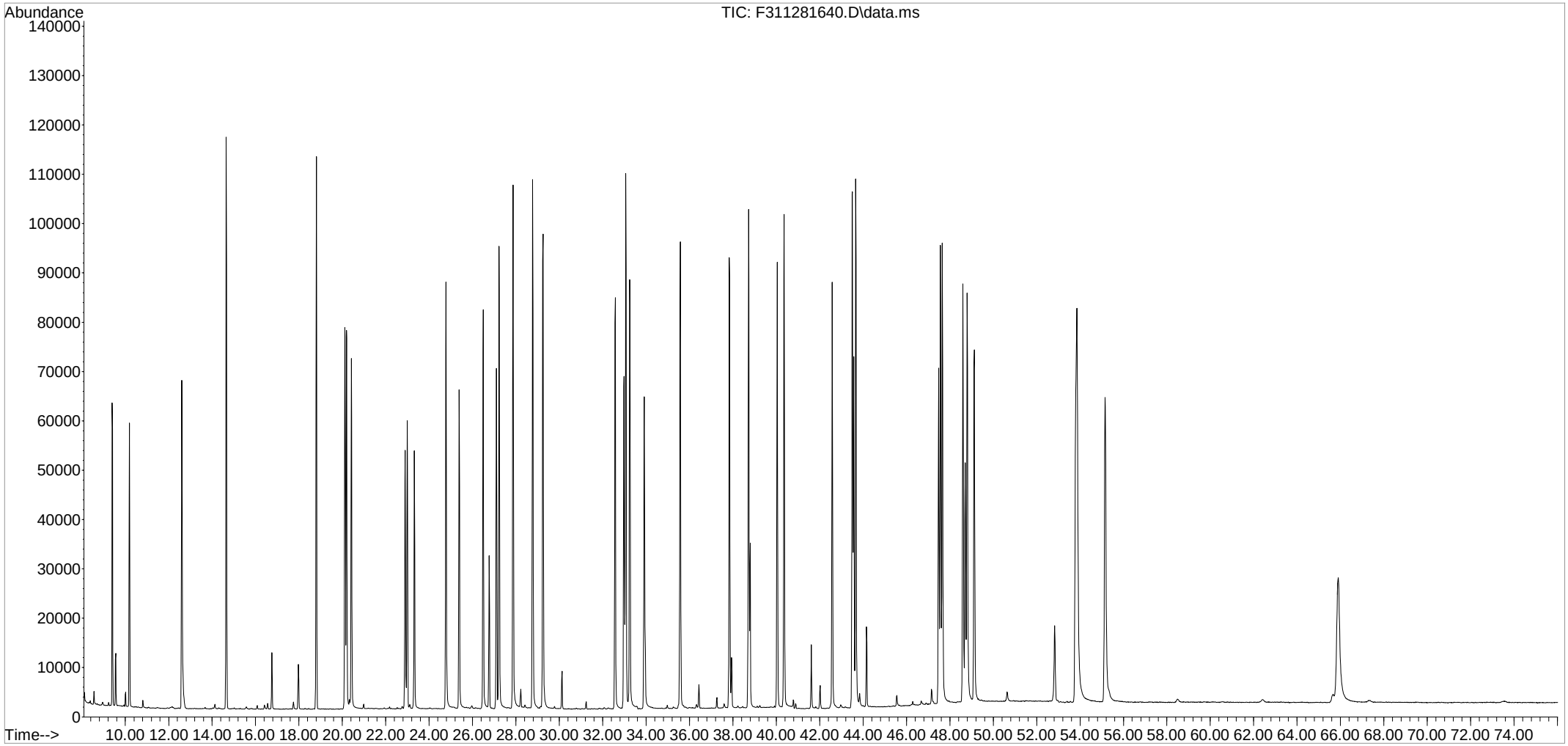
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\NOV16\NOV28\
Data File : F311281640.D
Acq On : 30 Nov 2016 11:49 pm
Operator : AC
Sample : c311281605
Misc : cc frax92 500ng/ml
ALS Vial : 40 Sample Multiplier: 1

Quant Time: Dec 07 09:43:28 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011602.D
Acq On : 1 Dec 2016 11:30 am
Operator : AC
Sample : c312011601
Misc : cc frax92 500ng/ml
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 07 09:50:54 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	92	-0.06
2	A1	trans-Decalin	0.433	0.456	-5.3	102	-0.05
3	t	cis-Decalin	0.325	0.346	-6.5	104	-0.05
8	s	Naphthalene-d8	2.145	2.245	-4.7	99	-0.05
9	A1	Naphthalene	2.359	2.548	-8.0	99	-0.05
14	t	2-Methylnaphthalene	1.500	1.551	-3.4	97	-0.05
15	t	1-Methylnaphthalene	1.421	1.487	-4.6	97	-0.05
16	A1	Benzothiophene	2.089	2.296	-9.9	100	-0.05
21	t	Biphenyl	1.904	1.965	-3.2	97	-0.06
22	t	2,6-Dimethylnaphthalene	1.301	1.349	-3.7	98	-0.05
23	t	Dibenzofuran	1.998	2.150	-7.6	97	-0.05
24	t	Acenaphthylene	2.284	2.457	-7.6	99	-0.06
25	t	Acenaphthene	1.397	1.460	-4.5	96	-0.05
26	t	2,3,5-Trimethylnaphthalene	1.118	1.198	-7.2	100	-0.05
27	A1	Fluorene	1.525	1.662	-9.0	99	-0.05
31	A1	Dibenzothiophene	2.250	2.421	-7.6	97	-0.05
40	s	Phenanthrene-d10	1.644	1.762	-7.2	103	-0.05
41	A1	Phenanthrene	2.138	2.371	-10.9	98	-0.05
52	t	Retene	0.595	0.600	-0.8	101	-0.05
53	t	Anthracene	2.029	2.206	-8.7	98	-0.05
54	t	Carbazole	1.982	2.152	-8.6	98	-0.05
55	t	1-Methylphenanthrene	1.577	1.680	-6.5	100	-0.05
56	A1	Fluoranthene	2.373	2.536	-6.9	96	-0.05
57	t	Benzo(b)fluorene	1.406	1.513	-7.6	102	-0.06
58	A1	Pyrene	2.572	2.784	-8.2	98	-0.05
63	A1	Naphthobenzothiophene	2.229	2.400	-7.7	100	-0.05
64	A2	Naphthobenzothiophene-2,1-D	2.229	2.400	-7.7	100	-0.05
71	i	Chrysene-d12	1.000	1.000	0.0	100	-0.06
72	t	Benz[a]anthracene	1.385	1.419	-2.5	103	-0.05
73	A1	Chrysene	1.299	1.379	-6.2	104	-0.05
74	A2	Chrysene/Triphenylene	1.299	1.379	-6.2	104	-0.05
80	s	Benzo[b]fluoranthene-d12	1.041	1.029	1.2	102	-0.05
81	t	Benzo[b]fluoranthene	1.410	1.452	-3.0	98	-0.05
82	A1	Benzo[j]+[k]fluoranthene	1.299	1.351	-4.0	106	-0.05
84	t	Benzo[e]pyrene	1.311	1.337	-2.0	101	-0.06
85	s	Benzo[a]pyrene-d12	0.838	0.843	-0.6	98	-0.06
86	t	Benzo[a]pyrene	1.251	1.338	-7.0	102	-0.06
87	t	Perylene	1.266	1.349	-6.6	103	-0.05
88	t	Indeno[1,2,3-cd]pyrene	1.615	1.489	7.8	94	-0.08
89	t	Dibenz[ah]+[ac]anthracene	1.378	1.415	-2.7	104	-0.06
90	t	Benzo[g,h,i]perylene	1.562	1.557	0.3	102	-0.08
91	A1	Hopane (T19)	0.286	0.265	7.3	91	-0.06
92	A2	17a(H),21B(H)-hopane - C30H	0.286	0.265	7.3	91	-0.06
126	SA1	5B(H)Cholane - Surr	0.162	0.166	-2.5	109	-0.05

* Evaluation of CC level amount vs concentration.
(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	0.90	0.70 - 1.30

Mass Discrimination (Response)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	1.05	0.70 - 2.00

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011602.D
Acq On : 1 Dec 2016 11:30 am
Operator : AC
Sample : c312011601
Misc : cc frax92 500ng/ml
ALS Vial : 2 Sample Multiplier: 1

MAL 12/7/16

Quant Time: Dec 07 09:50:54 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.054	164	65658M4	500.000	ng/ml	-0.06
71) Chrysene-d12	43.525	240	105270	500.000	ng/ml	-0.06
System Monitoring Compounds						
8) Naphthalene-d8	20.069	136	147384	523.323	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.33%			
40) Phenanthrene-d10	32.925	188	115689	536.047	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 53.60%			
80) Benzo[b]fluoranthene-d12	47.425	264	108307	493.940	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.39%#			
85) Benzo[a]pyrene-d12	48.644	264	88755	502.841	ng/ml	-0.06
Spiked Amount 1000.000	Range 50 - 130		Recovery = 50.28%			
126) 5B(H)Cholane - Surr	44.112	217	17503	511.981	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.20%			
Target Compounds						Qvalue
2) trans-Decalin	16.712	138	14984	263.412	ng/ml	100
3) cis-Decalin	17.931	138	11354	265.717	ng/ml	100
9) Naphthalene	20.144	128	167310	540.171	ng/ml	100
14) 2-Methylnaphthalene	22.839	142	101836	517.154	ng/ml	100
15) 1-Methylnaphthalene	23.275	142	97626	523.353	ng/ml	100
16) Benzothiophene	20.370	134	150779	549.664	ng/ml	100
21) Biphenyl	24.721	154	128987	515.975	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.338	156	88565	518.222	ng/ml	100
23) Dibenzofuran	27.822	168	141159	537.952	ng/ml	96
24) Acenaphthylene	26.437	152	161344M4	537.835	ng/ml	
25) Acenaphthene	27.175	153	95836	522.454	ng/ml	100
26) 2,3,5-Trimethylnaphthalen	28.725	170	78684	535.816	ng/ml	98
27) Fluorene	29.192	166	109115M4	544.861	ng/ml	
31) Dibenzothiophene	32.519	184	158967	537.950	ng/ml	99
41) Phenanthrene	33.016	178	155678	554.574	ng/ml	100
52) Retene	40.002	234	39422	504.732	ng/ml	91
53) Anthracene	33.196	178	144828	543.612	ng/ml	100
54) Carbazole	33.859	167	141279M4	542.803	ng/ml	
55) 1-Methylphenanthrene	35.515	192	110326	532.896	ng/ml	100
56) Fluoranthene	37.788	202	166482M4	534.339	ng/ml	
57) Benzo(b)fluorene	40.303	216	99369	538.263	ng/ml	98
58) Pyrene	38.677	202	182760	541.117	ng/ml	98
63) Naphthobenzothiophene	42.531	234	157596	538.373	ng/ml	96
64) Naphthobenzothiophene-2,1	42.531	234	157596	538.373	ng/ml	96
72) Benz[a]anthracene	43.449	228	149408	512.215	ng/ml	100
73) Chrysene	43.615	228	145202	530.795	ng/mL	100
74) Chrysene/Triphenylene	43.615	228	145202	530.795	ng/ml	100
81) Benzo[b]fluoranthene	47.515	252	152859	515.056	ng/ml	98
82) Benzo[j]+[k]fluoranthene	47.605	252	142196	519.759	ng/ml	97
84) Benzo[e]pyrene	48.539	252	140710	509.869	ng/ml	96
86) Benzo[a]pyrene	48.735	252	140879	535.041	ng/ml	94
87) Perylene	49.066	252	142058	532.842	ng/ml	95
88) Indeno[1,2,3-cd]pyrene	53.705	276	156728M3	460.933	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.780	278	148967	513.299	ng/ml	98
90) Benzo[g,h,i]perylene	55.060	276	163933	498.444	ng/ml	100
91) Hopane (T19)	52.771	191	27889	463.520	ng/mL	91
92) 17a(H),21B(H)-hopane - C3	52.771	191	27889	463.520	ng/mL	91

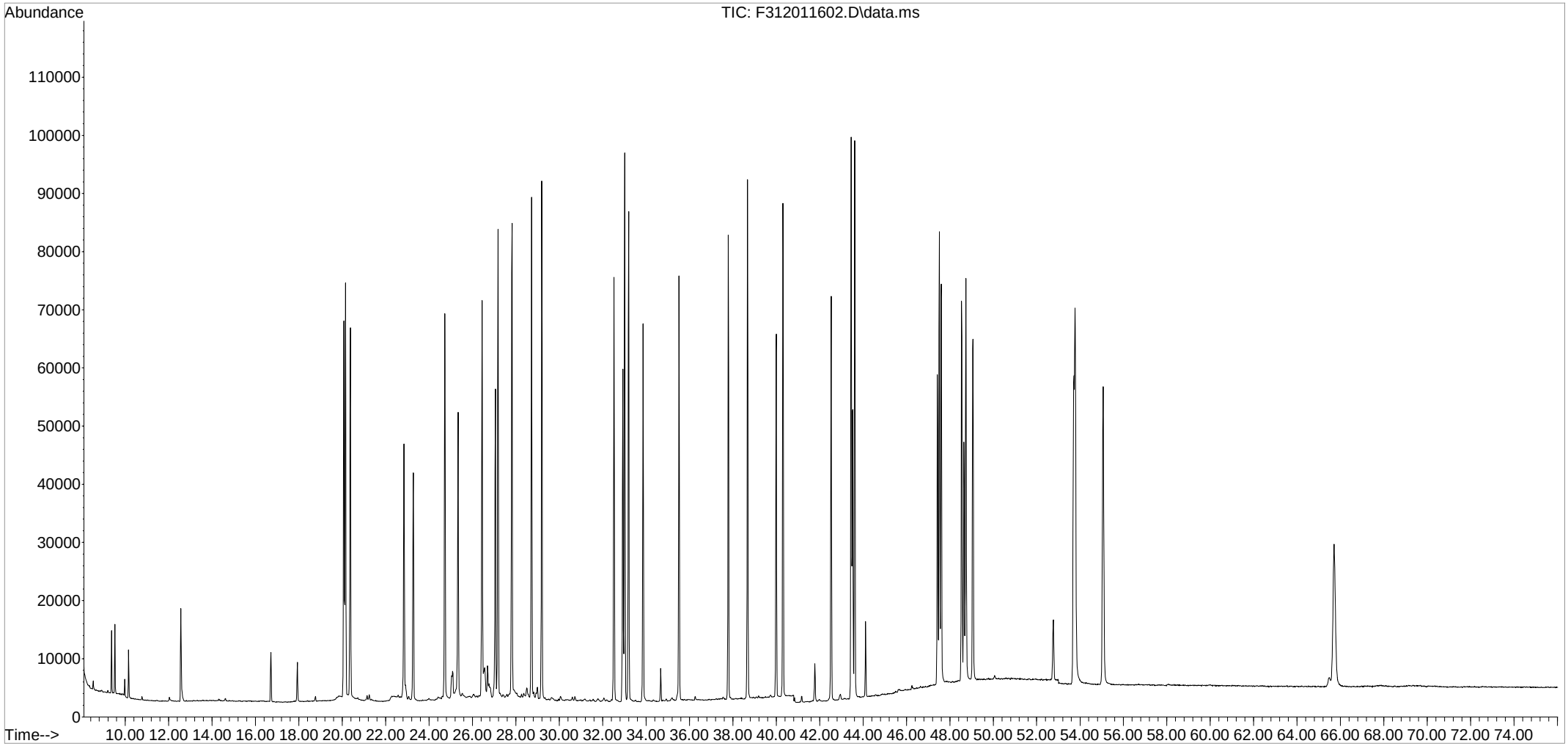
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011602.D
Acq On : 1 Dec 2016 11:30 am
Operator : AC
Sample : c312011601
Misc : cc frax92 500ng/ml
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Dec 07 09:50:54 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011616.D
Acq On : 2 Dec 2016 8:01 am
Operator : AC
Sample : c312011602
Misc : cc frax92 500ng/ml
ALS Vial : 16 Sample Multiplier: 1

Quant Time: Dec 07 09:51:48 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Acenaphthene-d10	1.000	1.000	0.0	74	-0.06
2	A1	trans-Decalin	0.433	0.447	-3.2	80	-0.06
3	t	cis-Decalin	0.325	0.336	-3.4	81	-0.05
8	s	Naphthalene-d8	2.145	2.252	-5.0	80	-0.05
9	A1	Naphthalene	2.359	2.510	-6.4	78	-0.05
14	t	2-Methylnaphthalene	1.500	1.542	-2.8	77	-0.05
15	t	1-Methylnaphthalene	1.421	1.484	-4.4	77	-0.06
16	A1	Benzothiophene	2.089	2.243	-7.4	78	-0.05
21	t	Biphenyl	1.904	2.002	-5.1	79	-0.06
22	t	2,6-Dimethylnaphthalene	1.301	1.353	-4.0	78	-0.05
23	t	Dibenzofuran	1.998	2.194	-9.8	79	-0.06
24	t	Acenaphthylene	2.284	2.423	-6.1	78	-0.06
25	t	Acenaphthene	1.397	1.504	-7.7	79	-0.05
26	t	2,3,5-Trimethylnaphthalene	1.118	1.176	-5.2	78	-0.05
27	A1	Fluorene	1.525	1.634	-7.1	78	-0.05
31	A1	Dibenzothiophene	2.250	2.418	-7.5	78	-0.05
40	s	Phenanthrene-d10	1.644	1.719	-4.6	80	-0.05
41	A1	Phenanthrene	2.138	2.422	-13.3	80	-0.05
52	t	Retene	0.595	0.557	6.4	75	-0.06
53	t	Anthracene	2.029	2.184	-7.6	77	-0.05
54	t	Carbazole	1.982	2.077	-4.8	75	-0.05
55	t	1-Methylphenanthrene	1.577	1.623	-2.9	77	-0.05
56	A1	Fluoranthene	2.373	2.504	-5.5	76	-0.05
57	t	Benzo(b)fluorene	1.406	1.425	-1.4	77	-0.06
58	A1	Pyrene	2.572	2.714	-5.5	76	-0.05
63	A1	Naphthobenzothiophene	2.229	2.336	-4.8	77	-0.06
64	A2	Naphthobenzothiophene-2,1-D	2.229	2.336	-4.8	77	-0.06
71	i	Chrysene-d12	1.000	1.000	0.0	76	-0.08
72	t	Benz[a]anthracene	1.385	1.382	0.2	77	-0.05
73	A1	Chrysene	1.299	1.402	-7.9	81	-0.06
74	A2	Chrysene/Triphenylene	1.299	1.402	-7.9	81	-0.06
80	s	Benzo[b]fluoranthene-d12	1.041	0.999	4.0	76	-0.05
81	t	Benzo[b]fluoranthene	1.410	1.391	1.3	72	-0.06
82	A1	Benzo[j]+[k]fluoranthene	1.299	1.440	-10.9	87	-0.06
84	t	Benzo[e]pyrene	1.311	1.349	-2.9	79	-0.06
85	s	Benzo[a]pyrene-d12	0.838	0.820	2.1	73	-0.06
86	t	Benzo[a]pyrene	1.251	1.334	-6.6	78	-0.06
87	t	Perylene	1.266	1.356	-7.1	79	-0.06
88	t	Indeno[1,2,3-cd]pyrene	1.615	1.520	5.9	74	-0.08
89	t	Dibenz[ah]+[ac]anthracene	1.378	1.391	-0.9	78	-0.08
90	t	Benzo[g,h,i]perylene	1.562	1.577	-1.0	79	-0.09
91	A1	Hopane (T19)	0.286	0.259	9.4	68	-0.08
92	A2	17a(H),21B(H)-hopane - C30H	0.286	0.259	9.4	68	-0.08
126	SA1	5B(H)Cholane - Surr	0.162	0.156	3.7	78	-0.05

* Evaluation of CC level amount vs concentration.
(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Concentration)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	0.89	0.70 - 1.30

Mass Discrimination (Response)	Ratio	Range Limits
Benzo[g,h,i]perylene to Phenanthrene	1.00	0.70 - 2.00

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011616.D
Acq On : 2 Dec 2016 8:01 am
Operator : AC
Sample : c312011602
Misc : cc frax92 500ng/ml
ALS Vial : 16 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Dec 07 09:51:48 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Acenaphthene-d10	27.054	164	52420M4	500.000	ng/ml	-0.06
71) Chrysene-d12	43.509	240	80805	500.000	ng/ml	-0.08
System Monitoring Compounds						
8) Naphthalene-d8	20.069	136	118032	524.941	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.49%			
40) Phenanthrene-d10	32.925	188	90102	522.921	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 52.29%			
80) Benzo[b]fluoranthene-d12	47.425	264	80722	479.597	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 47.96%#			
85) Benzo[a]pyrene-d12	48.644	264	66231	488.839	ng/ml	-0.06
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.88%#			
126) 5B(H)Cholane - Surr	44.112	217	12630	481.295	ng/ml	-0.05
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.13%#			
Target Compounds						Qvalue
2) trans-Decalin	16.697	138	11723	258.129	ng/ml	100
3) cis-Decalin	17.931	138	8803	258.042	ng/ml	100
9) Naphthalene	20.144	128	131576	532.080	ng/ml	100
14) 2-Methylnaphthalene	22.839	142	80832	514.153	ng/ml	100
15) 1-Methylnaphthalene	23.260	142	77792	522.341	ng/ml	100
16) Benzothiophene	20.370	134	117603	536.989	ng/ml	100
21) Biphenyl	24.721	154	104945	525.818	ng/ml	100
22) 2,6-Dimethylnaphthalene	25.338	156	70904	519.655	ng/ml	100
23) Dibenzofuran	27.807	168	115009	548.981	ng/ml	94
24) Acenaphthylene	26.437	152	127029	530.383	ng/ml	100
25) Acenaphthene	27.174	153	78827	538.251	ng/ml	99
26) 2,3,5-Trimethylnaphthalen	28.725	170	61651	525.848	ng/ml	98
27) Fluorene	29.192	166	85636M4	535.609	ng/ml	
31) Dibenzothiophene	32.519	184	126771	537.336	ng/ml	99
41) Phenanthrene	33.015	178	126945	566.420	ng/ml	100
52) Retene	39.986	234	29208	468.398	ng/ml	90
53) Anthracene	33.196	178	114473	538.184	ng/ml	100
54) Carbazole	33.859	167	108898	524.053	ng/ml	99
55) 1-Methylphenanthrene	35.515	192	85061	514.618	ng/ml	100
56) Fluoranthene	37.788	202	131248M4	527.634	ng/ml	
57) Benzo(b)fluorene	40.303	216	74718	506.943	ng/ml	98
58) Pyrene	38.676	202	142246	527.522	ng/ml	100
63) Naphthobenzothiophene	42.516	234	122451	523.952	ng/ml#	94
64) Naphthobenzothiophene-2,1	42.516	234	122451	523.952	ng/ml#	94
72) Benz[a]anthracene	43.449	228	111708	498.918	ng/ml	100
73) Chrysene	43.600	228	113261	539.388	ng/mL	99
74) Chrysene/Triphenylene	43.600	228	113261	539.388	ng/ml	99
81) Benzo[b]fluoranthene	47.500	252	112365	493.243	ng/ml	97
82) Benzo[j]+[k]fluoranthene	47.590	252	116359	554.091	ng/ml	95
84) Benzo[e]pyrene	48.539	252	109019	514.638	ng/ml	96
86) Benzo[a]pyrene	48.735	252	107812	533.426	ng/ml	94
87) Perylene	49.051	252	109543	535.283	ng/ml	95
88) Indeno[1,2,3-cd]pyrene	53.705	276	122809M3	470.530	ng/ml	
89) Dibenz[ah]+[ac]anthracene	53.765	278	112364	504.399	ng/ml	97
90) Benzo[g,h,i]perylene	55.045	276	127410	504.684	ng/ml	99
91) Hopane (T19)	52.756	191	20908	452.704	ng/mL#	91
92) 17a(H),21B(H)-hopane - C3	52.756	191	20908	452.704	ng/mL#	91

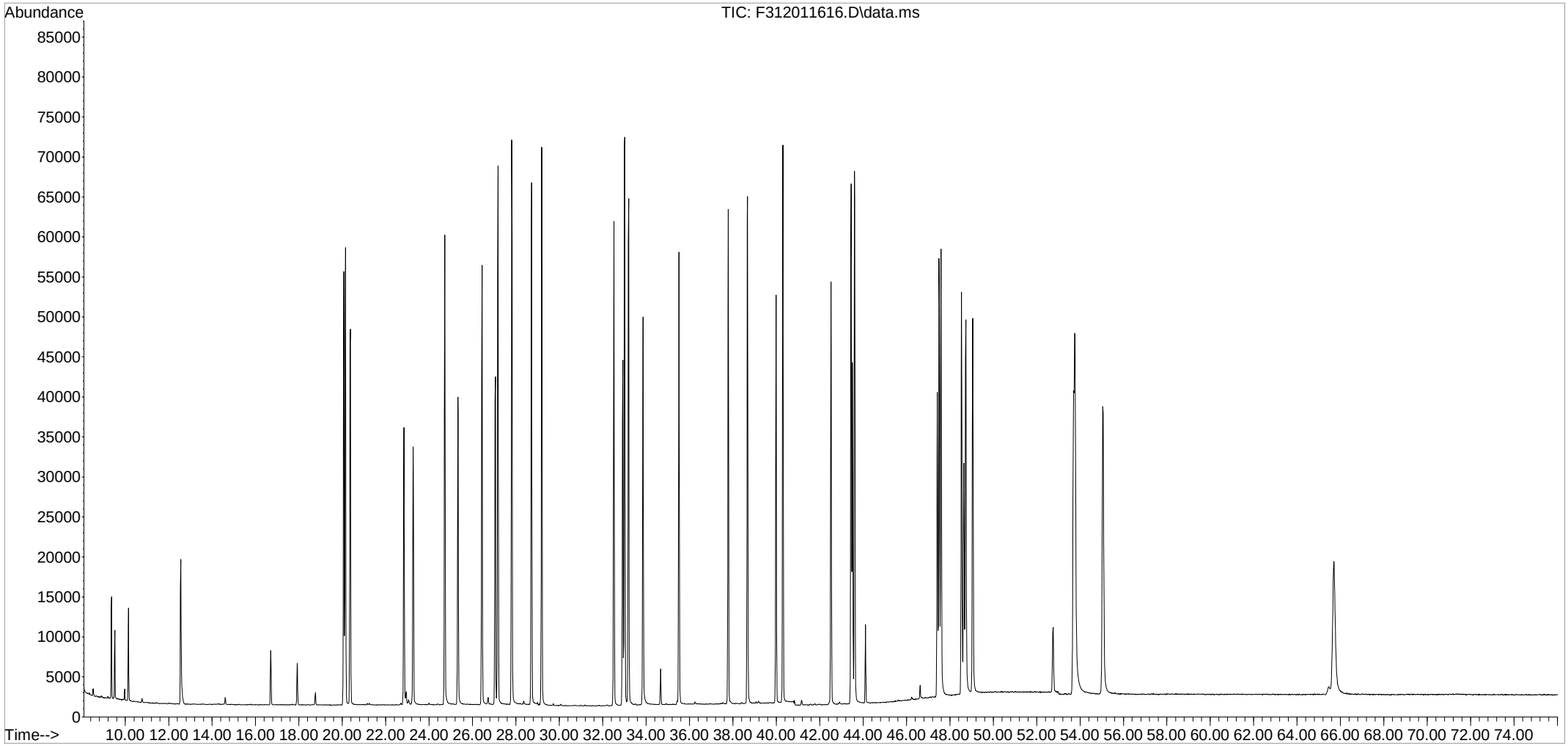
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH3\2016\DEC16\DEC01\
Data File : F312011616.D
Acq On : 2 Dec 2016 8:01 am
Operator : AC
Sample : c312011602
Misc : cc frax92 500ng/ml
ALS Vial : 16 Sample Multiplier: 1

Quant Time: Dec 07 09:51:48 2016
Quant Method : C:\msdchem\1\METHODS\PAH3\PAH3110916.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Tue Nov 29 07:20:12 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Form VIII
Internal Standard Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **C311281601**

Case: **N/A** SDG: **N/A**

		Chrysene-d12		Acenaphthene-d10	
		Area	**RT**	**Area**	**RT**
Standard:		108053	43.57	68272	27.10
Upper Limit:		216106	44.07	136544	27.60
Lower Limit:		54026	43.07	34136	26.60
Client ID	**Lab ID**				
Blank	SO111116B03	105523	43.57	70003	27.10
LCS	SO111116LCS02	108981	43.57	70906	27.10
LCSD	SO111116LCSD02	104929	43.57	67887	27.10
NFNP-02	1611004-05	86373	43.57	49733	27.11
NFNP-02	1611004-05 D	86485	43.59	45118	27.11
CCV	C311281602	122029	43.57	71930	27.10

N/A - Not Applicable

Area Upper Limit = +100% of internal standard.
Area Lower Limit = -50% of internal standard.
RT = Retention Time.
RT Upper Limit = +0.5 minutes of internal standard RT.
RT Lower Limit = -0.5 minutes of internal standard RT.

12/07/16 11:28

Form VIII
Internal Standard Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **C311281602**

Case: **N/A** SDG: **N/A**

		Chrysene-d12		Acenaphthene-d10	
		Area	**RT**	**Area**	**RT**
Standard:		122029	43.57	71930	27.10
Upper Limit:		244058	44.07	143860	27.60
Lower Limit:		61014	43.07	35965	26.60
Client ID	**Lab ID**				
Blank	SO111016B02	90179	43.57	57689	27.10
LCS	SO111016LCS02	98468	43.57	61106	27.10
LCSD	SO111016LCSD02	98035	43.57	62175	27.10
NFNP-01	1611004-04	108726	43.57	69133	27.10
NFNP-03	1611004-06	85093	43.57	40659	27.11
CCV	C311281603	103642	43.57	62705	27.10

N/A - Not Applicable

Area Upper Limit = +100% of internal standard.
Area Lower Limit = -50% of internal standard.
RT = Retention Time.
RT Upper Limit = +0.5 minutes of internal standard RT.
RT Lower Limit = -0.5 minutes of internal standard RT.

12/07/16 11:28

Form VIII
Internal Standard Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **C311281603**

Case: **N/A** SDG: **N/A**

		Chrysene-d12		Acenaphthene-d10	
		Area	**RT**	**Area**	**RT**
Standard:		103642	43.57	62705	27.10
Upper Limit:		207284	44.07	125410	27.60
Lower Limit:		51821	43.07	31352	26.60
Client ID	**Lab ID**				
NFSB-01(MW)	1611004-08	114090	43.57	58296	27.10
DUP-1	1611004-09	117373	43.57	59997	27.10
DUP-1	1611004-09 D	116389	43.57	59292	27.10
NFSB-02(MW)	1611004-01	102848	43.57	55040	27.10
ENV-9MW	1611004-02	102845	43.57	52679	27.10
ENV-9MW	1611004-02 D	101724	43.57	51729	27.10
ENV-3MW	1611004-03	97801	43.57	54389	27.10
CCV	C311281605	146135	43.57	85804	27.10

N/A - Not Applicable

Area Upper Limit = +100% of internal standard.
Area Lower Limit = -50% of internal standard.
RT = Retention Time.
RT Upper Limit = +0.5 minutes of internal standard RT.
RT Lower Limit = -0.5 minutes of internal standard RT.

12/07/16 11:28

Form VIII
Internal Standard Summary
Alkylated Polynuclear Aromatic Hydrocarbons

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **C312011601**

Case: **N/A** SDG: **N/A**

		Chrysene-d12		Acenaphthene-d10	
		Area	**RT**	**Area**	**RT**
Standard:		105270	43.53	65658	27.05
Upper Limit:		210540	44.03	131316	27.55
Lower Limit:		52635	43.03	32829	26.55
Client ID	**Lab ID**				
Blank	SW110716B01	101770	43.51	62605	27.05
LCS	SW110716LCS01	103874	43.51	62323	27.05
LCSD	SW110716LCSD01	101532	43.51	62647	27.05
NFSB-08(MW)	1611004-07	99770	43.51	63737	27.05
NFSB-01(MW)	1611004-08E	88265	43.51	56508	27.05
DUP-1	1611004-09E	82079	43.51	53085	27.04
DUP-1	1611004-09E D	78925	43.51	51336	27.05
ENV-3MW	1611004-03E	83737	43.51	49997	27.04
CCV	C312011602	80805	43.51	52420	27.05

N/A - Not Applicable

Area Upper Limit = +100% of internal standard.
Area Lower Limit = -50% of internal standard.
RT = Retention Time.
RT Upper Limit = +0.5 minutes of internal standard RT.
RT Lower Limit = -0.5 minutes of internal standard RT.

12/07/16 11:28

Total Petroleum Hydrocarbons by GC/FID

Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-02(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-01**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/13/16	100	0.1084	20	1	WR

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**865000**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	94	50-130
d50-Tetracosane	89	50-130

12/07/16 13:37

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121621.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 6:04 am
Operator : FID17:WR
Sample : 1611004-01
Misc : 1X
ALS Vial : 61 Sample Multiplier: 1

MAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 10:59:15 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1711121601R
Blank File : F1711121607.D

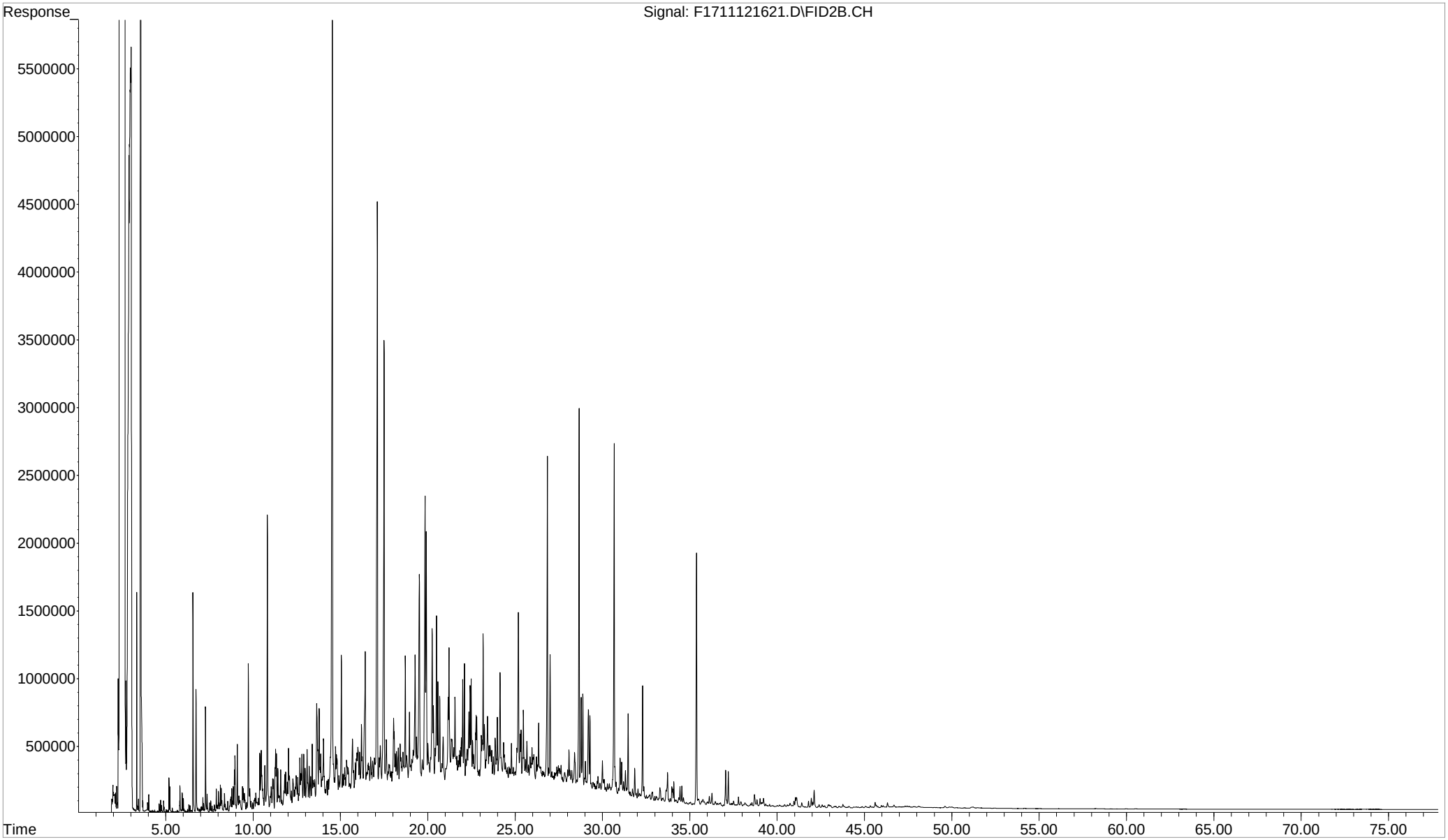
Sub List : TPH - TPH

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	30.671	64913731	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	28.662	65039900	46.816 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	93.63%
24) s d50-Tetracosane	35.383	51430068	44.433 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	88.87%
Target Compounds			
42) h C9-C44 Total Petroleu...	38.899	6271919809	5141.586 ug/mL m
42) h C9-C44 Total Petroleu BS	38.899	5721462147	4690.332 ug/mLm
46) h Total Resolved Hydroc...	39.803	2809503506	2303.171 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121621.D
Operator : FID17:WR
Acquired : 13 Nov 2016 6:04 am using AcqMethod FID17.M
Sample Name: 1611004-01
Instrument: FID17
Misc Info : 1X
Vial Number: 61
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/13/16	100	0.1084	20	1	WR

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**828000**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	90	50-130
d50-Tetracosane	86	50-130

12/07/16 13:37

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121623.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 7:33 am
Operator : FID17:WR
Sample : 1611004-02
Misc : 1X
ALS Vial : 62 Sample Multiplier: 1

MAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 10:59:41 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1711121601R
Blank File : F1711121607.D

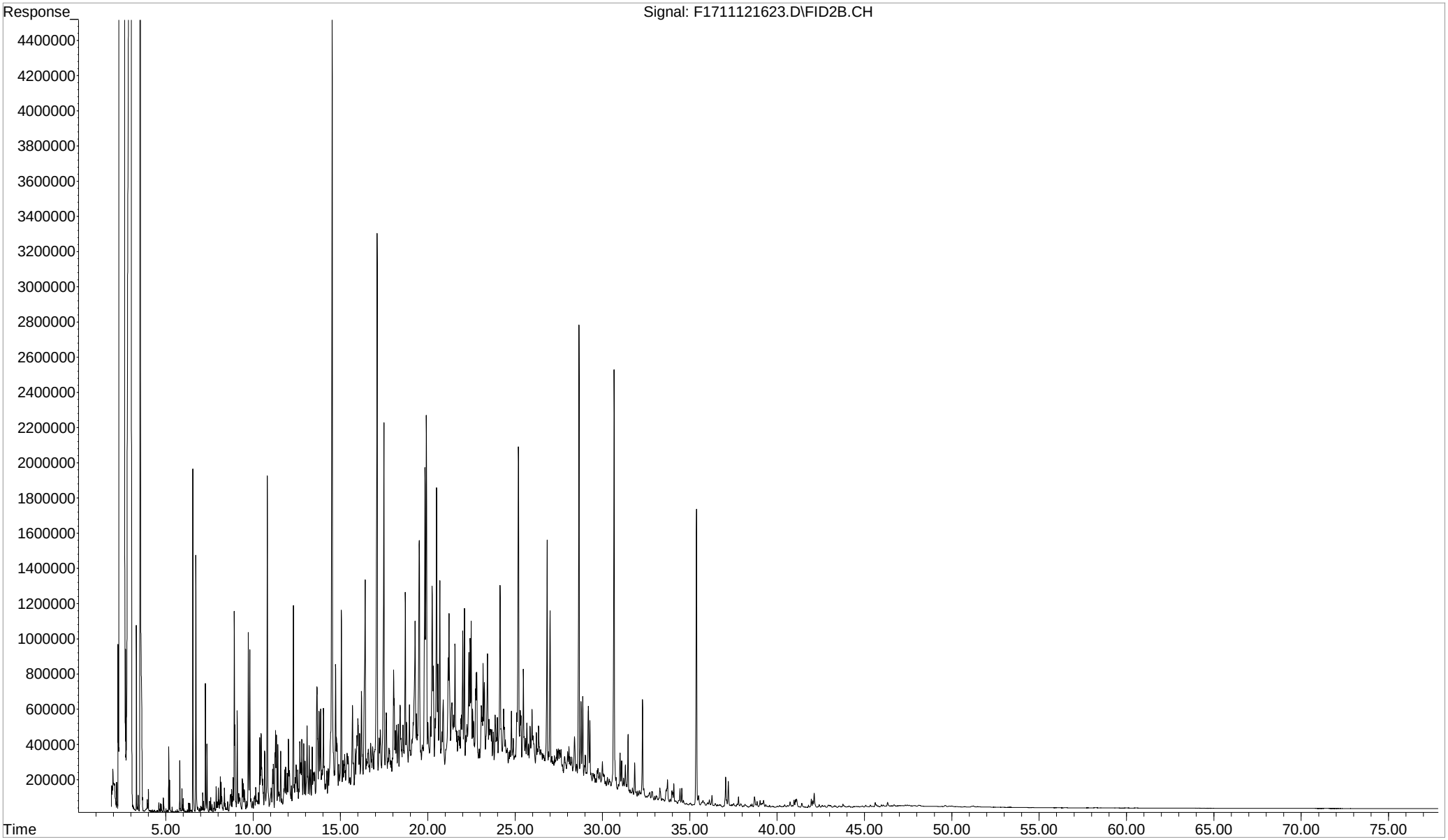
Sub List : TPH - TPH

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	30.667	67025559	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	28.658	64607629	45.040 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	90.08%
24) s d50-Tetracosane	35.382	51156540	42.804 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	85.61%
Target Compounds			
42) h C9-C44 Total Petroleu...	38.899	6203822684	4925.520 ug/mL m
42) h C9-C44 Total Petroleu BS	38.899	5653365022	4488.485 ug/mLm
46) h Total Resolved Hydroc...	39.803	2698987513	2142.859 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121623.D
Operator : FID17:WR
Acquired : 13 Nov 2016 7:33 am using AcqMethod FID17.M
Sample Name: 1611004-02
Instrument: FID17
Misc Info : 1X
Vial Number: 62
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Form I
Duplicate
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02 D**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/13/16	100	0.1095	20	1	WR

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**852000**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	91	50-130
d50-Tetracosane	86	50-130

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Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121625.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 9:01 am
Operator : FID17:WR
Sample : 1611004-02D
Misc : 1X
ALS Vial : 63 Sample Multiplier: 1

NAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 11:00:06 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1711121601R
Blank File : F1711121607.D

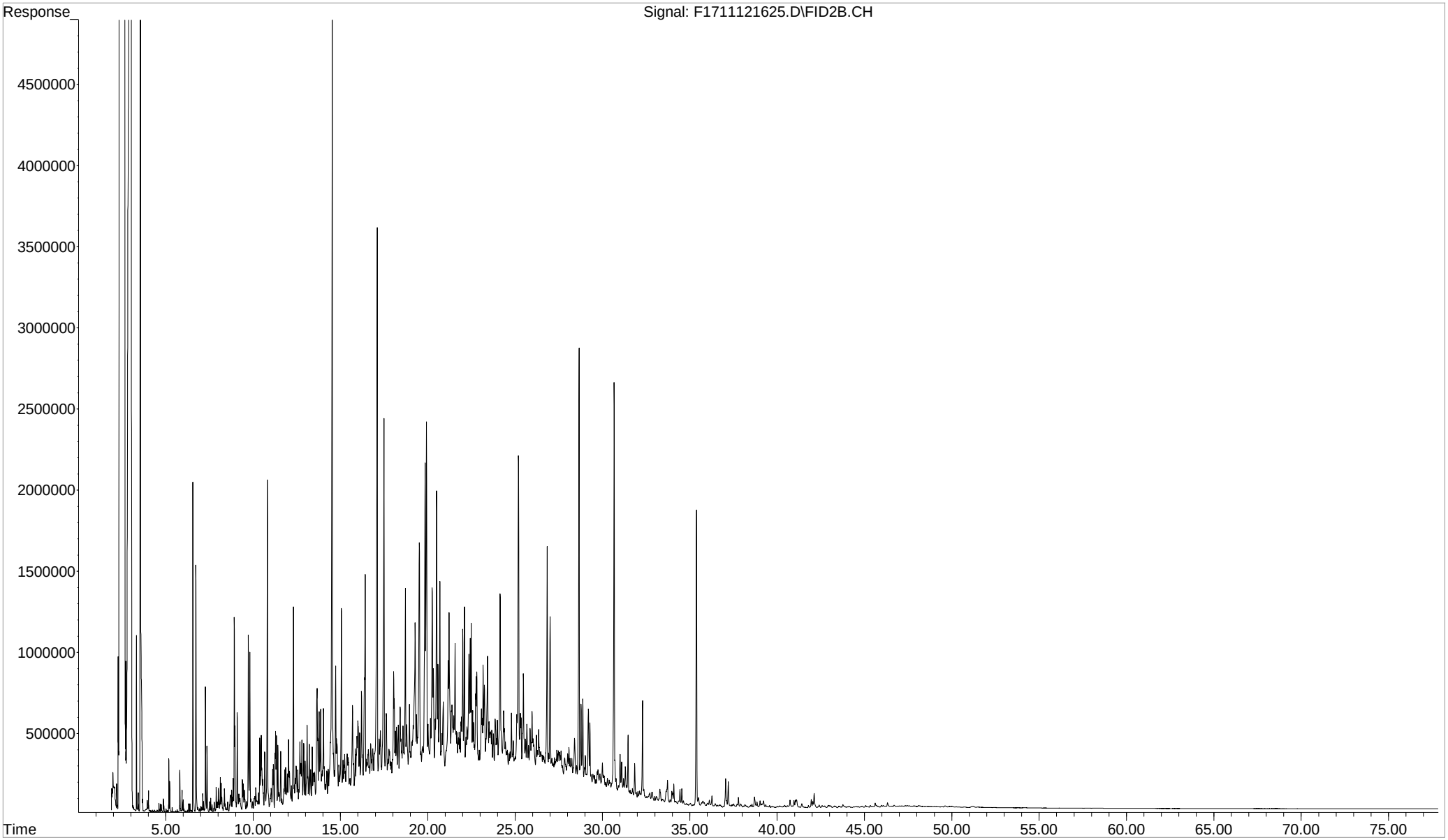
Sub List : TPH - TPH

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	30.669	68036621	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	28.660	66066151	45.372 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	90.74%
24) s d50-Tetracosane	35.381	52288664	43.102 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	86.20%
Target Compounds			
42) h C9-C44 Total Petroleu...	38.899	6515861740	5096.386 ug/mL m
42) h C9-C44 Total Petroleu BS	38.899	5965404078	4665.845 ug/mLm
46) h Total Resolved Hydroc...	39.803	3023033954	2364.468 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121625.D
Operator : FID17:WR
Acquired : 13 Nov 2016 9:01 am using AcqMethod FID17.M
Sample Name: 1611004-02D
Instrument: FID17
Misc Info : 1X
Vial Number: 63
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Duplicate
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/10/16	100	WR

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
Total Petroleum Hydrocarbons (C9-C44)	**828000**	**852000**	3	30

N/A - Not Applicable

Surrogate	% Recovery		Acceptance Range (%)
ortho-Terphenyl	90	91	50-130
d50-Tetracosane	86	86	50-130

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

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Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-3MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-03**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/13/16	100	0.1021	20	1	WR

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**763000**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	91	50-130
d50-Tetracosane	89	50-130

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Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121627.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 10:29 am
Operator : FID17:WR
Sample : 1611004-03
Misc : 1X
ALS Vial : 64 Sample Multiplier: 1

MAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 11:00:33 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1711121601R
Blank File : F1711121607.D

Sub List : TPH - TPH

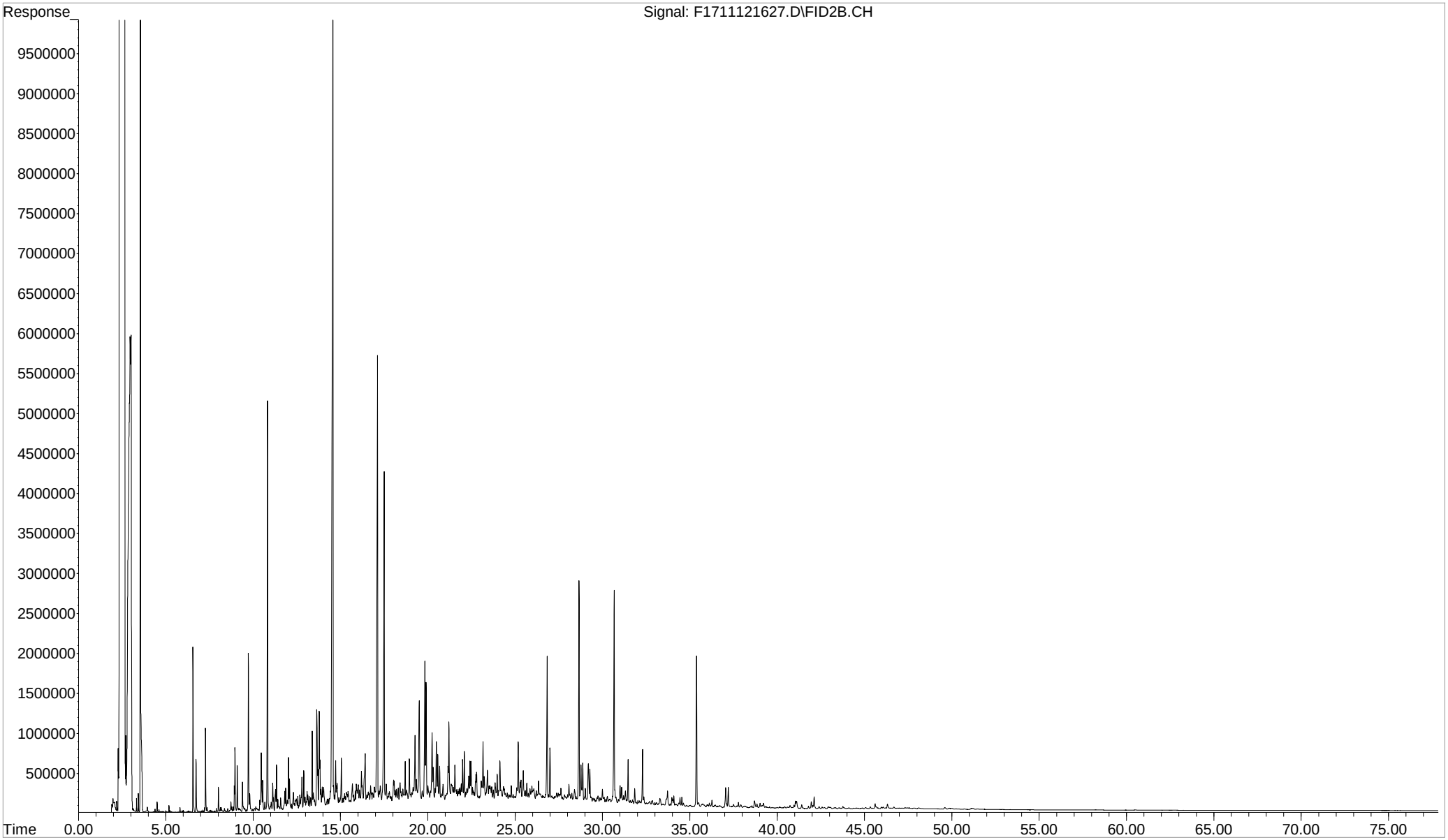
Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	30.669	67056122	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	28.659	65012050	45.301 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	90.60%
24) s d50-Tetracosane	35.386	53184652	44.481 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	88.96%
Target Compounds			
42) h C9-C44 Total Petroleu...	38.899	5458774746	4332.015 ug/mL m
42) h C9-C44 Total Petroleu BS	38.899	4908317084	3895.178 ug/mLm
46) h Total Resolved Hydroc...	39.803	2612001931	2072.852 ug/mL m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121627.D
Operator : FID17:WR
Acquired : 13 Nov 2016 10:29 am using AcqMethod FID17.M
Sample Name: 1611004-03
Instrument: FID17
Misc Info : 1X
Vial Number: 64
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-01**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-04**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/13/16	100	0.00462	1	1	WR

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**508000**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	96	50-130
d50-Tetracosane	96	50-130

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Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121629.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 11:57 am
Operator : FID17:WR
Sample : 1611004-04
Misc : 1X
ALS Vial : 65 Sample Multiplier: 1

NAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 11:01:02 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1711121601R
Blank File : F1711121607.D

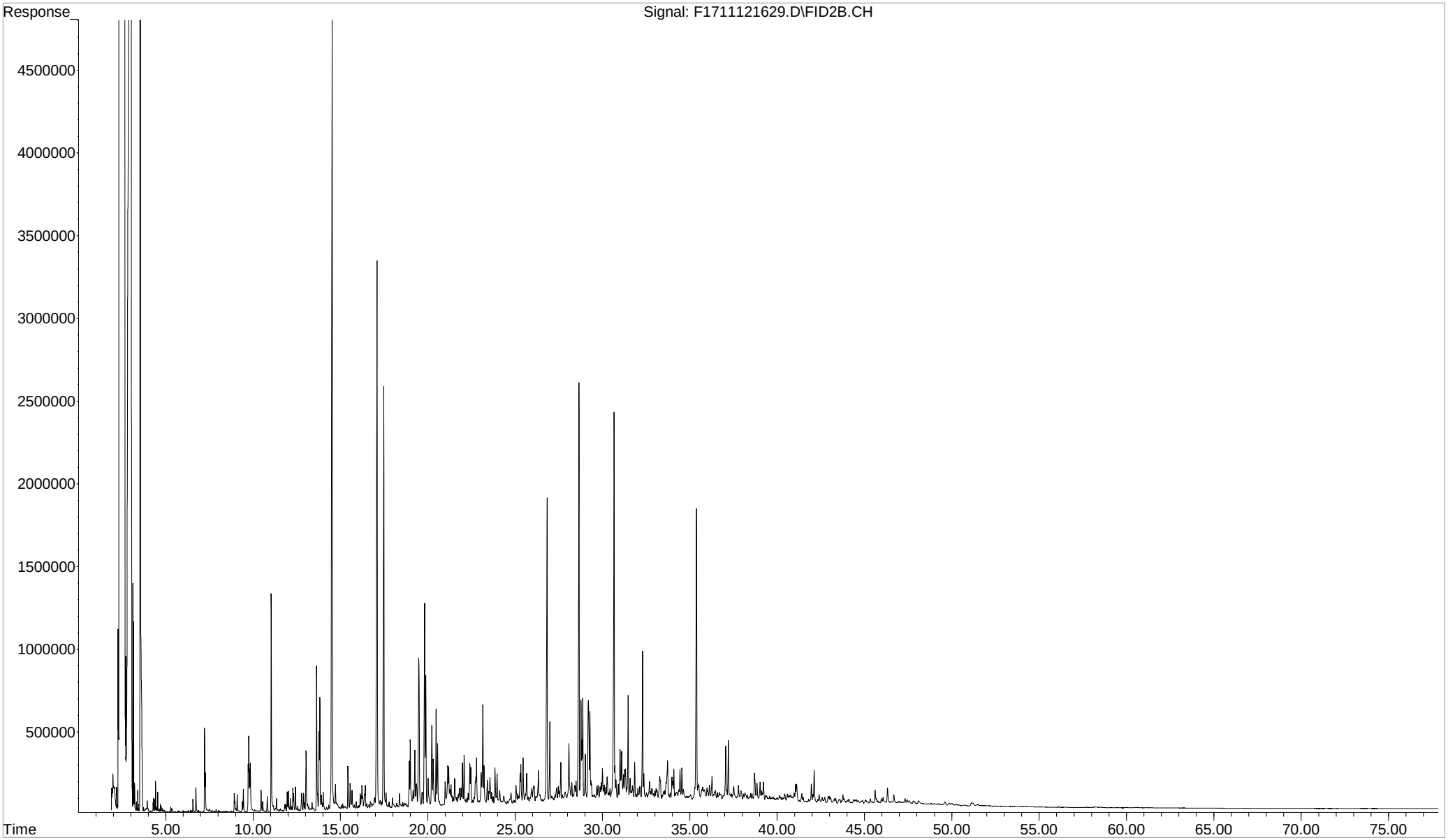
Sub List : TPH - TPH

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	30.664	64396356	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	28.656	65839104	47.772 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 95.54%	
24) s d50-Tetracosane	35.382	55168507	48.046 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 96.09%	
Target Compounds			
42) h C9-C44 Total Petroleu...	38.899	3391048683	2802.244 ug/mL m
42) h C9-C44 Total Petroleu BS	38.899	2840591021	2347.365 ug/mLm
46) h Total Resolved Hydroc...	39.803	1457406721	1204.350 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121629.D
Operator : FID17:WR
Acquired : 13 Nov 2016 11:57 am using AcqMethod FID17.M
Sample Name: 1611004-04
Instrument: FID17
Misc Info : 1X
Vial Number: 65
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/13/16	100	0.00285	1	1	WR

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**686000**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	98	50-130
d50-Tetracosane	92	50-130

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Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121637.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 5:50 pm
Operator : FID17:WR
Sample : 1611004-05
Misc : 1X
ALS Vial : 69 Sample Multiplier: 1

NAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Nov 16 19:38:45 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1711121602R
Blank File : F1711121635.D

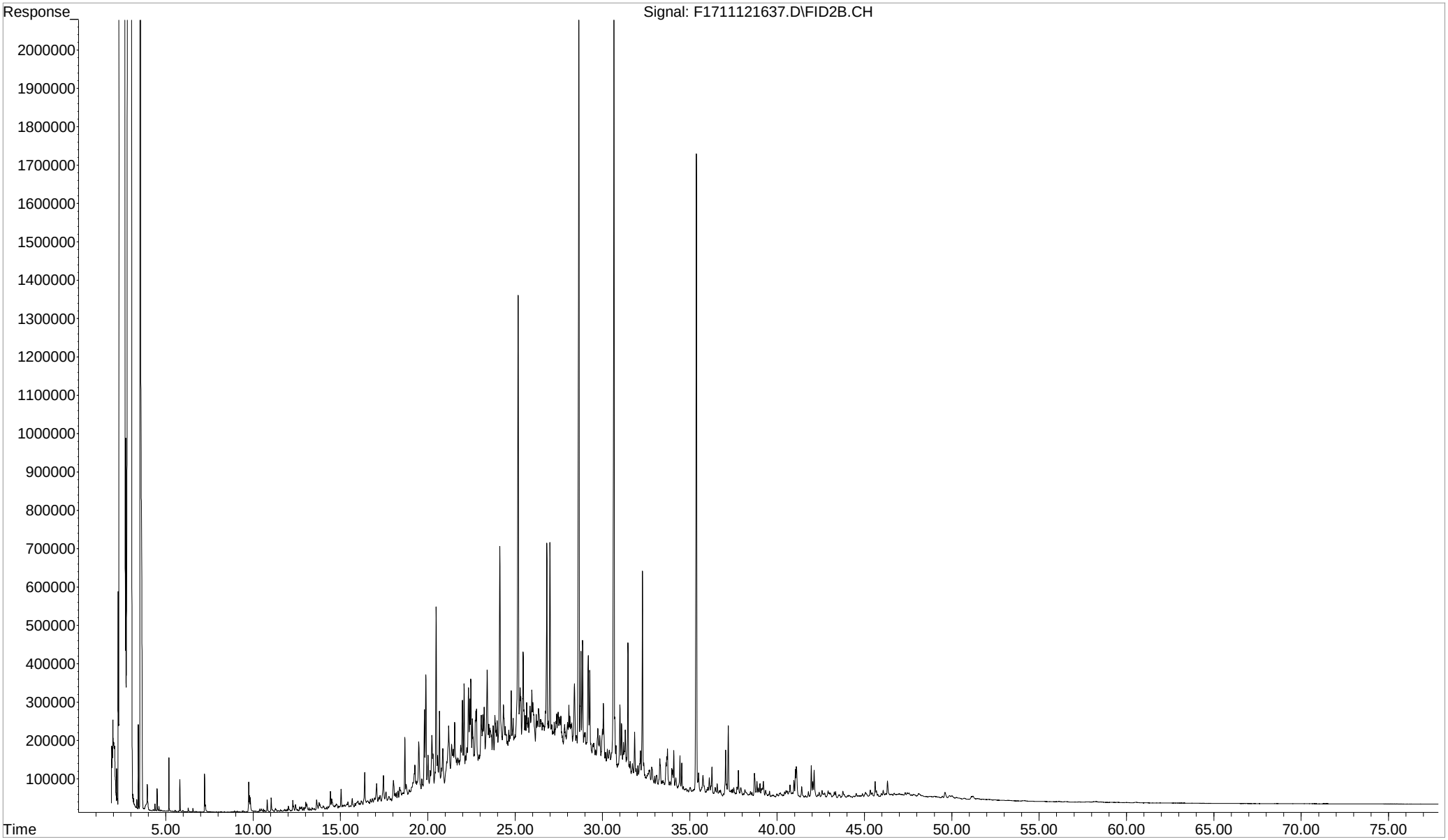
Sub List : TPH - TPH

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	30.660	63438387	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	28.652	66279167	48.817 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	97.63%
24) s d50-Tetracosane	35.378	52211926	46.158 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	92.32%
Target Compounds			
42) h C9-C44 Total Petroleu...	38.899	2731647741	2291.425 ug/mL m
42) h C9-C44 Total Petroleu BS	38.899	2331222510	1955.531 ug/mLm
46) h Total Resolved Hydroc...	39.803	630757846	529.107 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121637.D
Operator : FID17:WR
Acquired : 13 Nov 2016 5:50 pm using AcqMethod FID17.M
Sample Name: 1611004-05
Instrument: FID17
Misc Info : 1X
Vial Number: 69
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Form I
Duplicate
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05 D**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/13/16	100	0.0037	1	1	WR

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**1040000**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	98	50-130
d50-Tetracosane	95	50-130

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Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121639.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 7:19 pm
Operator : FID17:WR
Sample : 1611004-05D
Misc : 1X
ALS Vial : 70 Sample Multiplier: 1

MAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 10:39:34 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1711121602R
Blank File : F1711121635.D

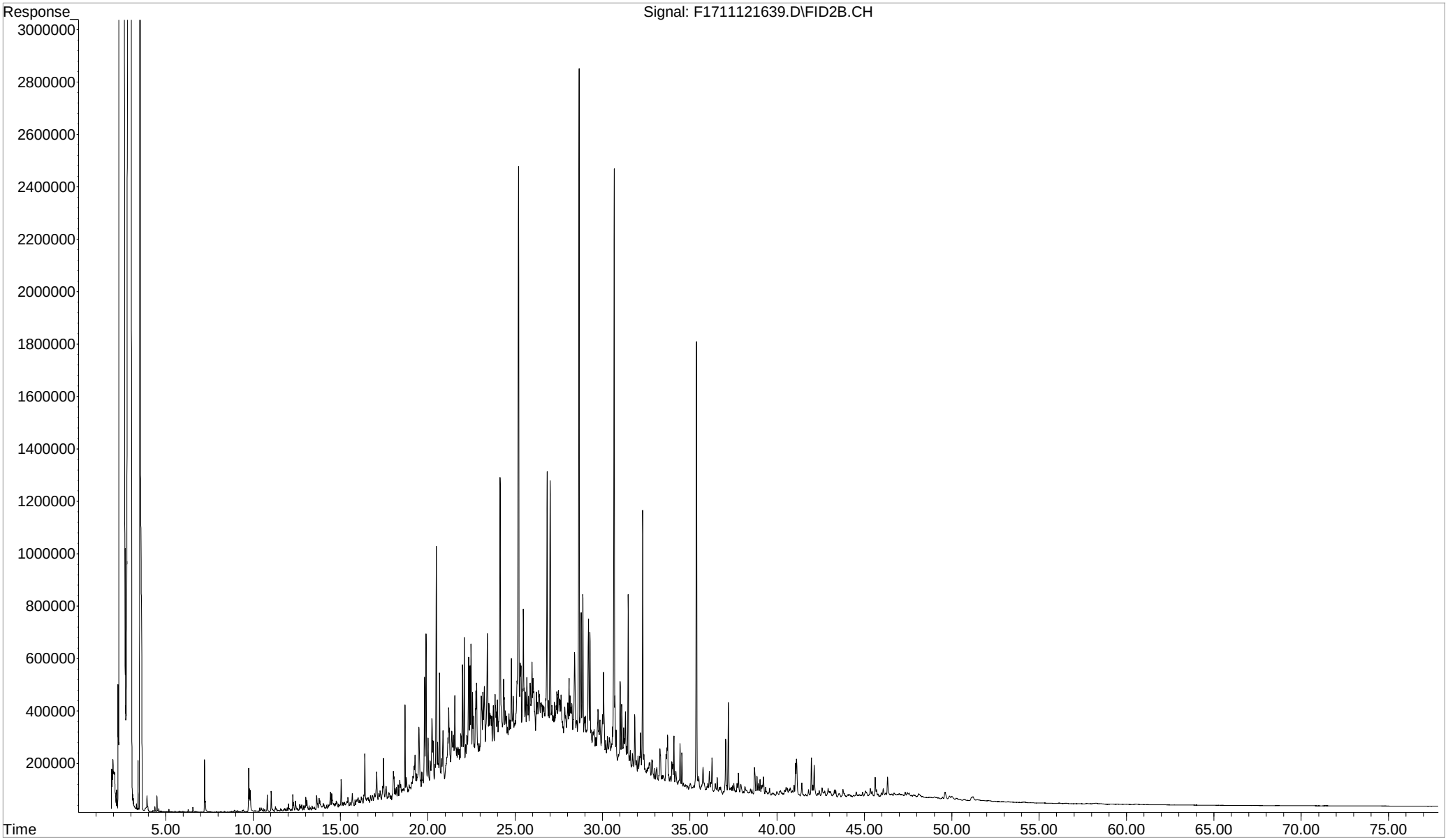
Sub List : TPH - TPH

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	30.670	56194935	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	28.661	59059969	49.107 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	98.21%
24) s d50-Tetracosane	35.383	47453323	47.358 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	94.72%
Target Compounds			
42) h C9-C44 Total Petroleu...	38.899	4448201768	4212.311 ug/mL m
42) h C9-C44 Total Petroleu BS	38.899	4047776537	3833.121 ug/mLm
46) h Total Resolved Hydroc...	39.803	1137563332	1077.238 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121639.D
Operator : FID17:WR
Acquired : 13 Nov 2016 7:19 pm using AcqMethod FID17.M
Sample Name: 1611004-05D
Instrument: FID17
Misc Info : 1X
Vial Number: 70
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Duplicate
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/11/16	100	WR

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
Total Petroleum Hydrocarbons (C9-C44)	**686000**	**1040000**	41[a]	30

[a] - Value outside of QC Limits.
N/A - Not Applicable

Surrogate	% Recovery		Acceptance Range (%)
ortho-Terphenyl	98	98	50-130
d50-Tetracosane	92	95	50-130

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 13:38

Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-03**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-06**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/13/16	100	0.00328	1	1	WR

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**1030000**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	101	50-130
d50-Tetracosane	94	50-130

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Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121641.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 8:47 pm
Operator : FID17:WR
Sample : 1611004-06
Misc : 1X
ALS Vial : 71 Sample Multiplier: 1

NAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Nov 16 19:40:31 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1711121602R
Blank File : F1711121635.D

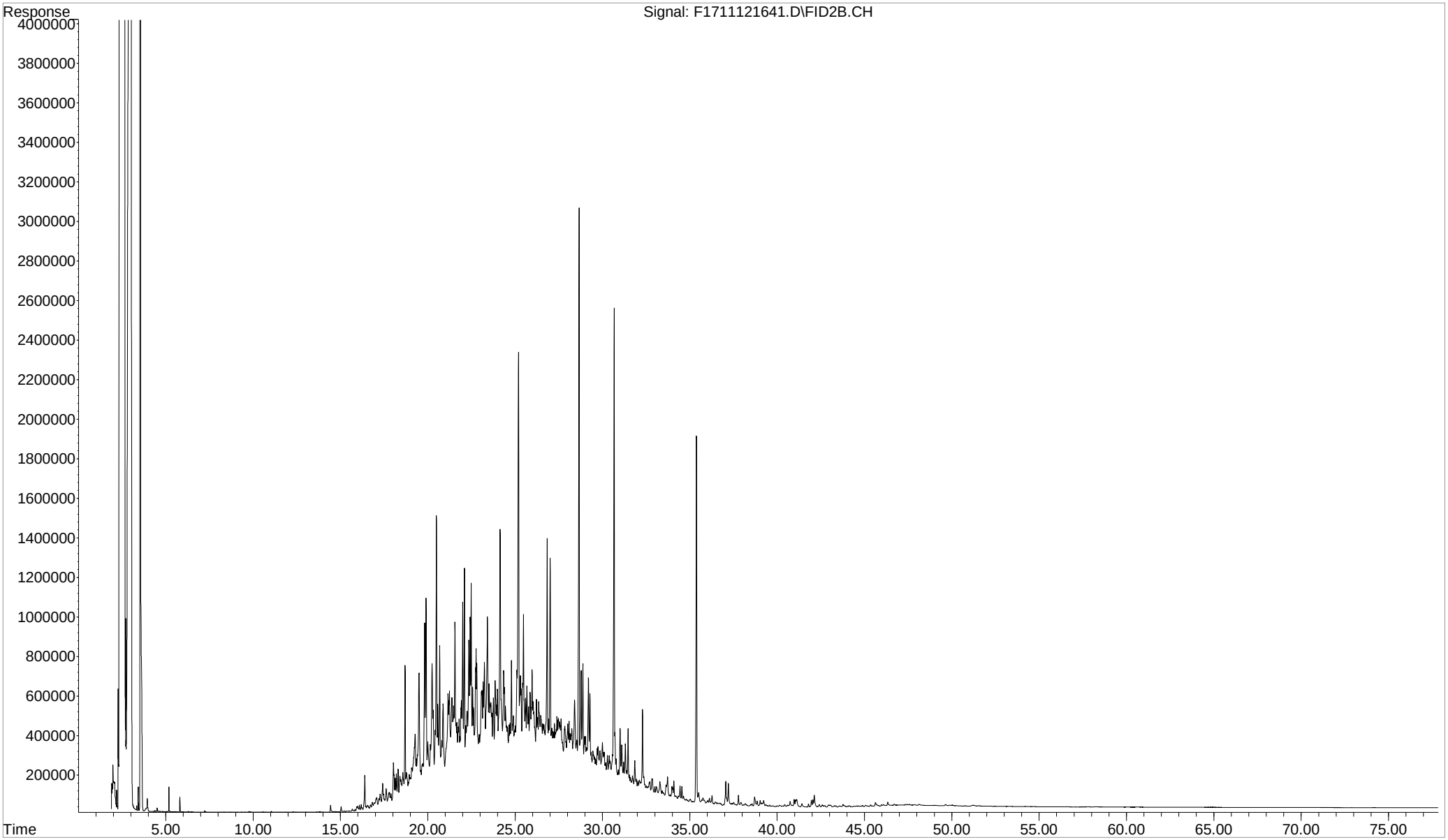
Sub List : TPH - TPH

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	30.670	65545501	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	28.661	70955492	50.582 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 101.16%	
24) s d50-Tetracosane	35.379	55153151	47.191 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 94.38%	
Target Compounds			
42) h C9-C44 Total Petroleu...	38.899	4544847530	3689.858 ug/mL m
42) h C9-C44 Total Petroleu BS	38.899	4144422299	3364.761 ug/mLm
46) h Total Resolved Hydroc...	39.803	1315584391	1068.093 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121641.D
Operator : FID17:WR
Acquired : 13 Nov 2016 8:47 pm using AcqMethod FID17.M
Sample Name: 1611004-06
Instrument: FID17
Misc Info : 1X
Vial Number: 71
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-08(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-07**
Associated Blank: **SW110716B01**
Concentration Units: **mg/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/11/16	1000	1	1	NLJr

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**0.302**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	95	50-130
d50-Tetracosane	92	50-130

12/07/16 13:25

Quantitation Report (QT Reviewed)

NAL
12/7/16

Data Path : O:\Forensics\Data\FID6\2016\Nov\Nov10\
Data File : F611101618.D
Signal(s) : FID1A.CH
Acq On : 11 Nov 2016 1:39 am
Operator : FID6:NL
Sample : 1611004-07
Misc :
ALS Vial : 9 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 14 19:19:47 2016
Quant Method : O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 07 17:13:19 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB611101601F
Blank File : F611101610.D

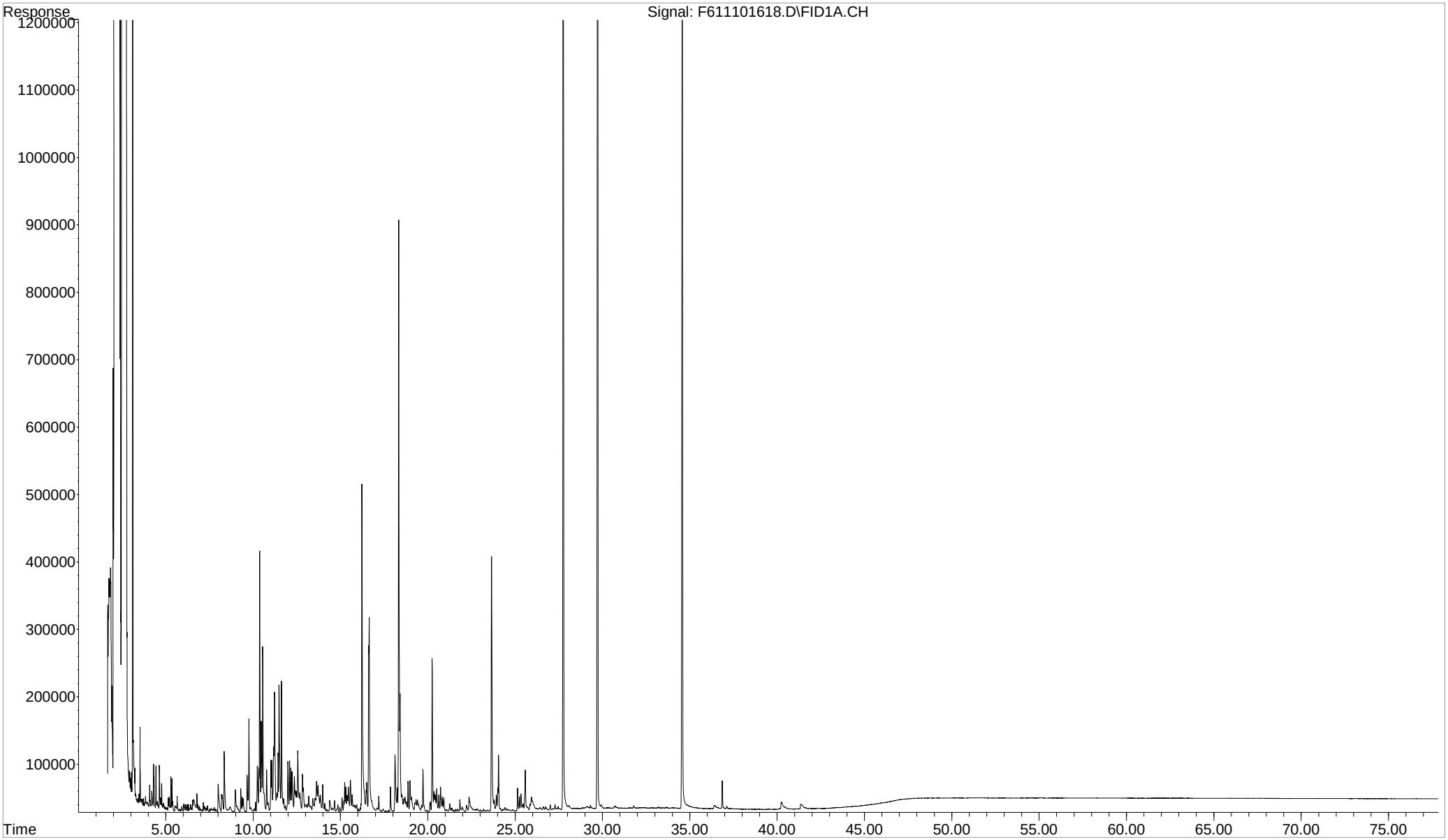
Sub List : TPH - TPH

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	29.727	61449582	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	27.764	61979832	47.267 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	94.53%
24) s d50-Tetracosane	34.569	50668315	45.814 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	91.63%
Target Compounds			
42) h C9-C44 Total Petroleu...	36.597	856183550	731.075 ug/mL m
42) h C9-C44 Total Petroleu BS	36.597	353827243	302.125 ug/mLm
49) h Total Resolved Hydroc...	38.277	216564471	184.919 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2016\Nov\Nov10\F611101618.D
Operator : FID6:NL
Acquired : 11 Nov 2016 1:39 am using AcqMethod FID6A.M
Sample Name: 1611004-07
Instrument: FID6
Misc Info :
Vial Number: 9
CurrentMeth: O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-01(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-08**
Associated Blank: **SW110716B01**
Concentration Units: **mg/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/11/16	1000	1	1	NLJr

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**16.5**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	96	50-130
d50-Tetracosane	90	50-130

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Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2016\Nov\Nov10\
Data File : F611101620.D
Signal(s) : FID1A.CH
Acq On : 11 Nov 2016 3:08 am
Operator : FID6:NL
Sample : 1611004-08
Misc :
ALS Vial : 10 Sample Multiplier: 1

NAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Nov 14 19:20:49 2016
Quant Method : O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 07 17:13:19 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB611101601F
Blank File : F611101610.D

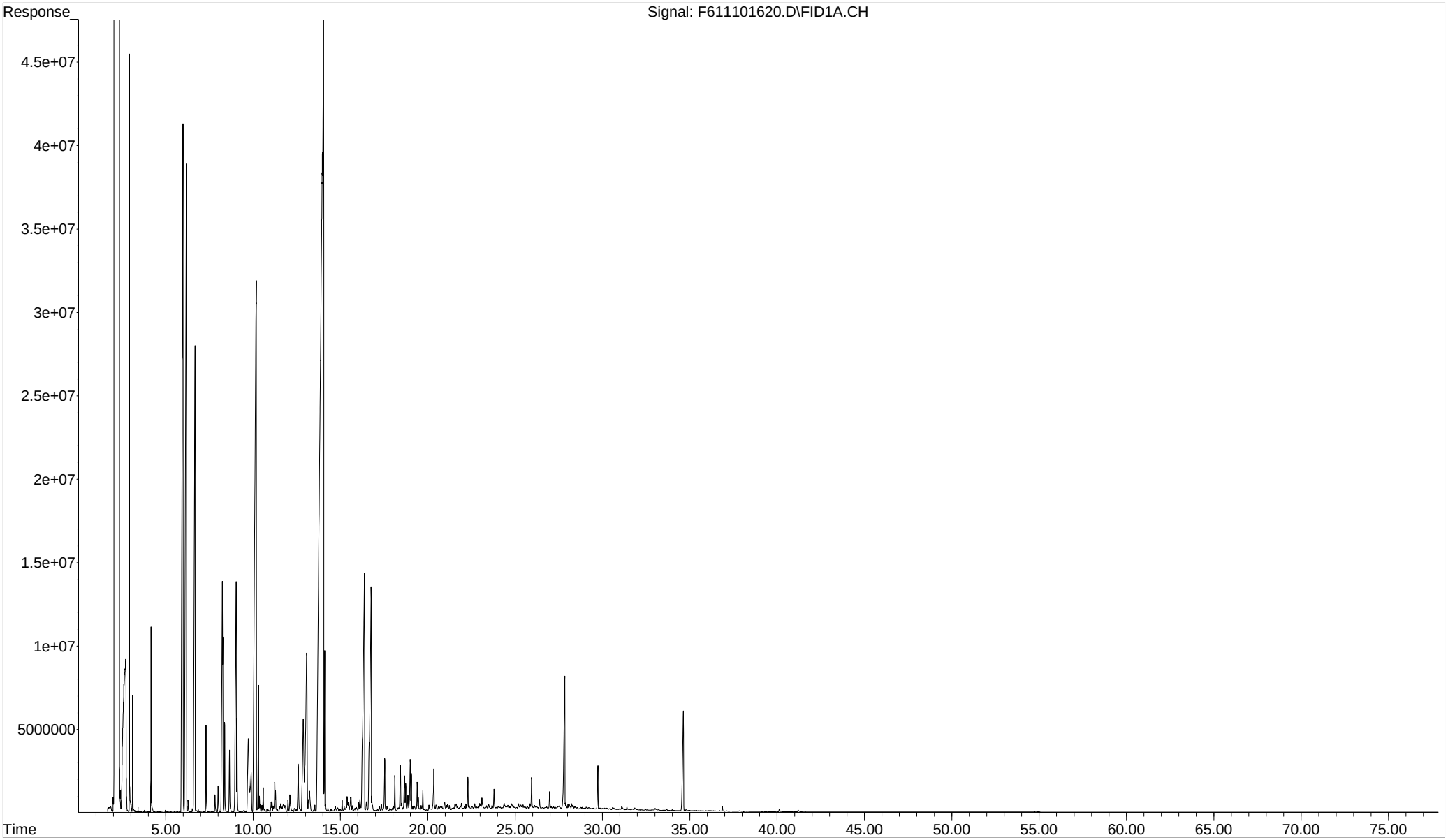
Sub List : TPH - TPH

Compound	R.T.	Response	Conc	Units
Internal Standards				
1) I 5-alpha-androstane	29.738	61320018	50.000	ug/mL M4
System Monitoring Compounds				
19) s ortho-terphenyl	27.840	315229965	240.908	ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 481.82%#		
24) s d50-Tetracosane	34.631	249362498	225.948	ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 451.90%#		
Target Compounds				
42) h C9-C44 Total Petroleu...	36.597	19784947749	16929.590	ug/mL m
42) h C9-C44 Total Petroleu BS	36.597	19282591442	16499.734	ug/mLm
49) h Total Resolved Hydroc...	38.277	16302047259	13949.341	ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument				

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2016\Nov\Nov10\F611101620.D
Operator : FID6:NL
Acquired : 11 Nov 2016 3:08 am using AcqMethod FID6A.M
Sample Name: 1611004-08
Instrument: FID6
Misc Info :
Vial Number: 10
CurrentMeth: O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09**
Associated Blank: **SW110716B01**
Concentration Units: **mg/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/11/16	1000	1	1	NLJr

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**15.3**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	95	50-130
d50-Tetracosane	90	50-130

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Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2016\Nov\Nov10\
Data File : F611101622.D
Signal(s) : FID1A.CH
Acq On : 11 Nov 2016 4:37 am
Operator : FID6:NL
Sample : 1611004-09
Misc :
ALS Vial : 11 Sample Multiplier: 1

MAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Nov 14 19:21:34 2016
Quant Method : O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 07 17:13:19 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB611101601F
Blank File : F611101610.D

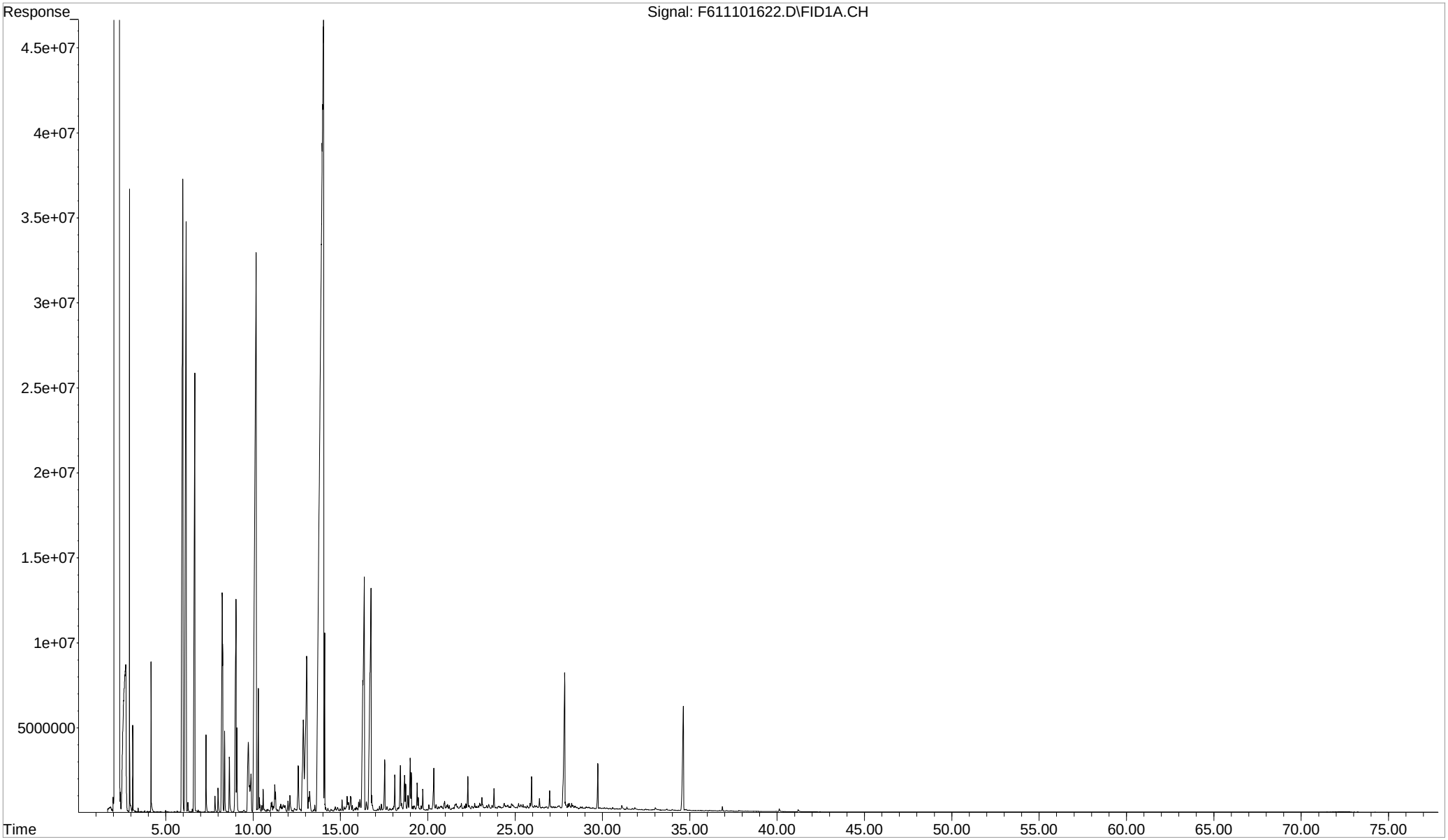
Sub List : TPH - TPH

Compound	R.T.	Response	Conc	Units	
Internal Standards					
1) I 5-alpha-androstane	29.735	64390118	50.000	ug/mL	M4
System Monitoring Compounds					
19) s ortho-terphenyl	27.838	326824104	237.860	ug/mL	M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 475.72%#			
24) s d50-Tetracosane	34.632	259470746	223.898	ug/mL	M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 447.80%#			
Target Compounds					
42) h C9-C44 Total Petroleu...	36.597	19323796798	15746.609	ug/mL	m
42) h C9-C44 Total Petroleu BS	36.597	18821440491	15337.248	ug/mL	m
49) h Total Resolved Hydroc...	38.277	15337123060	12497.942	ug/mL	m
SemiQuant Compounds - Not Calibrated on this Instrument					

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2016\Nov\Nov10\F611101622.D
Operator : FID6:NL
Acquired : 11 Nov 2016 4:37 am using AcqMethod FID6A.M
Sample Name: 1611004-09
Instrument: FID6
Misc Info :
Vial Number: 11
CurrentMeth: O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M



Form I
Duplicate
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09 D**
Associated Blank: **SW110716B01**
Concentration Units: **mg/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/11/16	1000	1	1	NLJr

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**17.6**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	97	50-130
d50-Tetracosane	91	50-130

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Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2016\Nov\Nov10\
Data File : F611101624.D
Signal(s) : FID1A.CH
Acq On : 11 Nov 2016 6:06 am
Operator : FID6:NL
Sample : 1611004-09D
Misc :
ALS Vial : 12 Sample Multiplier: 1

NAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Nov 14 19:22:28 2016
Quant Method : O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 07 17:13:19 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB611101601F
Blank File : F611101610.D

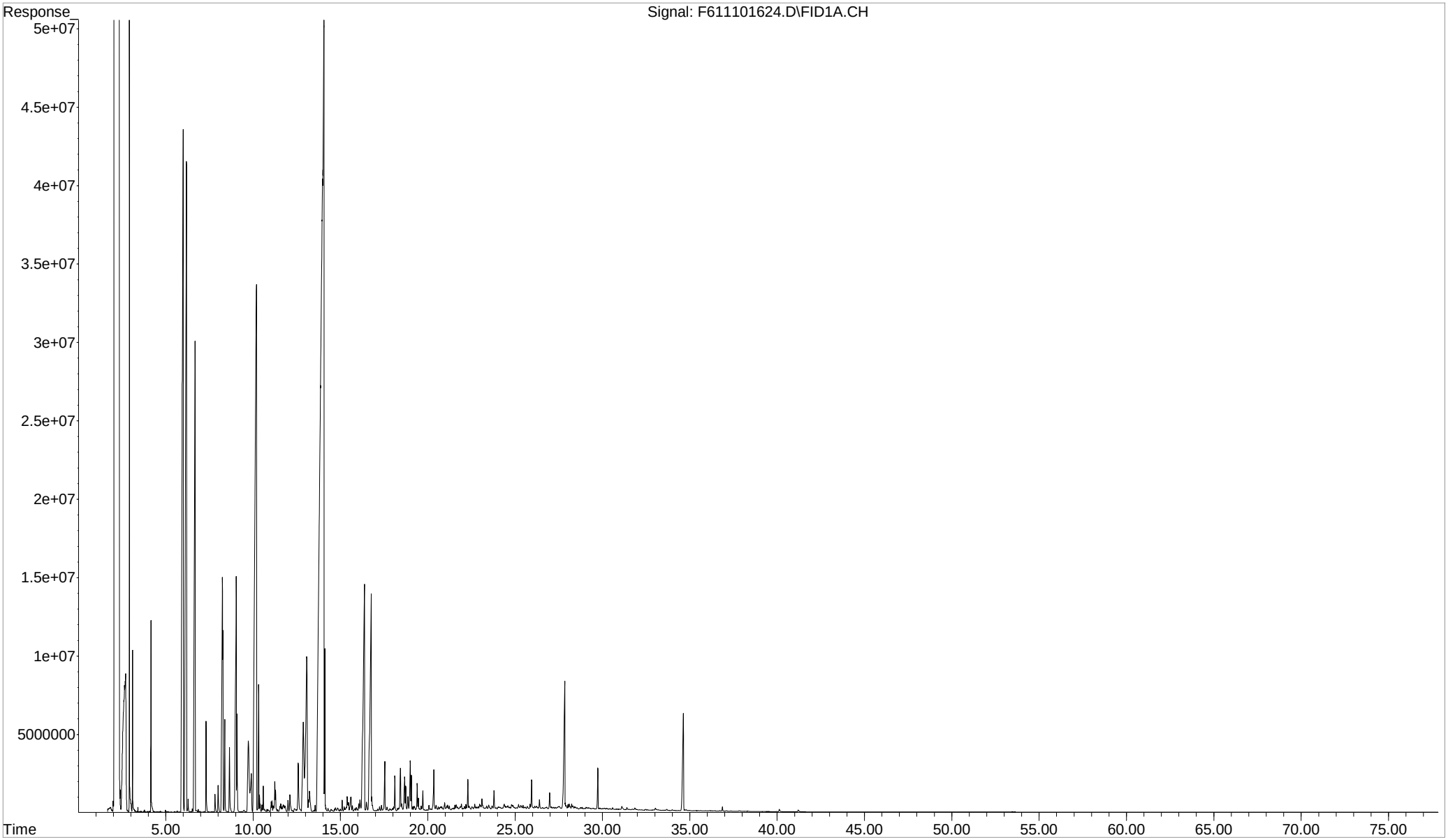
Sub List : TPH - TPH

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	29.735	61991108	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	27.841	320181851	242.043 ug/mL M4
Spiked Amount 50.000	Range 50 - 130	Recovery	= 484.09%#
24) s d50-Tetracosane	34.630	253499675	227.211 ug/mL M4
Spiked Amount 50.000	Range 50 - 130	Recovery	= 454.42%#
Target Compounds			
42) h C9-C44 Total Petroleu...	36.597	21320155219	18045.743 ug/mL m
42) h C9-C44 Total Petroleu BS	36.597	20817798912	17620.540 ug/mLm
49) h Total Resolved Hydroc...	38.277	17402029146	14729.374 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2016\Nov\Nov10\F611101624.D
Operator : FID6:NL
Acquired : 11 Nov 2016 6:06 am using AcqMethod FID6A.M
Sample Name: 1611004-09D
Instrument: FID6
Misc Info :
Vial Number: 12
CurrentMeth: O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M



Duplicate
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09**
Associated Blank: **SW110716B01**
Concentration Units: **mg/L**

Date Collected	Date Received	Date Extracted	Analyst
11/01/16	11/02/16	11/07/16	NLJr

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
Total Petroleum Hydrocarbons (C9-C44)	**15.3**	**17.6**	14	30

N/A - Not Applicable

Surrogate	% Recovery		Acceptance Range (%)
ortho-Terphenyl	95	97	50-130
d50-Tetracosane	90	91	50-130

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

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Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016B02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/13/16	100	0.10	20	1	WR

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	6600 U

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	102	50-130
d50-Tetracosane	97	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 13:37

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121615.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 1:39 am
Operator : FID17:WR
Sample : SO111016B02
Misc : 1X ETR 1611004
ALS Vial : 58 Sample Multiplier: 1

MAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 10:56:16 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1711121601R
Blank File : F1711121607.D

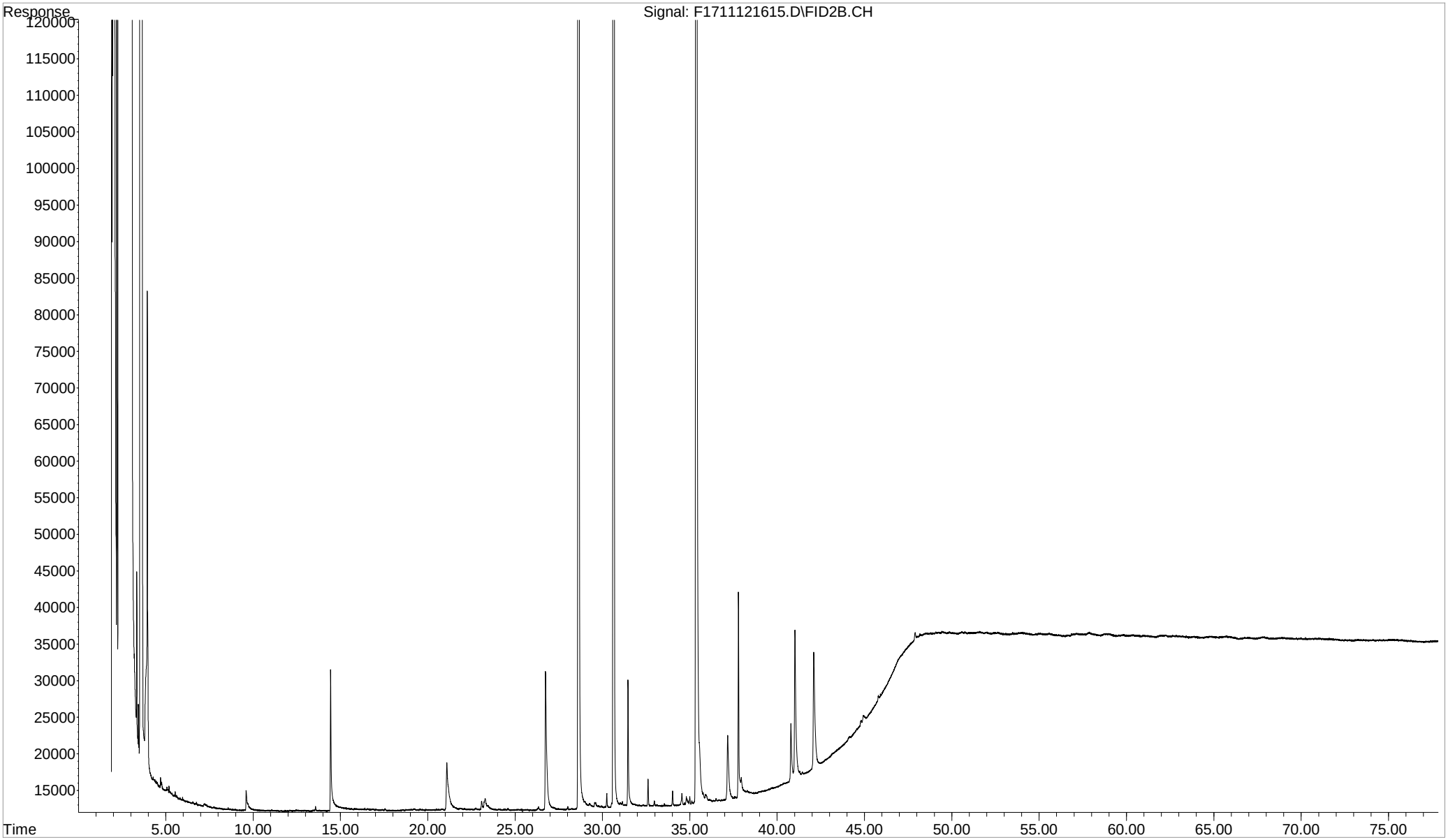
Sub List : TPH - TPH

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	30.656	55858385	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	28.647	61208668	51.201 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 102.40%	
24) s d50-Tetracosane	35.383	48167492	48.361 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 96.72%	
Target Compounds			
42) h C9-C44 Total Petroleu...	38.899	468445843	446.277 ug/mL m
42) h C9-C44 Total Petroleu BS	38.899	-82011819	N.D. ug/mLm
46) h Total Resolved Hydroc...	39.803	9994529	9.522 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121615.D
Operator : FID17:WR
Acquired : 13 Nov 2016 1:39 am using AcqMethod FID17.M
Sample Name: SO111016B02
Instrument: FID17
Misc Info : 1X ETR 1611004
Vial Number: 58
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116B03**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/12/16	100	0.0040	1	1	WR

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	8250 U

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	103	50-130
d50-Tetracosane	97	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 13:37

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121609.D
Signal(s) : FID2B.CH
Acq On : 12 Nov 2016 9:14 pm
Operator : FID17:WR
Sample : SO111116B03
Misc : 1X ETR 1611004
ALS Vial : 55 Sample Multiplier: 1

MAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 10:55:35 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1711121601R
Blank File : F1711121607.D

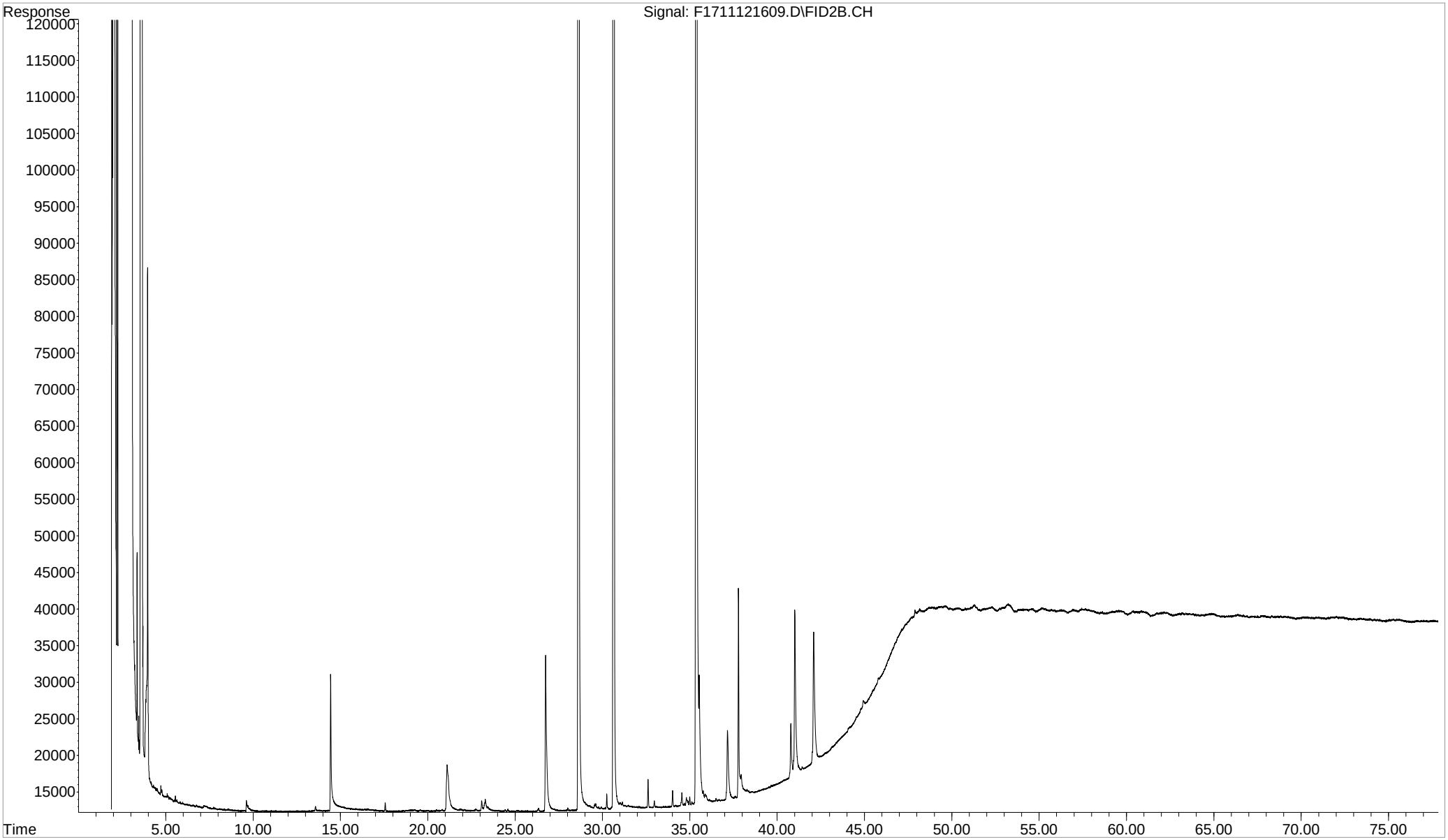
Sub List : TPH - TPH

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	30.659	58748457	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	28.650	64808925	51.545 ug/mL M4
Spiked Amount 50.000	Range 50 - 130	Recovery = 103.09%	
24) s d50-Tetracosane	35.383	50721261	48.420 ug/mL M4
Spiked Amount 50.000	Range 50 - 130	Recovery = 96.84%	
Target Compounds			
42) h C9-C44 Total Petroleu...	38.899	527138760	477.487 ug/mL m
42) h C9-C44 Total Petroleu BS	38.899	-23318902	N.D. ug/mLm
46) h Total Resolved Hydroc...	39.803	12110192	10.970 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121609.D
Operator : FID17:WR
Acquired : 12 Nov 2016 9:14 pm using AcqMethod FID17.M
Sample Name: SO111116B03
Instrument: FID17
Misc Info : 1X ETR 1611004
Vial Number: 55
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716B01**
Associated Blank: **N/A**
Concentration Units: **mg/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	11/10/16	1000	1	1	NLJr

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	0.0330 U

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	93	50-130
d50-Tetracosane	91	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 13:25

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2016\Nov\Nov10\
Data File : F611101612.D
Signal(s) : FID1A.CH
Acq On : 10 Nov 2016 9:13 pm
Operator : FID6:NL
Sample : SW110716B01
Misc : 1X
ALS Vial : 6 Sample Multiplier: 1

NAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 11:03:29 2016
Quant Method : O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 07 17:13:19 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB611101601F
Blank File : F611101610.D

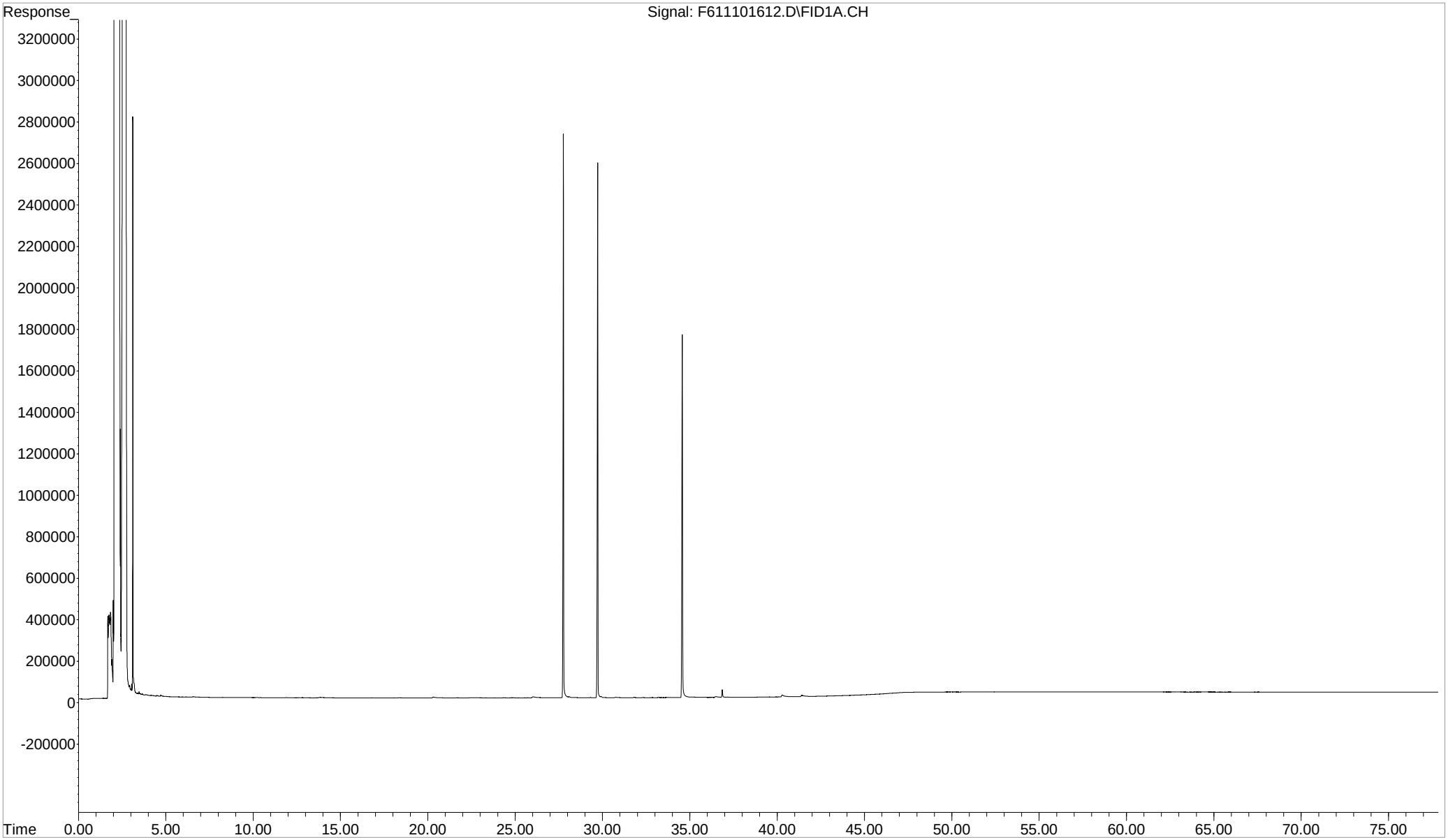
Sub List : TPH - TPH

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	29.725	61082177	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	27.761	60836232	46.674 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	93.35%
24) s d50-Tetracosane	34.567	49950279	45.436 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	90.87%
Target Compounds			
42) h C9-C44 Total Petroleu...	36.597	497916779	427.717 ug/mL m
42) h C9-C44 Total Petroleu BS	36.597	-4439528	N.D. ug/mLm
49) h Total Resolved Hydroc...	38.277	7301645	6.272 ug/mL m
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2016\Nov\Nov10\F611101612.D
Operator : FID6:NL
Acquired : 10 Nov 2016 9:13 pm using AcqMethod FID6A.M
Sample Name: SW110716B01
Instrument: FID6
Misc Info : 1X
Vial Number: 6
CurrentMeth: O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M



Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **See Below**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	11/10/16	100	WR

Lab ID:	SO111016B02		SO111016LCS02		SO111016LCSD02				
Parameter	**Blank Conc.**		**LCS Conc.**	**LCS % Recovery**	**LCSD Conc.**	**LCSD % Recovery**	**% RPD**	**RPD Limit**	**% Recovery Limits**
n-Nonane (C9)	200	U	4020	101	4050	101	1	30	50-130
n-Decane (C10)	200	U	4060	102	4060	101	0	30	50-130
n-Dodecane (C12)	200	U	4080	102	4070	102	0	30	50-130
n-Tetradecane (C14)	200	U	4150	104	4140	103	0	30	50-130
n-Hexadecane (C16)	200	U	4370	109	4370	109	0	30	50-130
n-Octadecane (C18)	200	U	4270	107	4280	107	0	30	50-130
n-Nonadecane (C19)	200	U	4010	100	4020	100	0	30	50-130
n-Eicosane (C20)	200	U	4100	103	4120	103	0	30	50-130
n-Docosane (C22)	200	U	4120	103	4130	103	0	30	50-130
n-Tetracosane (C24)	200	U	4160	104	4170	104	0	30	50-130
n-Hexacosane (C26)	200	U	4110	103	4120	103	0	30	50-130
n-Octacosane (C28)	200	U	4220	106	4230	106	0	30	50-130
n-Triacontane (C30)	200	U	4170	104	4190	105	0	30	50-130
n-Hexatriacontane (C36)	200	U	4070	102	4090	102	0	30	50-130

Surrogate	% Recovery		Acceptance Range (%)
ortho-Terphenyl	102	102	50-130
d50-Tetracosane	96	96	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

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Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016LCS02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/13/16	100	0.10	20	1	WR

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**45700**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	102	50-130
d50-Tetracosane	96	50-130

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Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121617.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 3:07 am
Operator : FID17:WR
Sample : SO111016LCS02
Misc : 1X ETR 1611004
ALS Vial : 59 Sample Multiplier: 1

MAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 10:57:12 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1711121601R
Blank File : F1711121607.D

Sub List : TPH_QC_Samples - TPH_QC_Samples

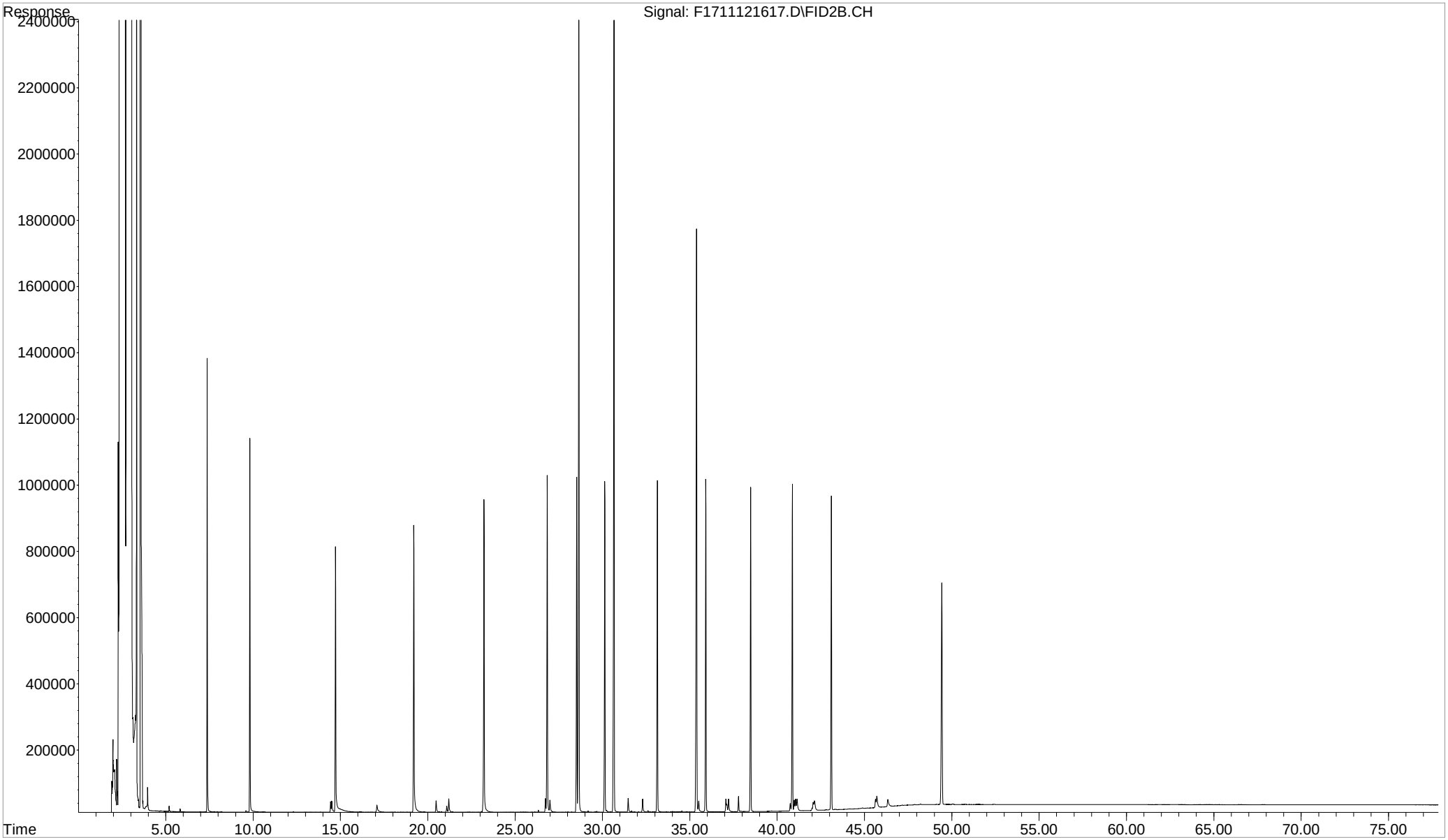
	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.660	58772737	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.651	64340021	51.151 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery	= 102.30%
24) s	d50-Tetracosane	35.383	50358514	48.054 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery	= 96.11%
	Target Compounds			
3) t	n-Nonane (C9)	7.364	20262880	20.108 ug/mL M4
4) t	n-Decane (C10)	9.807	21170522	20.321 ug/mL M4
6) t	n-Dodecane (C12)	14.714	21754148	20.426 ug/mL M4
9) t	n-Tetradecane (C14)	19.198	22465076	20.738 ug/mL M4
12) t	n-Hexadecane (C16)	23.215	23982698	21.850 ug/mL M4
16) t	n-Octadecane (C18)	26.837	23950583	21.360 ug/mL M4
18) t	n-Nonadecane (C19)	28.522	22257637	20.040 ug/mL M4
20) t	n-Eicosane (C20)	30.132	22675951	20.521 ug/mL M4
22) t	n-Docosane (C22)	33.143	23045455	20.592 ug/mL M4
25) t	n-Tetracosane (C24)	35.916	23433372	20.800 ug/mL M4
27) t	n-Hexacosane (C26)	38.482	23331210	20.543 ug/mL M4
29) t	n-Octacosane (C28)	40.871	23571179	21.101 ug/mL M4
31) t	n-Triacontane (C30)	43.103	23427680	20.841 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.427	23670525	20.332 ug/mL M4
42) h	C9-C44 Total Petroleu...	38.899	802647901	726.745 ug/mL m
42) h	C9-C44 Total Petroleu BS	38.899	252190239	228.342 ug/mLm
46) h	Total Resolved Hydroc...	39.803	346693285	313.908 ug/mL m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121617.D
Operator : FID17:WR
Acquired : 13 Nov 2016 3:07 am using AcqMethod FID17.M
Sample Name: SO111016LCS02
Instrument: FID17
Misc Info : 1X ETR 1611004
Vial Number: 59
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016LCSD02**
Associated Blank: **SO111016B02**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/13/16	100	0.10	20	1	WR

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**44100**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	102	50-130
d50-Tetracosane	96	50-130

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Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121619.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 4:36 am
Operator : FID17:WR
Sample : SO111016LCSD02
Misc : 1X ETR 1611004
ALS Vial : 60 Sample Multiplier: 1

NAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 10:58:23 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1711121601R
Blank File : F1711121607.D

Sub List : TPH_QC_Samples - TPH_QC_Samples

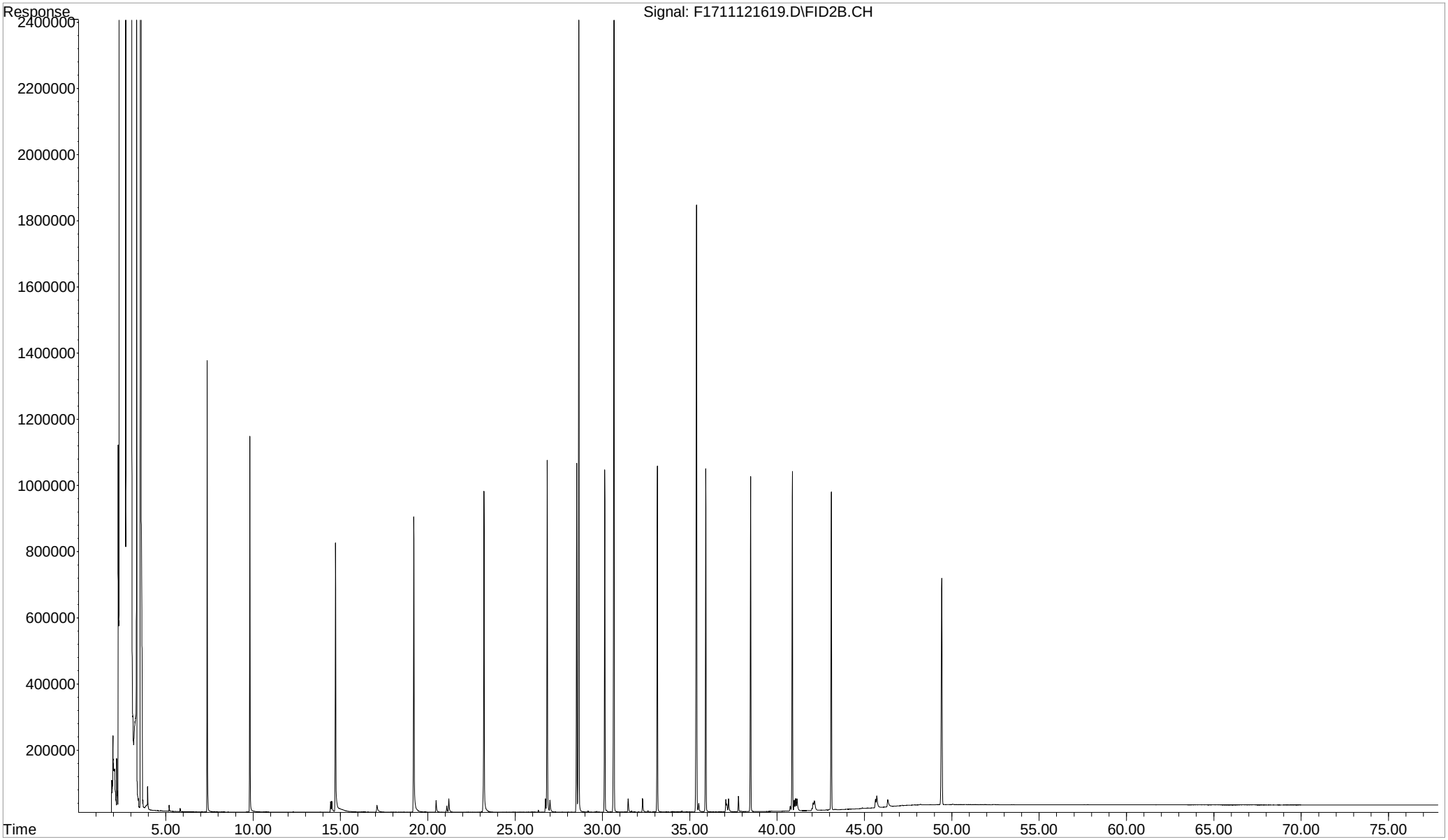
	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.660	58645737	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.651	64084644	51.059 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery	= 102.12%
24) s	d50-Tetracosane	35.384	50128520	47.938 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery	= 95.88%
	Target Compounds			
3) t	n-Nonane (C9)	7.365	20369130	20.258 ug/mL M4
4) t	n-Decane (C10)	9.808	21096017	20.293 ug/mL M4
6) t	n-Dodecane (C12)	14.715	21640630	20.363 ug/mL M4
9) t	n-Tetradecane (C14)	19.198	22366859	20.692 ug/mL M4
12) t	n-Hexadecane (C16)	23.216	23941968	21.860 ug/mL M4
16) t	n-Octadecane (C18)	26.837	23955784	21.411 ug/mL M4
18) t	n-Nonadecane (C19)	28.523	22256287	20.082 ug/mL M4
20) t	n-Eicosane (C20)	30.132	22688223	20.577 ug/mL M4
22) t	n-Docosane (C22)	33.141	23072828	20.661 ug/mL M4
25) t	n-Tetracosane (C24)	35.915	23426722	20.839 ug/mL M4
27) t	n-Hexacosane (C26)	38.481	23375140	20.626 ug/mL M4
29) t	n-Octacosane (C28)	40.871	23595451	21.169 ug/mL M4
31) t	n-Triacontane (C30)	43.105	23476044	20.929 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.423	23734977	20.432 ug/mL M4
42) h	C9-C44 Total Petroleu...	38.899	793227617	719.771 ug/mL m
42) h	C9-C44 Total Petroleu BS	38.899	242769955	220.288 ug/mLm
46) h	Total Resolved Hydroc...	39.803	344767659	312.841 ug/mL m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121619.D
Operator : FID17:WR
Acquired : 13 Nov 2016 4:36 am using AcqMethod FID17.M
Sample Name: SO111016LCSD02
Instrument: FID17
Misc Info : 1X ETR 1611004
Vial Number: 60
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **See Below**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	11/11/16	100	WR

Lab ID:	SO111116B03		SO111116LCS02		SO111116LCSD02				
Parameter	**Blank Conc.**		**LCS Conc.**	**LCS % Recovery**	**LCSD Conc.**	**LCSD % Recovery**	**% RPD**	**RPD Limit**	**% Recovery Limits**
n-Nonane (C9)	250	U	5140	103	5110	102	1	30	50-130
n-Decane (C10)	250	U	5140	103	5140	103	0	30	50-130
n-Dodecane (C12)	250	U	5160	103	5160	103	0	30	50-130
n-Tetradecane (C14)	250	U	5140	103	5230	105	2	30	50-130
n-Hexadecane (C16)	250	U	5480	110	5510	110	1	30	50-130
n-Octadecane (C18)	250	U	5350	107	5390	108	1	30	50-130
n-Nonadecane (C19)	250	U	5020	100	5060	101	1	30	50-130
n-Eicosane (C20)	250	U	5150	103	5170	103	0	30	50-130
n-Docosane (C22)	250	U	5160	103	5180	104	0	30	50-130
n-Tetracosane (C24)	250	U	5210	104	5220	104	0	30	50-130
n-Hexacosane (C26)	250	U	5170	103	5160	103	0	30	50-130
n-Octacosane (C28)	250	U	5320	106	5290	106	1	30	50-130
n-Triacontane (C30)	250	U	5280	106	5220	104	1	30	50-130
n-Hexatriacontane (C36)	250	U	5190	104	5050	101	3	30	50-130

Surrogate	% Recovery		Acceptance Range (%)
ortho-Terphenyl	102	103	50-130
d50-Tetracosane	96	96	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

12/07/16 13:38

Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116LCS02**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/12/16	100	0.0040	1	1	WR

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**67600**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	102	50-130
d50-Tetracosane	96	50-130

12/07/16 13:37

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121611.D
Signal(s) : FID2B.CH
Acq On : 12 Nov 2016 10:42 pm
Operator : FID17:WR
Sample : SO111116LCS02
Misc : 1X ETR 1611004
ALS Vial : 56 Sample Multiplier: 1

NAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 10:53:47 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1711121601R
Blank File : F1711121607.D

Sub List : TPH_QC_Samples - TPH_QC_Samples

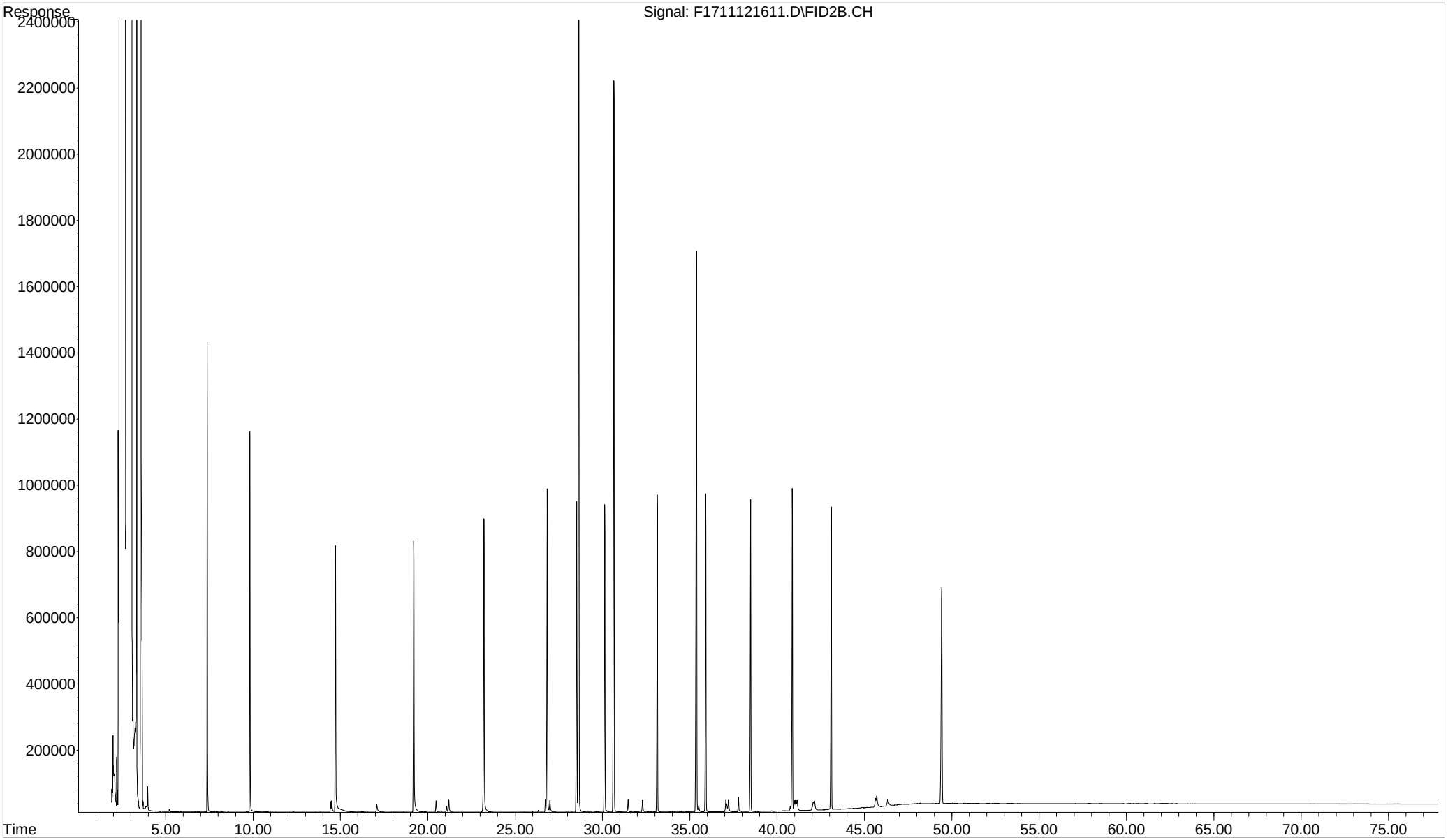
	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.656	59346512	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.648	65004874	51.180 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery	= 102.36%
24) s	d50-Tetracosane	35.382	50999614	48.195 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery	= 96.39%
	Target Compounds			
3) t	n-Nonane (C9)	7.368	20939849	20.579 ug/mL M4
4) t	n-Decane (C10)	9.809	21626846	20.558 ug/mL M4
6) t	n-Dodecane (C12)	14.714	22174727	20.619 ug/mL M4
9) t	n-Tetradecane (C14)	19.198	22476342	20.548 ug/mL M4
12) t	n-Hexadecane (C16)	23.214	24280805	21.908 ug/mL M4
16) t	n-Octadecane (C18)	26.837	24214543	21.386 ug/mL M4
18) t	n-Nonadecane (C19)	28.521	22513699	20.075 ug/mL M4
20) t	n-Eicosane (C20)	30.131	22990262	20.605 ug/mL M4
22) t	n-Docosane (C22)	33.140	23338547	20.652 ug/mL M4
25) t	n-Tetracosane (C24)	35.914	23726744	20.857 ug/mL M4
27) t	n-Hexacosane (C26)	38.480	23713619	20.678 ug/mL M4
29) t	n-Octacosane (C28)	40.869	24017019	21.293 ug/mL M4
31) t	n-Triacontane (C30)	43.100	23957401	21.106 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.423	24405944	20.761 ug/mL M4
42) h	C9-C44 Total Petroleu...	38.899	851865311	763.851 ug/mL m
42) h	C9-C44 Total Petroleu BS	38.899	301407649	270.267 ug/mLm
46) h	Total Resolved Hydroc...	39.803	348591436	312.575 ug/mL m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121611.D
Operator : FID17:WR
Acquired : 12 Nov 2016 10:42 pm using AcqMethod FID17.M
Sample Name: SO111116LCS02
Instrument: FID17
Misc Info : 1X ETR 1611004
Vial Number: 56
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116LCSD02**
Associated Blank: **SO111116B03**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/13/16	100	0.0040	1	1	WR

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**62600**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	103	50-130
d50-Tetracosane	96	50-130

12/07/16 13:37

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121613.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 12:11 am
Operator : FID17:WR
Sample : SO111116LCSD02
Misc : 1X ETR 1611004
ALS Vial : 57 Sample Multiplier: 1

MAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 10:54:45 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1711121601R
Blank File : F1711121607.D

Sub List : TPH_QC_Samples - TPH_QC_Samples

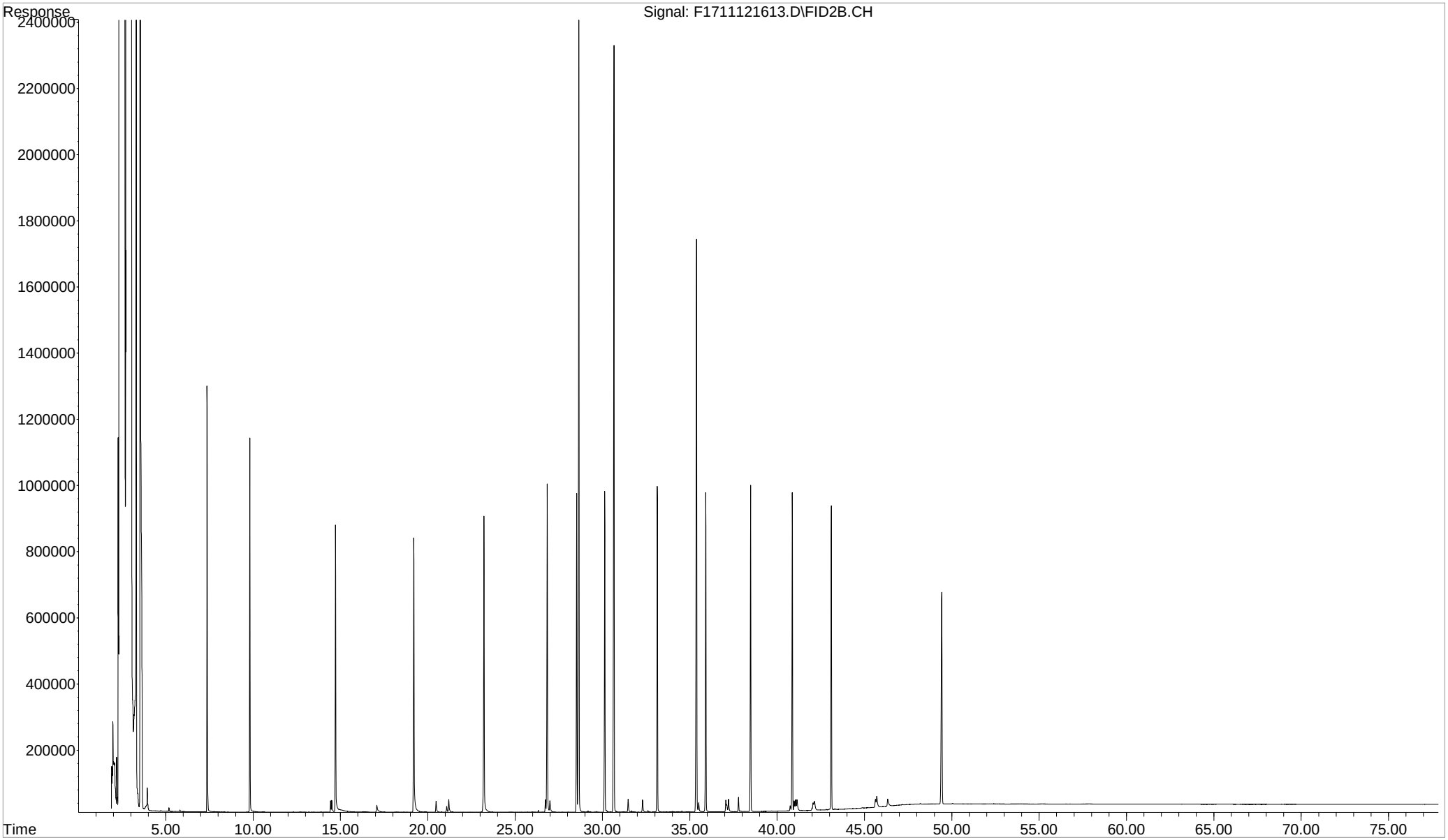
	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.658	56299919	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.650	61976760	51.437 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery	= 102.87%
24) s	d50-Tetracosane	35.384	48362216	48.176 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery	= 96.35%
	Target Compounds			
3) t	n-Nonane (C9)	7.359	19746790	20.457 ug/mL M4
4) t	n-Decane (C10)	9.807	20513246	20.555 ug/mL M4
6) t	n-Dodecane (C12)	14.715	21038811	20.622 ug/mL M4
9) t	n-Tetradecane (C14)	19.195	21726080	20.937 ug/mL M4
12) t	n-Hexadecane (C16)	23.214	23172352	22.039 ug/mL M4
16) t	n-Octadecane (C18)	26.836	23158556	21.560 ug/mL M4
18) t	n-Nonadecane (C19)	28.522	21533184	20.239 ug/mL M4
20) t	n-Eicosane (C20)	30.131	21904750	20.694 ug/mL M4
22) t	n-Docosane (C22)	33.140	22219316	20.726 ug/mL M4
25) t	n-Tetracosane (C24)	35.913	22548184	20.893 ug/mL M4
27) t	n-Hexacosane (C26)	38.482	22459604	20.644 ug/mL M4
29) t	n-Octacosane (C28)	40.868	22645752	21.163 ug/mL M4
31) t	n-Triacontane (C30)	43.101	22504939	20.900 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.423	22521994	20.195 ug/mL M4
42) h	C9-C44 Total Petroleu...	38.899	815463762	770.779 ug/mL m
42) h	C9-C44 Total Petroleu BS	38.899	265006100	250.485 ug/mLm
46) h	Total Resolved Hydroc...	39.803	331228170	313.078 ug/mL m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121613.D
Operator : FID17:WR
Acquired : 13 Nov 2016 12:11 am using AcqMethod FID17.M
Sample Name: SO111116LCSD02
Instrument: FID17
Misc Info : 1X ETR 1611004
Vial Number: 57
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **See Below**
Associated Blank: **SW110716B01**
Concentration Units: **mg/L**

Date Collected	Date Received	Date Extracted	Analyst
N/A	N/A	11/07/16	NLJr

Lab ID: SW110716B01 SW110716LCS01 SW110716LCSD01

Parameter	Blank Conc.		LCS Conc.	LCS % Recovery	LCSD Conc.	LCSD % Recovery	% RPD	RPD Limit	% Recovery Limits
n-Nonane (C9)	0.00100	U	0.00282	14[a]	0.00195	10[a]	36[a]	30	50-130
n-Decane (C10)	0.00100	U	0.00301	15[a]	0.00212	11[a]	35[a]	30	50-130
n-Dodecane (C12)	0.00100	U	0.00458	23[a]	0.00415	21[a]	10	30	50-130
n-Tetradecane (C14)	0.00100	U	0.00839	42[a]	0.0105	52	22	30	50-130
n-Hexadecane (C16)	0.00100	U	0.0165	83	0.0179	89	8	30	50-130
n-Octadecane (C18)	0.00100	U	0.0188	94	0.0197	99	5	30	50-130
n-Nonadecane (C19)	0.00100	U	0.0182	91	0.0190	95	4	30	50-130
n-Eicosane (C20)	0.00100	U	0.0190	95	0.0198	99	4	30	50-130
n-Docosane (C22)	0.00100	U	0.0192	96	0.0199	100	3	30	50-130
n-Tetracosane (C24)	0.00100	U	0.0193	97	0.0201	100	4	30	50-130
n-Hexacosane (C26)	0.00100	U	0.0190	95	0.0194	97	2	30	50-130
n-Octacosane (C28)	0.00100	U	0.0191	95	0.0197	99	3	30	50-130
n-Triacontane (C30)	0.00100	U	0.0190	95	0.0197	98	4	30	50-130
n-Hexatriacontane (C36)	0.00100	U	0.0180	90	0.0186	93	3	30	50-130

Surrogate	% Recovery		Acceptance Range (%)
ortho-Terphenyl	93	96	50-130
d50-Tetracosane	90	92	50-130

[a] - Value outside of QC Limits.
U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

12/07/16 13:25

Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716LCS01**
Associated Blank: **SW110716B01**
Concentration Units: **mg/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	11/10/16	1000	1	1	NLJr

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**0.208**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	93	50-130
d50-Tetracosane	90	50-130

12/07/16 13:25

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2016\Nov\Nov10\
Data File : F611101614.D
Signal(s) : FID1A.CH
Acq On : 10 Nov 2016 10:41 pm
Operator : FID6:NL
Sample : SW110716LCS01
Misc : 1X
ALS Vial : 7 Sample Multiplier: 1

NAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 11:04:10 2016
Quant Method : O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 07 17:13:19 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB611101601F
Blank File : F611101610.D

Sub List : TPH_QC_Samples - TPH_QC_Samples

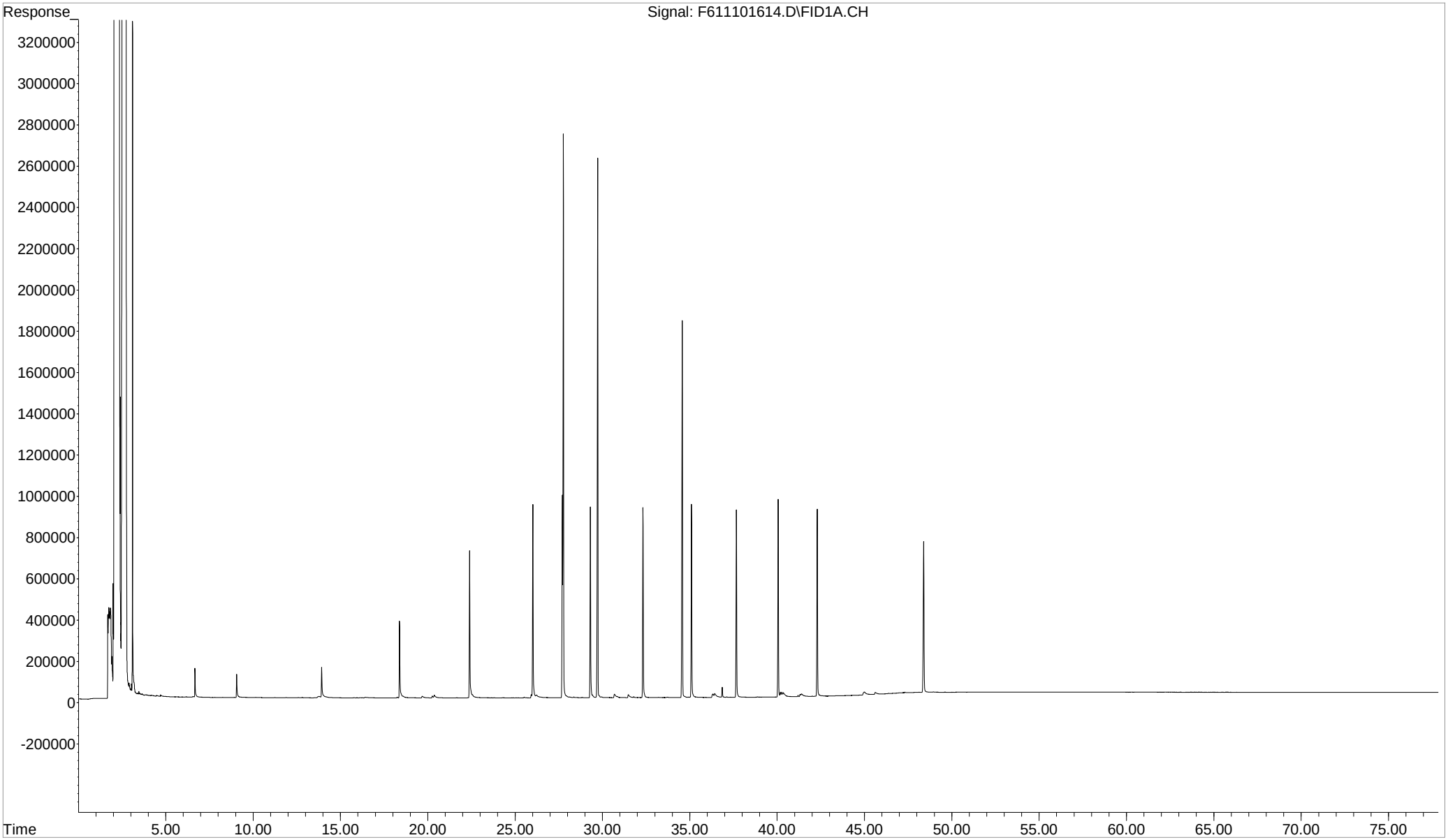
	Compound	R.T.	Response	Conc	Units	
	Internal Standards					
1) I	5-alpha-androstane	29.728	62065672	50.000	ug/mL	M4
	System Monitoring Compounds					
19) s	ortho-terphenyl	27.763	61397646	46.358	ug/mL	M4
Spiked Amount	50.000	Range	50 - 130	Recovery	=	92.72%
24) s	d50-Tetracosane	34.569	50028946	44.787	ug/mL	M4
Spiked Amount	50.000	Range	50 - 130	Recovery	=	89.57%
	Target Compounds					
3) t	n-Nonane (C9)	6.664	2941051	2.819	ug/mL	M4
4) t	n-Decane (C10)	9.051	3281201	3.011	ug/mL	M4
6) t	n-Dodecane (C12)	13.917	5156029	4.575	ug/mL	M4
9) t	n-Tetradecane (C14)	18.378	9594235	8.388	ug/mL	M4
12) t	n-Hexadecane (C16)	22.391	19214181	16.543	ug/mL	M4
16) T	n-Octadecane (C18)	26.011	22272327	18.796	ug/mL	M4
18) t	n-Nonadecane (C19)	27.701	21465103	18.233	ug/mL	M4
20) t	n-Eicosane (C20)	29.304	22356927	19.011	ug/mL	M4
22) t	n-Docosane (C22)	32.317	22942807	19.238	ug/mL	M4
25) t	n-Tetracosane (C24)	35.095	23315981	19.302	ug/mL	M4
27) t	n-Hexacosane (C26)	37.665	23219961	18.976	ug/mL	M4
29) t	n-Octacosane (C28)	40.060	23035580	19.080	ug/mL	M4
31) t	n-Triacontane (C30)	42.297	23191800	19.002	ug/mL	M4
37) t	n-Hexatriacontane (C36)	48.390	22903646	18.039	ug/mL	M4
42) h	C9-C44 Total Petroleu...	36.597	748427925	632.721	ug/mL	m
42) h	C9-C44 Total Petroleu BS	36.597	246071618	208.029	ug/mLm	
49) h	Total Resolved Hydroc...	38.277	258422081	218.470	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2016\Nov\Nov10\F611101614.D
Operator : FID6:NL
Acquired : 10 Nov 2016 10:41 pm using AcqMethod FID6A.M
Sample Name: SW110716LCS01
Instrument: FID6
Misc Info : 1X
Vial Number: 7
CurrentMeth: O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M



Form I
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Laboratory Control Sample Dup**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716LCSD01**
Associated Blank: **SW110716B01**
Concentration Units: **mg/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	11/11/16	1000	1	1	NLJr

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**0.205**

N/A - Not Applicable

Surrogate	% Recovery	Acceptance Range (%)
ortho-Terphenyl	96	50-130
d50-Tetracosane	92	50-130

12/07/16 13:25

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2016\Nov\Nov10\
Data File : F611101616.D
Signal(s) : FID1A.CH
Acq On : 11 Nov 2016 12:10 am
Operator : FID6:NL
Sample : SW110716LCSD01
Misc : 1X
ALS Vial : 8 Sample Multiplier: 1

NAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 11:05:01 2016
Quant Method : O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 07 17:13:19 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB611101601F
Blank File : F611101610.D

Sub List : TPH_QC_Samples - TPH_QC_Samples

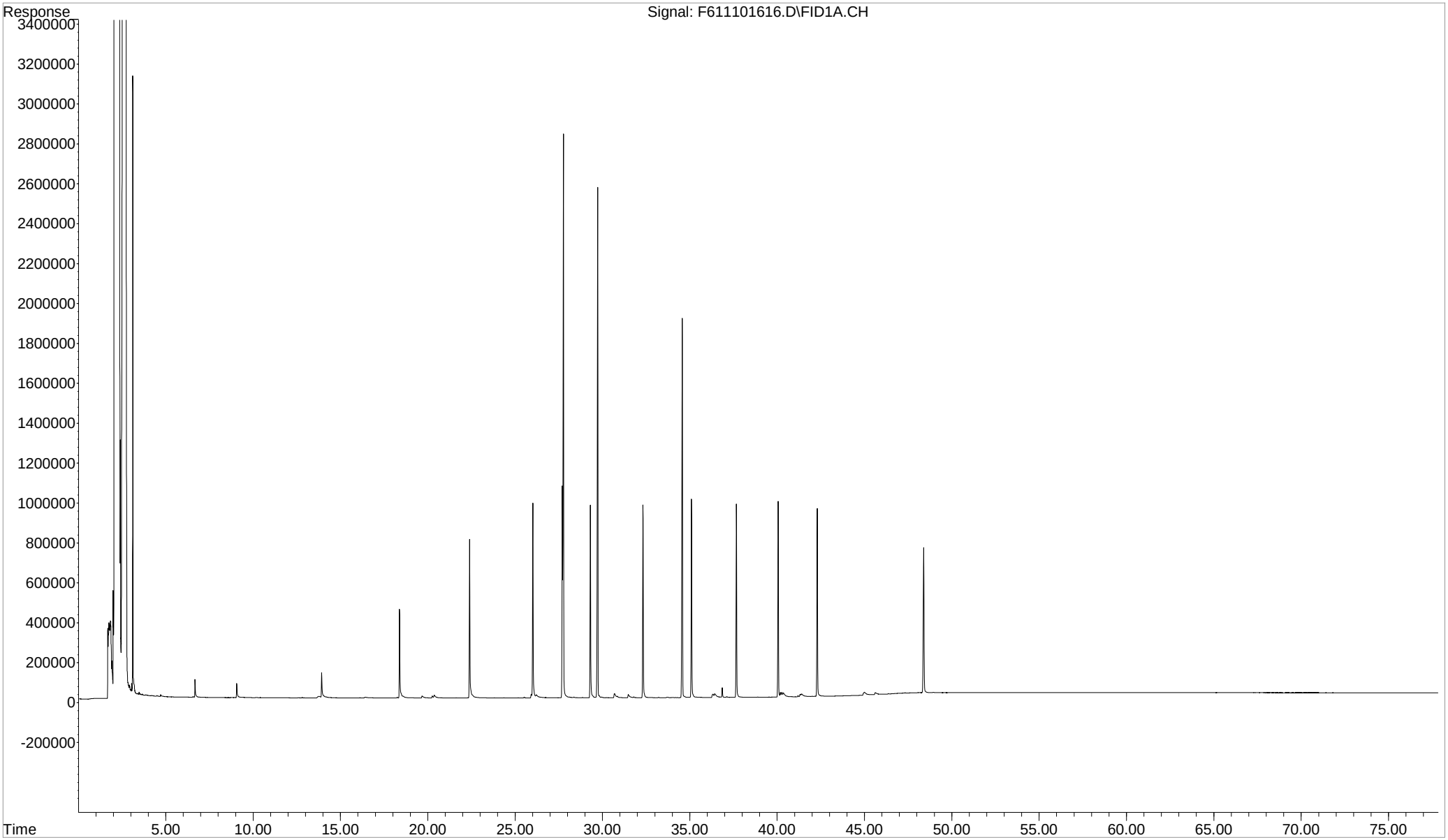
	Compound	R.T.	Response	Conc	Units	
	Internal Standards					
1) I	5-alpha-androstane	29.725	62551587	50.000	ug/mL	M4
	System Monitoring Compounds					
19) s	ortho-terphenyl	27.764	64261323	48.143	ug/mL	M4
Spiked Amount	50.000	Range	50 - 130	Recovery	=	96.29%
24) s	d50-Tetracosane	34.570	51680386	45.906	ug/mL	M4
Spiked Amount	50.000	Range	50 - 130	Recovery	=	91.81%
	Target Compounds					
3) t	n-Nonane (C9)	6.669	2048727	1.949	ug/mL	M4
4) t	n-Decane (C10)	9.055	2328952	2.120	ug/mL	M4
6) t	n-Dodecane (C12)	13.917	4717984	4.154	ug/mL	M4
9) t	n-Tetradecane (C14)	18.379	12091804	10.490	ug/mL	M4
12) t	n-Hexadecane (C16)	22.390	20905561	17.860	ug/mL	M4
16) T	n-Octadecane (C18)	26.012	23541109	19.713	ug/mL	M4
18) t	n-Nonadecane (C19)	27.699	22488099	18.954	ug/mL	M4
20) t	n-Eicosane (C20)	29.305	23412642	19.754	ug/mL	M4
22) t	n-Docosane (C22)	32.319	23925926	19.907	ug/mL	M4
25) t	n-Tetracosane (C24)	35.096	24431112	20.068	ug/mL	M4
27) t	n-Hexacosane (C26)	37.667	23930447	19.405	ug/mL	M4
29) t	n-Octacosane (C28)	40.060	23998257	19.723	ug/mL	M4
31) t	n-Triacontane (C30)	42.299	24210891	19.683	ug/mL	M4
37) t	n-Hexatriacontane (C36)	48.391	23745466	18.557	ug/mL	M4
42) h	C9-C44 Total Petroleu...	36.597	747067648	626.665	ug/mL	m
42) h	C9-C44 Total Petroleu BS	36.597	244711341	205.272	ug/mL	m
49) h	Total Resolved Hydroc...	38.277	274291699	230.085	ug/mL	m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2016\Nov\Nov10\F611101616.D
Operator : FID6:NL
Acquired : 11 Nov 2016 12:10 am using AcqMethod FID6A.M
Sample Name: SW110716LCSD01
Instrument: FID6
Misc Info : 1X
Vial Number: 8
CurrentMeth: O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M



Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **TO103015ANC03**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	NLJr

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
Total Petroleum Hydrocarbons (C9-C44)	554993	563000	101	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

12/07/16 16:21

Form I
Alaska North Slope Crude
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **TO103015ANC03**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	10/27/15	100	0.10382	10	1	NLJr

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**563000**

N/A - Not Applicable

12/07/16 16:21

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2015\Oct\Oct26\
Data File : F6102615042.D
Signal(s) : FID1A.CH
Acq On : 27 Oct 2015 7:54 pm
Operator : FID6:NLJr
Sample : TO103015ANC03
Misc : 1X FRAW36 10.382mg/mL
ALS Vial : 21 Sample Multiplier: 1

MJ
11-3-15

Integration File: SHCINT2.E
Quant Time: Nov 03 09:53:59 2015
Quant Method : O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Tue Nov 03 09:53:49 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB610261501F
Blank File : F6102615038.D

Sub List : Default - All compounds listed

	Compound	R.T.	Response	Conc	Units	
	Internal Standards					
1) I	5-alpha-androstane	31.735	57641879	50.000	ug/mL	M4
	System Monitoring Compounds					
19) s	ortho-terphenyl	29.695	62447799	50.770	ug/mL	M4
Spiked Amount	50.000	Range	50 - 130	Recovery	=	101.54%
24) s	d50-Tetracosane	36.362	53140595	51.223	ug/mL	M4
Spiked Amount	50.000	Range	50 - 130	Recovery	=	102.45%
	Target Compounds					
2) t	n-Octane (C8)	5.841	93641052	102.025	ug/mL	M4
3) t	n-Nonane (C9)	8.095	69958802	72.213	ug/mL	M4
4) t	n-Decane (C10)	10.613	57888179	57.190	ug/mL	M4
5) t	n-Undecane (C11)	13.144	54165515	52.580	ug/mL	M4
6) t	n-Dodecane (C12)	15.585	49087737	46.899	ug/mL	M4
7) t	n-Tridecane (C13)	17.902	45576633	43.345	ug/mL	M4
8) t	1380	19.584	10994907	10.351	ug/mL	M4
9) t	n-Tetradecane (C14)	20.096	43339322	40.800	ug/mL	M4
10) t	1470	21.383	15240260	14.103	ug/mL	M4
11) t	n-Pentadecane (C15)	22.170	49605706	45.905	ug/mL	M4
12) t	n-Hexadecane (C16)	24.134	39888794	36.980	ug/mL	M4
13) t	1650	25.047	12702752	11.682	ug/mL	M4
14) t	n-Heptadecane (C17)	26.002	34297518	31.541	ug/mL	M4
15) t	Pristane	26.096	27082459	24.915	ug/mL	M4
16) t	n-Octadecane (C18)	27.776	29918341	27.187	ug/mL	M4
17) t	Phytane	27.935	14605776	15.183	ug/mL	M4
18) t	n-Nonadecane (C19)	29.471	29648881	27.117	ug/mL	M4
20) t	n-Eicosane (C20)	31.086	27323214	25.018	ug/mL	M4
21) t	n-Heneicosane (C21)	32.630	26373098	23.995	ug/mL	M4
22) t	n-Docosane (C22)	34.113	24165159	21.818	ug/mL	M4
23) t	n-Tricosane (C23)	35.532	22225375	19.914	ug/mL	M4
25) t	n-Tetracosane (C24)	36.898	20939438	18.665	ug/mL	M4
26) t	n-Pentacosane (C25)	38.209	20471998	18.438	ug/mL	M4
27) t	n-Hexacosane (C26)	39.476	17072859	15.024	ug/mL	M4
28) t	n-Heptacosane (C27)	40.692	13750899	12.229	ug/mL	M4
29) t	n-Octacosane (C28)	41.869	10191375	9.089	ug/mL	M4
30) t	n-Nonacosane (C29)	43.006	10263995	9.089	ug/mL	M4
31) t	n-Triacontane (C30)	44.110	7667078	6.764	ug/mL	M4
32) t	n-Hentriacontane (C31)	45.175	7244500	6.345	ug/mL	M4
33) t	n-Dotriacontane (C32)	46.206	4885777	4.250	ug/mL	M4
34) t	n-Tritriacontane (C33)	47.214	3797337	3.496	ug/mL	M4
35) t	n-tetratriacontane (C34)	48.304	3506744	3.084	ug/mL	M4
36) t	n-Pentatriacontane (C35)	49.532	3466157	3.010	ug/mL	M4
37) t	n-Hexatriacontane (C36)	50.939	2212497	1.876	ug/mL	M4
38) t	n-Heptatriacontane (C37)	52.572	2096806	1.819	ug/mL	M4
39) t	n-Octatriacontane (C38)	54.486	1616808	1.430	ug/mL	M4
40) t	n-Nonatriacontane (C39)	56.732	1077790	0.921	ug/mL	M4
41) t	n-Tetracontane (C40)	59.394	1086150	0.928	ug/mL	M4
42) h	C9-C44 Total Petroleu...	38.830	6715097553	6112.629	ug/mL	m
42) h	C9-C44 Total Petroleu BS	38.830	6416814846	5841.107	ug/mL	m
44) h	C10-C28 DRO	26.229	4619808026	4205.325	ug/mL	m

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2015\Oct\Oct26\
Data File : F6102615042.D
Signal(s) : FID1A.CH
Acq On : 27 Oct 2015 7:54 pm
Operator : FID6:NLJr
Sample : TO103015ANC03
Misc : 1X FRAW36 10.382mg/mL
ALS Vial : 21 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 03 09:53:59 2015
Quant Method : O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Tue Nov 03 09:53:49 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB610261501F
Blank File : F6102615038.D

Sub List : Default - All compounds listed

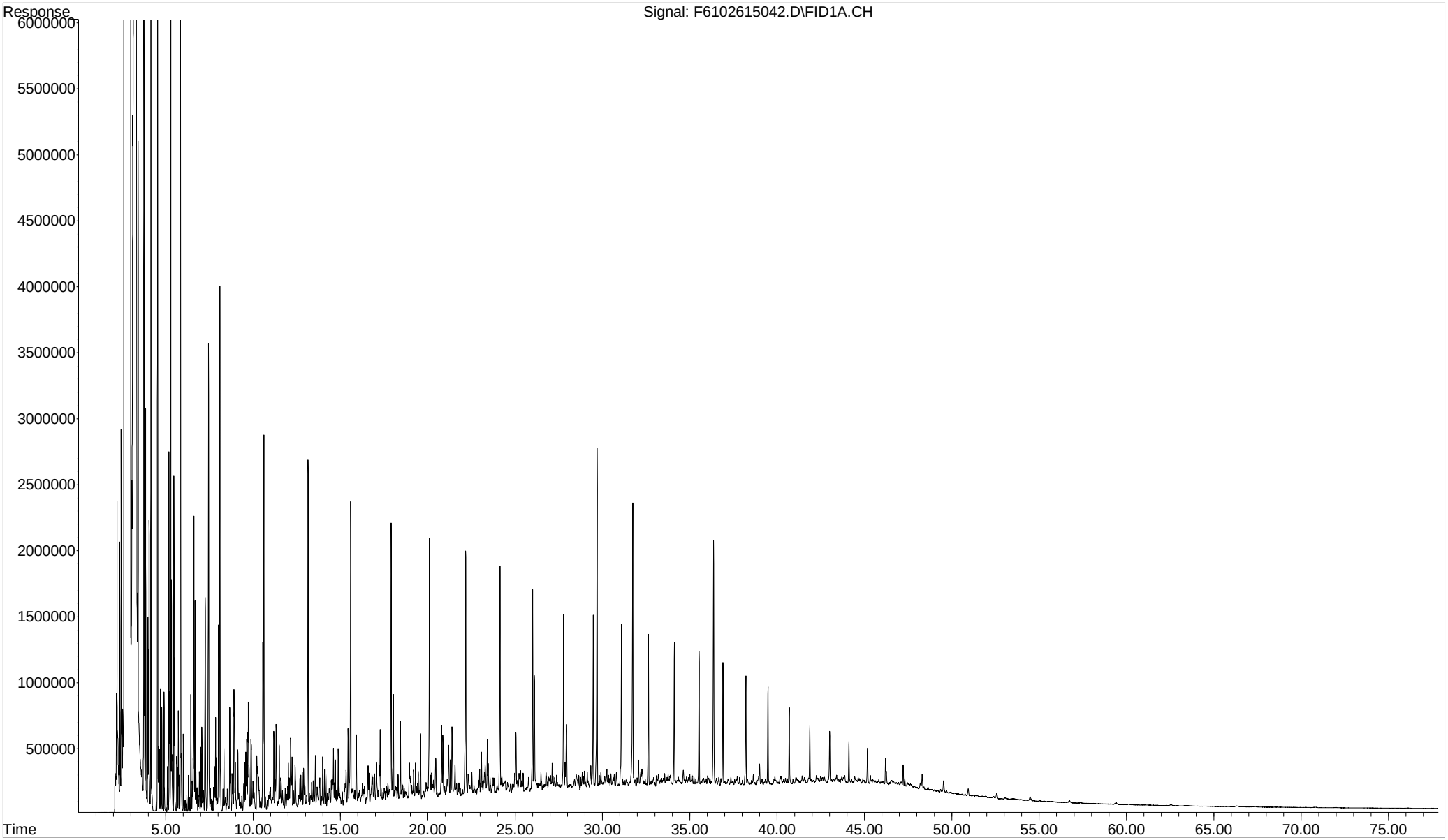
	Compound	R.T.	Response	Conc	Units
44) h	C10-C28 DRO BS	26.229	4583397713	4172.182	ug/mLm
46) h	Total Resolved Hydroc...	42.740	1974962133	1797.771	ug/mL m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2015\Oct\Oct26\F6102615042.D
Operator : FID6:NLJr
Acquired : 27 Oct 2015 7:54 pm using AcqMethod FID6A.M
Sample Name: TO103015ANC03
Instrument: FID6
Misc Info : 1X FRAW36 10.382mg/mL
Vial Number: 21
CurrentMeth: O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M



Form III
Spike Recovery Summary
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **TO103015ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	NLJr

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
Total Petroleum Hydrocarbons (C9-C44)	554993	600000	108	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

12/07/16 16:22

Form I
Alaska North Slope Crude
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **TO103015ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	10/27/15	100	0.10382	10	1	NLJr

Parameter	Result
Total Petroleum Hydrocarbons (C9-C44)	**600000**

N/A - Not Applicable

12/07/16 16:22

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615025.D
Signal(s) : FID2B.CH
Acq On : 27 Oct 2015 6:02 am
Operator : FID17:NL
Sample : TO103015ANC02
Misc : ,FRAW36 10.382mg/mL
ALS Vial : 63 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:31:40 2015
Quant Method : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 19 08:30:39 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1710261501R
Blank File : F17102615021.D

Sub List : Default - All compounds listed

	Compound	R.T.	Response	Conc	Units	
	Internal Standards					
1) I	5-alpha-androstane	31.381	62993161	50.000	ug/mL	M4
	System Monitoring Compounds					
19) s	ortho-terphenyl	29.358	66685118	49.464	ug/mL	M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	98.93%		
24) s	d50-Tetracosane	36.005	56609587	50.399	ug/mL	M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	100.80%		
	Target Compounds					
2) t	n-Octane (C8)	5.659	99153658	96.110	ug/mL	M4
3) t	n-Nonane (C9)	7.882	75549931	69.951	ug/mL	M4
4) t	n-Decane (C10)	10.379	63797059	57.134	ug/mL	M4
5) t	n-Undecane (C11)	12.897	58158963	51.656	ug/mL	M4
6) t	n-Dodecane (C12)	15.328	54099841	47.393	ug/mL	M4
7) t	n-Tridecane (C13)	17.638	49906316	43.497	ug/mL	M4
8) t	1380	19.314	11915193	10.262	ug/mL	M4
9) t	n-Tetradecane (C14)	19.823	46871416	40.369	ug/mL	M4
10) t	1470	21.107	17264386	14.628	ug/mL	M4
11) t	n-Pentadecane (C15)	21.889	54961790	46.569	ug/mL	M4
12) t	n-Hexadecane (C16)	23.845	42898821	36.466	ug/mL	M4
13) t	1650	24.749	16178967	13.640	ug/mL	M4
14) t	n-Heptadecane (C17)	25.705	37303202	31.449	ug/mL	M4
15) t	Pristane	25.798	29306941	24.595	ug/mL	M4
16) t	n-Octadecane (C18)	27.471	32591310	27.118	ug/mL	M4
17) t	Phytane	27.630	16478416	15.680	ug/mL	M4
18) t	n-Nonadecane (C19)	29.157	31332430	26.321	ug/mL	M4
20) t	n-Eicosane (C20)	30.763	34009779	28.716	ug/mL	M4
21) t	n-Heneicosane (C21)	32.297	27963825	23.426	ug/mL	M4
22) t	n-Docosane (C22)	33.770	26258304	21.891	ug/mL	M4
23) t	n-Tricosane (C23)	35.181	23349620	19.375	ug/mL	M4
25) t	n-Tetracosane (C24)	36.536	22234117	18.413	ug/mL	M4
26) t	n-Pentacosane (C25)	37.838	22029695	18.453	ug/mL	M4
27) t	n-Hexacosane (C26)	39.092	18435782	15.145	ug/mL	M4
28) t	n-Heptacosane (C27)	40.301	14530027	12.080	ug/mL	M4
29) t	n-Octacosane (C28)	41.470	10476590	8.750	ug/mL	M4
30) t	n-Nonacosane (C29)	42.596	10575487	8.787	ug/mL	M4
31) t	n-Triacontane (C30)	43.688	8294585	6.884	ug/mL	M4
32) t	n-Hentriacontane (C31)	44.743	6786919	5.623	ug/mL	M4
33) t	n-Dotriacontane (C32)	45.769	7658286	6.286	ug/mL	M4
34) t	n-Tritriacontane (C33)	46.758	4168971	3.618	ug/mL	M4
35) t	n-tetratriacontane (C34)	47.771	3917007	3.246	ug/mL	M4
36) t	n-Pentatriacontane (C35)	48.917	3501375	2.884	ug/mL	M4
37) t	n-Hexatriacontane (C36)	50.227	2236863	1.793	ug/mL	M4
38) t	n-Heptatriacontane (C37)	51.744	2172362	1.780	ug/mL	M4
39) t	n-Octatriacontane (C38)	53.504	1849231	1.545	ug/mL	M4
40) t	n-Nonatriacontane (C39)	55.556	1233055	0.994	ug/mL	M4
41) t	n-Tetracontane (C40)	58.011	1227799	0.990	ug/mL	M4
42) h	C9-C44 Total Petroleu...	40.600	7611738070	6430.187	ug/mL	m
42) h	C9-C44 Total Petroleu BS	40.600	7370774868	6226.628	ug/mLm	
44) h	C10-C28 DRO	25.935	5037808549	4255.802	ug/mL	m

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615025.D
Signal(s) : FID2B.CH
Acq On : 27 Oct 2015 6:02 am
Operator : FID17:NL
Sample : TO103015ANC02
Misc : ,FRAW36 10.382mg/mL
ALS Vial : 63 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:31:40 2015
Quant Method : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 19 08:30:39 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1710261501R
Blank File : F17102615021.D

Sub List : Default - All compounds listed

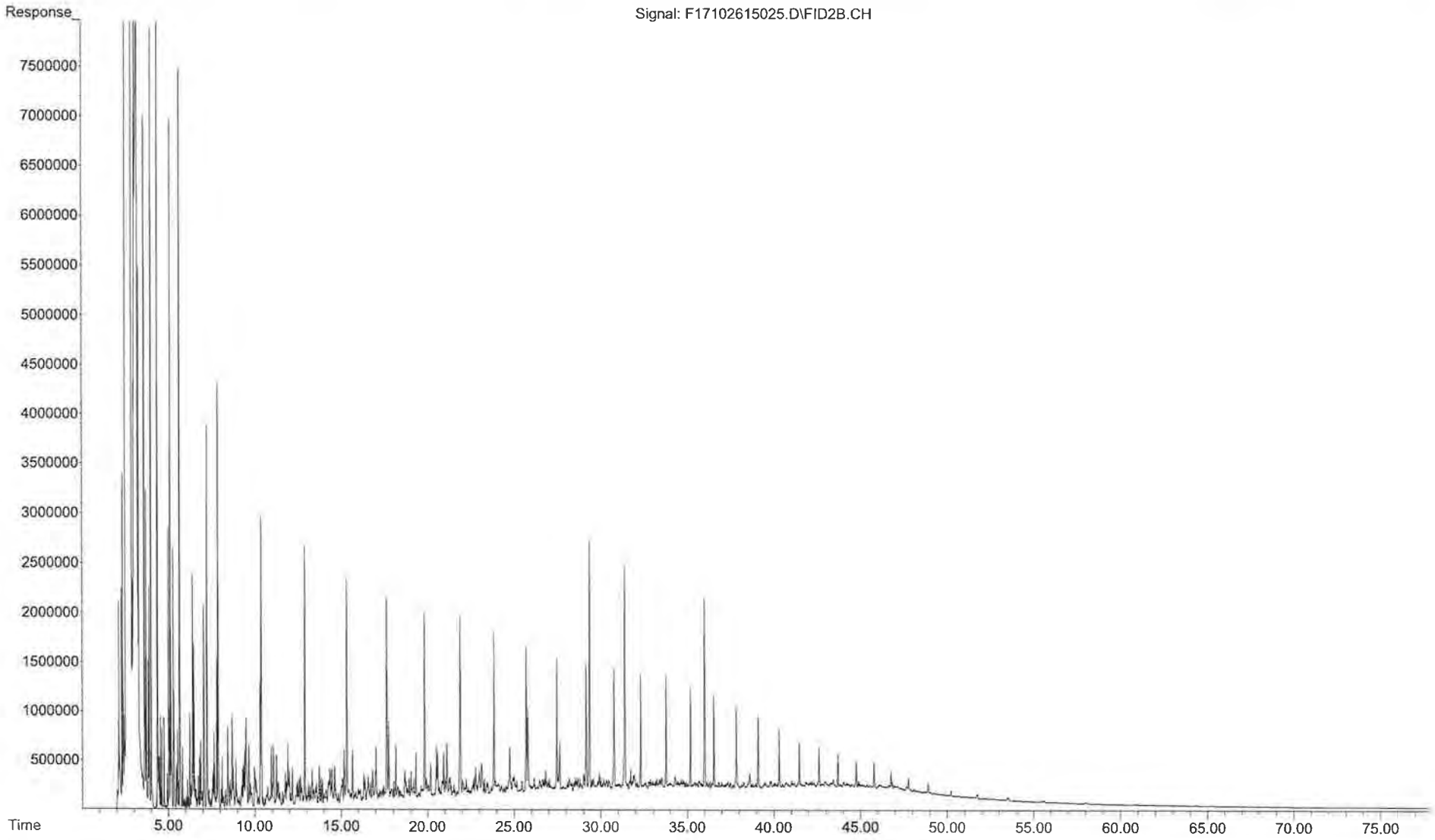
	Compound	R.T.	Response	Conc	Units
44) h	C10-C28 DRO BS	25.935	5028167431	4247.658	ug/mLm
45) h	Total Resolved Hydroc...	40.600	2369905691	2002.031	ug/mL m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615025.D
Operator : FID17:NL
Acquired : 27 Oct 2015 6:02 am using AcqMethod FID17.M
Instrument: FID17
Sample : TO103015ANC02
Misc Info : ,FRAW36 10.382mg/mL
ALS Vial : 63



Instrument Blank
Raw Data

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2015\Oct\Oct26\
Data File : F6102615038.D
Signal(s) : FID1A.CH
Acq On : 27 Oct 2015 4:53 pm
Operator : FID6:NLJr
Sample : IB610261501F
Misc : DCM
ALS Vial : 19 Sample Multiplier: 1

MJ9
11-3-15

Integration File: SHCINT2.E
Quant Time: Nov 03 09:30:38 2015
Quant Method : O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 02 19:42:55 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : TPH_DRO - TPH (C9-C44) & DRO (C10-C28)

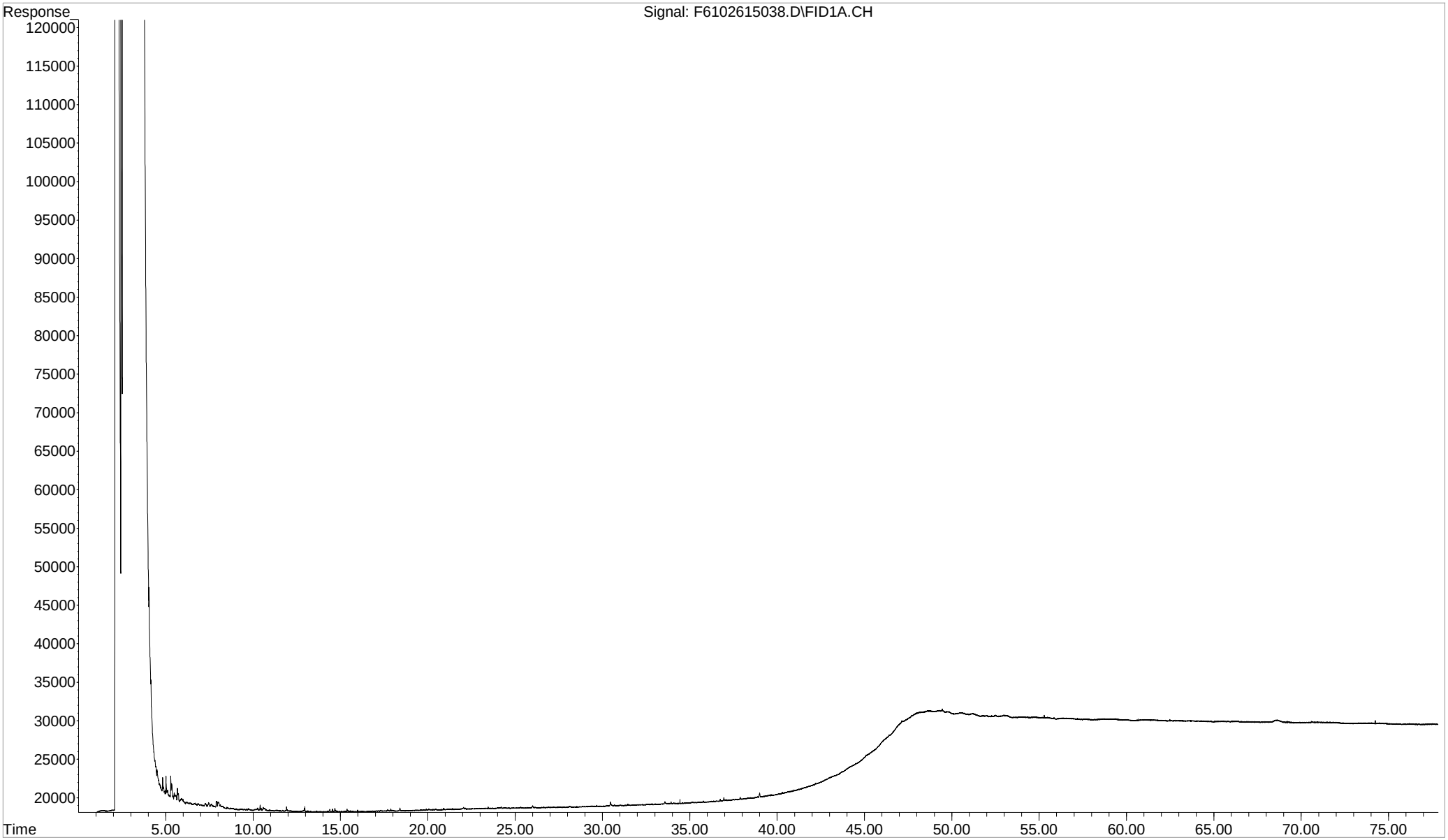
Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.728	22	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	0.000	0	N.D. ug/mL d
Spiked Amount 50.000	Range 50 - 130	Recovery	= 0.00%#
24) s d50-Tetracosane	0.000	0	N.D. ug/mL d
Spiked Amount 50.000	Range 50 - 130	Recovery	= 0.00%#
Target Compounds			
42) h C9-C44 Total Petroleu...	42.470	298282707	711404585.851 ug/mL M5
44) h C10-C28 DRO	26.325	36410313	86838636.731 ug/mL M5

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2015\Oct\Oct26\F6102615038.D
Operator : FID6:NLJr
Acquired : 27 Oct 2015 4:53 pm using AcqMethod FID6A.M
Sample Name: IB610261501F
Instrument: FID6
Misc Info : DCM
Vial Number: 19
CurrentMeth: O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615021.D
Signal(s) : FID2B.CH
Acq On : 27 Oct 2015 3:06 am
Operator : FID17:NL
Sample : IB1710261501R
Misc : DCM
ALS Vial : 61 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:18:43 2015
Quant Method : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 13 17:32:24 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : Default - All compounds listed

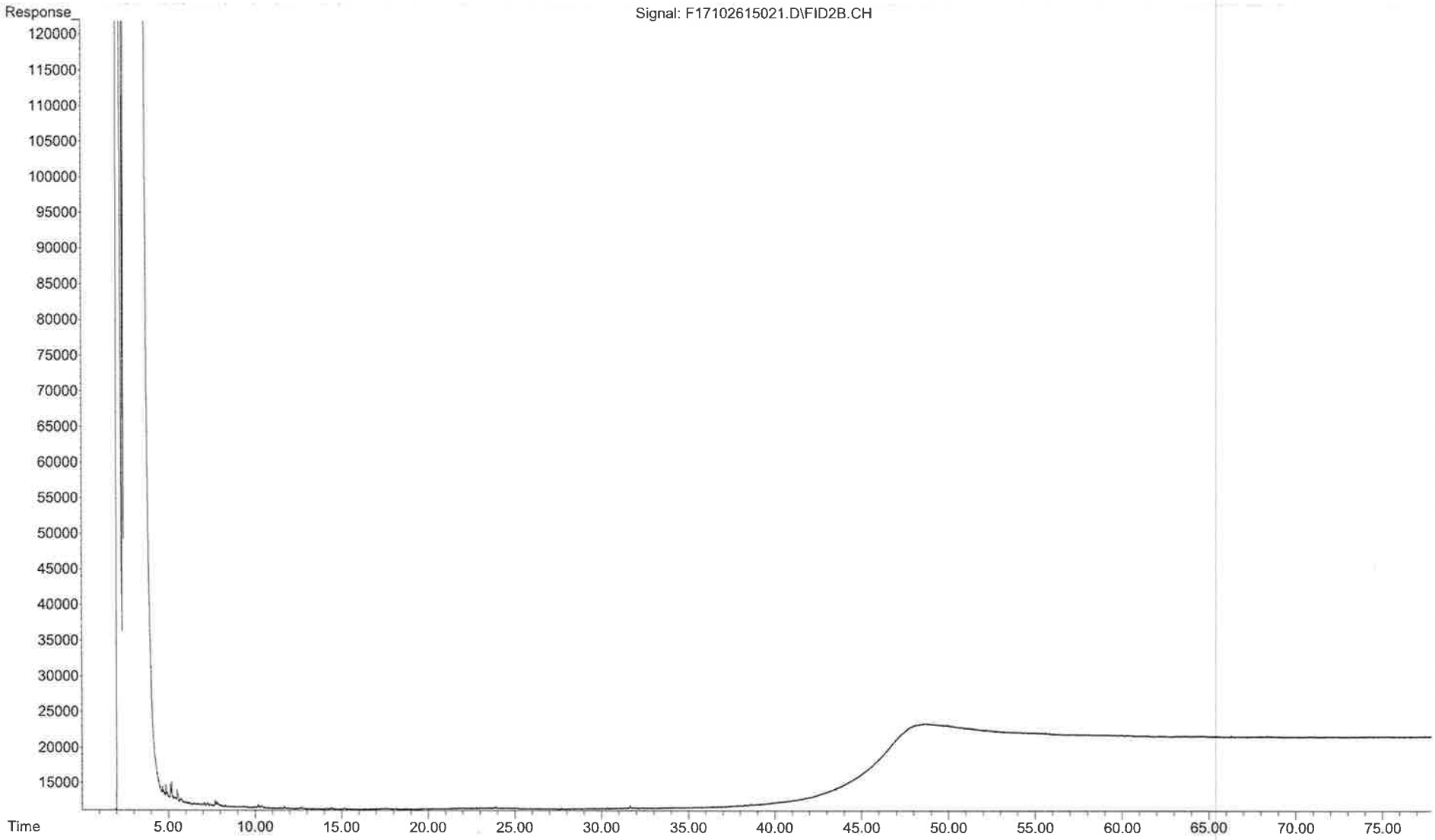
Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.400	3518	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	0.000	0	N.D. ug/mL d
Spiked Amount 50.000	Range 50 - 130	Recovery =	0.00%#
24) s d50-Tetracosane	0.000	0	N.D. ug/mL d
Spiked Amount 50.000	Range 50 - 130	Recovery =	0.00%#
Target Compounds			
42) h C9-C44 Total Petroleu...	40.600	240963202	3644153.223 ug/mL M5
44) h C10-C28 DRO	25.935	9641118	145805.291 ug/mL M5

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2C15\Oct\OCT26.SEC\
Data File : F17102615021.D
Operator : FID17:NL
Acquired : 27 Oct 2015 3:06 am using AcqMethod FID17.M
Instrument: FID17
Sample : IB1710261501R
Misc Info : DCM
ALS Vial : 61



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2016\Nov\Nov10\
Data File : F611101610.D
Signal(s) : FID1A.CH
Acq On : 10 Nov 2016 7:44 pm
Operator : FID6:NL
Sample : IB611101601F
Misc : DCM
ALS Vial : 5 Sample Multiplier: 1

MAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Nov 22 08:08:20 2016
Quant Method : O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 07 17:13:19 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

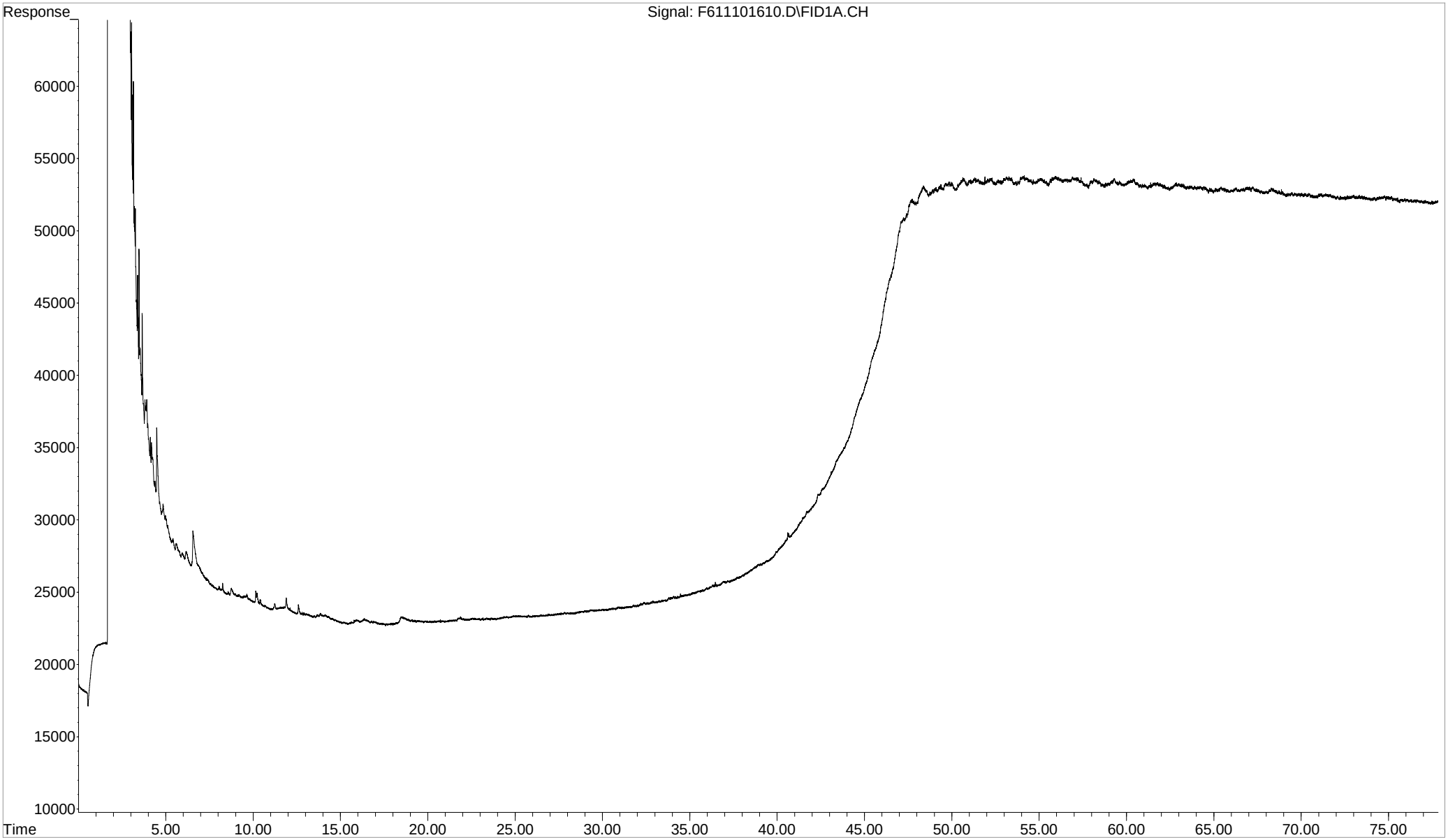
Sub List : TPH_DRO - TPH (C9-C44) & DRO (C10-C28)

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	29.785	3876	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	0.000	0	N.D. ug/mL
Spiked Amount 50.000	Range 50 - 130	Recovery	= 0.00%#
24) s d50-Tetracosane	0.000	0	N.D. ug/mL
Spiked Amount 50.000	Range 50 - 130	Recovery	= 0.00%#
Target Compounds			
42) h C9-C44 Total Petroleu...	36.597	502356307	6800999.166 ug/mL M5
46) h C10-C28 DRO	25.125	44866030	607405.196 ug/mL M5
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2016\Nov\Nov10\F611101610.D
Operator : FID6:NL
Acquired : 10 Nov 2016 7:44 pm using AcqMethod FID6A.M
Sample Name: IB611101601F
Instrument: FID6
Misc Info : DCM
Vial Number: 5
CurrentMeth: O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121607.D
Signal(s) : FID2B.CH
Acq On : 12 Nov 2016 7:46 pm
Operator : FID17:WR
Sample : IB1711121601R
Misc : DCM
ALS Vial : 54 Sample Multiplier: 1

NAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 10:34:36 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : TPH - TPH

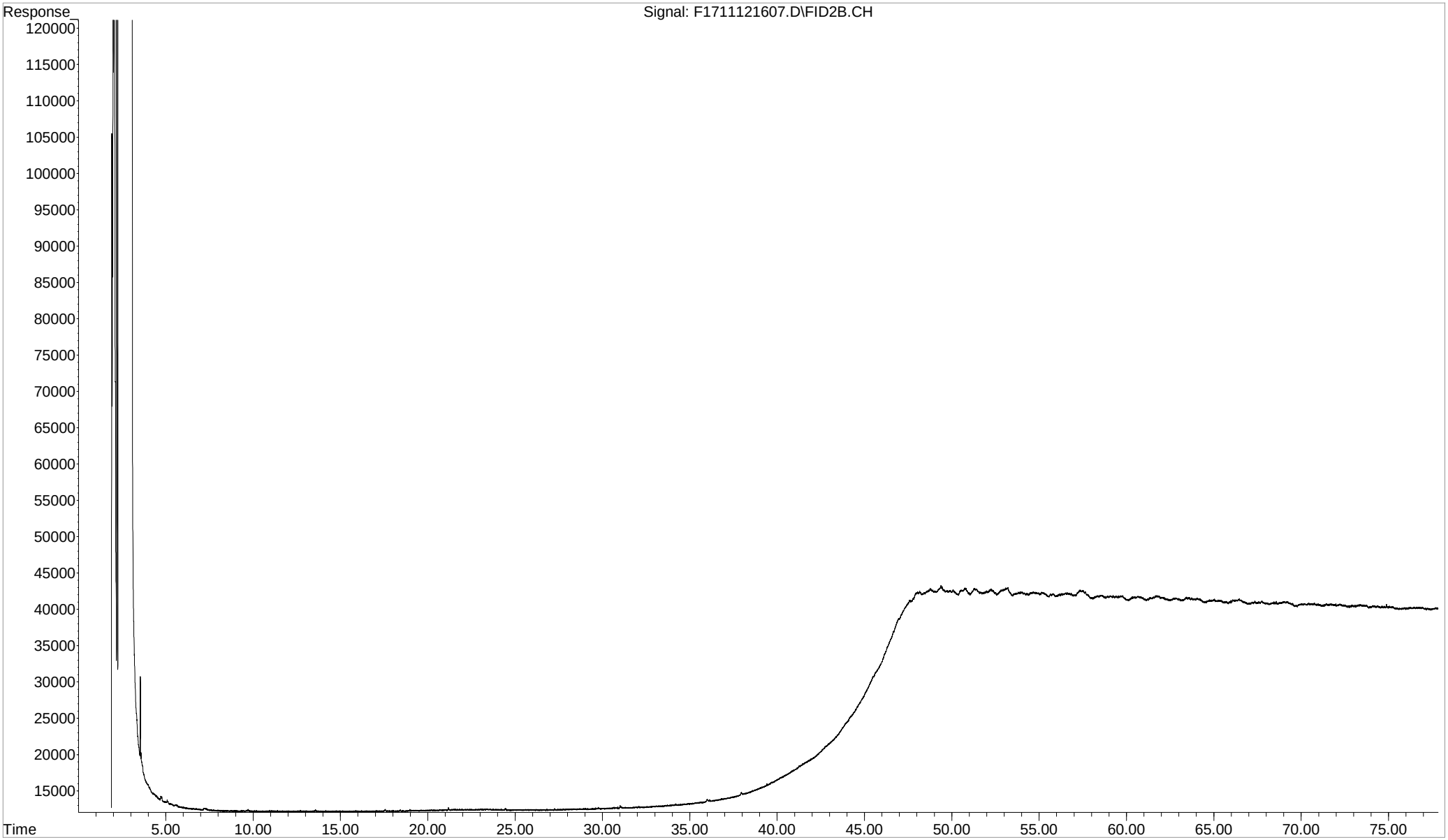
Compound	R.T.	Response	Conc	Units
Internal Standards				
1) I 5-alpha-androstane	30.657	7404	50.000	ug/mL M4
System Monitoring Compounds				
19) s ortho-terphenyl	0.000	0	N.D.	ug/mL
Spiked Amount 50.000	Range 50 - 130	Recovery	=	0.00%#
24) s d50-Tetracosane	0.000	0	N.D.	ug/mL
Spiked Amount 50.000	Range 50 - 130	Recovery	=	0.00%#
Target Compounds				
42) h C9-C44 Total Petroleu...	38.899	550457662	3956320.072	ug/mL M5

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121607.D
Operator : FID17:WR
Acquired : 12 Nov 2016 7:46 pm using AcqMethod FID17.M
Sample Name: IB1711121601R
Instrument: FID17
Misc Info : DCM
Vial Number: 54
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121635.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 4:22 pm
Operator : FID17:WR
Sample : IB1711121602R
Misc : DCM
ALS Vial : 68 Sample Multiplier: 1

MAL
12/7/16

Integration File: SHCINT2.E
Quant Time: Dec 07 10:38:42 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : TPH - TPH

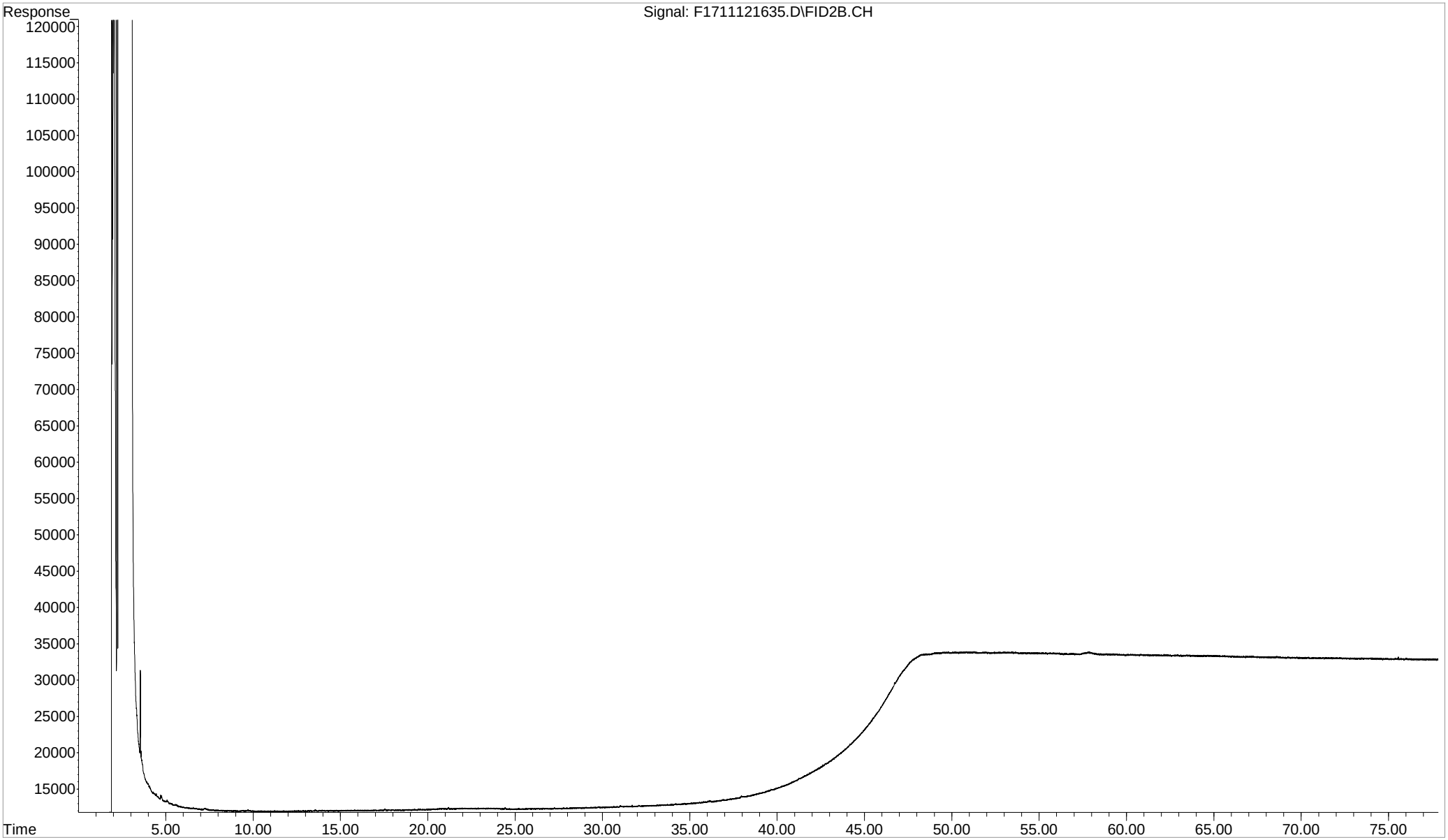
Compound	R.T.	Response	Conc	Units
Internal Standards				
1) I 5-alpha-androstane	30.688	1711	50.000	ug/mL M4
System Monitoring Compounds				
19) s ortho-terphenyl	0.000	0	N.D.	ug/mL
Spiked Amount 50.000	Range 50 - 130	Recovery	=	0.00%#
24) s d50-Tetracosane	0.000	0	N.D.	ug/mL
Spiked Amount 50.000	Range 50 - 130	Recovery	=	0.00%#
Target Compounds				
42) h C9-C44 Total Petroleu...	38.899	400425231	12454747.899	ug/mL M5

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121635.D
Operator : FID17:WR
Acquired : 13 Nov 2016 4:22 pm using AcqMethod FID17.M
Sample Name: IB1711121602R
Instrument: FID17
Misc Info : DCM
Vial Number: 68
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Analysis log File

Total Files Reported in Log : 28
Log Generated From Directory: O:\Forensics\Data\FID6\2015\Oct\Oct26\

No.	DATA FILE	INJ METH	SAMPLE NAME	MISC	DATE INJ'D
1	F6102615002.D	FID6A.M	ANS	FRAW36 10.382mg/mL	10/26/2015 2:09 pm
2	F6102615004.D	FID6A.M	C610261501F	FRAW36 10.382MG/ML	10/26/2015 3:37 pm
3	F6102615006.D	FID6A.M			10/26/2015 5:05 pm
4	F6102615008.D	FID6A.M			10/26/2015 6:34 pm
5	F6102615010.D	FID6A.M			10/26/2015 8:04 pm
6	F6102615012.D	FID6A.M			10/26/2015 9:33 pm
7	F6102615014.D	FID6A.M			10/26/2015 11:02 pm
8	F6102615016.D	FID6A.M			10/27/2015 12:31 am
9	F6102615018.D	FID6A.M			10/27/2015 2:01 am
10	F6102615020.D	FID6A.M			10/27/2015 3:30 am
11	F6102615022.D	FID6A.M	L1 Primer	L1 Primer	10/27/2015 4:59 am
12	F6102615024.D	FID6A.M	✓ I610261501F	,FRAW60 1ug/ml	10/27/2015 6:28 am
13	F6102615026.D	FID6A.M	✓ I610261502F	,FRAW61 10ug/ml	10/27/2015 7:57 am
14	F6102615028.D	FID6A.M	✓ I610261503F	,FRAW35 50ug/ml	10/27/2015 9:26 am
15	F6102615030.D	FID6A.M	✓ I610261504F	,FRAW62 100ug/ml	10/27/2015 10:56 am
16	F6102615032.D	FID6A.M	✓ I610261505F	,FRAW63 200ug/ml	10/27/2015 12:25 pm
17	F6102615034.D	FID6A.M	✓ I610261506F	,FRAW64 500ug/ml	10/27/2015 1:54 pm
18	F6102615036.D	FID6A.M	DCM		10/27/2015 3:24 pm
19	F6102615038.D	FID6A.M	✓ IB610261501F	DCM	10/27/2015 4:53 pm
20	F6102615040.D	FID6A.M	✓ CQ610261501F	,FRAW65 50ug/ml	10/27/2015 6:23 pm
21	F6102615042.D	FID6A.M	✓ TO103015ANC03	1X FRAW36 10.382mg/m..	10/27/2015 7:54 pm
22	F6102615044.D	FID6A.M	DCM	DCM	10/27/2015 9:23 pm
23	F6102615046.D	FID6A.M	IB610261502F	DCM	10/27/2015 10:53 pm
24	F6102615048.D	FID6A.M			10/28/2015 12:22 am
25	F6102615050.D	FID6A.M			10/28/2015 1:51 am
26	F6102615052.D	FID6A.M			10/28/2015 3:20 am
27	F6102615054.D	FID6A.M			10/28/2015 4:50 am
28	F6102615056.D	FID6A.M			10/28/2015 6:19 am

Method: HC6102615F

MEB
11-3-15

Analysis log File

11/20/15

Total Files Reported in Log : 16
Log Generated From Directory: O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\

No.	DATA FILE	INJ METH	SAMPLE NAME	MISC	DATE INJ'D
1	F17102615001.D	FID17.M	Primer	Primer	10/26/2015 11:48 a
2	F17102615003.D	FID17.M	DCM	DCM	10/26/2015 1:16 p
3	F17102615005.D	FID17.M	L1 Primer	Primer	10/26/2015 3:20 p
4	F17102615007.D	FID17.M	I1710261501R	,FRAW60 1ug/ml	10/26/2015 4:48 p
5	F17102615009.D	FID17.M	I1710261502R	,FRAW61 10ug/ml	10/26/2015 6:17 p
6	F17102615011.D	FID17.M	I1710261503R ICAL	,FRAW35 50ug/ml	10/26/2015 7:45 p
7	F17102615013.D	FID17.M	I1710261504R	,FRAW62 100ug/ml	10/26/2015 9:13 p
8	F17102615015.D	FID17.M	I1710261505R files	,FRAW63 200ug/ml	10/26/2015 10:42 p
9	F17102615017.D	FID17.M	I1710261506R	,FRAW64 500ug/ml	10/27/2015 12:10 a
10	F17102615019.D	FID17.M	DCM	DCM	10/27/2015 1:38 a
11	F17102615021.D	FID17.M	IB1710261501R	DCM	10/27/2015 3:06 a
12	F17102615023.D	FID17.M	CQ1710261501R ✓ PASS	,FRAW65 50ug/ml	10/27/2015 4:34 a
13	F17102615025.D	FID17.M	TO103015ANC02 ✓ PASS	,FRAW36 10.382mg/mL	10/27/2015 6:02 a
14	F17102615027.D	FID17.M	DCM	DCM	10/27/2015 7:30 a
15	F17102615029.D	FID17.M	IB1710261502R	DCM	10/27/2015 8:59 a
16	F17102615031.D	FID17.M			10/27/2015 10:27 a

SeqLog 1.0 - (c) 2009 Abacus Database Applications

Analysis log File

12/7/16

Total Files Reported in Log : 59
Log Generated From Directory: O:\Forensics\Data\FID6\2016\Nov\Nov10\

No.	DATA FILE	INJ METH	SAMPLE NAME	MISC	DATE INJ'D
1	F611071602.D	FID6A.M	Low Level	Low Level Standard	11/10/2016 1:49 pm
2	F611101604.D	FID6A.M	ANS	ANS	11/10/2016 3:18 pm
3	✓F611101606.D	FID6A.M	C611101601F	FRAX76 50ug/mL	11/10/2016 4:46 pm
4	F611101608.D	FID6A.M	DCM	DCM	11/10/2016 6:15 pm
5	✓F611101610.D	FID6A.M	IB611101601F	DCM	11/10/2016 7:44 pm
6	✓F611101612.D	FID6A.M	SW110716B01	1X	11/10/2016 9:13 pm
7	✓F611101614.D	FID6A.M	SW110716LCS01	1X	11/10/2016 10:41 pm
8	✓F611101616.D	FID6A.M	SW110716LCSD01	1X	11/11/2016 12:10 am
9	✓F611101618.D	FID6A.M	1611004-07		11/11/2016 1:39 am
10	✓F611101620.D	FID6A.M	1611004-08		11/11/2016 3:08 am
11	✓F611101622.D	FID6A.M	1611004-09		11/11/2016 4:37 am
12	✓F611101624.D	FID6A.M	1611004-09D		11/11/2016 6:06 am
13	F611101626.D	FID6A.M	L1635207-22	WG952621,WG949943,IC..	11/11/2016 7:34 am
14	F611101628.D	FID6A.M	L1635207-23	WG952621,WG949943,IC..	11/11/2016 9:03 am
15	F611101630.D	FID6A.M	L1635207-25	WG952621,WG949943,IC..	11/11/2016 10:32 am
16	F611101632.D	FID6A.M	L1635207-26	WG952621,WG949943,IC..	11/11/2016 12:00 pm
17	F611101634.D	FID6A.M	L1635207-27	WG952621,WG949943,IC..	11/11/2016 1:29 pm
18	✓F611101636.D	FID6A.M	C611101602F	FRAX76 50ug/mL	11/11/2016 6:15 pm
19	F611101638.D	FID6A.M	DCM	DCM	11/11/2016 7:44 pm
20	F611101640.D	FID6A.M	IB611101602F	DCM	11/11/2016 9:12 pm
21	F611101642.D	FID6A.M	L1635207-28	WG952621,WG949943,IC..	11/11/2016 10:41 pm
22	F611101644.D	FID6A.M	L1635207-29	WG952621,WG949943,IC..	11/12/2016 12:09 am
23	F611101646.D	FID6A.M	L1635207-30	WG952621,WG949943,IC..	11/12/2016 1:38 am
24	F611101648.D	FID6A.M	L1635207-31	WG952621,WG949943,IC..	11/12/2016 3:07 am
25	F611101650.D	FID6A.M	L1635207-32	WG952621,WG949943,IC..	11/12/2016 4:36 am
26	F611101652.D	FID6A.M	L1635207-33	WG952621,WG949943,IC..	11/12/2016 6:05 am
27	F611101654.D	FID6A.M	L1635207-34	WG952621,WG949943,IC..	11/12/2016 7:34 am
28	F611101656.D	FID6A.M	L1635207-35	WG952621,WG949943,IC..	11/12/2016 9:03 am
29	F611101658.D	FID6A.M	L1635207-36	WG952621,WG949943,IC..	11/12/2016 10:31 am
30	F611101660.D	FID6A.M	WG952621-3	WG952621,,ICAL11643,..	11/12/2016 12:00 pm
31	F611101662.D	FID6A.M	DCM	DCM	11/12/2016 1:28 pm
32	F611101664.D	FID6A.M	IB611101603F	DCM	11/12/2016 2:57 pm
33	F611101666.D	FID6A.M	WG950741-1	WG951561,WG950741,IC..	11/12/2016 4:26 pm
34	F611101668.D	FID6A.M	WG950741-2	WG951561,WG950741,IC..	11/12/2016 5:54 pm
35	F611101670.D	FID6A.M	WG950741-3	WG951561,WG950741,IC..	11/12/2016 7:23 pm
36	F611101672.D	FID6A.M	L1635758-01	WG951561,WG950741,IC..	11/12/2016 8:51 pm
37	F611101674.D	FID6A.M	L1635758-02	WG951561,WG950741,IC..	11/12/2016 10:20 pm
38	F611101676.D	FID6A.M	L1635758-03	WG951561,WG950741,IC..	11/12/2016 11:49 pm
39	F611101678.D	FID6A.M	L1635758-04	WG951561,WG950741,IC..	11/13/2016 1:18 am
40	F611101680.D	FID6A.M	L1635758-05	WG951561,WG950741,IC..	11/13/2016 2:47 am
41	F611101682.D	FID6A.M	L1635758-07	WG951561,WG950741,IC..	11/13/2016 4:16 am
42	F611101684.D	FID6A.M	L1635758-08	WG951561,WG950741,IC..	11/13/2016 5:44 am
43	F611101686.D	FID6A.M	L1635758-09	WG951561,WG950741,IC..	11/13/2016 7:13 am
44	F611101688.D	FID6A.M	L1635758-10	WG951561,WG950741,IC..	11/13/2016 8:42 am
45	F611101690.D	FID6A.M	WG952620-5	WG952620,,ICAL11643,..	11/13/2016 10:10 am
46	F611101692.D	FID6A.M	DCM	DCM	11/13/2016 11:39 am
47	F611101694.D	FID6A.M	IB611101604F	DCM	11/13/2016 1:08 pm
48	F611101696.D	FID6A.M	L1635758-11	WG951561,WG950741,IC..	11/13/2016 2:36 pm
49	F611101698.D	FID6A.M	L1635942-01	WG951561,WG950741,IC..	11/13/2016 4:05 pm
50	F6111016100.D	FID6A.M	L1635942-02	WG951561,WG950741,IC..	11/13/2016 5:33 pm
51	F6111016102.D	FID6A.M	L1635942-03	WG951561,WG950741,IC..	11/13/2016 7:02 pm
52	F6111016104.D	FID6A.M	L1635942-04	WG951561,WG950741,IC..	11/13/2016 8:31 pm
53	F6111016106.D	FID6A.M	L1635942-05	WG951561,WG950741,IC..	11/13/2016 10:00 pm
54	F6111016108.D	FID6A.M	L1635942-07	WG951561,WG950741,IC..	11/13/2016 11:29 pm
55	F6111016110.D	FID6A.M	L1635207-09D,42,4	WG952620,WG949639,IC..	11/14/2016 12:58 am
56	F6111016112.D	FID6A.M	L1635207-18D,42,4	WG952620,WG949639,IC..	11/14/2016 2:27 am
57	F6111016114.D	FID6A.M	WG952620-6	WG952620,,ICAL11643,..	11/14/2016 3:55 am
58	F6111016116.D	FID6A.M	DCM	DCM	11/14/2016 5:24 am
59	F6111016118.D	FID6A.M	IB611101605F	DCM	11/14/2016 6:53 am

Processing Method: HC6102615F.M CCV - FRAX76 - 50ug/mL

Analysis log File

12/7/16

Total Files Reported in Log : 24
Log Generated From Directory: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\

No.	DATA FILE	INJ METH	SAMPLE NAME	MISC	DATE INJ'D
1	F1711121601.D	FID17.M	ANS	ANS	11/12/2016 3:21 pm
2	✓F1711121603.D	FID17.M	C1711121601R	FRAX76 50ug/mL	11/12/2016 4:49 pm
3	F1711121605.D	FID17.M	DCM	DCM	11/12/2016 6:17 pm
4	✓F1711121607.D	FID17.M	IB1711121601R	DCM	11/12/2016 7:46 pm
5	✓F1711121609.D	FID17.M	SO111116B03	1X ETR 1611004	11/12/2016 9:14 pm
6	✓F1711121611.D	FID17.M	SO111116LCS02	1X ETR 1611004	11/12/2016 10:42 pm
7	✓F1711121613.D	FID17.M	SO111116LCSD02	1X ETR 1611004	11/13/2016 12:11 am
8	✓F1711121615.D	FID17.M	SO111016B02	1X ETR 1611004	11/13/2016 1:39 am
9	✓F1711121617.D	FID17.M	SO111016LCS02	1X ETR 1611004	11/13/2016 3:07 am
10	✓F1711121619.D	FID17.M	SO111016LCSD02	1X ETR 1611004	11/13/2016 4:36 am
11	✓F1711121621.D	FID17.M	1611004-01	1X	11/13/2016 6:04 am
12	✓F1711121623.D	FID17.M	1611004-02	1X	11/13/2016 7:33 am
13	✓F1711121625.D	FID17.M	1611004-02D	1X	11/13/2016 9:01 am
14	✓F1711121627.D	FID17.M	1611004-03	1X	11/13/2016 10:29 am
15	✓F1711121629.D	FID17.M	1611004-04	1X	11/13/2016 11:57 am
16	✓F1711121631.D	FID17.M	C1711121602R	FRAX76 50ug/mL	11/13/2016 1:26 pm
17	F1711121633.D	FID17.M	DCM	DCM	11/13/2016 2:54 pm
18	✓F1711121635.D	FID17.M	IB1711121602R	DCM	11/13/2016 4:22 pm
19	✓F1711121637.D	FID17.M	1611004-05	1X	11/13/2016 5:50 pm
20	✓F1711121639.D	FID17.M	1611004-05D	1X	11/13/2016 7:19 pm
21	✓F1711121641.D	FID17.M	1611004-06	1X	11/13/2016 8:47 pm
22	✓F1711121643.D	FID17.M	C1711121603R	FRAX 76 50ug/mL	11/13/2016 10:15 pm
23	F1711121645.D	FID17.M	DCM	DCM	11/13/2016 11:44 pm
24	F1711121647.D	FID17.M	IB1711121603R	DCM	11/14/2016 1:12 am

Processing Method: HC17102615R.m CCV - FRAX76 - 50ug/mL

Supporting Quality Control Results

Form IV
Method Blank Summary
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116B03**
Date Analyzed: **11/12/16 21:14**

Client ID	Lab ID	Date/Time Analyzed
LCS	SO111116LCS02	11/12/16 22:42
LCSD	SO111116LCSD02	11/13/16 00:11
NFNP-01	1611004-04	11/13/16 11:57
NFNP-02	1611004-05	11/13/16 17:50
NFNP-02	1611004-05 D	11/13/16 19:19
NFNP-03	1611004-06	11/13/16 20:47

N/A - Not Applicable

320 Forbes Blvd, Mansfield, MA 02048, (508) 822-9300, Fax (508) 822-3288

Form IV
Method Blank Summary
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016B02**
Date Analyzed: **11/13/16 01:39**

Client ID	Lab ID	Date/Time Analyzed
LCS	SO111016LCS02	11/13/16 03:07
LCSD	SO111016LCSD02	11/13/16 04:36
NFSB-02(MW)	1611004-01	11/13/16 06:04
ENV-9MW	1611004-02	11/13/16 07:33
ENV-9MW	1611004-02 D	11/13/16 09:01
ENV-3MW	1611004-03	11/13/16 10:29

N/A - Not Applicable

320 Forbes Blvd, Mansfield, MA 02048, (508) 822-9300, Fax (508) 822-3288

Form IV
Method Blank Summary
Total Saturated Hydrocarbons by GC/FID

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716B01**
Date Analyzed: **11/10/16 21:13**

Client ID	Lab ID	Date/Time Analyzed
LCS	SW110716LCS01	11/10/16 22:41
LCSD	SW110716LCSD01	11/11/16 00:10
NFSB-08(MW)	1611004-07	11/11/16 01:39
NFSB-01(MW)	1611004-08	11/11/16 03:08
DUP-1	1611004-09	11/11/16 04:37
DUP-1	1611004-09 D	11/11/16 06:06

N/A - Not Applicable

320 Forbes Blvd, Mansfield, MA 02048, (508) 822-9300, Fax (508) 822-3288

Analysis log File

Total Files Reported in Log : 28
Log Generated From Directory: O:\Forensics\Data\FID6\2015\Oct\Oct26\

No.	DATA FILE	INJ METH	SAMPLE NAME	MISC	DATE INJ'D
1	F6102615002.D	FID6A.M	ANS	FRAW36 10.382mg/mL	10/26/2015 2:09 pm
2	F6102615004.D	FID6A.M	C610261501F	FRAW36 10.382MG/ML	10/26/2015 3:37 pm
3	F6102615006.D	FID6A.M			10/26/2015 5:05 pm
4	F6102615008.D	FID6A.M			10/26/2015 6:34 pm
5	F6102615010.D	FID6A.M			10/26/2015 8:04 pm
6	F6102615012.D	FID6A.M			10/26/2015 9:33 pm
7	F6102615014.D	FID6A.M			10/26/2015 11:02 pm
8	F6102615016.D	FID6A.M			10/27/2015 12:31 am
9	F6102615018.D	FID6A.M			10/27/2015 2:01 am
10	F6102615020.D	FID6A.M			10/27/2015 3:30 am
11	F6102615022.D	FID6A.M	L1 Primer	L1 Primer	10/27/2015 4:59 am
12	F6102615024.D	FID6A.M	I610261501F	,FRAW60 1ug/ml	10/27/2015 6:28 am
13	F6102615026.D	FID6A.M	I610261502F	,FRAW61 10ug/ml	10/27/2015 7:57 am
14	F6102615028.D	FID6A.M	I610261503F	,FRAW35 50ug/ml	10/27/2015 9:26 am
15	F6102615030.D	FID6A.M	I610261504F	,FRAW62 100ug/ml	10/27/2015 10:56 am
16	F6102615032.D	FID6A.M	I610261505F	,FRAW63 200ug/ml	10/27/2015 12:25 pm
17	F6102615034.D	FID6A.M	I610261506F	,FRAW64 500ug/ml	10/27/2015 1:54 pm
18	F6102615036.D	FID6A.M	DCM		10/27/2015 3:24 pm
19	F6102615038.D	FID6A.M	IB610261501F	DCM	10/27/2015 4:53 pm
20	F6102615040.D	FID6A.M	CQ610261501F	,FRAW65 50ug/ml	10/27/2015 6:23 pm
21	F6102615042.D	FID6A.M	TO103015ANC03	1X FRAW36 10.382mg/m..	10/27/2015 7:54 pm
22	F6102615044.D	FID6A.M	DCM	DCM	10/27/2015 9:23 pm
23	F6102615046.D	FID6A.M	IB610261502F	DCM	10/27/2015 10:53 pm
24	F6102615048.D	FID6A.M			10/28/2015 12:22 am
25	F6102615050.D	FID6A.M			10/28/2015 1:51 am
26	F6102615052.D	FID6A.M			10/28/2015 3:20 am
27	F6102615054.D	FID6A.M			10/28/2015 4:50 am
28	F6102615056.D	FID6A.M			10/28/2015 6:19 am

Method: HC6102615F

11-3-15

SeqLog 1.0 - (c) 2009 Abacus Database Applications

Response Factor Report FID6

Method Path : O:\Forensics\Data\FID6\2016\Feb\FEB24\
Method File : HC6102615F.M
Title : FID Forensics
Last Update : Wed Mar 02 11:45:35 2016
Response Via : Initial Calibration

Calibration Files
1 =F6102615024.D 10 =F6102615026.D 50 =F6111715028.D 100 =F6102615030.D 200 =F6102615032.D 500 =F6102615034.D

		Compound	1	10	50	100	200	500	Avg	%RSD
1)	I	5-alpha-androstane	----------ISTD----------							
2)	t	n-Octane (C8)	0.756	0.794	0.816	0.824	0.791		0.796	3.31
3)	t	n-Nonane (C9)	0.789	0.838	0.859	0.868	0.847		0.840	3.70
4)	t	n-Decane (C10)	0.821	0.874	0.897	0.907	0.891		0.878	3.88
5)	t	n-Undecane (C11)	0.831	0.891	0.915	0.923	0.907		0.894	4.12
6)	t	n-Dodecane (C12)	0.845	0.905	0.930	0.938	0.921		0.908	4.07
7)	t	n-Tridecane (...	0.853	0.909	0.935	0.940	0.923		0.912	3.86
8)	t	1380	0.864	0.917	0.945	0.949	0.932		0.921	3.73
9)	t	n-Tetradecane...	0.864	0.917	0.945	0.949	0.932		0.921	3.73
10)	t	1470	0.882	0.933	0.962	0.964	0.947		0.937	3.59
11)	t	n-Pentadecane...	0.882	0.933	0.962	0.964	0.947		0.937	3.59
12)	t	n-Hexadecane ...	0.881	0.931	0.960	0.962	0.944		0.936	3.53
13)	t	1650	0.885	0.934	0.965	0.969	0.963		0.943	3.74
14)	t	n-Heptadecane...	0.885	0.934	0.965	0.969	0.963		0.943	3.74
15)	t	Pristane	0.892	0.943	0.973	0.970	0.937		0.943	3.47
16)	T	n-Octadecane ...	0.899	0.948	0.981	0.981	0.963		0.955	3.57
17)	t	Phytane	0.786	0.829	0.857	0.860	0.841		0.834	3.59
18)	t	n-Nonadecane ...	0.897	0.943	0.974	0.974	0.954		0.948	3.35
19)	s	ortho-terphenyl	1.036	1.100	1.074	1.050	1.052	1.088	1.067	2.31
20)	t	n-Eicosane (C20)	0.905	0.940	0.971	0.970	0.951		0.947	2.87
21)	t	n-Heneicosane...	0.903	0.948	0.979	0.978	0.959		0.953	3.25
22)	t	n-Docosane (C22)	0.912	0.953	0.986	0.985	0.967		0.961	3.17
23)	t	n-Tricosane (...	0.920	0.961	0.994	0.993	0.973		0.968	3.14
24)	s	d50-Tetracosane	0.875	0.925	0.909	0.886	0.886	0.918	0.900	2.25
25)	t	n-Tetracosane...	0.933	0.964	0.998	0.995	0.975		0.973	2.70
26)	t	n-Pentacosane...	0.917	0.956	0.989	0.987	0.967		0.963	3.03
27)	t	n-Hexacosane ...	0.940	0.979	1.012	1.010	0.989		0.986	2.97
28)	t	n-Heptacosane...	0.930	0.969	1.001	0.999	0.978		0.975	2.97
29)	t	n-Octacosane ...	0.927	0.966	0.997	0.996	0.976		0.973	2.96
30)	t	n-Nonacosane ...	0.933	0.973	1.005	1.003	0.984		0.980	3.02
31)	t	n-Triacontane...	0.938	0.976	1.008	1.007	0.987		0.983	2.90
32)	t	n-Hentriacont...	0.962	0.978	1.011	1.010	0.991		0.990	2.11
33)	t	n-Dotriaconta...	0.955	0.987	1.021	1.020	1.001		0.997	2.74
34)	t	n-Tritriacont...	0.897	0.932	0.967	0.966	0.948		0.942	3.08
35)	t	n-tetratriaco...	0.936	0.976	1.013	1.013	0.993		0.986	3.26
36)	t	n-Pentatriaco...	0.964	0.984	1.022	1.022	1.001		0.999	2.51
37)	t	n-Hexatriacon...	0.979	1.009	1.050	1.049	1.026		1.023	2.91
38)	t	n-Heptatriaco...	0.960	0.988	1.027	1.024	1.001		1.000	2.78
39)	t	n-Octatriacon...	0.946	0.968	1.007	1.004	0.980		0.981	2.59
40)	t	n-Nonatriacon...	0.984	0.999	1.045	1.039	1.010		1.016	2.55
41)	t	n-Tetracontan...	0.984	0.999	1.045	1.039	1.010		1.016	2.55
42)	h	C9-C44 Total ...	0.905	0.946	0.977	0.978	0.958		0.953	3.16
43)	h	C9-C40 Total ...	0.905	0.946	0.977	0.978	0.958		0.953	3.16
44)	h	C10-C28 DRO	0.905	0.946	0.977	0.978	0.958		0.953	3.16

MJS
3-3-2016

Response Factor Report FID6

Method Path : O:\Forensics\Data\FID6\2016\Feb\FEB24\
Method File : HC6102615F.M
Title : FID Forensics
Last Update : Wed Mar 02 11:45:35 2016
Response Via : Initial Calibration

Calibration Files
1 =F6102615024.D 10 =F6102615026.D 50 =F6111715028.D 100 =F6102615030.D 200 =F6102615032.D 500 =F6102615034.D

	Compound	1	10	50	100	200	500	Avg	%RSD
45) h	C8-C40 Total ...	0.905	0.946	0.977	0.978	0.958		0.953	3.16
46) h	C28-C40 ORO	0.905	0.946	0.977	0.978	0.958		0.953	3.16
47) h	Total Resolve...	0.905	0.946	0.977	0.978	0.958		0.953	3.16

(#) = Out of Range

MJS
3-3-2016

rfupdate

RSF Update Summary Report

Method Path.....: C:\msdchem\1\METHODS\FID\
Method File.....: HC6102615F.M
Method Title.....: FID Forensics
Last Update.....: Wed Mar 02 11:14:25 2016

Generating Average Response Factor For: C9-C44 Total Petroleum Hydrocarbons

No	Compound	Level	Conc	Response
1	n-Nonane (C9)	1	1.00000	898704.154
2	n-Decane (C10)	1	1.00000	935569.374
3	n-Undecane (C11)	1	1.00000	947189.992
4	n-Dodecane (C12)	1	1.00000	963461.648
5	n-Tridecane (C13)	1	1.00000	972091.721
6	n-Tetradecane (C14)	1	1.00000	984780.333
7	n-Pentadecane (C15)	1	1.00000	1004579.595
8	n-Hexadecane (C16)	1	1.00000	1003958.433
9	n-Heptadecane (C17)	1	1.00000	1008711.606
10	Pristane	1	1.00000	1016009.422
11	n-Octadecane (C18)	1	1.00000	1024274.010
12	Phytane	1	1.00000	895337.958
13	n-Nonadecane (C19)	1	1.00000	1022236.773
14	n-Eicosane (C20)	1	1.00000	1030763.093
15	n-Heneicosane (C21)	1	1.00000	1029046.798
16	n-Docosane (C22)	1	1.00000	1039261.077
17	n-Tricosane (C23)	1	1.00000	1048012.158
18	n-Tetracosane (C24)	1	1.00000	1063425.038
19	n-Pentacosane (C25)	1	1.00000	1044943.676
20	n-Hexacosane (C26)	1	1.00000	1070757.759
21	n-Heptacosane (C27)	1	1.00000	1059378.498
22	n-Octacosane (C28)	1	1.00000	1056333.229
23	n-Nonacosane (C29)	1	1.00000	1062781.969
24	n-Triacontane (C30)	1	1.00000	1069117.628
25	n-Hentriacontane (C31)	1	1.00000	1096424.190
26	n-Dotriacontane (C32)	1	1.00000	1088538.994
27	n-Tritriacontane (C33)	1	1.00000	1022233.759
28	n-tetratriacontane (C34)	1	1.00000	1066336.604
29	n-Pentatriacontane (C35)	1	1.00000	1098714.296
30	n-Hexatriacontane (C36)	1	1.00000	1115771.348
31	n-Heptatriacontane (C37)	1	1.00000	1093397.790
32	n-Octatriacontane (C38)	1	1.00000	1078500.216
33	n-Tetracontane (C40)	1	1.00000	1121533.171
Avg RSF For: C9-C44 Total Petroleum			1.00000	1031278.070
1	n-Nonane (C9)	2	10.00000	9153892.852
2	n-Decane (C10)	2	10.00000	9546612.951
3	n-Undecane (C11)	2	10.00000	9733152.908
4	n-Dodecane (C12)	2	10.00000	9889052.247
5	n-Tridecane (C13)	2	10.00000	9924367.092
6	n-Tetradecane (C14)	2	10.00000	10017552.896
7	n-Pentadecane (C15)	2	10.00000	10186718.630
8	n-Hexadecane (C16)	2	10.00000	10168793.456
9	n-Heptadecane (C17)	2	10.00000	10203222.000

10	Pristane	2	10.00000	10295816.620
11	n-Octadecane (C18)	2	10.00000	10359014.614
12	Phytane	2	10.00000	9050485.926
13	n-Nonadecane (C19)	2	10.00000	10296723.625
14	n-Eicosane (C20)	2	10.00000	10269092.744
15	n-Heneicosane (C21)	2	10.00000	10355387.866
16	n-Docosane (C22)	2	10.00000	10413422.669
17	n-Tricosane (C23)	2	10.00000	10495505.297
18	n-Tetracosane (C24)	2	10.00000	10533114.403
19	n-Pentacosane (C25)	2	10.00000	10441393.137
20	n-Hexacosane (C26)	2	10.00000	10692217.247
21	n-Heptacosane (C27)	2	10.00000	10583902.213
22	n-Octacosane (C28)	2	10.00000	10550502.459
23	n-Nonacosane (C29)	2	10.00000	10626401.500
24	n-Triacontane (C30)	2	10.00000	10658083.950
25	n-Hentriacontane (C31)	2	10.00000	10681962.160
26	n-Dotriacontane (C32)	2	10.00000	10782921.410
27	n-Tritriacontane (C33)	2	10.00000	10184236.404
28	n-tetratriacontane (C34)	2	10.00000	10664489.690
29	n-Pentatriacontane (C35)	2	10.00000	10748900.510
30	n-Hexatriacontane (C36)	2	10.00000	11024241.013
31	n-Heptatriacontane (C37)	2	10.00000	10794826.371
32	n-Octatriacontane (C38)	2	10.00000	10567272.412
33	n-Tetracontane (C40)	2	10.00000	10916298.268
Avg RSF For: C9-C44 Total Petroleum			10.00000	10327562.956

1	n-Nonane (C9)	3	50.00000	46754161.082
2	n-Decane (C10)	3	50.00000	48787260.236
3	n-Undecane (C11)	3	50.00000	49776229.068
4	n-Dodecane (C12)	3	50.00000	50624078.594
5	n-Tridecane (C13)	3	50.00000	50876078.746
6	n-Tetradecane (C14)	3	50.00000	51409015.594
7	n-Pentadecane (C15)	3	50.00000	52327326.974
8	n-Hexadecane (C16)	3	50.00000	52217766.416
9	n-Heptadecane (C17)	3	50.00000	52501393.393
10	Pristane	3	50.00000	52938396.828
11	n-Octadecane (C18)	3	50.00000	53378966.995
12	Phytane	3	50.00000	46627271.532
13	n-Nonadecane (C19)	3	50.00000	53019541.330
14	n-Eicosane (C20)	3	50.00000	52836636.275
15	n-Heneicosane (C21)	3	50.00000	53273829.905
16	n-Docosane (C22)	3	50.00000	53654304.670
17	n-Tricosane (C23)	3	50.00000	54083280.806
18	n-Tetracosane (C24)	3	50.00000	54273723.819
19	n-Pentacosane (C25)	3	50.00000	53791987.060
20	n-Hexacosane (C26)	3	50.00000	55041768.935
21	n-Heptacosane (C27)	3	50.00000	54464159.610
22	n-Octacosane (C28)	3	50.00000	54262488.205
23	n-Nonacosane (C29)	3	50.00000	54693039.489
24	n-Triacontane (C30)	3	50.00000	54838357.237
25	n-Hentriacontane (C31)	3	50.00000	55011240.338
26	n-Dotriacontane (C32)	3	50.00000	55561629.678
27	n-Tritriacontane (C33)	3	50.00000	52633180.291
28	n-tetratriacontane (C34)	3	50.00000	55143252.378
29	n-Pentatriacontane (C35)	3	50.00000	55608342.749
30	n-Hexatriacontane (C36)	3	50.00000	57152606.238
31	n-Heptatriacontane (C37)	3	50.00000	55868739.850
32	n-Octatriacontane (C38)	3	50.00000	54811937.180
33	n-Tetracontane (C40)	3	50.00000	56871927.739
Avg RSF For: C9-C44 Total Petroleum			50.00000	53185270.280

1	n-Nonane (C9)	4	100.00000	95868365.088
2	n-Decane (C10)	4	100.00000	100180605.300
3	n-Undecane (C11)	4	100.00000	101933715.912
4	n-Dodecane (C12)	4	100.00000	103496813.136
5	n-Tridecane (C13)	4	100.00000	103819957.163
6	n-Tetradecane (C14)	4	100.00000	104786549.151
7	n-Pentadecane (C15)	4	100.00000	106442603.961
8	n-Hexadecane (C16)	4	100.00000	106223924.827
9	n-Heptadecane (C17)	4	100.00000	107002677.663
10	Pristane	4	100.00000	107049730.517
11	n-Octadecane (C18)	4	100.00000	108348516.943
12	Phytane	4	100.00000	94884965.474
13	n-Nonadecane (C19)	4	100.00000	107520840.050
14	n-Eicosane (C20)	4	100.00000	107054306.354
15	n-Heneicosane (C21)	4	100.00000	107929128.198
16	n-Docosane (C22)	4	100.00000	108763303.326
17	n-Tricosane (C23)	4	100.00000	109605526.186
18	n-Tetracosane (C24)	4	100.00000	109894164.781
19	n-Pentacosane (C25)	4	100.00000	108948336.062
20	n-Hexacosane (C26)	4	100.00000	111462388.160
21	n-Heptacosane (C27)	4	100.00000	110281542.895
22	n-Octacosane (C28)	4	100.00000	109981816.480
23	n-Nonacosane (C29)	4	100.00000	110772421.674
24	n-Triacontane (C30)	4	100.00000	111139743.875
25	n-Hentriacontane (C31)	4	100.00000	111452584.730
26	n-Dotriacontane (C32)	4	100.00000	112652460.477
27	n-Tritriacontane (C33)	4	100.00000	106652139.287
28	n-tetratriacontane (C34)	4	100.00000	111796988.634
29	n-Pentatriacontane (C35)	4	100.00000	112841244.294
30	n-Hexatriacontane (C36)	4	100.00000	115783183.220
31	n-Heptatriacontane (C37)	4	100.00000	113090423.361
32	n-Octatriacontane (C38)	4	100.00000	110798183.206
33	n-Tetracontane (C40)	4	100.00000	114672032.340

Avg RSF For: C9-C44 Total Petroleum 100.00000 107973672.204

1	n-Nonane (C9)	5	200.00000	198402339.513
2	n-Decane (C10)	5	200.00000	208616351.255
3	n-Undecane (C11)	5	200.00000	212467455.653
4	n-Dodecane (C12)	5	200.00000	215594786.581
5	n-Tridecane (C13)	5	200.00000	216181080.870
6	n-Tetradecane (C14)	5	200.00000	218156069.843
7	n-Pentadecane (C15)	5	200.00000	221654402.830
8	n-Hexadecane (C16)	5	200.00000	221123312.250
9	n-Heptadecane (C17)	5	200.00000	225424907.826
10	Pristane	5	200.00000	219521298.264
11	n-Octadecane (C18)	5	200.00000	225526717.277
12	Phytane	5	200.00000	197004207.964
13	n-Nonadecane (C19)	5	200.00000	223351402.910
14	n-Eicosane (C20)	5	200.00000	222749940.216
15	n-Heneicosane (C21)	5	200.00000	224559843.811
16	n-Docosane (C22)	5	200.00000	226411596.121
17	n-Tricosane (C23)	5	200.00000	227853504.695
18	n-Tetracosane (C24)	5	200.00000	228339078.365
19	n-Pentacosane (C25)	5	200.00000	226456392.339
20	n-Hexacosane (C26)	5	200.00000	231556911.737
21	n-Heptacosane (C27)	5	200.00000	229088059.499
22	n-Octacosane (C28)	5	200.00000	228666651.044
23	n-Nonacosane (C29)	5	200.00000	230317779.960
24	n-Triacontane (C30)	5	200.00000	231250346.949

rfupdate

25	n-Hentriacontane (C31)	5	200.00000	232065204.473
26	n-Dotriacontane (C32)	5	200.00000	234504563.634
27	n-Tritriacontane (C33)	5	200.00000	221927030.966
28	n-tetratriacontane (C34)	5	200.00000	232607956.591
29	n-Pentatriacontane (C35)	5	200.00000	234498693.103
30	n-Hexatriacontane (C36)	5	200.00000	240362422.677
31	n-Heptatriacontane (C37)	5	200.00000	234488637.643
32	n-Octatriacontane (C38)	5	200.00000	229400006.678
33	n-Tetracontane (C40)	5	200.00000	236556377.427
Avg RSF For: C9-C44 Total Petroleum			200.00000	224445010.029

1	n-Nonane (C9)	7	50.00000	48719438.801
2	n-Decane (C10)	7	50.00000	59332023.580
3	n-Undecane (C11)	7	50.00000	52719934.546
4	n-Dodecane (C12)	7	50.00000	54640732.761
5	n-Tridecane (C13)	7	50.00000	55221588.545
6	n-Tetradecane (C14)	7	50.00000	56511792.123
7	n-Pentadecane (C15)	7	50.00000	57971631.172
8	n-Hexadecane (C16)	7	50.00000	58453246.702
9	n-Heptadecane (C17)	7	50.00000	58719321.246
10	Pristane	7	50.00000	61195022.690
11	n-Octadecane (C18)	7	50.00000	60816082.075
12	Phytane	7	50.00000	54226412.454
13	n-Nonadecane (C19)	7	50.00000	60845016.944
14	n-Eicosane (C20)	7	50.00000	60704742.767
15	n-Heneicosane (C21)	7	50.00000	61907167.830
16	n-Docosane (C22)	7	50.00000	62209048.402
17	n-Tricosane (C23)	7	50.00000	63430980.238
18	n-Tetracosane (C24)	7	50.00000	63828299.778
19	n-Pentacosane (C25)	7	50.00000	63236762.500
20	n-Hexacosane (C26)	7	50.00000	65087170.838
21	n-Heptacosane (C27)	7	50.00000	64768243.159
22	n-Octacosane (C28)	7	50.00000	64833764.053
23	n-Nonacosane (C29)	7	50.00000	65505172.333
24	n-Triacontane (C30)	7	50.00000	65660781.422
25	n-Hentriacontane (C31)	7	50.00000	66221351.794
26	n-Dotriacontane (C32)	7	50.00000	66747961.065
27	n-Tritriacontane (C33)	7	50.00000	64436958.639
28	n-tetratriacontane (C34)	7	50.00000	66184447.995
29	n-Pentatriacontane (C35)	7	50.00000	66742640.986
30	n-Hexatriacontane (C36)	7	50.00000	68511699.584
31	n-Heptatriacontane (C37)	7	50.00000	66545258.362
32	n-Octatriacontane (C38)	7	50.00000	64837949.406
33	n-Tetracontane (C40)	7	50.00000	66620158.207
Avg RSF For: C9-C44 Total Petroleum			50.00000	61739175.848

Generating Reference Response Factors

No	Compound	No	Refrence Compound
8	1380	9	n-Tetradecane (C14)
10	1470	11	n-Pentadecane (C15)
13	1650	14	n-Heptadecane (C17)
40	n-Nonatriacontane (C39)	41	n-Tetracontane (C40)
43	C9-C40 Total Petroleum Hydrocarbons	42	C9-C44 Total Petroleum Hydrocarbons
44	C10-C28 DRO	42	C9-C44 Total Petroleum Hydrocarbons
45	C8-C40 Total Petroleum Hydrocarbons	42	C9-C44 Total Petroleum Hydrocarbons
46	C28-C40 ORO	42	C9-C44 Total Petroleum Hydrocarbons
47	Total Resolved Hydrocarbons	42	C9-C44 Total Petroleum Hydrocarbons

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2015\Oct\Oct26\
Data File : F6102615024.D
Signal(s) : FID1A.CH
Acq On : 27 Oct 2015 6:28 am
Operator : FID6:NLJr
Sample : I610261501F
Misc : ,FRAW60 1ug/ml
ALS Vial : 12 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 02 17:13:36 2015
Quant Method : O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 02 17:13:28 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

MJ
11-3-15

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

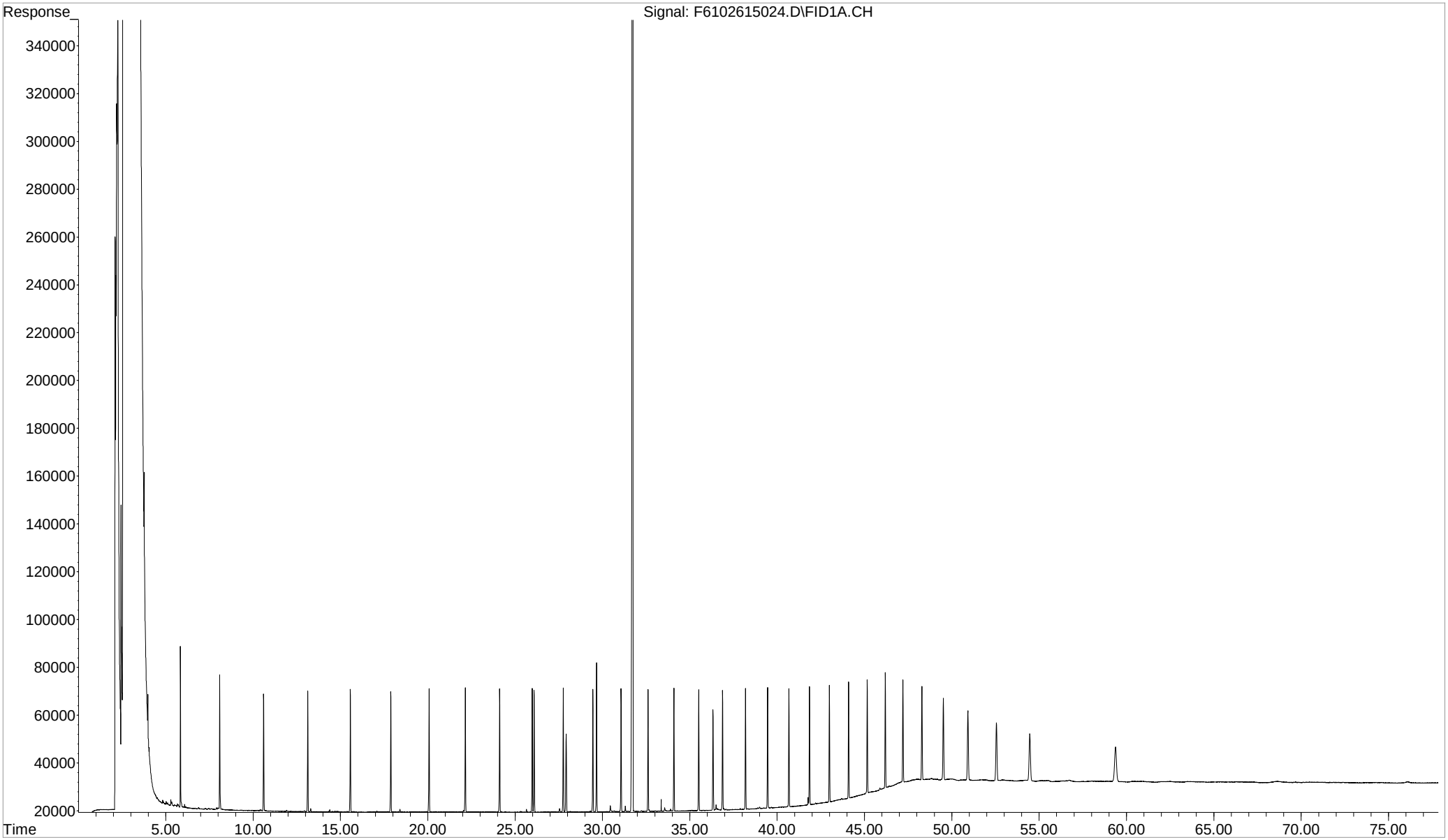
	Compound	R.T.	Response	Conc	Units	
	Internal Standards					
1) I	5-alpha-androstane	31.726	56977466	50.000	ug/mL	M4
	System Monitoring Compounds					
19) s	ortho-terphenyl	29.659	1180964	0.971	ug/mL	M4
Spiked Amount	50.000	Range	50 - 130	Recovery	=	1.94%#
24) s	d50-Tetracosane	36.327	997140	0.972	ug/mL	M4
Spiked Amount	50.000	Range	50 - 130	Recovery	=	1.94%#
	Target Compounds					
2) t	n-Octane (C8)	5.833	861575	0.950	ug/mL	M4
3) t	n-Nonane (C9)	8.080	898704	0.938	ug/mL	M4
4) t	n-Decane (C10)	10.596	935569	0.934	ug/mL	M4
5) t	n-Undecane (C11)	13.125	947190	0.930	ug/mL	M4
6) t	n-Dodecane (C12)	15.565	963462	0.931	ug/mL	M4
7) t	n-Tridecane (C13)	17.881	972092	0.935	ug/mL	M4
9) t	n-Tetradecane (C14)	20.072	984780	0.938	ug/mL	M4
11) t	n-Pentadecane (C15)	22.145	1004580	0.940	ug/mL	M4
12) t	n-Hexadecane (C16)	24.112	1003958	0.942	ug/mL	M4
14) t	n-Heptadecane (C17)	25.978	1008712	0.938	ug/mL	M4
15) t	Pristane	26.086	1016009	0.946	ug/mL	M4
16) t	n-Octadecane (C18)	27.753	1024274	0.942	ug/mL	M4
17) t	Phytane	27.919	895338	0.942	ug/mL	M4
18) t	n-Nonadecane (C19)	29.447	1022237	0.946	ug/mL	M4
20) t	n-Eicosane (C20)	31.064	1030763	0.955	ug/mL	M4
21) t	n-Heneicosane (C21)	32.608	1029047	0.947	ug/mL	M4
22) t	n-Docosane (C22)	34.088	1039261	0.949	ug/mL	M4
23) t	n-Tricosane (C23)	35.509	1048012	0.950	ug/mL	M4
25) t	n-Tetracosane (C24)	36.875	1063425	0.959	ug/mL	M4
26) t	n-Pentacosane (C25)	38.189	1044944	0.952	ug/mL	M4
27) t	n-Hexacosane (C26)	39.452	1070758	0.953	ug/mL	M4
28) t	n-Heptacosane (C27)	40.673	1059378	0.953	ug/mL	M4
29) t	n-Octacosane (C28)	41.850	1056333	0.953	ug/mL	M4
30) t	n-Nonacosane (C29)	42.988	1062782	0.952	ug/mL	M4
31) t	n-Triacontane (C30)	44.091	1069118	0.954	ug/mL	M4
32) t	n-Hentriacontane (C31)	45.156	1096424	0.972	ug/mL	M4
33) t	n-Dotriacontane (C32)	46.191	1088539	0.958	ug/mL	M4
34) t	n-Tritriacontane (C33)	47.198	1022234	0.952	ug/mL	M4
35) t	n-tetratriacontane (C34)	48.290	1066337	0.949	ug/mL	M4
36) t	n-Pentatriacontane (C35)	49.513	1098714	0.965	ug/mL	M4
37) t	n-Hexatriacontane (C36)	50.920	1115771	0.957	ug/mL	M4
38) t	n-Heptatriacontane (C37)	52.556	1093398	0.959	ug/mL	M4
39) t	n-Octatriacontane (C38)	54.462	1078500	0.965	ug/mL	M4
41) t	n-Tetracontane (C40)	59.375	1121533	0.969	ug/mL	M2

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2015\Oct\Oct26\F6102615024.D
Operator : FID6:NLJr
Acquired : 27 Oct 2015 6:28 am using AcqMethod FID6A.M
Sample Name: I610261501F
Instrument: FID6
Misc Info : ,FRAW60 1ug/ml
Vial Number: 12
CurrentMeth: O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2015\Oct\Oct26\
Data File : F6102615026.D
Signal(s) : FID1A.CH
Acq On : 27 Oct 2015 7:57 am
Operator : FID6:NLJr
Sample : I610261502F
Misc : ,FRAW61 10ug/ml
ALS Vial : 13 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 02 17:25:15 2015
Quant Method : O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 02 17:13:39 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

MJ
11-3-15

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

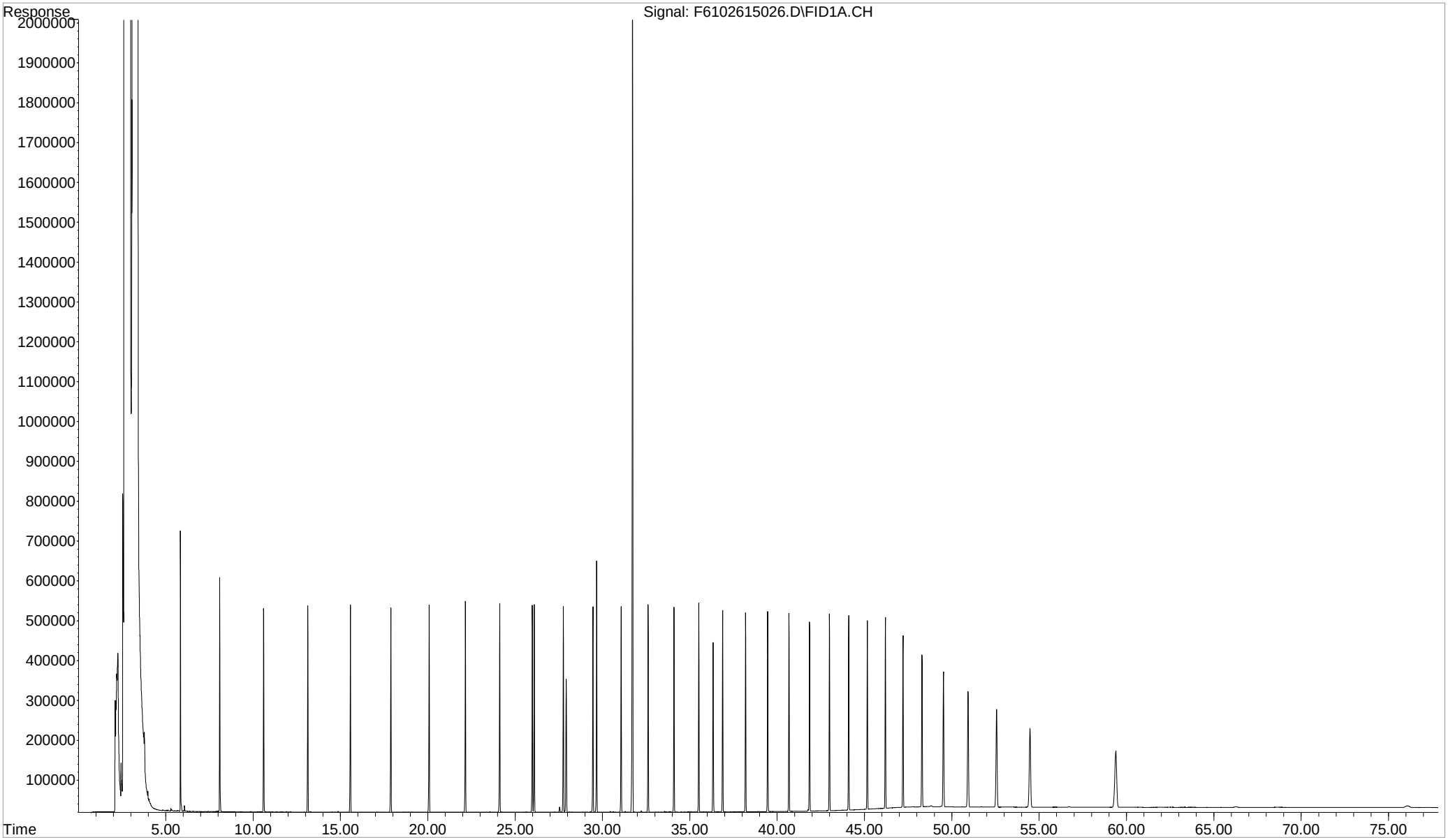
	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.727	54609116	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.666	12017189	10.312 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	20.62%#
24) s	d50-Tetracosane	36.332	10105137	10.282 ug/mL M4
Spiked Amount	50.000	Range 50 - 130	Recovery =	20.56%#
	Target Compounds			
2) t	n-Octane (C8)	5.834	8673354	9.975 ug/mL M4
3) t	n-Nonane (C9)	8.082	9153893	9.974 ug/mL M4
4) t	n-Decane (C10)	10.598	9546613	9.943 ug/mL M4
5) t	n-Undecane (C11)	13.127	9733153	9.973 ug/mL M4
6) t	n-Dodecane (C12)	15.567	9889052	9.973 ug/mL M4
7) t	n-Tridecane (C13)	17.883	9924367	9.963 ug/mL M4
9) t	n-Tetradecane (C14)	20.076	10017553	9.953 ug/mL M4
11) t	n-Pentadecane (C15)	22.151	10186719	9.950 ug/mL M4
12) t	n-Hexadecane (C16)	24.116	10168793	9.951 ug/mL M4
14) t	n-Heptadecane (C17)	25.983	10203222	9.904 ug/mL M4
15) t	Pristane	26.093	10295817	9.998 ug/mL M4
16) t	n-Octadecane (C18)	27.759	10359015	9.936 ug/mL M4
17) t	Phytane	27.924	9050486	9.931 ug/mL M4
18) t	n-Nonadecane (C19)	29.453	10296724	9.941 ug/mL M4
20) t	n-Eicosane (C20)	31.068	10269093	9.925 ug/mL M4
21) t	n-Heneicosane (C21)	32.612	10355388	9.944 ug/mL M4
22) t	n-Docosane (C22)	34.094	10413423	9.922 ug/mL M4
23) t	n-Tricosane (C23)	35.515	10495505	9.926 ug/mL M4
25) t	n-Tetracosane (C24)	36.881	10533114	9.910 ug/mL M4
26) t	n-Pentacosane (C25)	38.194	10441393	9.925 ug/mL M4
27) t	n-Hexacosane (C26)	39.459	10692217	9.931 ug/mL M4
28) t	n-Heptacosane (C27)	40.678	10583902	9.932 ug/mL M4
29) t	n-Octacosane (C28)	41.855	10550502	9.932 ug/mL M4
30) t	n-Nonacosane (C29)	42.996	10626402	9.933 ug/mL M4
31) t	n-Triacontane (C30)	44.098	10658084	9.925 ug/mL M4
32) t	n-Hentriacontane (C31)	45.163	10681962	9.876 ug/mL M4
33) t	n-Dotriacontane (C32)	46.197	10782921	9.901 ug/mL M4
34) t	n-Tritriacontane (C33)	47.208	10184236	9.897 ug/mL M4
35) t	n-tetratriacontane (C34)	48.294	10664490	9.900 ug/mL M4
36) t	n-Pentatriacontane (C35)	49.525	10748901	9.854 ug/mL M4
37) t	n-Hexatriacontane (C36)	50.929	11024241	9.868 ug/mL M4
38) t	n-Heptatriacontane (C37)	52.563	10794826	9.883 ug/mL M4
39) t	n-Octatriacontane (C38)	54.476	10567272	9.864 ug/mL M4
41) t	n-Tetracontane (C40)	59.394	10916298	9.842 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2015\Oct\Oct26\F6102615026.D
Operator : FID6:NLJr
Acquired : 27 Oct 2015 7:57 am using AcqMethod FID6A.M
Sample Name: I610261502F
Instrument: FID6
Misc Info : ,FRAW61 10ug/ml
Vial Number: 13
CurrentMeth: O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2015\Oct\Oct26\
Data File : F6102615028.D
Signal(s) : FID1A.CH
Acq On : 27 Oct 2015 9:26 am
Operator : FID6:NLJr
Sample : I610261503F
Misc : ,FRAW35 50ug/ml
ALS Vial : 14 Sample Multiplier: 1

MEG
11-3-15

Integration File: SHCINT2.E
Quant Time: Nov 02 18:10:29 2015
Quant Method : O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 02 17:13:49 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

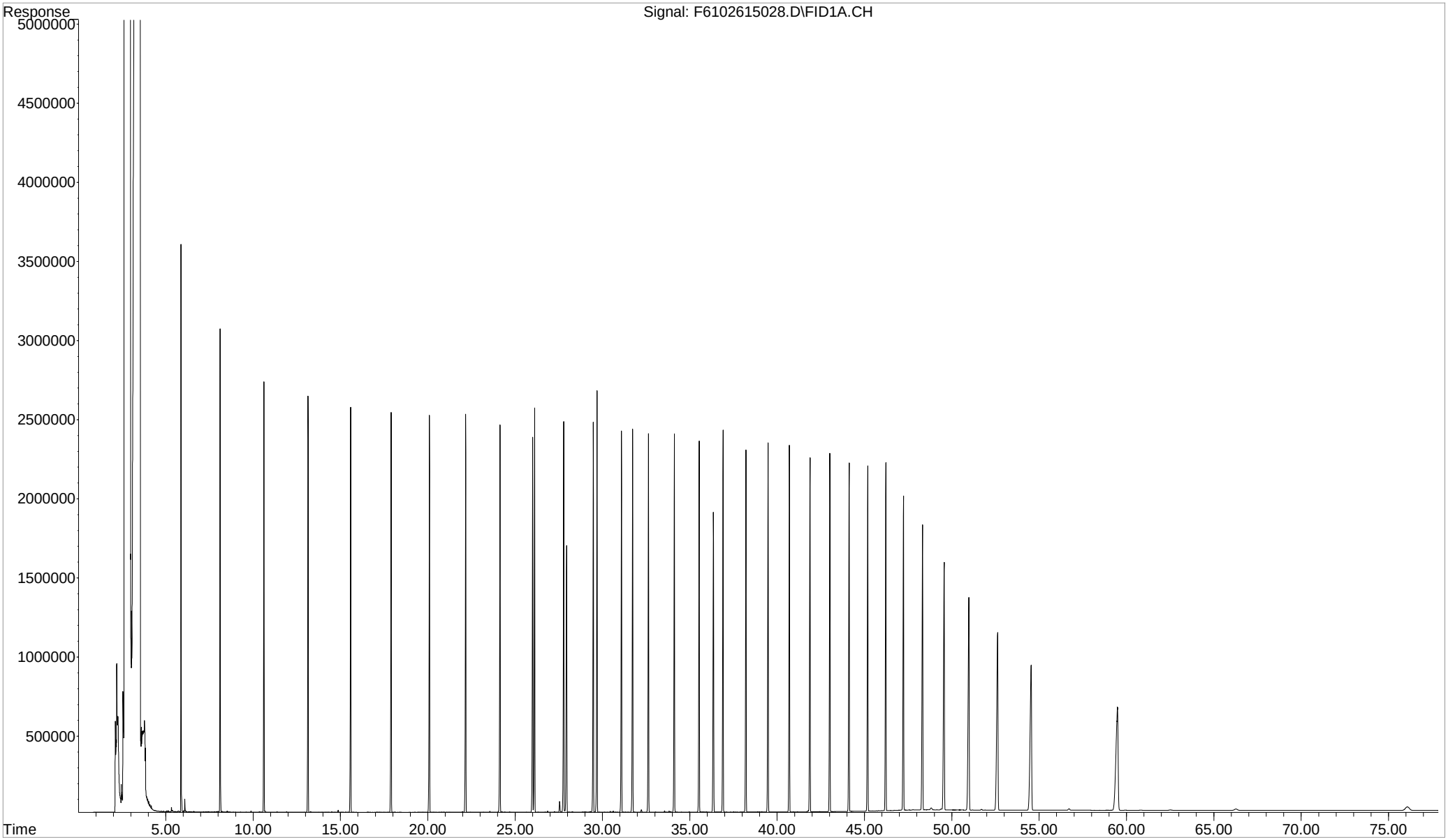
	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.728	54409510	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.690	58451031	50.343 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 100.69%
24) s	d50-Tetracosane	36.352	49469179	50.517 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 101.03%
	Target Compounds			
2) t	n-Octane (C8)	5.867	44385776	51.233 ug/mL M4
3) t	n-Nonane (C9)	8.105	46754161	51.128 ug/mL M4
4) t	n-Decane (C10)	10.615	48787260	51.000 ug/mL M4
5) t	n-Undecane (C11)	13.143	49776229	51.190 ug/mL M4
6) t	n-Dodecane (C12)	15.582	50624079	51.240 ug/mL M4
7) t	n-Tridecane (C13)	17.901	50876079	51.260 ug/mL M4
9) t	n-Tetradecane (C14)	20.094	51409016	51.266 ug/mL M4
11) t	n-Pentadecane (C15)	22.168	52327327	51.301 ug/mL M4
12) t	n-Hexadecane (C16)	24.135	52217766	51.286 ug/mL M4
14) t	n-Heptadecane (C17)	26.003	52501393	51.149 ug/mL M4
15) t	Pristane	26.115	52938397	51.596 ug/mL M4
16) t	n-Octadecane (C18)	27.780	53378967	51.387 ug/mL M4
17) t	Phytane	27.945	46627272	51.351 ug/mL M4
18) t	n-Nonadecane (C19)	29.475	53019541	51.373 ug/mL M4
20) t	n-Eicosane (C20)	31.088	52836636	51.252 ug/mL M4
21) t	n-Heneicosane (C21)	32.633	53273830	51.343 ug/mL M4
22) t	n-Docosane (C22)	34.116	53654305	51.311 ug/mL M4
23) t	n-Tricosane (C23)	35.536	54083281	51.338 ug/mL M4
25) t	n-Tetracosane (C24)	36.903	54273724	51.252 ug/mL M4
26) t	n-Pentacosane (C25)	38.215	53791987	51.322 ug/mL M4
27) t	n-Hexacosane (C26)	39.483	55041769	51.312 ug/mL M4
28) t	n-Heptacosane (C27)	40.702	54464160	51.298 ug/mL M4
29) t	n-Octacosane (C28)	41.882	54262488	51.270 ug/mL M4
30) t	n-Nonacosane (C29)	43.019	54693039	51.310 ug/mL M4
31) t	n-Triacontane (C30)	44.122	54838357	51.253 ug/mL M4
32) t	n-Hentriacontane (C31)	45.187	55011240	51.045 ug/mL M4
33) t	n-Dotriacontane (C32)	46.223	55561630	51.207 ug/mL M4
34) t	n-Tritriacontane (C33)	47.235	52633180	51.338 ug/mL M4
35) t	n-tetratriacontane (C34)	48.325	55143252	51.376 ug/mL M4
36) t	n-Pentatriacontane (C35)	49.562	55608343	51.164 ug/mL M4
37) t	n-Hexatriacontane (C36)	50.976	57152606	51.348 ug/mL M4
38) t	n-Heptatriacontane (C37)	52.622	55868740	51.336 ug/mL M4
39) t	n-Octatriacontane (C38)	54.542	54811937	51.349 ug/mL M4
41) t	n-Tetracontane (C40)	59.482	56871928	51.462 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2015\Oct\Oct26\F6102615028.D
Operator : FID6:NLJr
Acquired : 27 Oct 2015 9:26 am using AcqMethod FID6A.M
Sample Name: I610261503F
Instrument: FID6
Misc Info : ,FRAW35 50ug/ml
Vial Number: 14
CurrentMeth: O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2015\Oct\Oct26\
Data File : F6102615030.D
Signal(s) : FID1A.CH
Acq On : 27 Oct 2015 10:56 am
Operator : FID6:NLJr
Sample : I610261504F
Misc : ,FRAW62 100ug/ml
ALS Vial : 15 Sample Multiplier: 1

MEJ
11-3-15

Integration File: SHCINT2.E
Quant Time: Nov 02 18:13:50 2015
Quant Method : O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 02 17:14:03 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

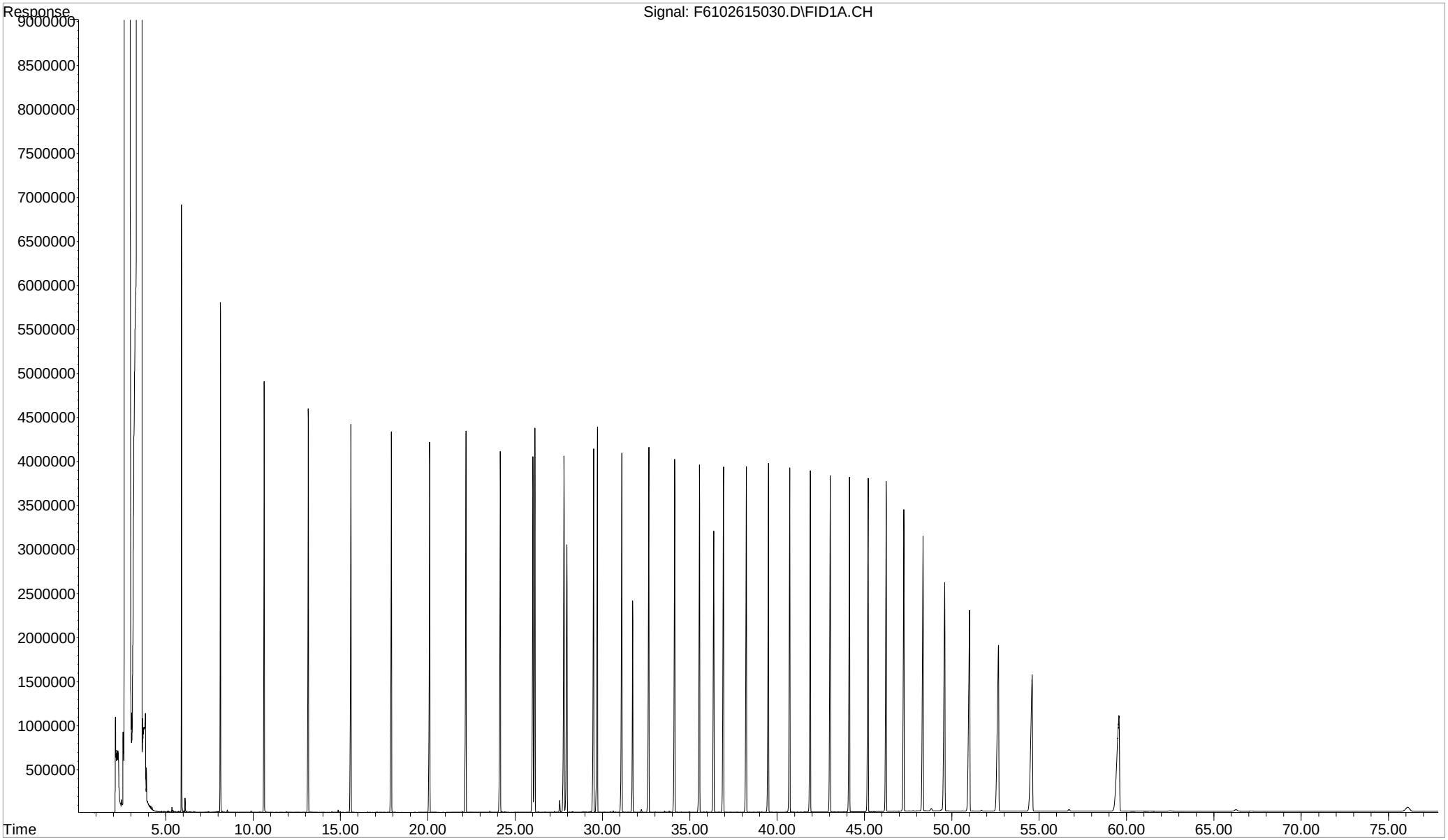
	Compound	R.T.	Response	Conc	Units	
	Internal Standards					
1) I	5-alpha-androstane	31.729	55196485	50.000	ug/mL	M4
	System Monitoring Compounds					
19) s	ortho-terphenyl	29.711	115944507	98.438	ug/mL	M4
Spiked Amount	50.000	Range	50 - 130	Recovery	=	196.88%#
24) s	d50-Tetracosane	36.370	97829416	98.478	ug/mL	M4
Spiked Amount	50.000	Range	50 - 130	Recovery	=	196.96%#
	Target Compounds					
2) t	n-Octane (C8)	5.899	90938984	103.470	ug/mL	M4
3) t	n-Nonane (C9)	8.128	95868365	103.342	ug/mL	M4
4) t	n-Decane (C10)	10.632	100180605	103.232	ug/mL	M4
5) t	n-Undecane (C11)	13.158	101933716	103.335	ug/mL	M4
6) t	n-Dodecane (C12)	15.598	103496813	103.263	ug/mL	M4
7) t	n-Tridecane (C13)	17.916	103819957	103.112	ug/mL	M4
9) t	n-Tetradecane (C14)	20.108	104786549	103.004	ug/mL	M4
11) t	n-Pentadecane (C15)	22.185	106442604	102.867	ug/mL	M4
12) t	n-Hexadecane (C16)	24.150	106223925	102.841	ug/mL	M4
14) t	n-Heptadecane (C17)	26.021	107002678	102.761	ug/mL	M4
15) t	Pristane	26.134	107049731	102.847	ug/mL	M4
16) t	n-Octadecane (C18)	27.799	108348517	102.818	ug/mL	M4
17) t	Phytane	27.963	94884965	103.008	ug/mL	M4
18) t	n-Nonadecane (C19)	29.494	107520840	102.697	ug/mL	M4
20) t	n-Eicosane (C20)	31.108	107054306	102.364	ug/mL	M4
21) t	n-Heneicosane (C21)	32.655	107929128	102.535	ug/mL	M4
22) t	n-Docosane (C22)	34.138	108763303	102.530	ug/mL	M4
23) t	n-Tricosane (C23)	35.558	109605526	102.558	ug/mL	M4
25) t	n-Tetracosane (C24)	36.929	109894165	102.297	ug/mL	M4
26) t	n-Pentacosane (C25)	38.238	108948336	102.463	ug/mL	M4
27) t	n-Hexacosane (C26)	39.503	111462388	102.429	ug/mL	M4
28) t	n-Heptacosane (C27)	40.725	110281543	102.389	ug/mL	M4
29) t	n-Octacosane (C28)	41.903	109981816	102.434	ug/mL	M4
30) t	n-Nonacosane (C29)	43.043	110772422	102.439	ug/mL	M4
31) t	n-Triacontane (C30)	44.145	111139744	102.393	ug/mL	M4
32) t	n-Hentriacontane (C31)	45.213	111452585	101.942	ug/mL	M4
33) t	n-Dotriacontane (C32)	46.247	112652460	102.342	ug/mL	M4
34) t	n-Tritriacontane (C33)	47.257	106652139	102.545	ug/mL	M4
35) t	n-tetratriacontane (C34)	48.354	111796989	102.675	ug/mL	M4
36) t	n-Pentatriacontane (C35)	49.594	112841244	102.342	ug/mL	M4
37) t	n-Hexatriacontane (C36)	51.020	115783183	102.541	ug/mL	M4
38) t	n-Heptatriacontane (C37)	52.674	113090423	102.434	ug/mL	M4
39) t	n-Octatriacontane (C38)	54.603	110798183	102.319	ug/mL	M4
41) t	n-Tetracontane (C40)	59.571	114672032	102.283	ug/mL	M4

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2015\Oct\Oct26\F6102615030.D
Operator : FID6:NLJr
Acquired : 27 Oct 2015 10:56 am using AcqMethod FID6A.M
Sample Name: I610261504F
Instrument: FID6
Misc Info : ,FRAW62 100ug/ml
Vial Number: 15
CurrentMeth: O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2015\Oct\Oct26\
Data File : F6102615032.D
Signal(s) : FID1A.CH
Acq On : 27 Oct 2015 12:25 pm
Operator : FID6:NLJr
Sample : I610261505F
Misc : ,FRAW63 200ug/ml
ALS Vial : 16 Sample Multiplier: 1

MEG
11-3-15

Integration File: SHCINT2.E
Quant Time: Nov 02 18:16:20 2015
Quant Method : O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 02 17:14:15 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

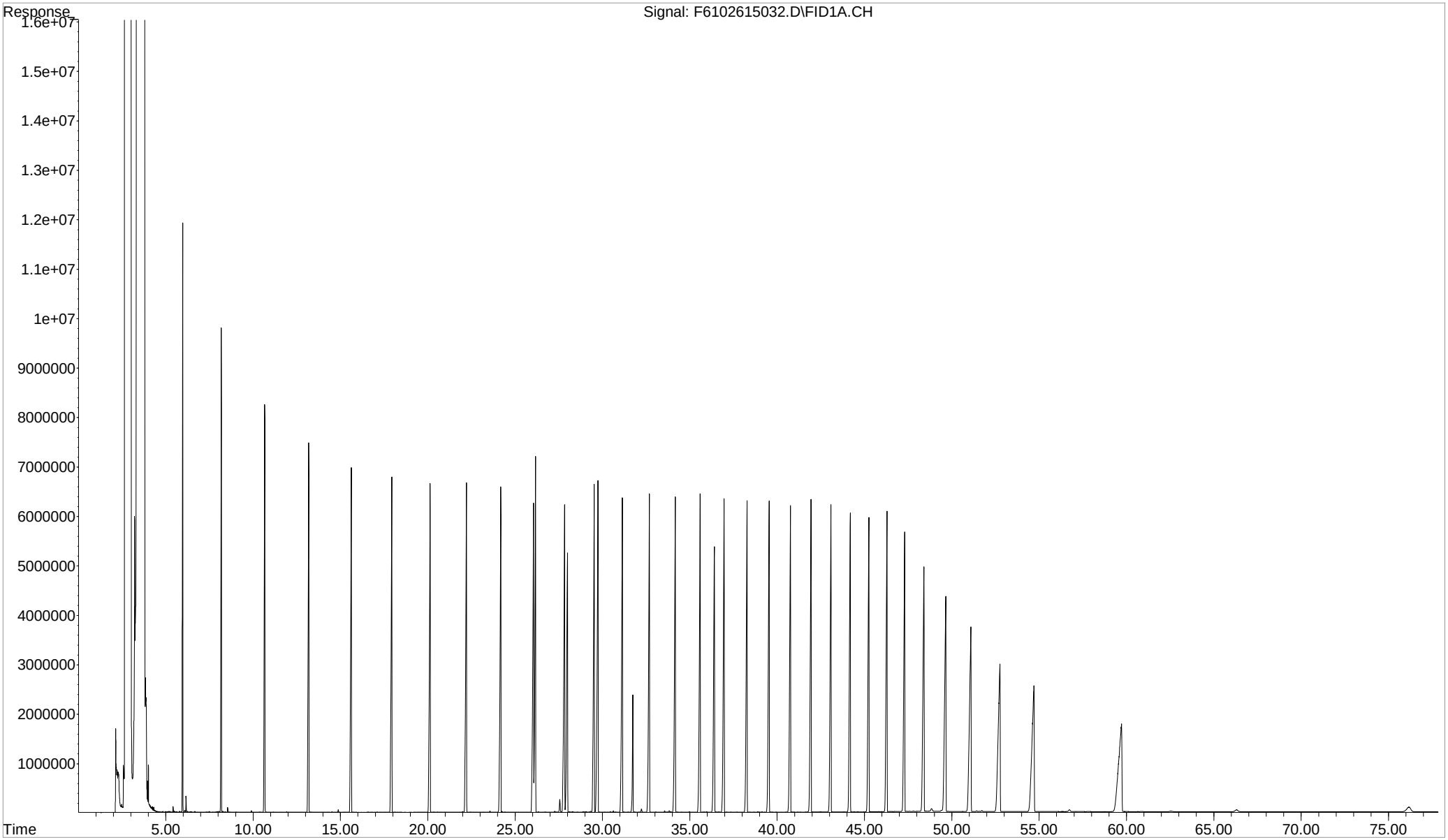
	Compound	R.T.	Response	Conc	Units	
	Internal Standards					
1) I	5-alpha-androstane	31.738	58544612	50.000	ug/mL	M4
	System Monitoring Compounds					
19) s	ortho-terphenyl	29.744	246418508	197.248	ug/mL	M4
Spiked Amount	50.000	Range	50 - 130	Recovery	= 394.50%#	
24) s	d50-Tetracosane	36.406	207474988	196.906	ug/mL	M4
Spiked Amount	50.000	Range	50 - 130	Recovery	= 393.81%#	
	Target Compounds					
2) t	n-Octane (C8)	5.965	185230599	198.703	ug/mL	M3
3) t	n-Nonane (C9)	8.176	198402340	201.638	ug/mL	M4
4) t	n-Decane (C10)	10.662	208616351	202.677	ug/mL	M4
5) t	n-Undecane (C11)	13.182	212467456	203.070	ug/mL	M4
6) t	n-Dodecane (C12)	15.619	215594787	202.806	ug/mL	M4
7) t	n-Tridecane (C13)	17.937	216181081	202.427	ug/mL	M4
9) t	n-Tetradecane (C14)	20.132	218156070	202.182	ug/mL	M4
11) t	n-Pentadecane (C15)	22.209	221654403	201.958	ug/mL	M4
12) t	n-Hexadecane (C16)	24.177	221123312	201.838	ug/mL	M4
14) t	n-Heptadecane (C17)	26.051	225424908	204.108	ug/mL	M4
15) t	Pristane	26.167	219521298	198.842	ug/mL	M4
16) t	n-Octadecane (C18)	27.830	225526717	201.775	ug/mL	M4
17) t	Phytane	27.996	197004208	201.639	ug/mL	M4
18) t	n-Nonadecane (C19)	29.526	223351403	201.131	ug/mL	M4
20) t	n-Eicosane (C20)	31.138	222749940	200.809	ug/mL	M4
21) t	n-Heneicosane (C21)	32.685	224559844	201.136	ug/mL	M4
22) t	n-Docosane (C22)	34.169	226411596	201.229	ug/mL	M4
23) t	n-Tricosane (C23)	35.594	227853505	201.010	ug/mL	M4
25) t	n-Tetracosane (C24)	36.965	228339078	200.397	ug/mL	M4
26) t	n-Pentacosane (C25)	38.274	226456392	200.797	ug/mL	M4
27) t	n-Hexacosane (C26)	39.542	231556912	200.621	ug/mL	M4
28) t	n-Heptacosane (C27)	40.765	229088059	200.529	ug/mL	M4
29) t	n-Octacosane (C28)	41.944	228666651	200.794	ug/mL	M4
30) t	n-Nonacosane (C29)	43.082	230317780	200.809	ug/mL	M4
31) t	n-Triacontane (C30)	44.186	231250347	200.866	ug/mL	M4
32) t	n-Hentriacontane (C31)	45.254	232065204	200.123	ug/mL	M4
33) t	n-Dotriacontane (C32)	46.288	234504564	200.859	ug/mL	M4
34) t	n-Tritriacontane (C33)	47.302	221927031	201.178	ug/mL	M4
35) t	n-tetratriacontane (C34)	48.405	232607957	201.410	ug/mL	M4
36) t	n-Pentatriacontane (C35)	49.654	234498693	200.518	ug/mL	M4
37) t	n-Hexatriacontane (C36)	51.092f	240362423	200.699	ug/mL	M2
38) t	n-Heptatriacontane (C37)	52.758	234488638	200.247	ug/mL	M2
39) t	n-Octatriacontane (C38)	54.701f	229400007	199.729	ug/mL	M2
41) t	n-Tetracontane (C40)	59.717f	236556377	198.933	ug/mL	M2

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2015\Oct\Oct26\F6102615032.D
Operator : FID6:NLJr
Acquired : 27 Oct 2015 12:25 pm using AcqMethod FID6A.M
Sample Name: I610261505F
Instrument: FID6
Misc Info : ,FRAW63 200ug/ml
Vial Number: 16
CurrentMeth: O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2015\Oct\Oct26\
Data File : F6102615034.D
Signal(s) : FID1A.CH
Acq On : 27 Oct 2015 1:54 pm
Operator : FID6:NLJr
Sample : I610261506F
Misc : ,FRAW64 500ug/ml
ALS Vial : 17 Sample Multiplier: 1

MEJ
11-3-15

Integration File: SHCINT2.E
Quant Time: Nov 02 17:14:31 2015
Quant Method : O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 02 17:14:26 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

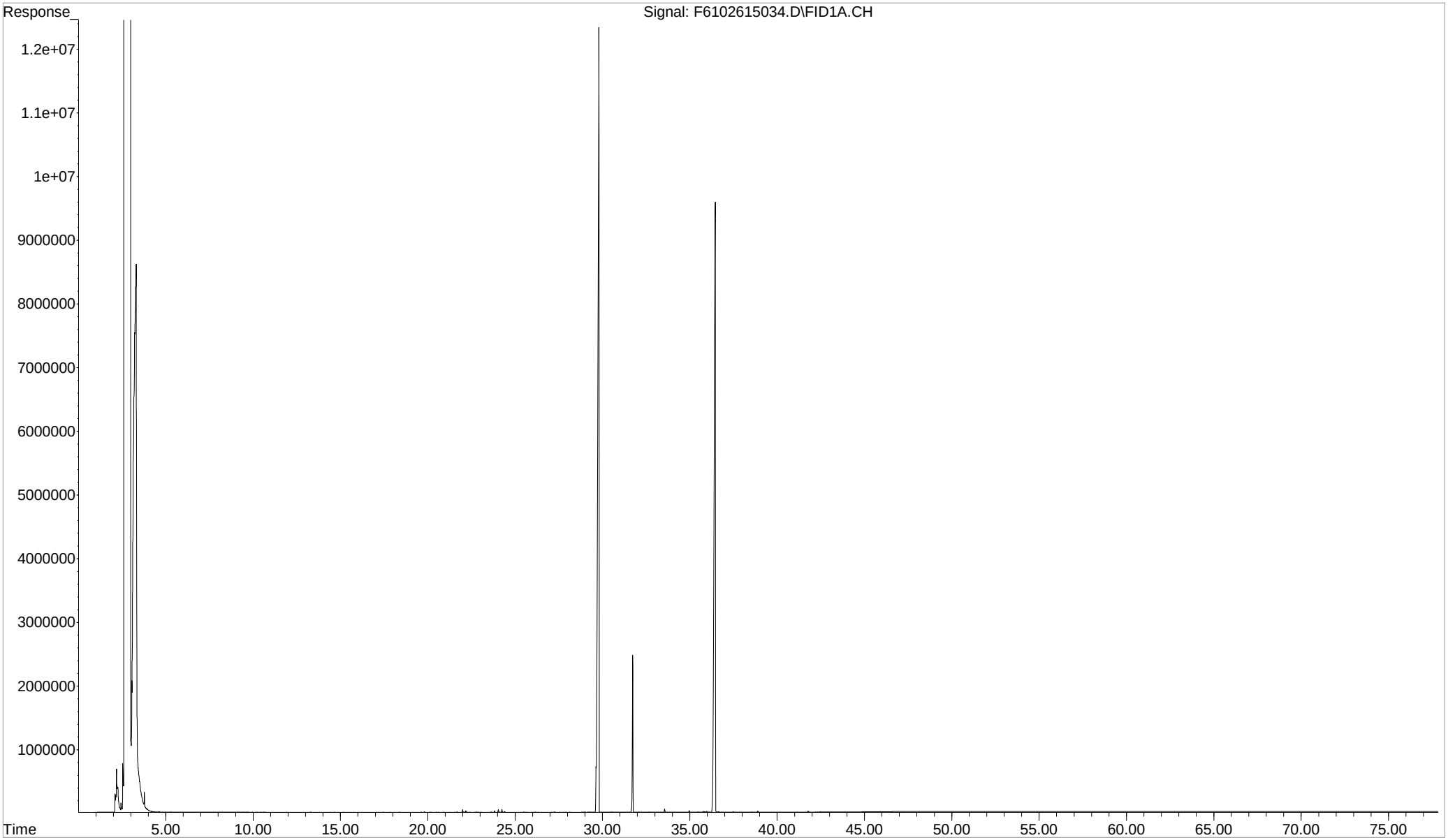
Sub List : CCAL - CCAL

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.731	55321103	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	29.798f	602020296	509.972 ug/mL M4
Spiked Amount 50.000	Range 50 - 130	Recovery	= 1019.94%#
24) s d50-Tetracosane	36.456f	507695251	509.909 ug/mL M3
Spiked Amount 50.000	Range 50 - 130	Recovery	= 1019.82%#
Target Compounds			
SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2015\Oct\Oct26\F6102615034.D
Operator : FID6:NLJr
Acquired : 27 Oct 2015 1:54 pm using AcqMethod FID6A.M
Sample Name: I610261506F
Instrument: FID6
Misc Info : ,FRAW64 500ug/ml
Vial Number: 17
CurrentMeth: O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\FID6\2015\Oct\Oct26\
Data File : F6102615040.D
Signal(s) : FID1A.CH
Acq On : 27 Oct 2015 6:23 pm
Operator : FID6:NLJr
Sample : CQ610261501F
Misc : ,FRAW65 50ug/ml
ALS Vial : 20 Sample Multiplier: 1

MJ
11-3-15

Integration File: SHCINT2.E
Quant Time: Nov 03 09:53:45 2015
Quant Method : O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Tue Nov 03 09:53:36 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	114	0.00
2	t	n-Octane (C8)	50.000	44.134	11.7	98	0.00
3	t	n-Nonane (C9)	50.000	44.903	10.2	100	0.00
4	t	n-Decane (C10)	50.000	46.380	7.2	104	0.00
5	t	n-Undecane (C11)	50.000	45.136	9.7	101	0.00
6	t	n-Dodecane (C12)	50.000	44.971	10.1	100	0.00
7	t	n-Tridecane (C13)	50.000	44.868	10.3	100	0.00
9	t	n-Tetradecane (C14)	50.000	46.141	7.7	103	0.00
11	t	n-Pentadecane (C15)	50.000	44.874	10.3	100	0.00
12	t	n-Hexadecane (C16)	50.000	45.307	9.4	101	0.00
14	t	n-Heptadecane (C17)	50.000	45.270	9.5	101	0.00
15	t	Pristane	50.000	45.354	9.3	100	0.00
16	t	n-Octadecane (C18)	50.000	44.468	11.1	99	0.00
17	t	Phytane	50.000	51.627	-3.3	115	0.00
18	t	n-Nonadecane (C19)	50.000	44.516	11.0	99	0.00
19	s	ortho-terphenyl	50.000	45.192	9.6	103	0.00
20	t	n-Eicosane (C20)	50.000	44.731	10.5	100	0.00
21	t	n-Heneicosane (C21)	50.000	44.879	10.2	100	0.00
22	t	n-Docosane (C22)	50.000	44.791	10.4	100	0.00
23	t	n-Tricosane (C23)	50.000	44.612	10.8	99	0.00
24	s	d50-Tetracosane	50.000	45.201	9.6	102	0.00
25	t	n-Tetracosane (C24)	50.000	44.339	11.3	99	0.00
26	t	n-Pentacosane (C25)	50.000	44.847	10.3	100	0.00
27	t	n-Hexacosane (C26)	50.000	44.619	10.8	99	0.00
28	t	n-Heptacosane (C27)	50.000	44.564	10.9	99	0.00
29	t	n-Octacosane (C28)	50.000	44.723	10.6	100	0.00
30	t	n-Nonacosane (C29)	50.000	44.678	10.6	99	0.00
31	t	n-Triacontane (C30)	50.000	44.471	11.1	99	0.00
32	t	n-Hentriacontane (C31)	50.000	44.297	11.4	99	0.00
33	t	n-Dotriacontane (C32)	50.000	43.582	12.8	97	0.00
34	t	n-Tritriacontane (C33)	50.000	44.591	10.8	99	0.00
35	t	n-tetratriacontane (C34)	50.000	45.000	10.0	100	0.00
36	t	n-Pentatriacontane (C35)	50.000	44.503	11.0	99	0.00
37	t	n-Hexatriacontane (C36)	50.000	46.634	6.7	104	0.00
38	t	n-Heptatriacontane (C37)	50.000	44.599	10.8	99	0.00
39	t	n-Octatriacontane (C38)	50.000	45.321	9.4	101	0.00
41	t	n-Tetracontane (C40)	50.000	41.704	16.6	93	0.00

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.13	0.85 - 1.15

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2015\Oct\Oct26\
Data File : F6102615040.D
Signal(s) : FID1A.CH
Acq On : 27 Oct 2015 6:23 pm
Operator : FID6:NLJr
Sample : CQ610261501F
Misc : ,FRAW65 50ug/ml
ALS Vial : 20 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 03 09:53:45 2015
Quant Method : O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Tue Nov 03 09:53:36 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

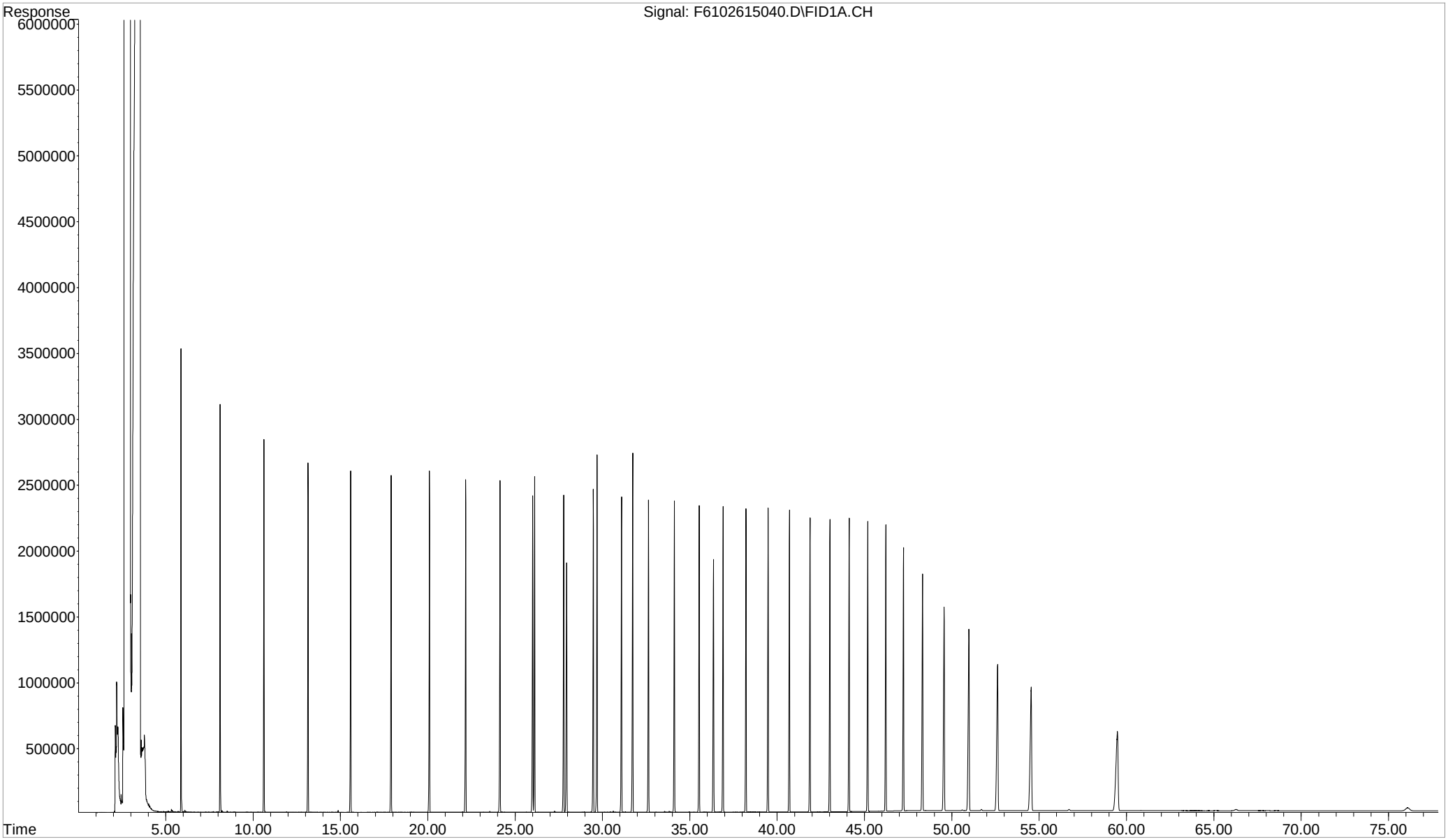
	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.732	62158164	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.692	59942055	45.192 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 90.38%
24) s	d50-Tetracosane	36.355	50567372	45.201 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 90.40%
	Target Compounds			
2) t	n-Octane (C8)	5.865	43681034	44.134 ug/mL M4
3) t	n-Nonane (C9)	8.104	46909641	44.903 ug/mL M4
4) t	n-Decane (C10)	10.616	50624531	46.380 ug/mL M4
5) t	n-Undecane (C11)	13.143	50139185	45.136 ug/mL M4
6) t	n-Dodecane (C12)	15.583	50758074	44.971 ug/mL M4
7) t	n-Tridecane (C13)	17.901	50874033	44.868 ug/mL M4
9) t	n-Tetradecane (C14)	20.095	52852518	46.141 ug/mL M4
11) t	n-Pentadecane (C15)	22.169	52290330	44.874 ug/mL M4
12) t	n-Hexadecane (C16)	24.134	52699941	45.307 ug/mL M4
14) t	n-Heptadecane (C17)	26.003	53083745	45.270 ug/mL M4
15) t	Pristane	26.116	53161158	45.354 ug/mL M4
16) t	n-Octadecane (C18)	27.780	52770758	44.468 ug/mL M4
17) t	Phytane	27.947	53553971	51.627 ug/mL M4
18) t	n-Nonadecane (C19)	29.477	52484748	44.516 ug/mL M4
20) t	n-Eicosane (C20)	31.092	52680750	44.731 ug/mL M4
21) t	n-Heneicosane (C21)	32.636	53190919	44.879 ug/mL M4
22) t	n-Docosane (C22)	34.117	53496295	44.791 ug/mL M4
23) t	n-Tricosane (C23)	35.539	53690956	44.612 ug/mL M4
25) t	n-Tetracosane (C24)	36.906	53639320	44.339 ug/mL M4
26) t	n-Pentacosane (C25)	38.219	53695202	44.847 ug/mL M4
27) t	n-Hexacosane (C26)	39.484	54677776	44.619 ug/mL M4
28) t	n-Heptacosane (C27)	40.704	54036486	44.564 ug/mL M4
29) t	n-Octacosane (C28)	41.882	54074389	44.723 ug/mL M4
30) t	n-Nonacosane (C29)	43.022	54405628	44.678 ug/mL M4
31) t	n-Triacontane (C30)	44.125	54357530	44.471 ug/mL M4
32) t	n-Hentriacontane (C31)	45.190	54537850	44.297 ug/mL M4
33) t	n-Dotriacontane (C32)	46.223	54022539	43.582 ug/mL M4
34) t	n-Tritriacontane (C33)	47.234	52226017	44.591 ug/mL M4
35) t	n-tetratriacontane (C34)	48.327	55177492	45.000 ug/mL M4
36) t	n-Pentatriacontane (C35)	49.560	55257143	44.503 ug/mL M4
37) t	n-Hexatriacontane (C36)	50.982	59297153	46.634 ug/mL M4
38) t	n-Heptatriacontane (C37)	52.622	55449213	44.599 ug/mL M4
39) t	n-Octatriacontane (C38)	54.546	55266874	45.321 ug/mL M4
41) t	n-Tetracontane (C40)	59.479	52652655	41.704 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2015\Oct\Oct26\F6102615040.D
Operator : FID6:NLJr
Acquired : 27 Oct 2015 6:23 pm using AcqMethod FID6A.M
Sample Name: CQ610261501F
Instrument: FID6
Misc Info : ,FRAW65 50ug/ml
Vial Number: 20
CurrentMeth: O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2015\Oct\Oct26\
Data File : F6102615042.D
Signal(s) : FID1A.CH
Acq On : 27 Oct 2015 7:54 pm
Operator : FID6:NLJr
Sample : TO103015ANC03
Misc : 1X FRAW36 10.382mg/mL
ALS Vial : 21 Sample Multiplier: 1

MJ
11-3-15

Integration File: SHCINT2.E
Quant Time: Nov 03 09:53:59 2015
Quant Method : O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Tue Nov 03 09:53:49 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB610261501F
Blank File : F6102615038.D

Sub List : Default - All compounds listed

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	31.735	57641879	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	29.695	62447799	50.770 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 101.54%
24) s	d50-Tetracosane	36.362	53140595	51.223 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 102.45%
	Target Compounds			
2) t	n-Octane (C8)	5.841	93641052	102.025 ug/mL M4
3) t	n-Nonane (C9)	8.095	69958802	72.213 ug/mL M4
4) t	n-Decane (C10)	10.613	57888179	57.190 ug/mL M4
5) t	n-Undecane (C11)	13.144	54165515	52.580 ug/mL M4
6) t	n-Dodecane (C12)	15.585	49087737	46.899 ug/mL M4
7) t	n-Tridecane (C13)	17.902	45576633	43.345 ug/mL M4
8) t	1380	19.584	10994907	10.351 ug/mL M4
9) t	n-Tetradecane (C14)	20.096	43339322	40.800 ug/mL M4
10) t	1470	21.383	15240260	14.103 ug/mL M4
11) t	n-Pentadecane (C15)	22.170	49605706	45.905 ug/mL M4
12) t	n-Hexadecane (C16)	24.134	39888794	36.980 ug/mL M4
13) t	1650	25.047	12702752	11.682 ug/mL M4
14) t	n-Heptadecane (C17)	26.002	34297518	31.541 ug/mL M4
15) t	Pristane	26.096	27082459	24.915 ug/mL M4
16) t	n-Octadecane (C18)	27.776	29918341	27.187 ug/mL M4
17) t	Phytane	27.935	14605776	15.183 ug/mL M4
18) t	n-Nonadecane (C19)	29.471	29648881	27.117 ug/mL M4
20) t	n-Eicosane (C20)	31.086	27323214	25.018 ug/mL M4
21) t	n-Heneicosane (C21)	32.630	26373098	23.995 ug/mL M4
22) t	n-Docosane (C22)	34.113	24165159	21.818 ug/mL M4
23) t	n-Tricosane (C23)	35.532	22225375	19.914 ug/mL M4
25) t	n-Tetracosane (C24)	36.898	20939438	18.665 ug/mL M4
26) t	n-Pentacosane (C25)	38.209	20471998	18.438 ug/mL M4
27) t	n-Hexacosane (C26)	39.476	17072859	15.024 ug/mL M4
28) t	n-Heptacosane (C27)	40.692	13750899	12.229 ug/mL M4
29) t	n-Octacosane (C28)	41.869	10191375	9.089 ug/mL M4
30) t	n-Nonacosane (C29)	43.006	10263995	9.089 ug/mL M4
31) t	n-Triacontane (C30)	44.110	7667078	6.764 ug/mL M4
32) t	n-Hentriacontane (C31)	45.175	7244500	6.345 ug/mL M4
33) t	n-Dotriacontane (C32)	46.206	4885777	4.250 ug/mL M4
34) t	n-Tritriacontane (C33)	47.214	3797337	3.496 ug/mL M4
35) t	n-tetratriacontane (C34)	48.304	3506744	3.084 ug/mL M4
36) t	n-Pentatriacontane (C35)	49.532	3466157	3.010 ug/mL M4
37) t	n-Hexatriacontane (C36)	50.939	2212497	1.876 ug/mL M4
38) t	n-Heptatriacontane (C37)	52.572	2096806	1.819 ug/mL M4
39) t	n-Octatriacontane (C38)	54.486	1616808	1.430 ug/mL M4
40) t	n-Nonatriacontane (C39)	56.732	1077790	0.921 ug/mL M4
41) t	n-Tetracontane (C40)	59.394	1086150	0.928 ug/mL M4
42) h	C9-C44 Total Petroleu...	38.830	6715097553	6112.629 ug/mL m
42) h	C9-C44 Total Petroleu BS	38.830	6416814846	5841.107 ug/mLm
44) h	C10-C28 DRO	26.229	4619808026	4205.325 ug/mL m

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2015\Oct\Oct26\
Data File : F6102615042.D
Signal(s) : FID1A.CH
Acq On : 27 Oct 2015 7:54 pm
Operator : FID6:NLJr
Sample : TO103015ANC03
Misc : 1X FRAW36 10.382mg/mL
ALS Vial : 21 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 03 09:53:59 2015
Quant Method : O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Tue Nov 03 09:53:49 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB610261501F
Blank File : F6102615038.D

Sub List : Default - All compounds listed

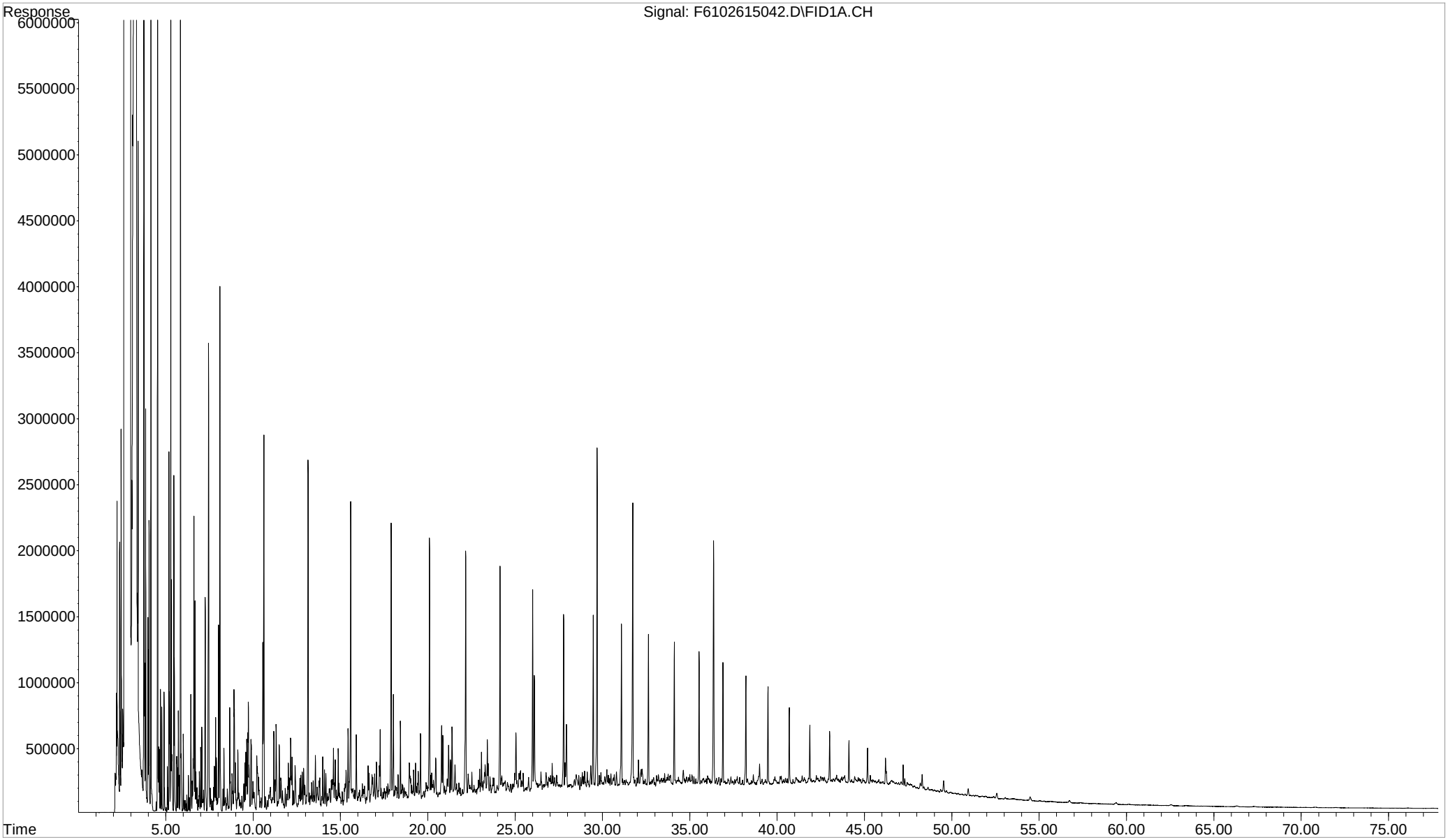
	Compound	R.T.	Response	Conc	Units
44) h	C10-C28 DRO BS	26.229	4583397713	4172.182	ug/mLm
46) h	Total Resolved Hydroc...	42.740	1974962133	1797.771	ug/mL m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2015\Oct\Oct26\F6102615042.D
Operator : FID6:NLJr
Acquired : 27 Oct 2015 7:54 pm using AcqMethod FID6A.M
Sample Name: TO103015ANC03
Instrument: FID6
Misc Info : 1X FRAW36 10.382mg/mL
Vial Number: 21
CurrentMeth: O:\Forensics\Data\FID6\2015\Oct\Oct26\HC6102615F.M



Analysis log File

Total Files Reported in Log : 16
Log Generated From Directory: O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\

11/20/15

No.	DATA FILE	INJ METH	SAMPLE NAME	MISC	DATE INJ'D
1	F17102615001.D	FID17.M	Primer	Primer	10/26/2015 11:48 a
2	F17102615003.D	FID17.M	DCM	DCM	10/26/2015 1:16 p
3	F17102615005.D	FID17.M	L1 Primer	Primer	10/26/2015 3:20 p
4	F17102615007.D	FID17.M	I1710261501R	,FRAW60 1ug/ml	10/26/2015 4:48 p
5	F17102615009.D	FID17.M	I1710261502R	,FRAW61 10ug/ml	10/26/2015 6:17 p
6	F17102615011.D	FID17.M	I1710261503R	,FRAW35 50ug/ml	10/26/2015 7:45 p
7	F17102615013.D	FID17.M	I1710261504R	,FRAW62 100ug/ml	10/26/2015 9:13 p
8	F17102615015.D	FID17.M	I1710261505R	,FRAW63 200ug/ml	10/26/2015 10:42 p
9	F17102615017.D	FID17.M	I1710261506R	,FRAW64 500ug/ml	10/27/2015 12:10 a
10	F17102615019.D	FID17.M	DCM	DCM	10/27/2015 1:38 a
11	F17102615021.D	FID17.M	IB1710261501R	DCM	10/27/2015 3:06 a
12	F17102615023.D	FID17.M	CQ1710261501R ✓PASS	,FRAW65 50ug/ml	10/27/2015 4:34 a
13	F17102615025.D	FID17.M	TO103015ANC02 ✓PASS	,FRAW36 10.382mg/mL	10/27/2015 6:02 a
14	F17102615027.D	FID17.M	DCM	DCM	10/27/2015 7:30 a
15	F17102615029.D	FID17.M	IB1710261502R	DCM	10/27/2015 8:59 a
16	F17102615031.D	FID17.M			10/27/2015 10:27 a

ICAL files

Processing Method: HC171026 15R.m

Printed: 11/13/15

SeqLog 1.0 - (c) 2009 Abacus Database Applications

Response Factor Report FID17

Method Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Method File : HC17102615R.M
Title : FID Forensics
Last Update : Thu Dec 03 13:40:52 2015
Response Via : Initial Calibration

Calibration Files
1 =F17102615007.D 10 =F17102615009.D 50 =F17102615011.D 100 =F17102615013.D 200 =F17102615015.D 500 =F17102615017.D

		Compound	1	10	50	100	200	500	Avg	%RSD
1)	I	5-alpha-androstane	----------ISTD----------							
2)	t	n-Octane (C8)	0.795	0.808	0.846	0.808	0.836		0.819	2.64
3)	t	n-Nonane (C9)	0.817	0.840	0.876	0.884	0.870		0.857	3.25
4)	t	n-Decane (C10)	0.835	0.872	0.910	0.913	0.901		0.886	3.72
5)	t	n-Undecane (C11)	0.828	0.882	0.922	0.923	0.913		0.894	4.51
6)	t	n-Dodecane (C12)	0.837	0.893	0.937	0.938	0.925		0.906	4.70
7)	t	n-Tridecane (...	0.843	0.901	0.940	0.942	0.927		0.911	4.55
8)	t	1380	0.859	0.912	0.950	0.952	0.935		0.922	4.19
9)	t	n-Tetradecane...	0.859	0.912	0.950	0.952	0.935		0.922	4.19
10)	t	1470	0.872	0.928	0.966	0.968	0.950		0.937	4.25
11)	t	n-Pentadecane...	0.872	0.928	0.966	0.968	0.950		0.937	4.25
12)	t	n-Hexadecane ...	0.869	0.926	0.963	0.965	0.946		0.934	4.23
13)	t	1650	0.871	0.931	0.968	0.973	0.965		0.941	4.53
14)	t	n-Heptadecane...	0.871	0.931	0.968	0.973	0.965		0.941	4.53
15)	t	Pristane	0.897	0.941	0.975	0.974	0.942		0.946	3.36
16)	t	n-Octadecane ...	0.895	0.946	0.982	0.983	0.965		0.954	3.82
17)	t	Phytane	0.786	0.827	0.857	0.859	0.841		0.834	3.59
18)	t	n-Nonadecane ...	0.887	0.940	0.972	0.972	0.954		0.945	3.73
19)	s	ortho-terphenyl	1.036	1.101	1.080	1.056	1.057	1.091	1.070	2.32
20)	t	n-Eicosane (C20)	0.886	0.936	0.964	0.966	0.949		0.940	3.48
21)	t	n-Heneicosane...	0.900	0.941	0.970	0.972	0.955		0.947	3.08
22)	t	n-Docosane (C22)	0.901	0.947	0.976	0.978	0.959		0.952	3.30
23)	t	n-Tricosane (...	0.905	0.952	0.980	0.983	0.962		0.957	3.31
24)	s	d50-Tetracosane	0.869	0.917	0.898	0.878	0.876	0.912	0.892	2.27
25)	t	n-Tetracosane...	0.912	0.952	0.981	0.984	0.962		0.958	3.04
26)	t	n-Pentacosane...	0.899	0.942	0.970	0.975	0.952		0.948	3.20
27)	t	n-Hexacosane ...	0.916	0.960	0.990	0.994	0.971		0.966	3.25
28)	t	n-Heptacosane...	0.908	0.948	0.976	0.982	0.959		0.955	3.05
29)	t	n-Octacosane ...	0.906	0.943	0.970	0.977	0.957		0.950	2.95
30)	t	n-Nonacosane ...	0.912	0.946	0.973	0.982	0.963		0.955	2.88
31)	t	n-Triacontane...	0.913	0.945	0.972	0.984	0.967		0.956	2.91
32)	t	n-Hentriacont...	0.916	0.946	0.972	0.985	0.972		0.958	2.89
33)	t	n-Dotriaconta...	0.926	0.951	0.979	0.996	0.984		0.967	2.93
34)	t	n-Tritriacont...	0.870	0.899	0.928	0.945	0.932		0.915	3.28
35)	t	n-tetratriaco...	0.912	0.938	0.970	0.990	0.978		0.958	3.31
36)	t	n-Pentatriaco...	0.902	0.943	0.979	1.004	0.990		0.964	4.28
37)	t	n-Hexatriacon...	0.934	0.969	1.007	1.029	1.013		0.990	3.87
38)	t	n-Heptatriaco...	0.915	0.947	0.986	1.007	0.989		0.969	3.85
39)	t	n-Octatriacon...	0.894	0.930	0.969	0.989	0.968		0.950	3.97
40)	t	n-Nonatriacon...	0.920	0.967	1.008	1.028	1.000		0.985	4.28
41)	t	n-Tetracontan...	0.920	0.967	1.008	1.028	1.000		0.985	4.28
42)	h	C9-C44 Total ...	0.886	0.928	0.962	0.970	0.952		0.940	3.58
43)	h	C9-C40 Total ...	0.886	0.928	0.962	0.970	0.952		0.940	3.58
44)	h	C10-C28 DRO	0.886	0.928	0.962	0.970	0.952		0.940	3.58

MES
12-3-2015

Response Factor Report FID17

Method Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Method File : HC17102615R.M
Title : FID Forensics
Last Update : Thu Dec 03 13:40:52 2015
Response Via : Initial Calibration

Calibration Files
1 =F17102615007.D 10 =F17102615009.D 50 =F17102615011.D 100 =F17102615013.D 200 =F17102615015.D 500 =F17102615017.D

	Compound	1	10	50	100	200	500	Avg	%RSD
45) h	C28-C40 ORO	0.886	0.928	0.962	0.970	0.952		0.940	3.58
46) h	Total Resolve...	0.886	0.928	0.962	0.970	0.952		0.940	3.58

(#) = Out of Range

rfupdate

RSF Update Summary Report

WES
12-3-2015

Method Path.....: O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Method File.....: HC17102615R.M
Method Title.....: FID Forensics
Last Update.....: Thu Nov 19 08:25:05 2015

Generating Average Response Factor For: C9-C44 Total Petroleum Hydroca

No	Compound	Level	Conc	Response
1	n-Nonane (C9)	1	1.00000	968668.949
2	n-Decane (C10)	1	1.00000	990154.872
3	n-Undecane (C11)	1	1.00000	981744.480
4	n-Dodecane (C12)	1	1.00000	992317.434
5	n-Tridecane (C13)	1	1.00000	998806.197
6	n-Tetradecane (C14)	1	1.00000	1018047.994
7	n-Pentadecane (C15)	1	1.00000	1033320.657
8	n-Hexadecane (C16)	1	1.00000	1029869.388
9	n-Heptadecane (C17)	1	1.00000	1032935.543
10	Pristane	1	1.00000	1063521.518
11	n-Octadecane (C18)	1	1.00000	1060429.172
12	Phytane	1	1.00000	931588.138
13	n-Nonadecane (C19)	1	1.00000	1051123.802
14	n-Eicosane (C20)	1	1.00000	1050163.400
15	n-Heneicosane (C21)	1	1.00000	1067184.320
16	n-Docosane (C22)	1	1.00000	1067898.857
17	n-Tricosane (C23)	1	1.00000	1072581.753
18	n-Tetracosane (C24)	1	1.00000	1081213.086
19	n-Pentacosane (C25)	1	1.00000	1065438.875
20	n-Hexacosane (C26)	1	1.00000	1085319.369
21	n-Heptacosane (C27)	1	1.00000	1076873.643
22	n-Octacosane (C28)	1	1.00000	1073657.426
23	n-Nonacosane (C29)	1	1.00000	1081457.936
24	n-Triacontane (C30)	1	1.00000	1082482.345
25	n-Hentriacontane (C31)	1	1.00000	1085564.816
26	n-Dotriacontane (C32)	1	1.00000	1097131.010
27	n-Tritriacontane (C33)	1	1.00000	1031606.466
28	n-tetratriacontane (C34)	1	1.00000	1081492.588
29	n-Pentatriacontane (C35)	1	1.00000	1069274.342
30	n-Hexatriacontane (C36)	1	1.00000	1107585.182
31	n-Heptatriacontane (C37)	1	1.00000	1084574.542
32	n-Octatriacontane (C38)	1	1.00000	1060006.758
33	n-Tetracontane (C40)	1	1.00000	1090812.389
Avg RSF For: C9-C44 Total Petroleum			1.00000	1050449.917

1	n-Nonane (C9)	2	10.00000	9810343.268
2	n-Decane (C10)	2	10.00000	10179234.076
3	n-Undecane (C11)	2	10.00000	10295430.948
4	n-Dodecane (C12)	2	10.00000	10433227.711
5	n-Tridecane (C13)	2	10.00000	10526967.878
6	n-Tetradecane (C14)	2	10.00000	10650946.722
7	n-Pentadecane (C15)	2	10.00000	10834692.528
8	n-Hexadecane (C16)	2	10.00000	10814604.755
9	n-Heptadecane (C17)	2	10.00000	10867450.185
10	Pristane	2	10.00000	10986971.786
11	n-Octadecane (C18)	2	10.00000	11043042.714

		rfupdate		
12	Phytane	2	10.00000	9659838.729
13	n-Nonadecane (C19)	2	10.00000	10973425.846
14	n-Eicosane (C20)	2	10.00000	10926826.517
15	n-Heneicosane (C21)	2	10.00000	10991010.382
16	n-Docosane (C22)	2	10.00000	11054540.892
17	n-Tricosane (C23)	2	10.00000	11117071.569
18	n-Tetracosane (C24)	2	10.00000	11120893.129
19	n-Pentacosane (C25)	2	10.00000	11004102.331
20	n-Hexacosane (C26)	2	10.00000	11216468.577
21	n-Heptacosane (C27)	2	10.00000	11074386.040
22	n-Octacosane (C28)	2	10.00000	11012436.964
23	n-Nonacosane (C29)	2	10.00000	11047708.212
24	n-Triacontane (C30)	2	10.00000	11042486.402
25	n-Hentriacontane (C31)	2	10.00000	11043418.305
26	n-Dotriacontane (C32)	2	10.00000	11109895.614
27	n-Tritriacontane (C33)	2	10.00000	10493878.666
28	n-tetratriacontane (C34)	2	10.00000	10960106.628
29	n-Pentatriacontane (C35)	2	10.00000	11018123.921
30	n-Hexatriacontane (C36)	2	10.00000	11317890.708
31	n-Heptatriacontane (C37)	2	10.00000	11057681.274
32	n-Octatriacontane (C38)	2	10.00000	10862354.266
33	n-Tetracontane (C40)	2	10.00000	11293425.644
Avg RSF For: C9-C44 Total Petroleum			10.00000	10843663.127

1	n-Nonane (C9)	3	50.00000	51611899.260
2	n-Decane (C10)	3	50.00000	53659318.377
3	n-Undecane (C11)	3	50.00000	54361934.135
4	n-Dodecane (C12)	3	50.00000	55222942.983
5	n-Tridecane (C13)	3	50.00000	55432396.681
6	n-Tetradecane (C14)	3	50.00000	55993581.825
7	n-Pentadecane (C15)	3	50.00000	56938769.489
8	n-Hexadecane (C16)	3	50.00000	56750603.801
9	n-Heptadecane (C17)	3	50.00000	57049035.842
10	Pristane	3	50.00000	57479124.144
11	n-Octadecane (C18)	3	50.00000	57874991.836
12	Phytane	3	50.00000	50531691.724
13	n-Nonadecane (C19)	3	50.00000	57301582.494
14	n-Eicosane (C20)	3	50.00000	56836238.703
15	n-Heneicosane (C21)	3	50.00000	57159926.136
16	n-Docosane (C22)	3	50.00000	57513554.731
17	n-Tricosane (C23)	3	50.00000	57786169.132
18	n-Tetracosane (C24)	3	50.00000	57831552.125
19	n-Pentacosane (C25)	3	50.00000	57203091.661
20	n-Hexacosane (C26)	3	50.00000	58333922.003
21	n-Heptacosane (C27)	3	50.00000	57529482.932
22	n-Octacosane (C28)	3	50.00000	57162249.101
23	n-Nonacosane (C29)	3	50.00000	57365160.605
24	n-Triacontane (C30)	3	50.00000	57311444.239
25	n-Hentriacontane (C31)	3	50.00000	57282795.293
26	n-Dotriacontane (C32)	3	50.00000	57714013.604
27	n-Tritriacontane (C33)	3	50.00000	54684679.187
28	n-tetratriacontane (C34)	3	50.00000	57154184.849
29	n-Pentatriacontane (C35)	3	50.00000	57685419.690
30	n-Hexatriacontane (C36)	3	50.00000	59356980.902
31	n-Heptatriacontane (C37)	3	50.00000	58131494.551
32	n-Octatriacontane (C38)	3	50.00000	57123515.884
33	n-Tetracontane (C40)	3	50.00000	59449348.023
Avg RSF For: C9-C44 Total Petroleum			50.00000	56691608.968

1	n-Nonane (C9)	4	100.00000	103906557.086
2	n-Decane (C10)	4	100.00000	107361148.750
3	n-Undecane (C11)	4	100.00000	108585004.558
4	n-Dodecane (C12)	4	100.00000	110344442.756
5	n-Tridecane (C13)	4	100.00000	110821344.851
6	n-Tetradecane (C14)	4	100.00000	111974283.704
7	n-Pentadecane (C15)	4	100.00000	113859269.250
8	n-Hexadecane (C16)	4	100.00000	113472867.482
9	n-Heptadecane (C17)	4	100.00000	114420858.432
10	Pristane	4	100.00000	114502650.182
11	n-Octadecane (C18)	4	100.00000	115558376.746
12	Phytane	4	100.00000	101033372.216
13	n-Nonadecane (C19)	4	100.00000	114330914.201
14	n-Eicosane (C20)	4	100.00000	113556668.399
15	n-Heneicosane (C21)	4	100.00000	114283358.778
16	n-Docosane (C22)	4	100.00000	115039021.692
17	n-Tricosane (C23)	4	100.00000	115645893.400
18	n-Tetracosane (C24)	4	100.00000	115759805.218
19	n-Pentacosane (C25)	4	100.00000	114611403.116
20	n-Hexacosane (C26)	4	100.00000	116905132.579
21	n-Heptacosane (C27)	4	100.00000	115468417.539
22	n-Octacosane (C28)	4	100.00000	114835614.425
23	n-Nonacosane (C29)	4	100.00000	115464545.290
24	n-Triacontane (C30)	4	100.00000	115657195.511
25	n-Hentriacontane (C31)	4	100.00000	115875179.049
26	n-Dotriacontane (C32)	4	100.00000	117071638.073
27	n-Tritriacontane (C33)	4	100.00000	111063980.067
28	n-tetratriacontane (C34)	4	100.00000	116373947.227
29	n-Pentatriacontane (C35)	4	100.00000	118104215.064
30	n-Hexatriacontane (C36)	4	100.00000	121021919.871
31	n-Heptatriacontane (C37)	4	100.00000	118447921.870
32	n-Octatriacontane (C38)	4	100.00000	116271552.854
33	n-Tetracontane (C40)	4	100.00000	120836554.190

Avg RSF For: C9-C44 Total Petroleum 100.00000 114014092.558

1	n-Nonane (C9)	5	200.00000	209844482.579
2	n-Decane (C10)	5	200.00000	217413173.320
3	n-Undecane (C11)	5	200.00000	220194673.447
4	n-Dodecane (C12)	5	200.00000	223041970.047
5	n-Tridecane (C13)	5	200.00000	223534205.653
6	n-Tetradecane (C14)	5	200.00000	225516777.986
7	n-Pentadecane (C15)	5	200.00000	229216550.922
8	n-Hexadecane (C16)	5	200.00000	228245843.312
9	n-Heptadecane (C17)	5	200.00000	232694878.332
10	Pristane	5	200.00000	227288728.829
11	n-Octadecane (C18)	5	200.00000	232757178.053
12	Phytane	5	200.00000	202950963.098
13	n-Nonadecane (C19)	5	200.00000	230040463.166
14	n-Eicosane (C20)	5	200.00000	228873075.536
15	n-Heneicosane (C21)	5	200.00000	230232750.274
16	n-Docosane (C22)	5	200.00000	231335280.740
17	n-Tricosane (C23)	5	200.00000	232114603.474
18	n-Tetracosane (C24)	5	200.00000	232137807.855
19	n-Pentacosane (C25)	5	200.00000	229573726.743
20	n-Hexacosane (C26)	5	200.00000	234273551.310
21	n-Heptacosane (C27)	5	200.00000	231279566.892
22	n-Octacosane (C28)	5	200.00000	230736031.793
23	n-Nonacosane (C29)	5	200.00000	232252727.126
24	n-Triacontane (C30)	5	200.00000	233263156.631
25	n-Hentriacontane (C31)	5	200.00000	234400539.379
26	n-Dotriacontane (C32)	5	200.00000	237312988.582

		rfupdate		
27	n-Tritriacontane (C33)	5	200.00000	224850529.751
28	n-tetratriacontane (C34)	5	200.00000	235988326.380
29	n-Pentatriacontane (C35)	5	200.00000	238880749.607
30	n-Hexatriacontane (C36)	5	200.00000	244224041.996
31	n-Heptatriacontane (C37)	5	200.00000	238420773.589
32	n-Octatriacontane (C38)	5	200.00000	233418941.868
33	n-Tetracontane (C40)	5	200.00000	241190802.640
Avg RSF For: C9-C44 Total Petroleum			200.00000	229621207.906

Generating Reference Response Factors

No	Compound	No	Refrence Compound
8	1380	9	n-Tetradecane (C14)
10	1470	11	n-Pentadecane (C15)
13	1650	14	n-Heptadecane (C17)
40	n-Nonatriacontane (C39)	41	n-Tetracontane (C40)
43	C9-C40 Total Petroleum Hydrocarbons	42	C9-C44 Total Petroleum Hydr
44	C10-C28 DRO	42	C9-C44 Total Petroleum Hydr
45	C28-C40 ORO	42	C9-C44 Total Petroleum Hydr
46	Total Resolved Hydrocarbons	42	C9-C44 Total Petroleum Hydr

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Abacus Response Factor Update Macro Ver. 1.0

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615007.D
Signal(s) : FID2B.CH
Acq On : 26 Oct 2015 4:48 pm
Operator : FID17:NL
Sample : I1710261501R
Misc : ,FRAW60 1ug/ml
ALS Vial : 54 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:01:19 2015
Quant Method : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 13 17:31:18 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

11/20/15

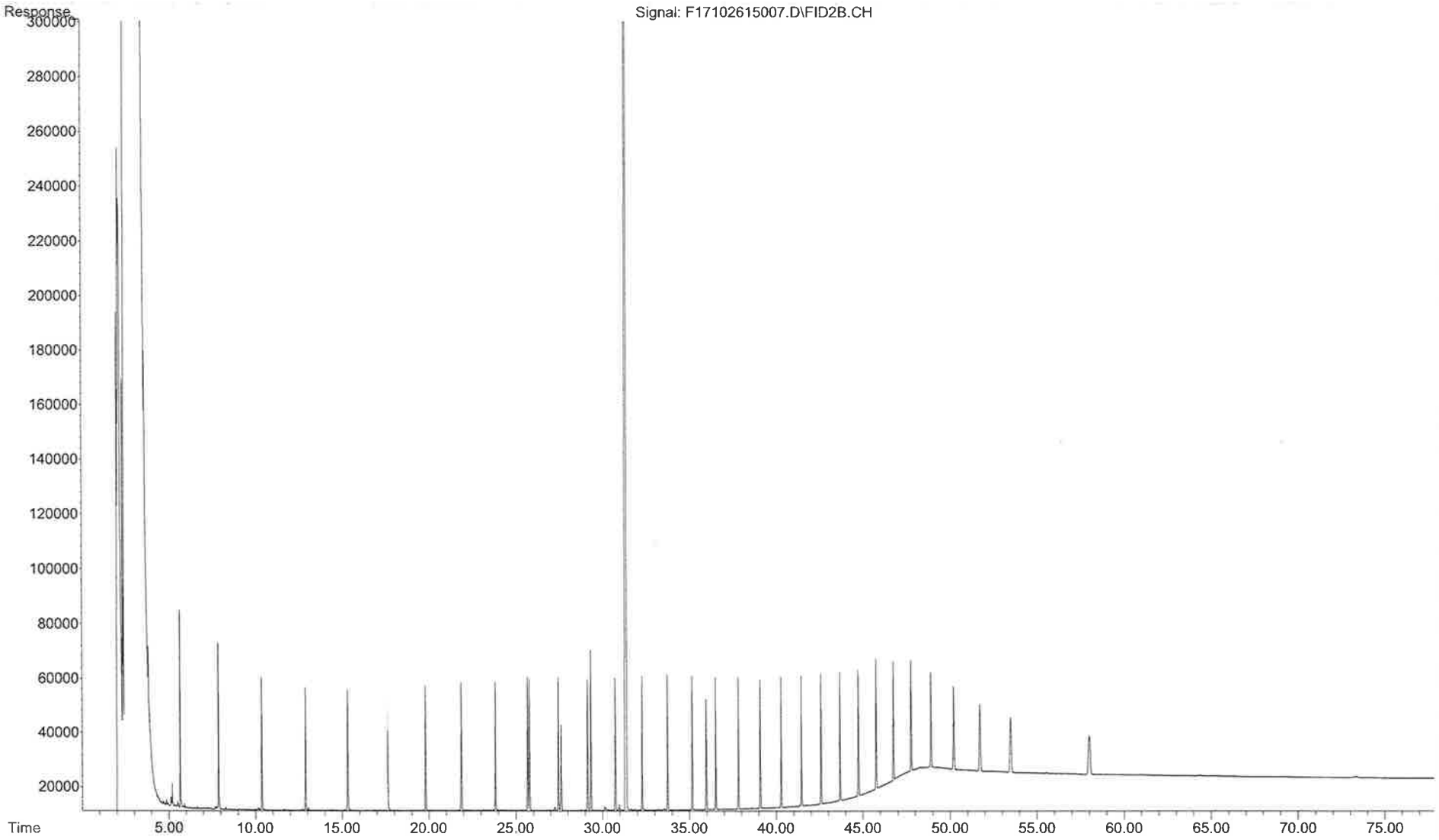
Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.379	59271171	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	29.330	1227767	0.968 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	1.94%#
24) s d50-Tetracosane	35.976	1029870	0.975 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	1.95%#
Target Compounds			
2) t n-Octane (C8)	5.657	942286	0.965 ug/mL M4
3) t n-Nonane (C9)	7.872	968669	0.953 ug/mL M4
4) t n-Decane (C10)	10.367	990155	0.941 ug/mL M4
5) t n-Undecane (C11)	12.885	981744	0.927 ug/mL M4
6) t n-Dodecane (C12)	15.315	992317	0.922 ug/mL M4
7) t n-Tridecane (C13)	17.623	998806	0.924 ug/mL M4
9) t n-Tetradecane (C14)	19.807	1018048	0.932 ug/mL M4
11) t n-Pentadecane (C15)	21.873	1033321	0.930 ug/mL M4
12) t n-Hexadecane (C16)	23.831	1029869	0.929 ug/mL M4
14) t n-Heptadecane (C17)	25.688	1032936	0.926 ug/mL M4
15) t Pristane	25.797	1063522	0.949 ug/mL M4
16) t n-Octadecane (C18)	27.455	1060429	0.938 ug/mL M4
17) t Phytane	27.618	931588	0.942 ug/mL M4
18) t n-Nonadecane (C19)	29.140	1051124	0.938 ug/mL M4
20) t n-Eicosane (C20)	30.746	1050163	0.942 ug/mL M4
21) t n-Heneicosane (C21)	32.282	1067184	0.949 ug/mL M4
22) t n-Docosane (C22)	33.754	1067899	0.946 ug/mL M4
23) t n-Tricosane (C23)	35.164	1072582	0.946 ug/mL M4
25) t n-Tetracosane (C24)	36.519	1081213	0.951 ug/mL M4
26) t n-Pentacosane (C25)	37.825	1065439	0.948 ug/mL M4
27) t n-Hexacosane (C26)	39.080	1085319	0.948 ug/mL M4
28) t n-Heptacosane (C27)	40.290	1076874	0.952 ug/mL M4
29) t n-Octacosane (C28)	41.458	1073657	0.953 ug/mL M4
30) t n-Nonacosane (C29)	42.587	1081458	0.955 ug/mL M4
31) t n-Triacontane (C30)	43.678	1082482	0.955 ug/mL M4
32) t n-Hentriacontane (C31)	44.736	1085565	0.956 ug/mL M4
33) t n-Dotriacontane (C32)	45.759	1097131	0.958 ug/mL M4
34) t n-Tritriacontane (C33)	46.752	1031606	0.951 ug/mL M4
35) t n-tetratriacontane (C34)	47.769	1081493	0.953 ug/mL M4
36) t n-Pentatriacontane (C35)	48.910	1069274	0.936 ug/mL M4
37) t n-Hexatriacontane (C36)	50.218	1107585	0.943 ug/mL M4
38) t n-Heptatriacontane (C37)	51.733	1084575	0.946 ug/mL M4
39) t n-Octatriacontane (C38)	53.492	1060007	0.942 ug/mL M4
41) t n-Tetracontane (C40)	58.009	1090812	0.935 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615007.D
Operator : FID17:NL
Acquired : 26 Oct 2015 4:48 pm using AcqMethod FID17.M
Instrument: FID17
Sample : I1710261501R
Misc Info : ,FRAW60 1ug/ml
ALS Vial : 54



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615009.D
Signal(s) : FID2B.CH
Acq On : 26 Oct 2015 6:17 pm
Operator : FID17:NL
Sample : I1710261502R
Misc : ,FRAW61 10ug/ml
ALS Vial : 55 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:05:31 2015
Quant Method : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 13 17:31:29 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

11/20/15

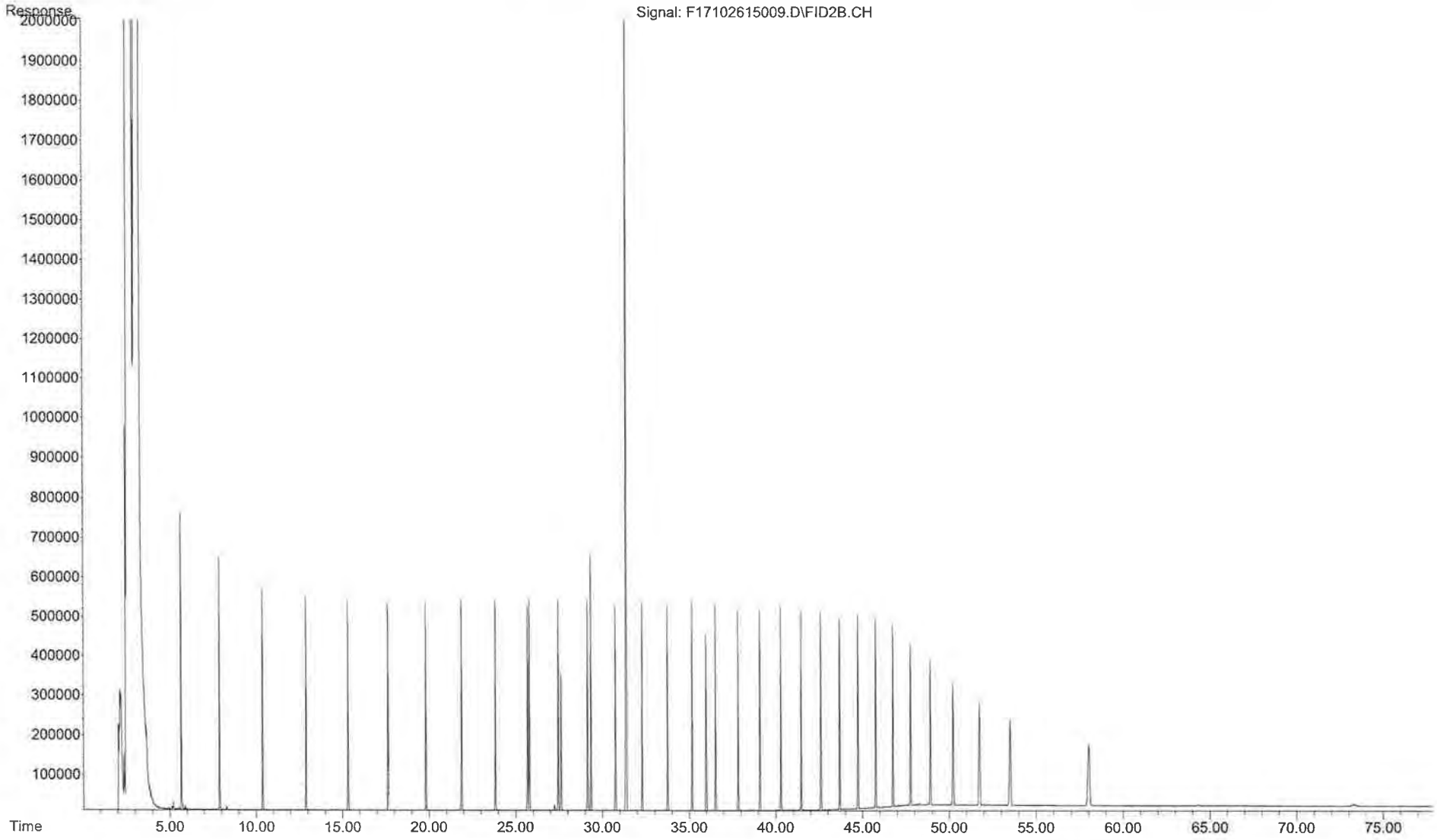
Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.376	58395290	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	29.336	12858284	10.289 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	20.58%#
24) s d50-Tetracosane	35.980	10711181	10.297 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	20.59%#
Target Compounds			
2) t n-Octane (C8)	5.662	9441518	9.819 ug/mL M4
3) t n-Nonane (C9)	7.875	9810343	9.798 ug/mL M4
4) t n-Decane (C10)	10.370	10179234	9.824 ug/mL M4
5) t n-Undecane (C11)	12.886	10295431	9.864 ug/mL M4
6) t n-Dodecane (C12)	15.316	10433228	9.836 ug/mL M4
7) t n-Tridecane (C13)	17.624	10526968	9.880 ug/mL M4
9) t n-Tetradecane (C14)	19.810	10650947	9.893 ug/mL M4
11) t n-Pentadecane (C15)	21.875	10834693	9.901 ug/mL M4
12) t n-Hexadecane (C16)	23.832	10814605	9.898 ug/mL M4
14) t n-Heptadecane (C17)	25.691	10867450	9.883 ug/mL M4
15) t Pristane	25.800	10986972	9.946 ug/mL M4
16) t n-Octadecane (C18)	27.459	11043043	9.912 ug/mL M4
17) t Phytane	27.621	9659839	9.915 ug/mL M4
18) t n-Nonadecane (C19)	29.144	10973426	9.944 ug/mL M4
20) t n-Eicosane (C20)	30.749	10926827	9.953 ug/mL M4
21) t n-Heneicosane (C21)	32.286	10991010	9.916 ug/mL M4
22) t n-Docosane (C22)	33.757	11054541	9.936 ug/mL M4
23) t n-Tricosane (C23)	35.169	11117072	9.950 ug/mL M4
25) t n-Tetracosane (C24)	36.523	11120893	9.932 ug/mL M4
26) t n-Pentacosane (C25)	37.829	11004102	9.941 ug/mL M4
27) t n-Hexacosane (C26)	39.081	11216469	9.940 ug/mL M4
28) t n-Heptacosane (C27)	40.294	11074386	9.932 ug/mL M4
29) t n-Octacosane (C28)	41.459	11012437	9.922 ug/mL M4
30) t n-Nonacosane (C29)	42.592	11047708	9.903 ug/mL M4
31) t n-Triacontane (C30)	43.683	11042486	9.887 ug/mL M4
32) t n-Hentriacontane (C31)	44.739	11043418	9.870 ug/mL M4
33) t n-Dotriacontane (C32)	45.765	11109896	9.842 ug/mL M4
34) t n-Tritriacontane (C33)	46.757	10493879	9.824 ug/mL M4
35) t n-tetratriacontane (C34)	47.774	10960107	9.799 ug/mL M4
36) t n-Pentatriacontane (C35)	48.917	11018124	9.789 ug/mL M4
37) t n-Hexatriacontane (C36)	50.223	11317891	9.785 ug/mL M4
38) t n-Heptatriacontane (C37)	51.733	11057681	9.793 ug/mL M4
39) t n-Octatriacontane (C38)	53.507	10862354	9.802 ug/mL M4
41) t n-Tetracontane (C40)	58.027	11293426	9.830 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615009.D
Operator : FID17:NL
Acquired : 26 Oct 2015 6:17 pm using AcqMethod FID17.M
Instrument: FID17
Sample : I1710261502R
Misc Info : ,FRAW61 10ug/ml
ALS Vial : 55



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615011.D
Signal(s) : FID2B.CH
Acq On : 26 Oct 2015 7:45 pm
Operator : FID17:NL
Sample : I1710261503R
Misc : ,FRAW35 50ug/ml
ALS Vial : 56 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:07:56 2015
Quant Method : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 13 17:31:40 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

11/20/15

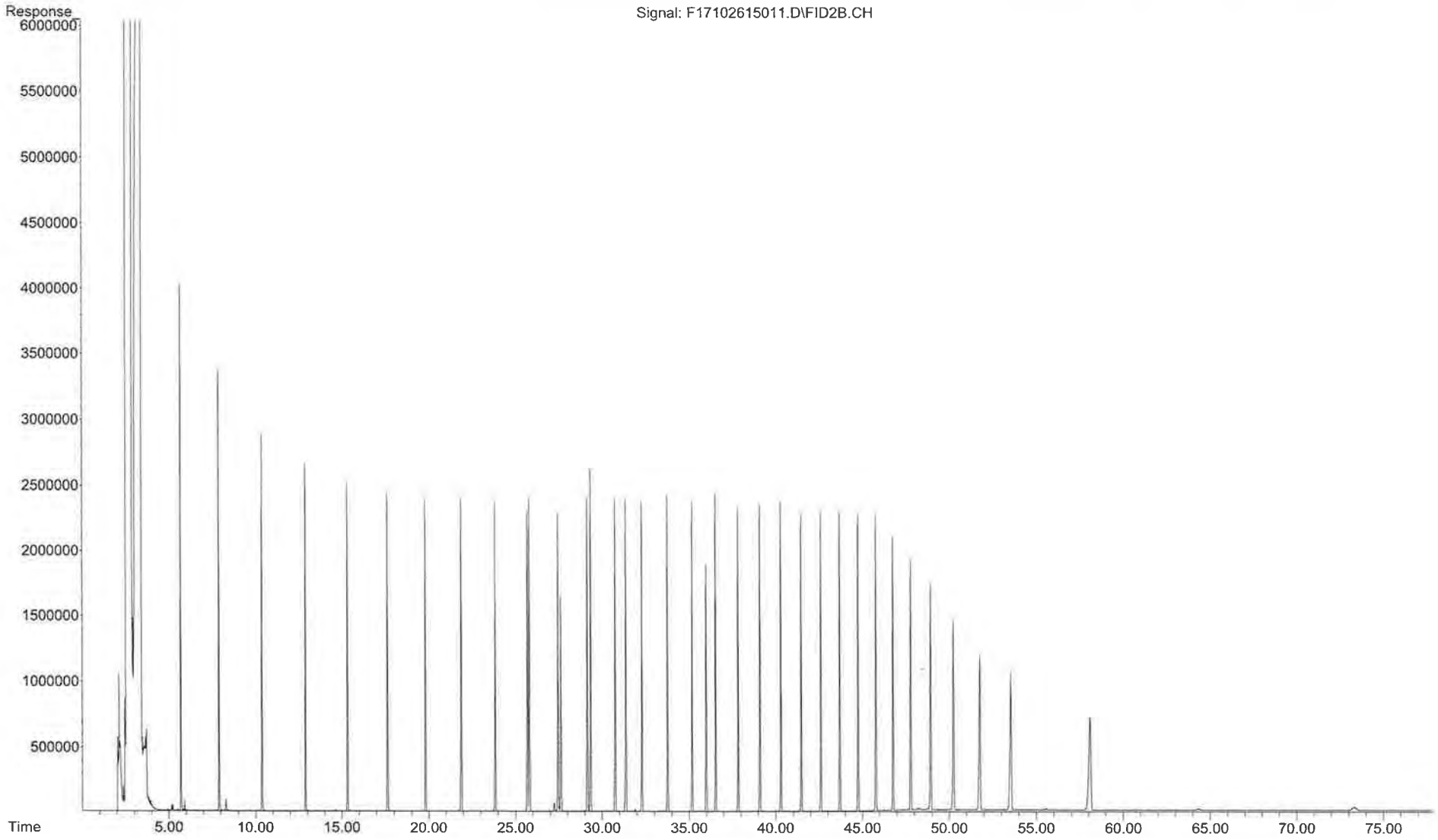
Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.377	58948732	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	29.357	63658943	50.459 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 100.92%	
24) s d50-Tetracosane	35.999	52907094	50.386 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 100.77%	
Target Compounds			
2) t n-Octane (C8)	5.691	49896609	51.405 ug/mL M4
3) t n-Nonane (C9)	7.896	51611899	51.066 ug/mL M4
4) t n-Decane (C10)	10.384	53659318	51.301 ug/mL M4
5) t n-Undecane (C11)	12.900	54361934	51.597 ug/mL M4
6) t n-Dodecane (C12)	15.329	55222943	51.574 ug/mL M4
7) t n-Tridecane (C13)	17.638	55432397	51.538 ug/mL M4
9) t n-Tetradecane (C14)	19.823	55993582	51.521 ug/mL M4
11) t n-Pentadecane (C15)	21.890	56938769	51.546 ug/mL M4
12) t n-Hexadecane (C16)	23.848	56750604	51.454 ug/mL M4
14) t n-Heptadecane (C17)	25.709	57049036	51.396 ug/mL M4
15) t Pristane	25.820	57479124	51.547 ug/mL M4
16) t n-Octadecane (C18)	27.479	57874992	51.460 ug/mL M4
17) t Phytane	27.640	50531692	51.381 ug/mL M4
18) t n-Nonadecane (C19)	29.162	57301582	51.438 ug/mL M4
20) t n-Eicosane (C20)	30.769	56836239	51.282 ug/mL M4
21) t n-Heneicosane (C21)	32.305	57159926	51.085 ug/mL M4
22) t n-Docosane (C22)	33.777	57513555	51.208 ug/mL M4
23) t n-Tricosane (C23)	35.190	57786169	51.233 ug/mL M4
25) t n-Tetracosane (C24)	36.547	57831552	51.167 ug/mL M4
26) t n-Pentacosane (C25)	37.851	57203092	51.194 ug/mL M4
27) t n-Hexacosane (C26)	39.106	58333922	51.209 ug/mL M4
28) t n-Heptacosane (C27)	40.315	57529483	51.112 ug/mL M4
29) t n-Octacosane (C28)	41.485	57162249	51.020 ug/mL M4
30) t n-Nonacosane (C29)	42.612	57365161	50.936 ug/mL M4
31) t n-Triacontane (C30)	43.706	57311444	50.832 ug/mL M4
32) t n-Hentriacontane (C31)	44.762	57282795	50.714 ug/mL M4
33) t n-Dotriacontane (C32)	45.786	57714014	50.650 ug/mL M4
34) t n-Tritriacontane (C33)	46.778	54684679	50.712 ug/mL M4
35) t n-tetratriacontane (C34)	47.800	57154185	50.620 ug/mL M4
36) t n-Pentatriacontane (C35)	48.950	57685420	50.768 ug/mL M4
37) t n-Hexatriacontane (C36)	50.265	59356981	50.833 ug/mL M4
38) t n-Heptatriacontane (C37)	51.780	58131495	50.999 ug/mL M4
39) t n-Octatriacontane (C38)	53.554	57123516	51.063 ug/mL M4
41) t n-Tetracontane (C40)	58.099	59449348	51.259 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615011.D
Operator : FID17:NL
Acquired : 26 Oct 2015 7:45 pm using AcqMethod FID17.M
Instrument: FID17
Sample : I1710261503R
Misc Info : ,FRAW35 50ug/ml
ALS Vial : 56



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615013.D
Signal(s) : FID2B.CH
Acq On : 26 Oct 2015 9:13 pm
Operator : FID17:NL
Sample : I1710261504R
Misc : ,FRAW62 100ug/ml
ALS Vial : 57 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:13:08 2015
Quant Method : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 13 17:31:55 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

11/20/15

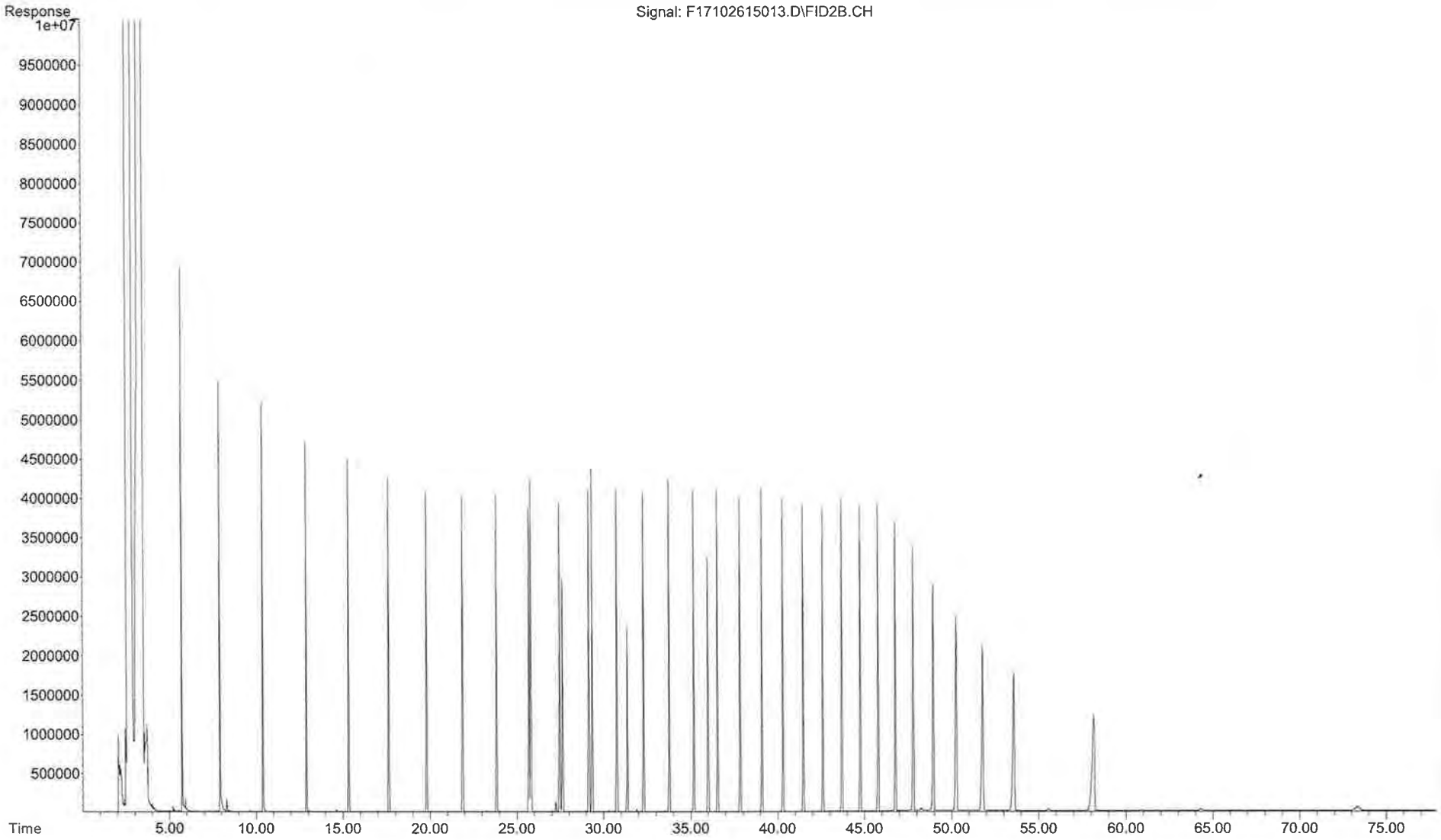
Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.380	58795026	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	29.376	124125372	98.644 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 197.29%#	
24) s d50-Tetracosane	36.015	103256195	98.592 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 197.18%#	
Target Compounds			
2) t n-Octane (C8)	5.723	95030473	98.159 ug/mL M4
3) t n-Nonane (C9)	7.919	103906557	103.075 ug/mL M4
4) t n-Decane (C10)	10.402	107361149	102.911 ug/mL M4
5) t n-Undecane (C11)	12.914	108585005	103.331 ug/mL M4
6) t n-Dodecane (C12)	15.343	110344443	103.323 ug/mL M4
7) t n-Tridecane (C13)	17.652	110821345	103.306 ug/mL M4
9) t n-Tetradecane (C14)	19.838	111974284	103.299 ug/mL M4
11) t n-Pentadecane (C15)	21.905	113859269	103.344 ug/mL M4
12) t n-Hexadecane (C16)	23.863	113472867	103.151 ug/mL M4
14) t n-Heptadecane (C17)	25.727	114420858	103.352 ug/mL M4
15) t Pristane	25.837	114502650	102.953 ug/mL M4
16) t n-Octadecane (C18)	27.496	115558377	103.019 ug/mL M4
17) t Phytane	27.658	101033372	103.001 ug/mL M4
18) t n-Nonadecane (C19)	29.182	114330914	102.900 ug/mL M4
20) t n-Eicosane (C20)	30.787	113556668	102.728 ug/mL M4
21) t n-Heneicosane (C21)	32.323	114283359	102.404 ug/mL M4
22) t n-Docosane (C22)	33.797	115039022	102.694 ug/mL M4
23) t n-Tricosane (C23)	35.209	115645893	102.799 ug/mL M4
25) t n-Tetracosane (C24)	36.567	115759805	102.686 ug/mL M4
26) t n-Pentacosane (C25)	37.870	114611403	102.840 ug/mL M4
27) t n-Hexacosane (C26)	39.128	116905133	102.895 ug/mL M4
28) t n-Heptacosane (C27)	40.336	115468418	102.856 ug/mL M4
29) t n-Octacosane (C28)	41.507	114835614	102.764 ug/mL M4
30) t n-Nonacosane (C29)	42.633	115464545	102.793 ug/mL M4
31) t n-Triacontane (C30)	43.727	115657196	102.849 ug/mL M4
32) t n-Hentriacontane (C31)	44.783	115875179	102.855 ug/mL M4
33) t n-Dotriacontane (C32)	45.810	117071638	103.011 ug/mL M4
34) t n-Tritriacontane (C33)	46.801	111063980	103.265 ug/mL M4
35) t n-tetratriacontane (C34)	47.826	116373947	103.339 ug/mL M4
36) t n-Pentatriacontane (C35)	48.980	118104215	104.214 ug/mL M4
37) t n-Hexatriacontane (C36)	50.298	121021920	103.914 ug/mL M4
38) t n-Heptatriacontane (C37)	51.825	118447922	104.187 ug/mL M4
39) t n-Octatriacontane (C38)	53.607	116271553	104.208 ug/mL M4
41) t n-Tetracontane (C40)	58.173	120836554	104.461 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615013.D
Operator : FID17:NL
Acquired : 26 Oct 2015 9:13 pm using AcqMethod FID17.M
Instrument: FID17
Sample : I1710261504R
Misc Info : ,FRAW62 100ug/ml
ALS Vial : 57



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615015.D
Signal(s) : FID2B.CH
Acq On : 26 Oct 2015 10:42 pm
Operator : FID17:NL
Sample : I1710261505R
Misc : ,FRAW63 200ug/ml
ALS Vial : 58 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 13 17:32:10 2015
Quant Method : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 13 17:32:05 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

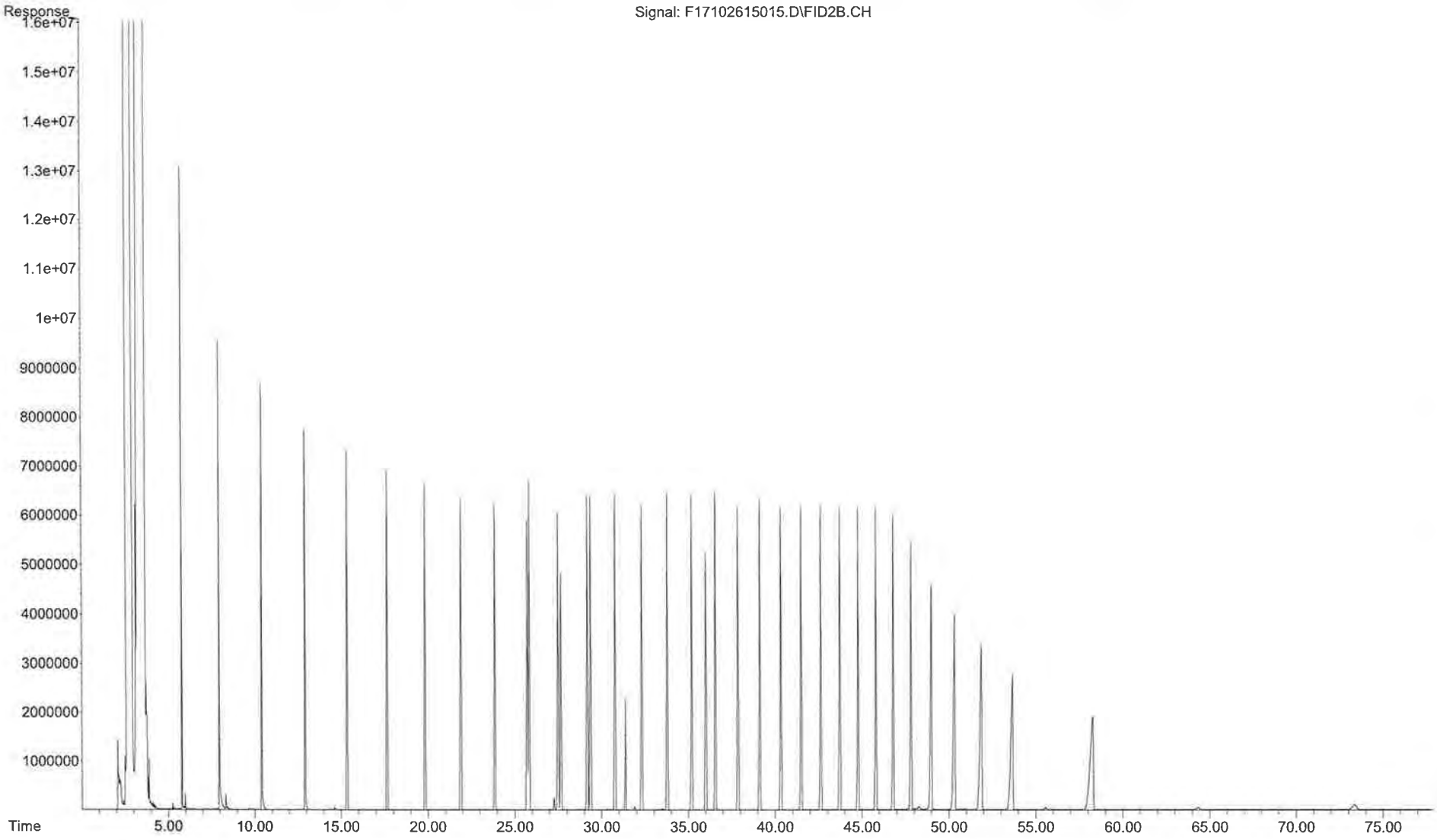
Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.384	60298196	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	29.400	254926737	197.543 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 395.09%#	
24) s d50-Tetracosane	36.038	211243419	196.674 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 393.35%#	
Target Compounds			
2) t n-Octane (C8)	5.795f	201751965	203.199 ug/mL M3
3) t n-Nonane (C9)	7.967	209844483	202.977 ug/mL M4
4) t n-Decane (C10)	10.431	217413173	203.207 ug/mL M4
5) t n-Undecane (C11)	12.938	220194673	204.317 ug/mL M4
6) t n-Dodecane (C12)	15.365	223041970	203.644 ug/mL M4
7) t n-Tridecane (C13)	17.671	223534206	203.180 ug/mL M4
9) t n-Tetradecane (C14)	19.857	225516778	202.859 ug/mL M4
11) t n-Pentadecane (C15)	21.924	229216551	202.862 ug/mL M4
12) t n-Hexadecane (C16)	23.883	228245843	202.312 ug/mL M4
14) t n-Heptadecane (C17)	25.751	232694878	204.944 ug/mL M4
15) t Pristane	25.862	227288729	199.268 ug/mL M4
16) t n-Octadecane (C18)	27.520	232757178	202.327 ug/mL M4
17) t Phytane	27.681	202950963	201.745 ug/mL M4
18) t n-Nonadecane (C19)	29.207	230040463	201.880 ug/mL M4
20) t n-Eicosane (C20)	30.811	228873076	201.886 ug/mL M4
21) t n-Heneicosane (C21)	32.349	230232750	201.158 ug/mL M4
22) t n-Docosane (C22)	33.824	231335281	201.363 ug/mL M4
23) t n-Tricosane (C23)	35.237	232114603	201.185 ug/mL M4
25) t n-Tetracosane (C24)	36.595	232137808	200.788 ug/mL M4
26) t n-Pentacosane (C25)	37.899	229573727	200.859 ug/mL M4
27) t n-Hexacosane (C26)	39.156	234273551	201.058 ug/mL M4
28) t n-Heptacosane (C27)	40.365	231279567	200.882 ug/mL M4
29) t n-Octacosane (C28)	41.537	230736032	201.333 ug/mL M4
30) t n-Nonacosane (C29)	42.664	232252727	201.609 ug/mL M4
31) t n-Triacontane (C30)	43.760	233263157	202.261 ug/mL M4
32) t n-Hentriacontane (C31)	44.819	234400539	202.875 ug/mL M4
33) t n-Dotriacontane (C32)	45.842	237312989	203.605 ug/mL M4
34) t n-Tritriacontane (C33)	46.836	224850530	203.851 ug/mL M4
35) t n-tetratriacontane (C34)	47.867	235988326	204.332 ug/mL M4
36) t n-Pentatriacontane (C35)	49.023	238880750	205.532 ug/mL M4
37) t n-Hexatriacontane (C36)	50.354	244224042	204.473 ug/mL M4
38) t n-Heptatriacontane (C37)	51.889	238420774	204.488 ug/mL M2
39) t n-Octatriacontane (C38)	53.678	233418942	203.986 ug/mL M2
41) t n-Tetracontane (C40)	58.286	241190803	203.307 ug/mL M2

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615015.D
Operator : FID17:NL
Acquired : 26 Oct 2015 10:42 pm using AcqMethod FID17.M
Instrument: FID17
Sample : I1710261505R
Misc Info : ,FRAW63 200ug/ml
ALS Vial : 58



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615017.D
Signal(s) : FID2B.CH
Acq On : 27 Oct 2015 12:10 am
Operator : FID17:NL
Sample : I1710261506R
Misc : ,FRAW64 500ug/ml
ALS Vial : 59 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 13 17:32:18 2015
Quant Method : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Fri Nov 13 17:32:15 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.377	58567827	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	29.447	639217938	509.965 ug/mL
Spiked Amount 50.000	Range 50 - 130	Recovery	= 1019.93%#
24) s d50-Tetracosane	36.094	534084137	511.938 ug/mL M4
Spiked Amount 50.000	Range 50 - 130	Recovery	= 1023.88%#

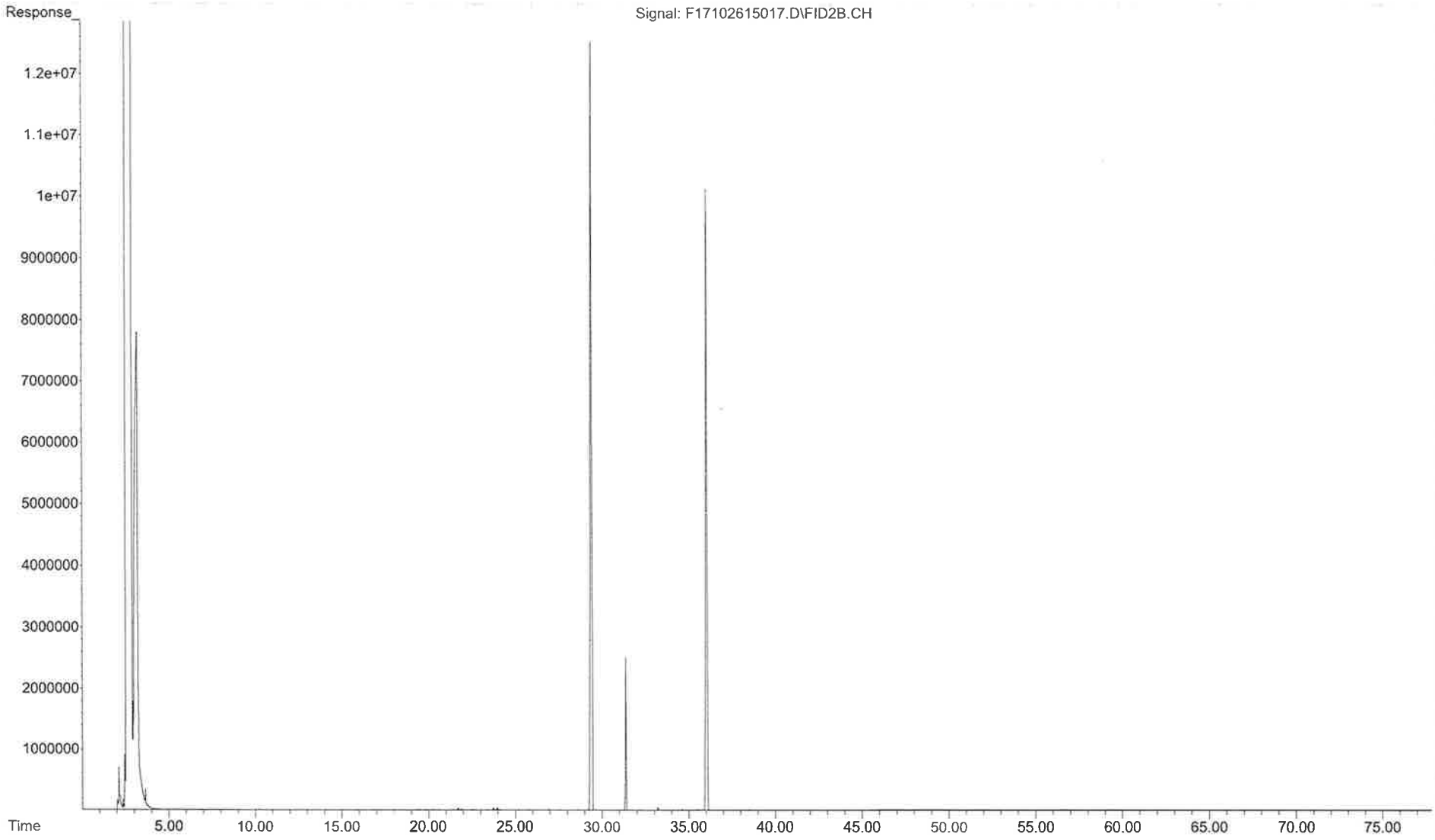
Target Compounds

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615017.D
Operator : FID17:NL
Acquired : 27 Oct 2015 12:10 am using AcqMethod FID17.M
Instrument: FID17
Sample : I1710261506R
Misc Info : ,FRAW64 500ug/ml
ALS Vial : 59



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615023.D
Signal(s) : FID2B.CH
Acq On : 27 Oct 2015 4:34 am
Operator : FID17:NL
Sample : CQ1710261501R
Misc : ,FRAW65 50ug/ml
ALS Vial : 62 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:21:00 2015
Quant Method : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 19 08:19:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	114	0.00
2	t	n-Octane (C8)	50.000	44.971	10.1	99	0.00
3	t	n-Nonane (C9)	50.000	45.005	10.0	100	0.00
4	t	n-Decane (C10)	50.000	46.583	6.8	103	0.00
5	t	n-Undecane (C11)	50.000	45.280	9.4	100	0.00
6	t	n-Dodecane (C12)	50.000	45.147	9.7	99	0.00
7	t	n-Tridecane (C13)	50.000	44.986	10.0	99	0.00
9	t	n-Tetradecane (C14)	50.000	46.148	7.7	102	0.00
11	t	n-Pentadecane (C15)	50.000	44.902	10.2	99	0.00
12	t	n-Hexadecane (C16)	50.000	45.387	9.2	100	0.00
14	t	n-Heptadecane (C17)	50.000	45.370	9.3	100	0.00
15	t	Pristane	50.000	45.203	9.6	100	0.00
16	t	n-Octadecane (C18)	50.000	44.470	11.1	98	0.00
17	t	Phytane	50.000	51.577	-3.2	114	0.00
18	t	n-Nonadecane (C19)	50.000	44.555	10.9	99	0.00
19	s	ortho-terphenyl	50.000	45.165	9.7	102	0.00
20	t	n-Eicosane (C20)	50.000	44.833	10.3	100	0.00
21	t	n-Heneicosane (C21)	50.000	44.872	10.3	100	0.00
22	t	n-Docosane (C22)	50.000	44.835	10.3	100	0.00
23	t	n-Tricosane (C23)	50.000	44.735	10.5	99	0.00
24	s	d50-Tetracosane	50.000	45.274	9.5	102	0.00
25	t	n-Tetracosane (C24)	50.000	44.562	10.9	99	0.00
26	t	n-Pentacosane (C25)	50.000	45.045	9.9	100	0.00
27	t	n-Hexacosane (C26)	50.000	44.904	10.2	100	0.00
28	t	n-Heptacosane (C27)	50.000	44.845	10.3	100	0.00
29	t	n-Octacosane (C28)	50.000	45.007	10.0	100	0.00
30	t	n-Nonacosane (C29)	50.000	44.966	10.1	100	0.00
31	t	n-Triacontane (C30)	50.000	44.789	10.4	100	0.00
32	t	n-Hentriacontane (C31)	50.000	44.771	10.5	100	0.00
33	t	n-Dotriacontane (C32)	50.000	43.935	12.1	99	0.00
34	t	n-Tritriacontane (C33)	50.000	44.897	10.2	101	0.00
35	t	n-tetratriacontane (C34)	50.000	45.254	9.5	102	0.00
36	t	n-Pentatriacontane (C35)	50.000	45.067	9.9	101	0.00
37	t	n-Hexatriacontane (C36)	50.000	47.139	5.7	106	0.00
38	t	n-Heptatriacontane (C37)	50.000	45.140	9.7	101	0.00
39	t	n-Octatriacontane (C38)	50.000	45.966	8.1	103	0.00
41	t	n-Tetracontane (C40)	50.000	42.407	15.2	94	-0.01

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.11	0.85 - 1.15

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615023.D
Signal(s) : FID2B.CH
Acq On : 27 Oct 2015 4:34 am
Operator : FID17:NL
Sample : CQ1710261501R
Misc : ,FRAW65 50ug/ml
ALS Vial : 62 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:21:00 2015
Quant Method : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 19 08:19:11 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

11/20/15

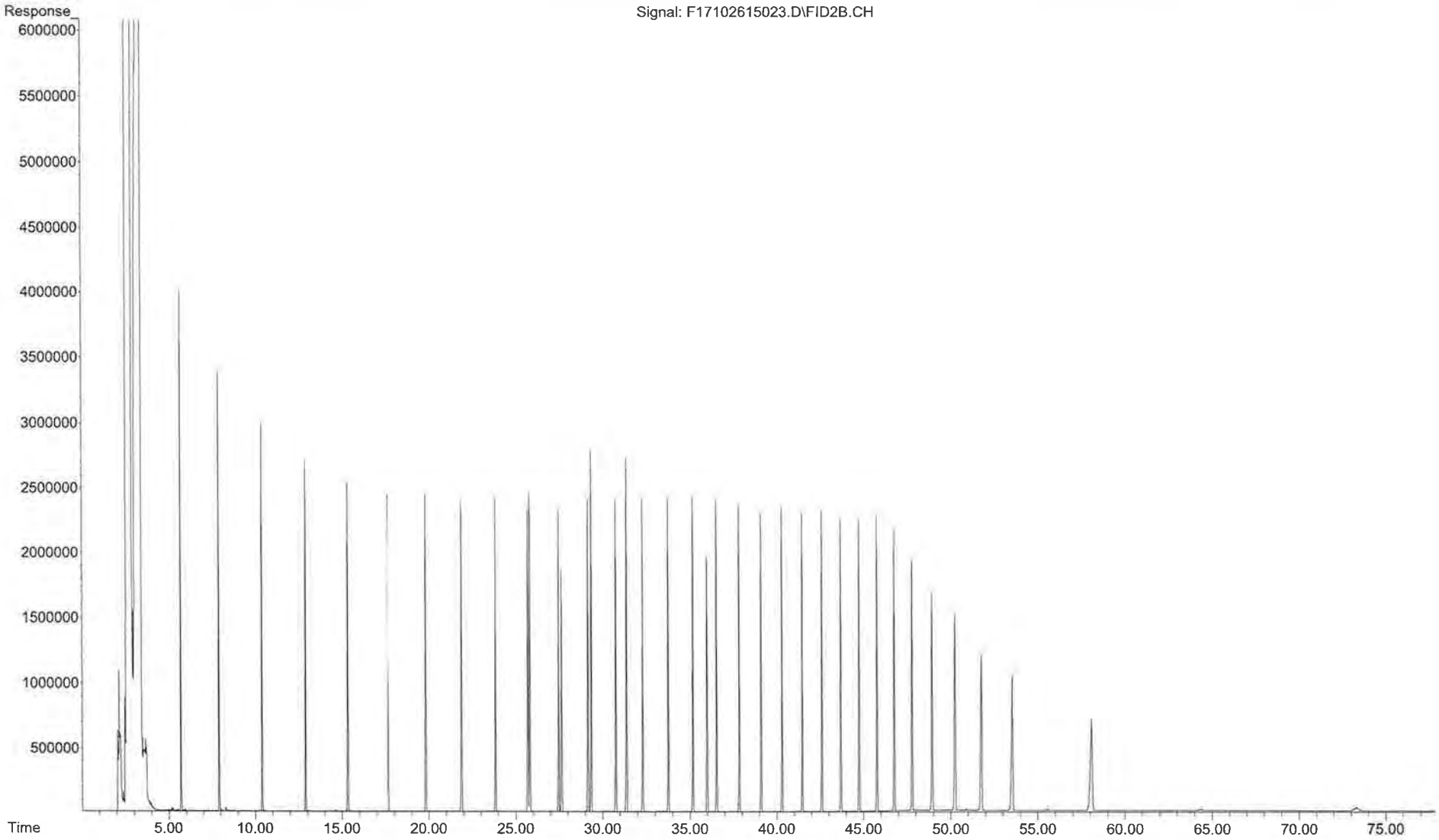
Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.377	67093766	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	29.354	64853049	45.165 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	90.33%
24) s d50-Tetracosane	35.994	54163069	45.274 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery =	90.55%
Target Compounds			
2) t n-Octane (C8)	5.693	49415034	44.971 ug/mL M4
3) t n-Nonane (C9)	7.896	51770898	45.005 ug/mL M4
4) t n-Decane (C10)	10.383	55402208	46.583 ug/mL M4
5) t n-Undecane (C11)	12.897	54298660	45.280 ug/mL M4
6) t n-Dodecane (C12)	15.327	54891281	45.147 ug/mL M4
7) t n-Tridecane (C13)	17.635	54974907	44.986 ug/mL M4
9) t n-Tetradecane (C14)	19.821	57068908	46.148 ug/mL M4
11) t n-Pentadecane (C15)	21.887	56443466	44.902 ug/mL M4
12) t n-Hexadecane (C16)	23.846	56868826	45.387 ug/mL M4
14) t n-Heptadecane (C17)	25.707	57319272	45.370 ug/mL M6
15) t Pristane	25.816	57369817	45.203 ug/mL M4
16) t n-Octadecane (C18)	27.474	56923770	44.470 ug/mL M4
17) t Phytane	27.639	57732490	51.577 ug/mL M4
18) t n-Nonadecane (C19)	29.160	56492174	44.555 ug/mL M4
20) t n-Eicosane (C20)	30.764	56554225	44.833 ug/mL M4
21) t n-Heneicosane (C21)	32.301	57051261	44.872 ug/mL M4
22) t n-Docosane (C22)	33.773	57280739	44.835 ug/mL M4
23) t n-Tricosane (C23)	35.186	57421711	44.735 ug/mL M4
25) t n-Tetracosane (C24)	36.543	57312351	44.562 ug/mL M4
26) t n-Pentacosane (C25)	37.846	57275416	45.045 ug/mL M4
27) t n-Hexacosane (C26)	39.102	58219441	44.904 ug/mL M4
28) t n-Heptacosane (C27)	40.314	57449688	44.845 ug/mL M4
29) t n-Octacosane (C28)	41.481	57392962	45.007 ug/mL M4
30) t n-Nonacosane (C29)	42.610	57638644	44.966 ug/mL M4
31) t n-Triacontane (C30)	43.702	57475874	44.789 ug/mL M4
32) t n-Hentriacontane (C31)	44.761	57558084	44.771 ug/mL M4
33) t n-Dotriacontane (C32)	45.781	57013957	43.935 ug/mL M4
34) t n-Tritriacontane (C33)	46.774	55103173	44.897 ug/mL M4
35) t n-tetratriacontane (C34)	47.799	58155491	45.254 ug/mL M4
36) t n-Pentatriacontane (C35)	48.943	58282465	45.067 ug/mL M4
37) t n-Hexatriacontane (C36)	50.260	62648110	47.139 ug/mL M4
38) t n-Heptatriacontane (C37)	51.776	58677700	45.140 ug/mL M4
39) t n-Octatriacontane (C38)	53.545	58595258	45.966 ug/mL M4
41) t n-Tetracontane (C40)	58.086	56031865	42.407 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615023.D
Operator : FID17:NL
Acquired : 27 Oct 2015 4:34 am using AcqMethod FID17.M
Instrument: FID17
Sample : CQ1710261501R
Misc Info : ,FRAW65 50ug/ml
ALS Vial : 62



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615025.D
Signal(s) : FID2B.CH
Acq On : 27 Oct 2015 6:02 am
Operator : FID17:NL
Sample : TO103015ANC02
Misc : ,FRAW36 10.382mg/mL
ALS Vial : 63 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:31:40 2015
Quant Method : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 19 08:30:39 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1710261501R
Blank File : F17102615021.D

Sub List : Default - All compounds listed

11/20/15

Compound	R.T.	Response	Conc Units
Internal Standards			
1) I 5-alpha-androstane	31.381	62993161	50.000 ug/mL M4
System Monitoring Compounds			
19) s ortho-terphenyl	29.358	66685118	49.464 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 98.93%	
24) s d50-Tetracosane	36.005	56609587	50.399 ug/mL M4
Spiked Amount 50.000 Range 50 - 130		Recovery = 100.80%	
Target Compounds			
2) t n-Octane (C8)	5.659	99153658	96.110 ug/mL M4
3) t n-Nonane (C9)	7.882	75549931	69.951 ug/mL M4
4) t n-Decane (C10)	10.379	63797059	57.134 ug/mL M4
5) t n-Undecane (C11)	12.897	58158963	51.656 ug/mL M4
6) t n-Dodecane (C12)	15.328	54099841	47.393 ug/mL M4
7) t n-Tridecane (C13)	17.638	49906316	43.497 ug/mL M4
8) t 1380	19.314	11915193	10.262 ug/mL M4
9) t n-Tetradecane (C14)	19.823	46871416	40.369 ug/mL M4
10) t 1470	21.107	17264386	14.628 ug/mL M4
11) t n-Pentadecane (C15)	21.889	54961790	46.569 ug/mL M4
12) t n-Hexadecane (C16)	23.845	42898821	36.466 ug/mL M4
13) t 1650	24.749	16178967	13.640 ug/mL M4
14) t n-Heptadecane (C17)	25.705	37303202	31.449 ug/mL M4
15) t Pristane	25.798	29306941	24.595 ug/mL M4
16) t n-Octadecane (C18)	27.471	32591310	27.118 ug/mL M4
17) t Phytane	27.630	16478416	15.680 ug/mL M4
18) t n-Nonadecane (C19)	29.157	31332430	26.321 ug/mL M4
20) t n-Eicosane (C20)	30.763	34009779	28.716 ug/mL M4
21) t n-Heneicosane (C21)	32.297	27963825	23.426 ug/mL M4
22) t n-Docosane (C22)	33.770	26258304	21.891 ug/mL M4
23) t n-Tricosane (C23)	35.181	23349620	19.375 ug/mL M4
25) t n-Tetracosane (C24)	36.536	22234117	18.413 ug/mL M4
26) t n-Pentacosane (C25)	37.838	22029695	18.453 ug/mL M4
27) t n-Hexacosane (C26)	39.092	18435782	15.145 ug/mL M4
28) t n-Heptacosane (C27)	40.301	14530027	12.080 ug/mL M4
29) t n-Octacosane (C28)	41.470	10476590	8.750 ug/mL M4
30) t n-Nonacosane (C29)	42.596	10575487	8.787 ug/mL M4
31) t n-Triacontane (C30)	43.688	8294585	6.884 ug/mL M4
32) t n-Hentriacontane (C31)	44.743	6786919	5.623 ug/mL M4
33) t n-Dotriacontane (C32)	45.769	7658286	6.286 ug/mL M4
34) t n-Tritriacontane (C33)	46.758	4168971	3.618 ug/mL M4
35) t n-tetratriacontane (C34)	47.771	3917007	3.246 ug/mL M4
36) t n-Pentatriacontane (C35)	48.917	3501375	2.884 ug/mL M4
37) t n-Hexatriacontane (C36)	50.227	2236863	1.793 ug/mL M4
38) t n-Heptatriacontane (C37)	51.744	2172362	1.780 ug/mL M4
39) t n-Octatriacontane (C38)	53.504	1849231	1.545 ug/mL M4
40) t n-Nonatriacontane (C39)	55.556	1233055	0.994 ug/mL M4
41) t n-Tetracontane (C40)	58.011	1227799	0.990 ug/mL M4
42) h C9-C44 Total Petroleu...	40.600	7611738070	6430.187 ug/mL m
42) h C9-C44 Total Petroleu BS	40.600	7370774868	6226.628 ug/mLm
44) h C10-C28 DRO	25.935	5037808549	4255.802 ug/mL m

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615025.D
Signal(s) : FID2B.CH
Acq On : 27 Oct 2015 6:02 am
Operator : FID17:NL
Sample : TO103015ANC02
Misc : ,FRAW36 10.382mg/mL
ALS Vial : 63 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 19 08:31:40 2015
Quant Method : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Thu Nov 19 08:30:39 2015
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Blank Name : IB1710261501R
Blank File : F17102615021.D

Sub List : Default - All compounds listed

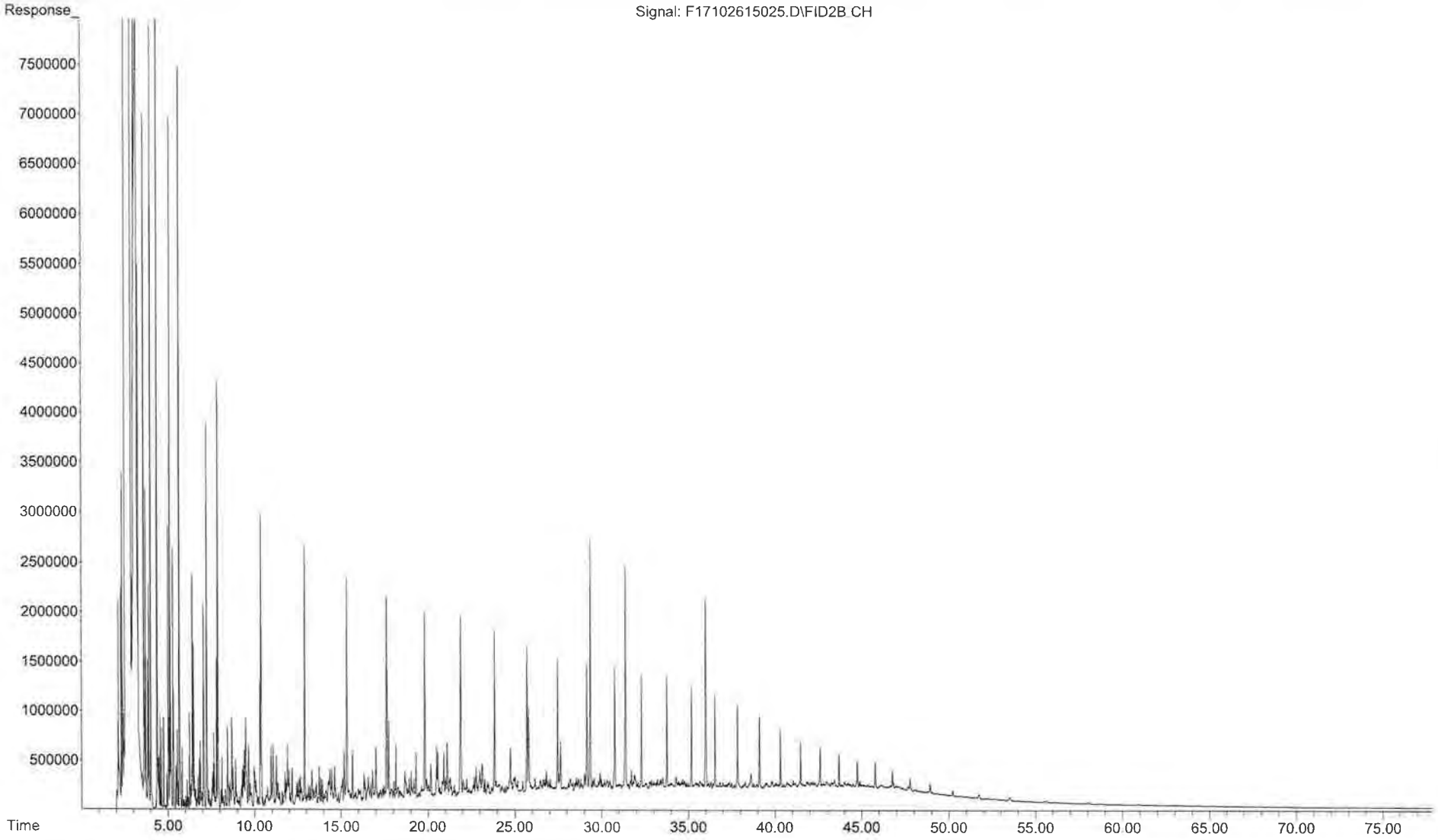
	Compound	R.T.	Response	Conc	Units
44) h	C10-C28 DRO BS	25.935	5028167431	4247.658	ug/mLm
45) h	Total Resolved Hydroc...	40.600	2369905691	2002.031	ug/mL m

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2015\Oct\OCT26.SEC\
Data File : F17102615025.D
Operator : FID17:NL
Acquired : 27 Oct 2015 6:02 am using AcqMethod FID17.M
Instrument: FID17
Sample : TO103015ANC02
Misc Info : ,FRAW36 10.382mg/mL
ALS Vial : 63



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\FID6\2016\Nov\Nov10\
Data File : F611101606.D
Signal(s) : FID1A.CH
Acq On : 10 Nov 2016 4:46 pm
Operator : FID6:NL
Sample : C611101601F
Misc : FRAX76 50ug/mL
ALS Vial : 3 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Dec 07 16:19:45 2016
Quant Method : O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 07 17:13:19 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	94	-0.03
2	t	n-Octane (C8)	50.000	52.527	-5.1	109	-0.02
3	t	n-Nonane (C9)	50.000	52.734	-5.5	108	-0.01
4	t	n-Decane (C10)	50.000	50.982	-2.0	89	-0.03
5	t	n-Undecane (C11)	50.000	51.487	-3.0	103	-0.03
6	t	n-Dodecane (C12)	50.000	51.435	-2.9	101	-0.03
7	t	n-Tridecane (C13)	50.000	51.707	-3.4	101	-0.03
9	t	n-Tetradecane (C14)	50.000	52.150	-4.3	101	-0.03
11	t	n-Pentadecane (C15)	50.000	51.225	-2.5	98	-0.03
12	t	n-Hexadecane (C16)	50.000	51.999	-4.0	99	-0.03
14	t	n-Heptadecane (C17)	50.000	49.963	0.1	95	-0.03
15	t	Pristane	50.000	53.884	-7.8	98	-0.03
16	T	n-Octadecane (C18)	50.000	51.733	-3.5	96	-0.03
17	t	Phytane	50.000	53.681	-7.4	98	-0.02
18	t	n-Nonadecane (C19)	50.000	55.954	-11.9	103	-0.03
19	s	ortho-terphenyl	50.000	47.185	5.6	89	-0.03
20	t	n-Eicosane (C20)	50.000	51.744	-3.5	96	-0.03
21	t	n-Heneicosane (C21)	50.000	52.283	-4.6	95	-0.03
22	t	n-Docosane (C22)	50.000	52.012	-4.0	95	-0.03
23	t	n-Tricosane (C23)	50.000	51.903	-3.8	94	-0.03
24	s	d50-Tetracosane	50.000	49.515	1.0	91	-0.03
25	t	n-Tetracosane (C24)	50.000	52.034	-4.1	94	-0.03
26	t	n-Pentacosane (C25)	50.000	52.228	-4.5	94	-0.03
27	t	n-Hexacosane (C26)	50.000	51.462	-2.9	92	-0.03
28	t	n-Heptacosane (C27)	50.000	50.869	-1.7	91	-0.03
29	t	n-Octacosane (C28)	50.000	53.050	-6.1	94	-0.03
30	t	n-Nonacosane (C29)	50.000	52.545	-5.1	93	-0.03
31	t	n-Triacontane (C30)	50.000	52.134	-4.3	92	-0.03
32	t	n-Hentriacontane (C31)	50.000	51.840	-3.7	92	-0.03
33	t	n-Dotriacontane (C32)	50.000	50.979	-2.0	90	-0.03
34	t	n-Tritriacontane (C33)	50.000	53.438	-6.9	93	-0.03
35	t	n-tetratriacontane (C34)	50.000	52.962	-5.9	94	-0.03
36	t	n-Pentatriacontane (C35)	50.000	50.320	-0.6	89	-0.03
37	t	n-Hexatriacontane (C36)	50.000	52.189	-4.4	92	-0.03
38	t	n-Heptatriacontane (C37)	50.000	49.735	0.5	89	-0.04
39	t	n-Octatriacontane (C38)	50.000	54.540	-9.1	98	-0.05
41	t	n-Tetracontane (C40)	50.000	49.308	1.4	89	-0.07

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.09	0.85 - 1.15

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2016\Nov\Nov10\
Data File : F611101606.D
Signal(s) : FID1A.CH
Acq On : 10 Nov 2016 4:46 pm
Operator : FID6:NL
Sample : C611101601F
Misc : FRAX76 50ug/mL
ALS Vial : 3 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Dec 07 16:19:45 2016
Quant Method : O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 07 17:13:19 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

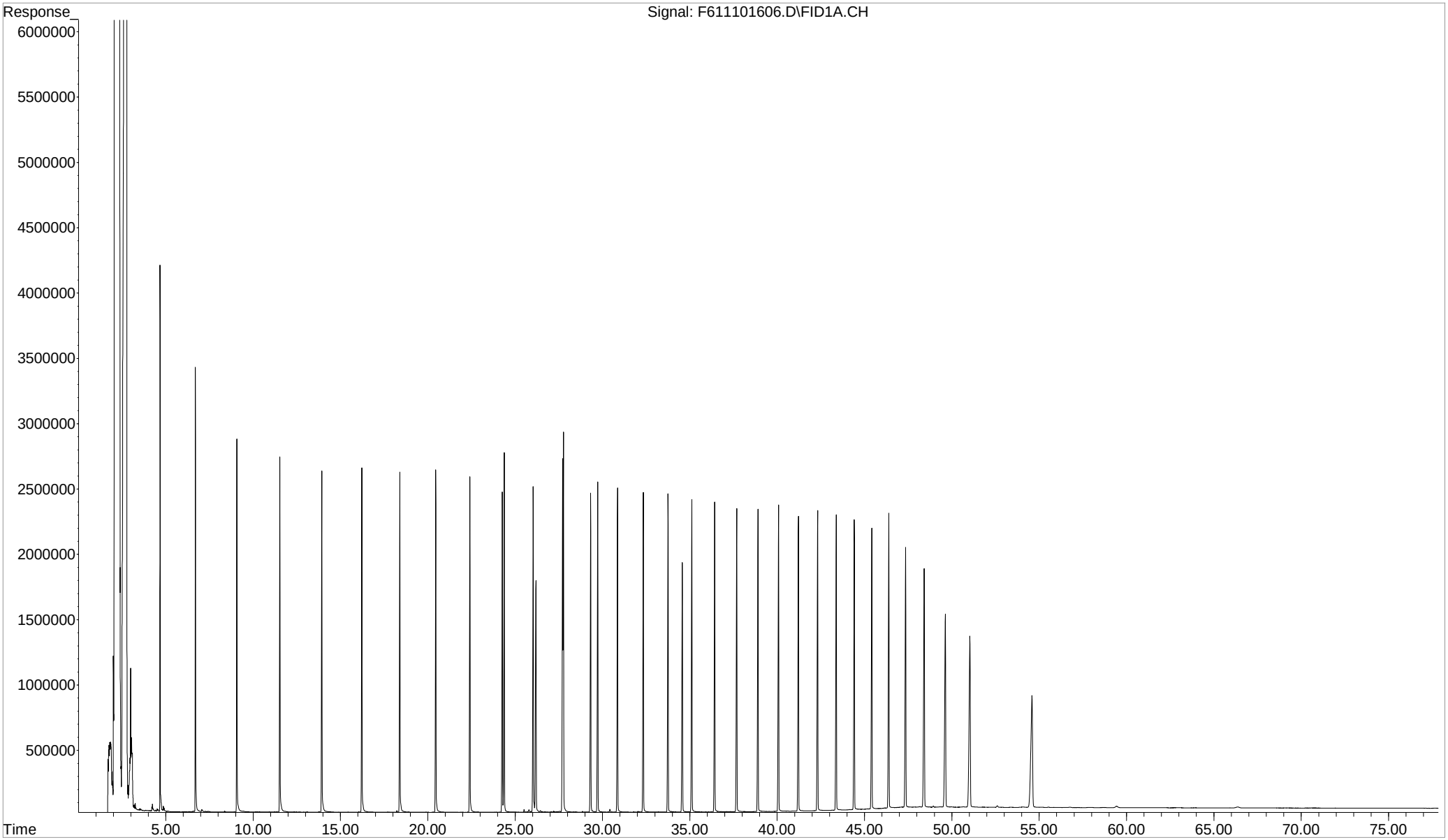
Sub List : CCAL - CCAL

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	29.727	59237099	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	27.766	59644520	47.185 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 94.37%
24) s	d50-Tetracosane	34.568	52790044	49.515 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 99.03%
	Target Compounds			
2) t	n-Octane (C8)	4.671	49544785	52.527 ug/mL M4
3) t	n-Nonane (C9)	6.691	52501261	52.734 ug/mL M4
4) t	n-Decane (C10)	9.063	53033130	50.982 ug/mL M4
5) t	n-Undecane (C11)	11.525	54506803	51.487 ug/mL M4
6) t	n-Dodecane (C12)	13.927	55324655	51.435 ug/mL M4
7) t	n-Tridecane (C13)	16.220	55872886	51.707 ug/mL M4
9) t	n-Tetradecane (C14)	18.395	56929012	52.150 ug/mL M4
11) t	n-Pentadecane (C15)	20.452	56885893	51.225 ug/mL M4
12) t	n-Hexadecane (C16)	22.407	57641234	51.999 ug/mL M4
14) t	n-Heptadecane (C17)	24.264	55833645	49.963 ug/mL M4
15) t	Pristane	24.373	60191815	53.884 ug/mL M4
16) T	n-Octadecane (C18)	26.030	58506283	51.733 ug/mL M4
17) t	Phytane	26.190	53067357	53.681 ug/mL M4
18) t	n-Nonadecane (C19)	27.716	62871174	55.954 ug/mL M4
20) t	n-Eicosane (C20)	29.323	58076336	51.744 ug/mL M4
21) t	n-Heneicosane (C21)	30.861	59053849	52.283 ug/mL M4
22) t	n-Docosane (C22)	32.337	59200711	52.012 ug/mL M4
23) t	n-Tricosane (C23)	33.754	59530553	51.903 ug/mL M4
25) t	n-Tetracosane (C24)	35.115	59990444	52.034 ug/mL M4
26) t	n-Pentacosane (C25)	36.423	59594592	52.228 ug/mL M4
27) t	n-Hexacosane (C26)	37.684	60100120	51.462 ug/mL M4
28) t	n-Heptacosane (C27)	38.904	58783320	50.869 ug/mL M4
29) t	n-Octacosane (C28)	40.082	61128577	53.050 ug/mL M4
30) t	n-Nonacosane (C29)	41.218	60979622	52.545 ug/mL M4
31) t	n-Triacontane (C30)	42.318	60729833	52.134 ug/mL M4
32) t	n-Hentriacontane (C31)	43.383	60825529	51.840 ug/mL M4
33) t	n-Dotriacontane (C32)	44.416	60222517	50.979 ug/mL M4
34) t	n-Tritriacontane (C33)	45.418	59646432	53.438 ug/mL M4
35) t	n-tetratriacontane (C34)	46.393	61888888	52.962 ug/mL M4
36) t	n-Pentatriacontane (C35)	47.355	59543586	50.320 ug/mL M4
37) t	n-Hexatriacontane (C36)	48.422	63241671	52.189 ug/mL M4
38) t	n-Heptatriacontane (C37)	49.627	58927959	49.735 ug/mL M4
39) t	n-Octatriacontane (C38)	51.032	63383093	54.540 ug/mL M4
41) t	n-Tetracontane (C40)	54.588	59327367	49.308 ug/mL M4
	SemiQuant Compounds - Not Calibrated on this Instrument			

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2016\Nov\Nov10\F611101606.D
Operator : FID6:NL
Acquired : 10 Nov 2016 4:46 pm using AcqMethod FID6A.M
Sample Name: C611101601F
Instrument: FID6
Misc Info : FRAX76 50ug/mL
Vial Number: 3
CurrentMeth: O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\FID6\2016\Nov\Nov10\
Data File : F611101636.D
Signal(s) : FID1A.CH
Acq On : 11 Nov 2016 6:15 pm
Operator : FID6:NL
Sample : C611101602F
Misc : FRAX76 50ug/mL
ALS Vial : 18 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 12 16:29:58 2016
Quant Method : O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 07 17:13:34 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	97	-0.03
2	t	n-Octane (C8)	50.000	49.933	0.1	107	-0.02
3	t	n-Nonane (C9)	50.000	51.287	-2.6	109	-0.01
4	t	n-Decane (C10)	50.000	50.941	-1.9	93	-0.03
5	t	n-Undecane (C11)	50.000	50.821	-1.6	106	-0.03
6	t	n-Dodecane (C12)	50.000	51.124	-2.2	104	-0.03
7	t	n-Tridecane (C13)	50.000	51.382	-2.8	104	-0.03
9	t	n-Tetradecane (C14)	50.000	51.850	-3.7	104	-0.02
11	t	n-Pentadecane (C15)	50.000	50.983	-2.0	101	-0.02
12	t	n-Hexadecane (C16)	50.000	51.872	-3.7	102	-0.03
14	t	n-Heptadecane (C17)	50.000	49.661	0.7	98	-0.03
15	t	Pristane	50.000	54.088	-8.2	102	-0.02
16	T	n-Octadecane (C18)	50.000	51.468	-2.9	99	-0.02
17	t	Phytane	50.000	54.045	-8.1	102	-0.02
18	t	n-Nonadecane (C19)	50.000	55.926	-11.9	107	-0.02
19	s	ortho-terphenyl	50.000	44.625	10.8	87	-0.03
20	t	n-Eicosane (C20)	50.000	51.708	-3.4	99	-0.02
21	t	n-Heneicosane (C21)	50.000	52.174	-4.3	99	-0.03
22	t	n-Docosane (C22)	50.000	52.050	-4.1	99	-0.03
23	t	n-Tricosane (C23)	50.000	51.776	-3.6	97	-0.03
24	s	d50-Tetracosane	50.000	49.384	1.2	94	-0.03
25	t	n-Tetracosane (C24)	50.000	51.915	-3.8	97	-0.03
26	t	n-Pentacosane (C25)	50.000	52.196	-4.4	98	-0.03
27	t	n-Hexacosane (C26)	50.000	51.296	-2.6	95	-0.03
28	t	n-Heptacosane (C27)	50.000	50.495	-1.0	93	-0.03
29	t	n-Octacosane (C28)	50.000	53.222	-6.4	98	-0.03
30	t	n-Nonacosane (C29)	50.000	52.173	-4.3	96	-0.03
31	t	n-Triacontane (C30)	50.000	51.410	-2.8	95	-0.03
32	t	n-Hentriacontane (C31)	50.000	51.548	-3.1	95	-0.03
33	t	n-Dotriacontane (C32)	50.000	50.634	-1.3	93	-0.03
34	t	n-Tritriacontane (C33)	50.000	53.094	-6.2	95	-0.03
35	t	n-tetratriacontane (C34)	50.000	52.609	-5.2	96	-0.03
36	t	n-Pentatriacontane (C35)	50.000	50.175	-0.3	92	-0.03
37	t	n-Hexatriacontane (C36)	50.000	51.590	-3.2	95	-0.03
38	t	n-Heptatriacontane (C37)	50.000	49.136	1.7	91	-0.04
39	t	n-Octatriacontane (C38)	50.000	53.646	-7.3	100	-0.04
41	t	n-Tetracontane (C40)	50.000	47.669	4.7	89	-0.06

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.08	0.85 - 1.15

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID6\2016\Nov\Nov10\
Data File : F611101636.D
Signal(s) : FID1A.CH
Acq On : 11 Nov 2016 6:15 pm
Operator : FID6:NL
Sample : C611101602F
Misc : FRAX76 50ug/mL
ALS Vial : 18 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 12 16:29:58 2016
Quant Method : O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M
Quant Title : FID Forensics
QLast Update : Mon Nov 07 17:13:34 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

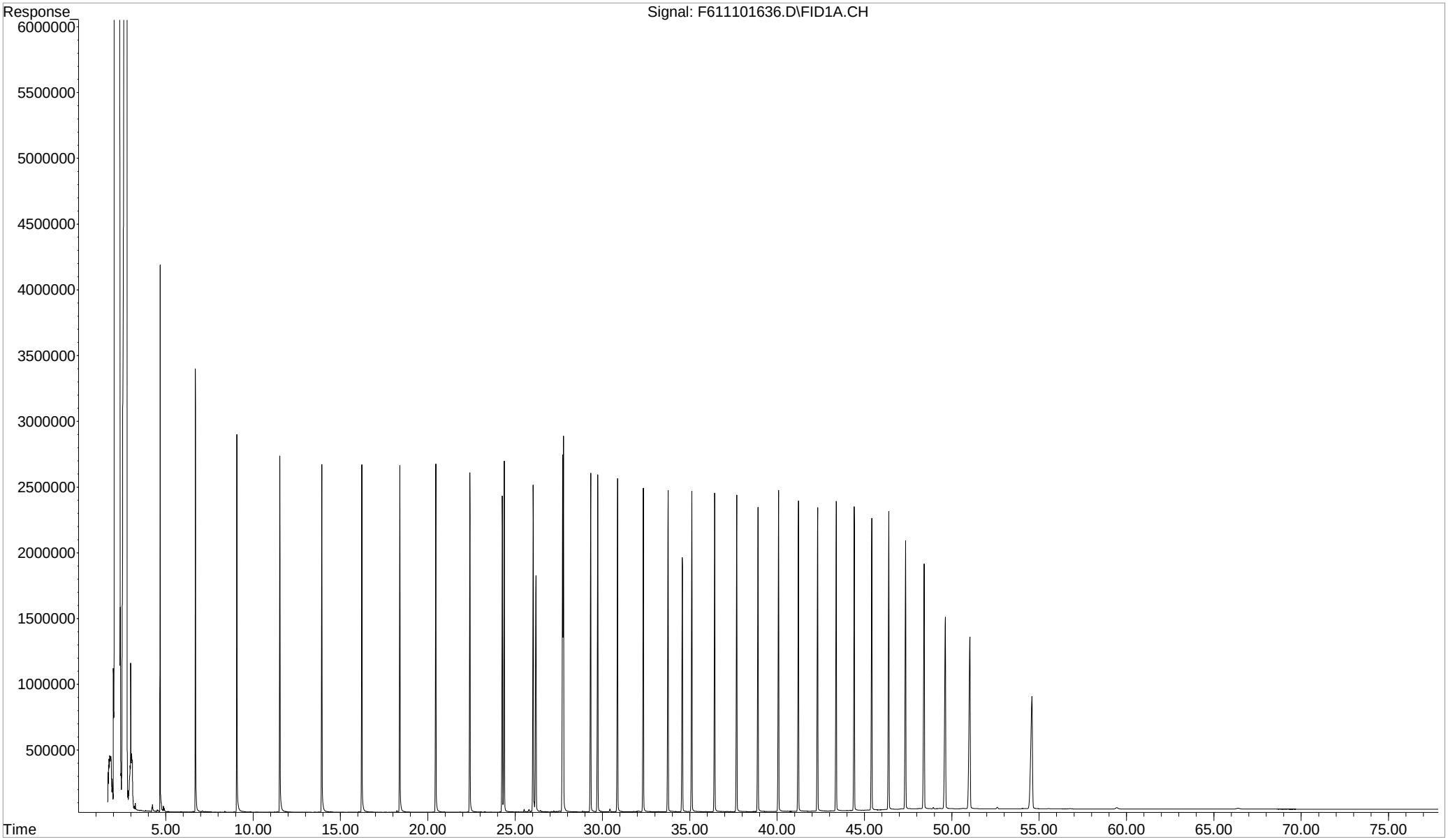
	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	29.730	61444972	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	27.767	58511171	44.625 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 89.25%
24) s	d50-Tetracosane	34.569	54612591	49.384 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 98.77%
	Target Compounds			
2) t	n-Octane (C8)	4.674	48853500	49.933 ug/mL M4
3) t	n-Nonane (C9)	6.693	52964343	51.287 ug/mL M4
4) t	n-Decane (C10)	9.064	54965121	50.941 ug/mL M4
5) t	n-Undecane (C11)	11.527	55806896	50.821 ug/mL M4
6) t	n-Dodecane (C12)	13.928	57039778	51.124 ug/mL M4
7) t	n-Tridecane (C13)	16.222	57592095	51.382 ug/mL M4
9) t	n-Tetradecane (C14)	18.397	58710579	51.850 ug/mL M4
11) t	n-Pentadecane (C15)	20.457	58727473	50.983 ug/mL M4
12) t	n-Hexadecane (C16)	22.410	59644252	51.872 ug/mL M4
14) t	n-Heptadecane (C17)	24.266	57564246	49.661 ug/mL M4
15) t	Pristane	24.376	62672020	54.088 ug/mL M4
16) T	n-Octadecane (C18)	26.033	60376548	51.468 ug/mL M4
17) t	Phytane	26.192	55419249	54.045 ug/mL M4
18) t	n-Nonadecane (C19)	27.720	65181935	55.926 ug/mL M4
20) t	n-Eicosane (C20)	29.325	60199686	51.708 ug/mL M4
21) t	n-Heneicosane (C21)	30.864	61127356	52.174 ug/mL M4
22) t	n-Docosane (C22)	32.339	61451820	52.050 ug/mL M4
23) t	n-Tricosane (C23)	33.756	61597987	51.776 ug/mL M4
25) t	n-Tetracosane (C24)	35.116	62083626	51.915 ug/mL M4
26) t	n-Pentacosane (C25)	36.425	61777469	52.196 ug/mL M4
27) t	n-Hexacosane (C26)	37.687	62139339	51.296 ug/mL M4
28) t	n-Heptacosane (C27)	38.906	60526063	50.495 ug/mL M4
29) t	n-Octacosane (C28)	40.083	63612605	53.222 ug/mL M4
30) t	n-Nonacosane (C29)	41.218	62803687	52.173 ug/mL M4
31) t	n-Triacontane (C30)	42.318	62118821	51.410 ug/mL M4
32) t	n-Hentriacontane (C31)	43.386	62736807	51.548 ug/mL M4
33) t	n-Dotriacontane (C32)	44.414	62044842	50.634 ug/mL M4
34) t	n-Tritriacontane (C33)	45.421	61471405	53.094 ug/mL M4
35) t	n-tetratriacontane (C34)	46.393	63767976	52.609 ug/mL M4
36) t	n-Pentatriacontane (C35)	47.354	61584430	50.175 ug/mL M4
37) t	n-Hexatriacontane (C36)	48.417	64846297	51.590 ug/mL M4
38) t	n-Heptatriacontane (C37)	49.628	60388044	49.136 ug/mL M4
39) t	n-Octatriacontane (C38)	51.035	64668489	53.646 ug/mL M4
41) t	n-Tetracontane (C40)	54.589	59492574	47.669 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID6\2016\Nov\Nov10\F611101636.D
Operator : FID6:NL
Acquired : 11 Nov 2016 6:15 pm using AcqMethod FID6A.M
Sample Name: C611101602F
Instrument: FID6
Misc Info : FRAX76 50ug/mL
Vial Number: 18
CurrentMeth: O:\Forensics\Data\FID6\2016\Nov\Nov10\HC6102615F.M



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121603.D
Signal(s) : FID2B.CH
Acq On : 12 Nov 2016 4:49 pm
Operator : FID17:WR
Sample : C1711121601R
Misc : FRAX76 50ug/mL
ALS Vial : 52 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 18:49:53 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 14 09:18:45 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	97	-0.01
2	t	n-Octane (C8)	50.000	51.517	-3.0	97	0.00
3	t	n-Nonane (C9)	50.000	51.535	-3.1	98	0.02
4	t	n-Decane (C10)	50.000	51.061	-2.1	96	0.00
5	t	n-Undecane (C11)	50.000	51.289	-2.6	96	0.00
6	t	n-Dodecane (C12)	50.000	51.467	-2.9	97	0.00
7	t	n-Tridecane (C13)	50.000	51.560	-3.1	97	0.00
9	t	n-Tetradecane (C14)	50.000	51.718	-3.4	97	0.00
11	t	n-Pentadecane (C15)	50.000	50.892	-1.8	96	0.00
12	t	n-Hexadecane (C16)	50.000	51.613	-3.2	97	0.00
14	t	n-Heptadecane (C17)	50.000	50.464	-0.9	95	0.00
15	t	Pristane	50.000	52.011	-4.0	98	0.01
16	t	n-Octadecane (C18)	50.000	50.632	-1.3	95	0.00
17	t	Phytane	50.000	52.927	-5.9	100	0.00
18	t	n-Nonadecane (C19)	50.000	51.050	-2.1	96	0.00
19	s	ortho-terphenyl	50.000	50.905	-1.8	98	0.00
20	t	n-Eicosane (C20)	50.000	51.846	-3.7	98	0.00
21	t	n-Heneicosane (C21)	50.000	52.208	-4.4	99	0.00
22	t	n-Docosane (C22)	50.000	51.960	-3.9	98	0.00
23	t	n-Tricosane (C23)	50.000	52.006	-4.0	98	0.00
24	s	d50-Tetracosane	50.000	49.478	1.0	95	-0.01
25	t	n-Tetracosane (C24)	50.000	52.128	-4.3	99	0.00
26	t	n-Pentacosane (C25)	50.000	52.319	-4.6	99	0.00
27	t	n-Hexacosane (C26)	50.000	51.690	-3.4	98	0.00
28	t	n-Heptacosane (C27)	50.000	50.995	-2.0	97	0.00
29	t	n-Octacosane (C28)	50.000	53.144	-6.3	101	0.00
30	t	n-Nonacosane (C29)	50.000	52.554	-5.1	100	0.00
31	t	n-Triacontane (C30)	50.000	51.815	-3.6	99	0.00
32	t	n-Hentriacontane (C31)	50.000	51.940	-3.9	99	0.00
33	t	n-Dotriacontane (C32)	50.000	50.773	-1.5	97	0.01
34	t	n-Tritriacontane (C33)	50.000	53.102	-6.2	101	0.01
35	t	n-tetratriacontane (C34)	50.000	52.508	-5.0	101	0.02
36	t	n-Pentatriacontane (C35)	50.000	50.453	-0.9	96	0.01
37	t	n-Hexatriacontane (C36)	50.000	52.107	-4.2	99	0.02
38	t	n-Heptatriacontane (C37)	50.000	50.100	-0.2	95	0.02
39	t	n-Octatriacontane (C38)	50.000	55.303	-10.6	105	0.03
41	t	n-Tetracontane (C40)	50.000	50.631	-1.3	96	0.04

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.06	0.85 - 1.15

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121603.D
Signal(s) : FID2B.CH
Acq On : 12 Nov 2016 4:49 pm
Operator : FID17:WR
Sample : C1711121601R
Misc : FRAX76 50ug/mL
ALS Vial : 52 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 18:49:53 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Mon Nov 14 09:18:45 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

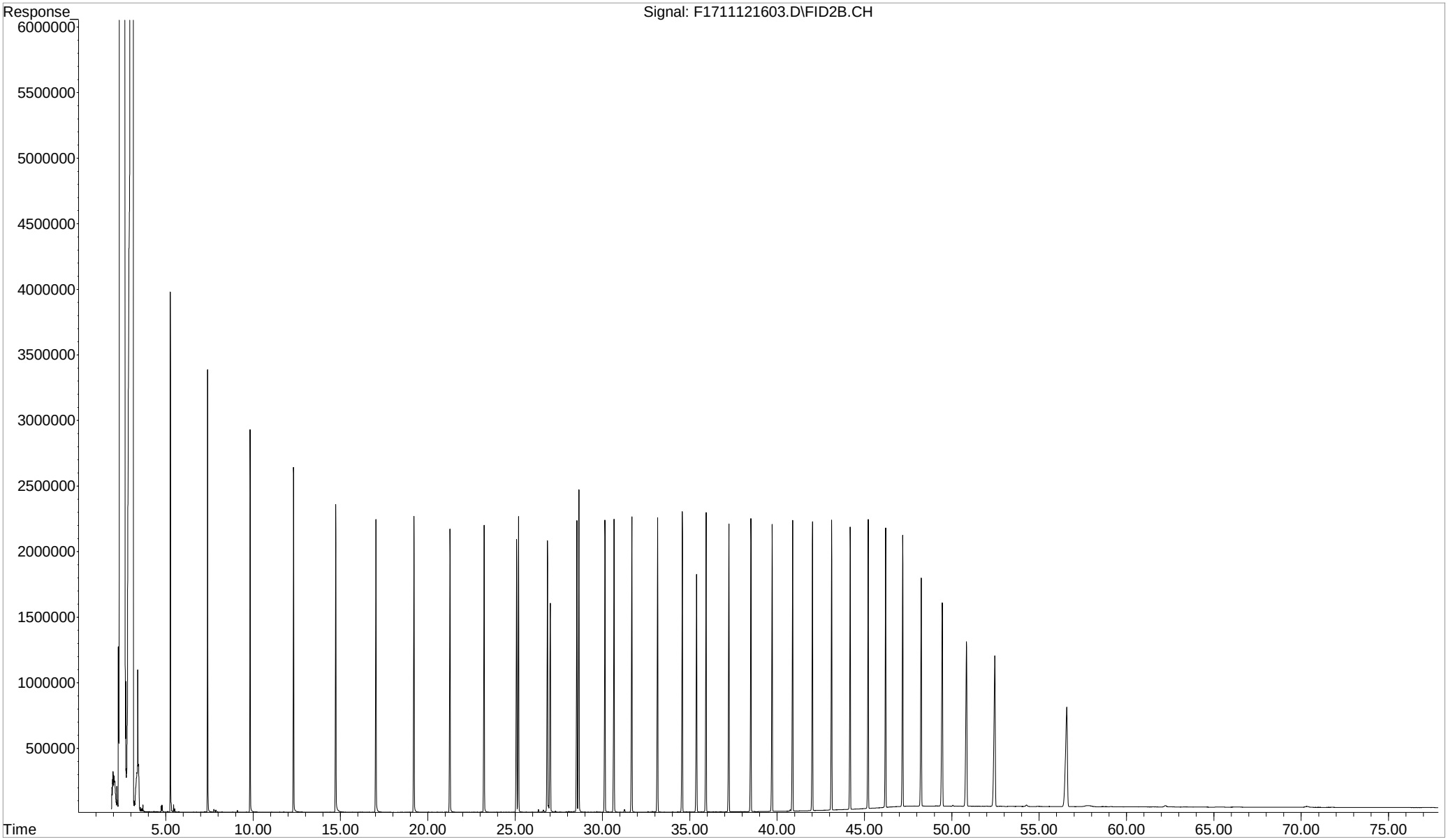
	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.664	57138872	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.653	62250780	50.905 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 101.81%
24) s	d50-Tetracosane	35.387	50410235	49.478 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 98.96%
	Target Compounds			
2) t	n-Octane (C8)	5.258	48208803	51.517 ug/mL M4
3) t	n-Nonane (C9)	7.390	50487076	51.535 ug/mL M4
4) t	n-Decane (C10)	9.825	51717253	51.061 ug/mL M4
5) t	n-Undecane (C11)	12.314	52378697	51.289 ug/mL M4
6) t	n-Dodecane (C12)	14.729	53290565	51.467 ug/mL M4
7) t	n-Tridecane (C13)	17.030	53660097	51.560 ug/mL M4
9) t	n-Tetradecane (C14)	19.207	54467223	51.718 ug/mL M4
11) t	n-Pentadecane (C15)	21.270	54481698	50.892 ug/mL M4
12) t	n-Hexadecane (C16)	23.226	55074838	51.613 ug/mL M4
14) t	n-Heptadecane (C17)	25.085	54295163	50.464 ug/mL M4
15) t	Pristane	25.195	56216270	52.011 ug/mL M4
16) t	n-Octadecane (C18)	26.852	55195753	50.632 ug/mL M4
17) t	Phytane	27.011	50453265	52.927 ug/mL M4
18) t	n-Nonadecane (C19)	28.535	55122914	51.050 ug/mL M4
20) t	n-Eicosane (C20)	30.144	55697233	51.846 ug/mL M4
21) t	n-Heneicosane (C21)	31.683	56529368	52.208 ug/mL M4
22) t	n-Docosane (C22)	33.158	56533748	51.960 ug/mL M4
23) t	n-Tricosane (C23)	34.573	56849617	52.006 ug/mL M4
25) t	n-Tetracosane (C24)	35.934	57095444	52.128 ug/mL M4
26) t	n-Pentacosane (C25)	37.240	56654188	52.319 ug/mL M4
27) t	n-Hexacosane (C26)	38.501	57073690	51.690 ug/mL M4
28) t	n-Heptacosane (C27)	39.717	55635118	50.995 ug/mL M4
29) t	n-Octacosane (C28)	40.890	57713776	53.144 ug/mL M4
30) t	n-Nonacosane (C29)	42.026	57369900	52.554 ug/mL M4
31) t	n-Triacontane (C30)	43.121	56626276	51.815 ug/mL M4
32) t	n-Hentriacontane (C31)	44.185	56866916	51.940 ug/mL M4
33) t	n-Dotriacontane (C32)	45.214	56111026	50.773 ug/mL M4
34) t	n-Tritriacontane (C33)	46.214	55503517	53.102 ug/mL M4
35) t	n-tetratriacontane (C34)	47.192	57465364	52.508 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.249	55566789	50.453 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.455	58976457	52.107 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.841	55462898	50.100 ug/mL M4
39) t	n-Octatriacontane (C38)	52.464	60037582	55.303 ug/mL M4
41) t	n-Tetracontane (C40)	56.582	56971906	50.631 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121603.D
Operator : FID17:WR
Acquired : 12 Nov 2016 4:49 pm using AcqMethod FID17.M
Sample Name: C1711121601R
Instrument: FID17
Misc Info : FRAX76 50ug/mL
Vial Number: 52
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121631.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 1:26 pm
Operator : FID17:WR
Sample : C1711121602R
Misc : FRAX76 50ug/mL
ALS Vial : 66 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 19:35:16 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	100	-0.02
2	t	n-Octane (C8)	50.000	47.563	4.9	92	0.00
3	t	n-Nonane (C9)	50.000	49.504	1.0	97	0.02
4	t	n-Decane (C10)	50.000	50.183	-0.4	97	0.00
5	t	n-Undecane (C11)	50.000	51.323	-2.6	99	0.00
6	t	n-Dodecane (C12)	50.000	51.396	-2.8	99	0.00
7	t	n-Tridecane (C13)	50.000	51.610	-3.2	100	0.00
9	t	n-Tetradecane (C14)	50.000	51.872	-3.7	100	0.00
11	t	n-Pentadecane (C15)	50.000	51.092	-2.2	99	0.00
12	t	n-Hexadecane (C16)	50.000	51.896	-3.8	100	0.00
14	t	n-Heptadecane (C17)	50.000	50.608	-1.2	98	0.00
15	t	Pristane	50.000	52.824	-5.6	102	0.01
16	t	n-Octadecane (C18)	50.000	50.890	-1.8	99	0.00
17	t	Phytane	50.000	53.367	-6.7	104	0.00
18	t	n-Nonadecane (C19)	50.000	51.621	-3.2	100	0.00
19	s	ortho-terphenyl	50.000	50.865	-1.7	101	-0.01
20	t	n-Eicosane (C20)	50.000	52.319	-4.6	102	0.00
21	t	n-Heneicosane (C21)	50.000	52.817	-5.6	103	0.00
22	t	n-Docosane (C22)	50.000	52.529	-5.1	102	0.00
23	t	n-Tricosane (C23)	50.000	52.697	-5.4	103	0.00
24	s	d50-Tetracosane	50.000	50.227	-0.5	100	-0.02
25	t	n-Tetracosane (C24)	50.000	52.851	-5.7	103	0.00
26	t	n-Pentacosane (C25)	50.000	53.161	-6.3	104	0.00
27	t	n-Hexacosane (C26)	50.000	52.581	-5.2	102	0.00
28	t	n-Heptacosane (C27)	50.000	51.958	-3.9	101	0.00
29	t	n-Octacosane (C28)	50.000	54.381	-8.8	106	0.00
30	t	n-Nonacosane (C29)	50.000	53.994	-8.0	106	0.00
31	t	n-Triacontane (C30)	50.000	53.518	-7.0	105	0.00
32	t	n-Hentriacontane (C31)	50.000	53.884	-7.8	106	0.00
33	t	n-Dotriacontane (C32)	50.000	53.002	-6.0	104	0.01
34	t	n-Tritriacontane (C33)	50.000	55.766	-11.5	110	0.01
35	t	n-tetratriacontane (C34)	50.000	55.492	-11.0	109	0.01
36	t	n-Pentatriacontane (C35)	50.000	53.499	-7.0	105	0.01
37	t	n-Hexatriacontane (C36)	50.000	55.427	-10.9	109	0.02
38	t	n-Heptatriacontane (C37)	50.000	53.409	-6.8	105	0.03
39	t	n-Octatriacontane (C38)	50.000	59.029	-18.1	115	0.04
41	t	n-Tetracontane (C40)	50.000	53.874	-7.7	105	0.04

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.12	0.85 - 1.15

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121631.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 1:26 pm
Operator : FID17:WR
Sample : C1711121602R
Misc : FRAX76 50ug/mL
ALS Vial : 66 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 19:35:16 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

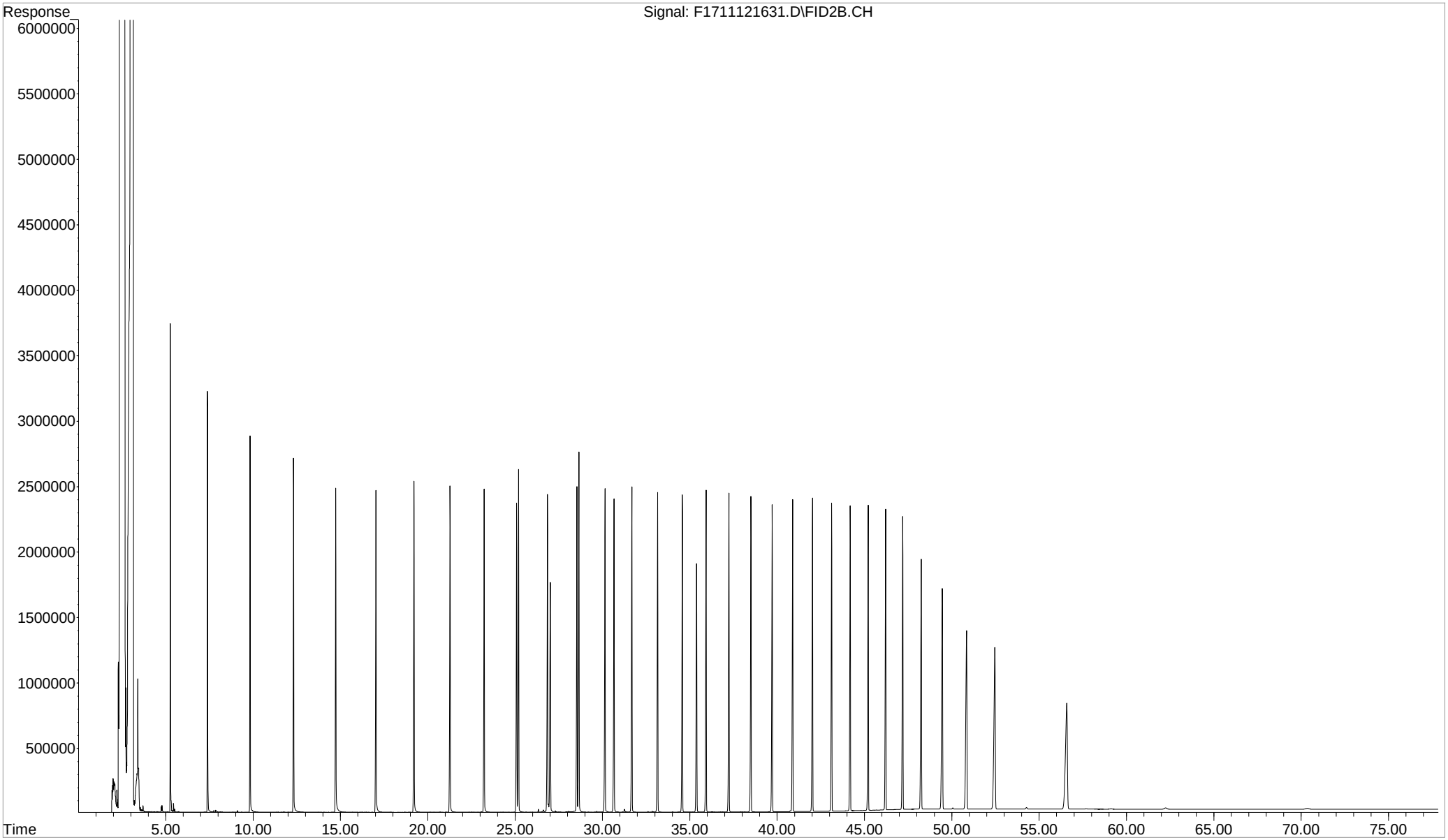
	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.661	58782940	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.651	63991160	50.865 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 101.73%
24) s	d50-Tetracosane	35.383	52645197	50.227 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 100.45%
	Target Compounds			
2) t	n-Octane (C8)	5.255	45789422	47.563 ug/mL M4
3) t	n-Nonane (C9)	7.385	49892758	49.504 ug/mL M4
4) t	n-Decane (C10)	9.823	52290116	50.183 ug/mL M4
5) t	n-Undecane (C11)	12.312	53921520	51.323 ug/mL M4
6) t	n-Dodecane (C12)	14.727	54748063	51.396 ug/mL M4
7) t	n-Tridecane (C13)	17.029	55257319	51.610 ug/mL M4
9) t	n-Tetradecane (C14)	19.208	56201118	51.872 ug/mL M4
11) t	n-Pentadecane (C15)	21.271	56269772	51.092 ug/mL M4
12) t	n-Hexadecane (C16)	23.226	56970223	51.896 ug/mL M4
14) t	n-Heptadecane (C17)	25.085	56016708	50.608 ug/mL M4
15) t	Pristane	25.195	58738332	52.824 ug/mL M4
16) t	n-Octadecane (C18)	26.853	57072427	50.890 ug/mL M4
17) t	Phytane	27.015	52336706	53.367 ug/mL M4
18) t	n-Nonadecane (C19)	28.538	57343828	51.621 ug/mL M4
20) t	n-Eicosane (C20)	30.145	57822165	52.319 ug/mL M4
21) t	n-Heneicosane (C21)	31.683	58834159	52.817 ug/mL M4
22) t	n-Docosane (C22)	33.158	58797893	52.529 ug/mL M4
23) t	n-Tricosane (C23)	34.573	59262299	52.697 ug/mL M4
25) t	n-Tetracosane (C24)	35.934	59552636	52.851 ug/mL M4
26) t	n-Pentacosane (C25)	37.240	59222841	53.161 ug/mL M4
27) t	n-Hexacosane (C26)	38.500	59727531	52.581 ug/mL M4
28) t	n-Heptacosane (C27)	39.715	58317045	51.958 ug/mL M4
29) t	n-Octacosane (C28)	40.890	60756643	54.381 ug/mL M4
30) t	n-Nonacosane (C29)	42.025	60637109	53.994 ug/mL M4
31) t	n-Triacontane (C30)	43.122	60170247	53.518 ug/mL M4
32) t	n-Hentriacontane (C31)	44.183	60692822	53.884 ug/mL M4
33) t	n-Dotriacontane (C32)	45.215	60260422	53.002 ug/mL M4
34) t	n-Tritriacontane (C33)	46.215	59964898	55.766 ug/mL M4
35) t	n-tetratriacontane (C34)	47.192	62478858	55.492 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.250	60616903	53.499 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.457	64538729	55.427 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.845	60827525	53.409 ug/mL M4
39) t	n-Octatriacontane (C38)	52.467	65925668	59.029 ug/mL M4
41) t	n-Tetracontane (C40)	56.585	62365253	53.874 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121631.D
Operator : FID17:WR
Acquired : 13 Nov 2016 1:26 pm using AcqMethod FID17.M
Sample Name: C1711121602R
Instrument: FID17
Misc Info : FRAX76 50ug/mL
Vial Number: 66
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121643.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 10:15 pm
Operator : FID17:WR
Sample : C1711121603R
Misc : FRAX 76 50ug/mL
ALS Vial : 72 Sample Multiplier: 1

Integration File: SHCINT2.E
Quant Time: Nov 16 19:47:02 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	Amount	Calc.	%Dev	Area%	Dev(Min)
1	I	5-alpha-androstane	50.000	50.000	0.0	103	-0.02
2	t	n-Octane (C8)	50.000	46.404	7.2	93	-0.02
3	t	n-Nonane (C9)	50.000	48.357	3.3	98	0.01
4	t	n-Decane (C10)	50.000	49.277	1.4	99	0.00
5	t	n-Undecane (C11)	50.000	50.552	-1.1	101	0.00
6	t	n-Dodecane (C12)	50.000	50.735	-1.5	101	0.00
7	t	n-Tridecane (C13)	50.000	51.109	-2.2	102	0.00
9	t	n-Tetradecane (C14)	50.000	51.348	-2.7	103	-0.01
11	t	n-Pentadecane (C15)	50.000	50.722	-1.4	102	-0.01
12	t	n-Hexadecane (C16)	50.000	51.488	-3.0	103	-0.01
14	t	n-Heptadecane (C17)	50.000	50.025	-0.0	101	-0.01
15	t	Pristane	50.000	52.255	-4.5	105	0.00
16	t	n-Octadecane (C18)	50.000	51.469	-2.9	103	0.00
17	t	Phytane	50.000	52.905	-5.8	106	-0.01
18	t	n-Nonadecane (C19)	50.000	50.937	-1.9	102	0.00
19	s	ortho-terphenyl	50.000	51.102	-2.2	105	-0.02
20	t	n-Eicosane (C20)	50.000	51.878	-3.8	104	0.00
21	t	n-Heneicosane (C21)	50.000	52.260	-4.5	105	0.00
22	t	n-Docosane (C22)	50.000	52.089	-4.2	105	0.00
23	t	n-Tricosane (C23)	50.000	52.108	-4.2	105	0.00
24	s	d50-Tetracosane	50.000	49.534	0.9	102	-0.02
25	t	n-Tetracosane (C24)	50.000	52.197	-4.4	105	0.00
26	t	n-Pentacosane (C25)	50.000	52.421	-4.8	106	0.00
27	t	n-Hexacosane (C26)	50.000	51.847	-3.7	105	0.00
28	t	n-Heptacosane (C27)	50.000	51.113	-2.2	103	0.00
29	t	n-Octacosane (C28)	50.000	53.358	-6.7	108	0.00
30	t	n-Nonacosane (C29)	50.000	52.781	-5.6	107	0.00
31	t	n-Triacontane (C30)	50.000	52.093	-4.2	106	0.00
32	t	n-Hentriacontane (C31)	50.000	52.204	-4.4	106	0.00
33	t	n-Dotriacontane (C32)	50.000	50.973	-1.9	104	0.00
34	t	n-Tritriacontane (C33)	50.000	53.302	-6.6	109	0.00
35	t	n-tetratriacontane (C34)	50.000	52.708	-5.4	108	0.00
36	t	n-Pentatriacontane (C35)	50.000	50.562	-1.1	103	0.00
37	t	n-Hexatriacontane (C36)	50.000	52.114	-4.2	106	0.01
38	t	n-Heptatriacontane (C37)	50.000	50.003	-0.0	101	0.01
39	t	n-Octatriacontane (C38)	50.000	56.087	-12.2	114	0.01
41	t	n-Tetracontane (C40)	50.000	49.838	0.3	101	0.02

Evaluate Continuing Calibration Report - Not Founds

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Mass Discrimination (Response)	Ratio	Range Limits
n-Hexatriacontane (C36) to n-Eicosane (C20)	1.06	0.85 - 1.15

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\
Data File : F1711121643.D
Signal(s) : FID2B.CH
Acq On : 13 Nov 2016 10:15 pm
Operator : FID17:WR
Sample : C1711121603R
Misc : FRAX 76 50ug/mL
ALS Vial : 72 Sample Multiplier: 1

MAL
12/15/16

Integration File: SHCINT2.E
Quant Time: Nov 16 19:47:02 2016
Quant Method : O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M
Quant Title : FID Forensics
QLast Update : Wed Nov 16 18:55:06 2016
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1.0
Signal Phase : Rtx-5MS
Signal Info : 0.25mm

Sub List : CCAL - CCAL

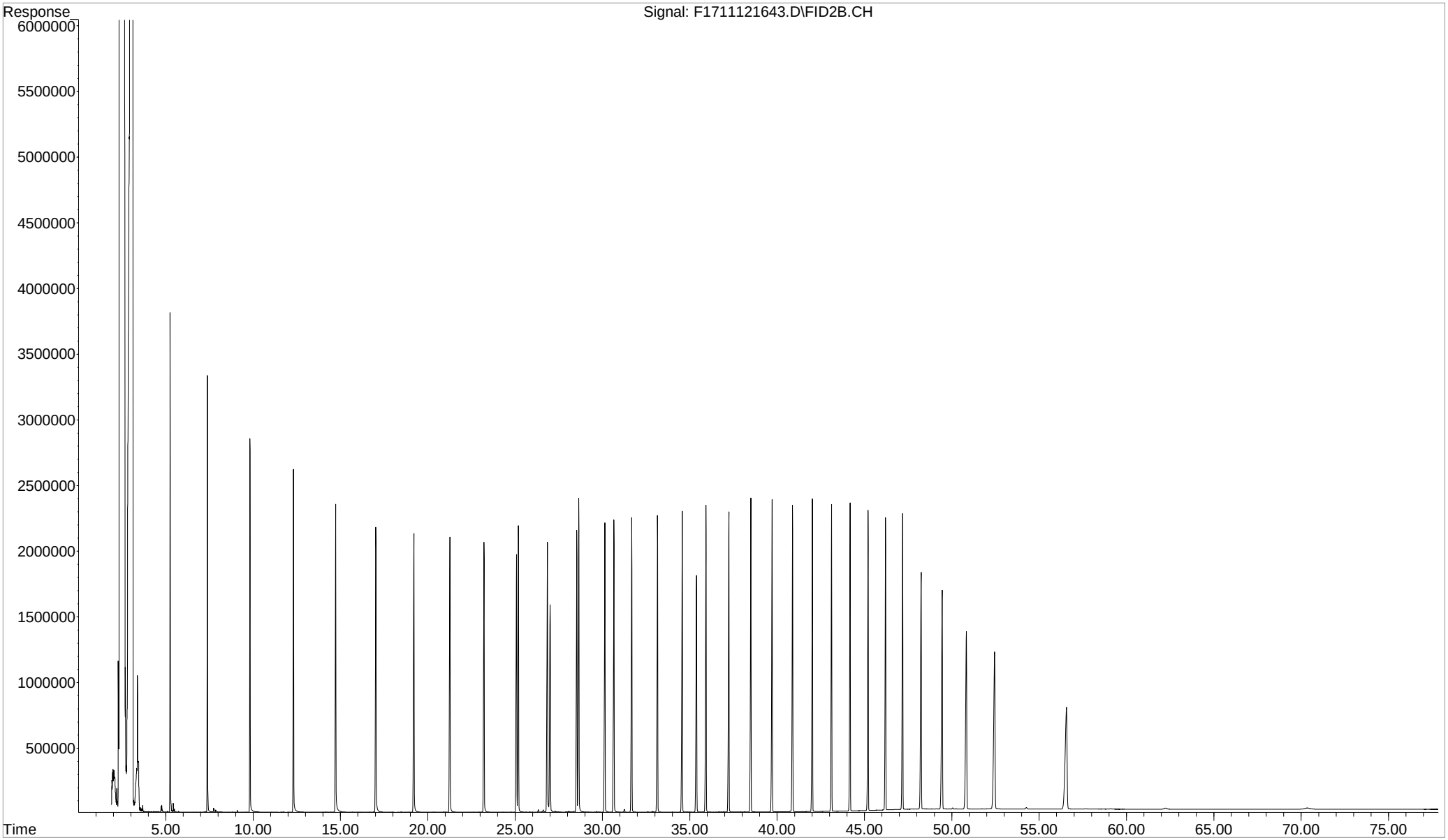
	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5-alpha-androstane	30.656	60891745	50.000 ug/mL M4
	System Monitoring Compounds			
19) s	ortho-terphenyl	28.645	66594984	51.102 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 102.20%
24) s	d50-Tetracosane	35.383	53781063	49.534 ug/mL M4
Spiked Amount	50.000	Range	50 - 130	Recovery = 99.07%
	Target Compounds			
2) t	n-Octane (C8)	5.243	46276863	46.404 ug/mL M4
3) t	n-Nonane (C9)	7.377	50485281	48.357 ug/mL M4
4) t	n-Decane (C10)	9.817	53188098	49.277 ug/mL M4
5) t	n-Undecane (C11)	12.307	55016373	50.552 ug/mL M4
6) t	n-Dodecane (C12)	14.722	55983351	50.735 ug/mL M4
7) t	n-Tridecane (C13)	17.022	56684338	51.109 ug/mL M4
9) t	n-Tetradecane (C14)	19.201	57629496	51.348 ug/mL M4
11) t	n-Pentadecane (C15)	21.263	57866432	50.722 ug/mL M4
12) t	n-Hexadecane (C16)	23.218	58550208	51.488 ug/mL M4
14) t	n-Heptadecane (C17)	25.076	57357542	50.025 ug/mL M4
15) t	Pristane	25.187	60189466	52.255 ug/mL M4
16) t	n-Octadecane (C18)	26.847	59793030	51.469 ug/mL M4
17) t	Phytane	26.996	53744753	52.905 ug/mL M4
18) t	n-Nonadecane (C19)	28.531	58613747	50.937 ug/mL M4
20) t	n-Eicosane (C20)	30.138	59391231	51.878 ug/mL M4
21) t	n-Heneicosane (C21)	31.676	60301945	52.260 ug/mL M4
22) t	n-Docosane (C22)	33.152	60396799	52.089 ug/mL M4
23) t	n-Tricosane (C23)	34.567	60702206	52.108 ug/mL M4
25) t	n-Tetracosane (C24)	35.928	60926008	52.197 ug/mL M4
26) t	n-Pentacosane (C25)	37.236	60492730	52.421 ug/mL M4
27) t	n-Hexacosane (C26)	38.495	61007409	51.847 ug/mL M4
28) t	n-Heptacosane (C27)	39.711	59426422	51.113 ug/mL M4
29) t	n-Octacosane (C28)	40.883	61752647	53.358 ug/mL M4
30) t	n-Nonacosane (C29)	42.018	61401470	52.781 ug/mL M4
31) t	n-Triacontane (C30)	43.116	60668882	52.093 ug/mL M4
32) t	n-Hentriacontane (C31)	44.178	60909793	52.204 ug/mL M4
33) t	n-Dotriacontane (C32)	45.208	60032720	50.973 ug/mL M4
34) t	n-Tritriacontane (C33)	46.207	59371755	53.302 ug/mL M4
35) t	n-tetratriacontane (C34)	47.186	61473172	52.708 ug/mL M4
36) t	n-Pentatriacontane (C35)	48.246	59344171	50.562 ug/mL M4
37) t	n-Hexatriacontane (C36)	49.449	62858432	52.114 ug/mL M4
38) t	n-Heptatriacontane (C37)	50.829	58991006	50.003 ug/mL M4
39) t	n-Octatriacontane (C38)	52.445	64887197	56.087 ug/mL M4
41) t	n-Tetracontane (C40)	56.565	59763181	49.838 ug/mL M4

SemiQuant Compounds - Not Calibrated on this Instrument

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

File :O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\F1711121643.D
Operator : FID17:WR
Acquired : 13 Nov 2016 10:15 pm using AcqMethod FID17.M
Sample Name: C1711121603R
Instrument: FID17
Misc Info : FRAX 76 50ug/mL
Vial Number: 72
CurrentMeth: O:\Forensics\Data\FID17\2016\Nov\NOV12.SEC\HC17102615R.M



Sample Preparation

Alpha Woods Hole Lab
Batch Prep Report

11/10/2016 1611004OIL - OP Steranes/Triterpanes

Lab ID	Prep Method	Analyst	Prep Start Date	Prep Completed	TCLP Date	Initial Amount (g or ml)	Split	PIV (ml)	Final Volume (ml)	Solvent Ex	Conc. Analyst	Conc. Date	Conc. Method	Transfer Volume (ml)	Vialed By	Vialed Date
1611004-01 (Oil - 1611004)	3580	JP	11/10/2016 3:00:00 PM	11/28/2016		0.1084	10	0.5	5	True	JP			0.1	BA	11/28/2016
1611004-02D (Oil - 1611004)	3580	JP	11/10/2016 3:00:00 PM	11/28/2016		0.1095	10	0.5	5	True	JP			0.1	BA	11/28/2016
1611004-02 (Oil - 1611004)	3580	JP	11/10/2016 3:00:00 PM	11/28/2016		0.1084	10	0.5	5	True	JP			0.1	BA	11/28/2016
1611004-03 (Oil - 1611004)	3580	JP	11/10/2016 3:00:00 PM	11/28/2016		0.1021	10	0.5	5	True	JP			0.1	BA	11/28/2016
SO111016B02 (Oil - 1611004)	3580	JP	11/10/2016 3:00:00 PM	11/28/2016		0.1	10	0.5	5	True	JP			0.1	BA	11/28/2016
SO111016LCS02 (Oil - 1611004)		JP	11/10/2016 3:00:00 PM	11/10/2016		0.1	20	1	20	False	JP				JP	11/10/2016
SO111016LCSD02 (Oil - 1611004)		JP	11/10/2016 3:00:00 PM	11/10/2016		0.1	20	1	20	False	JP				JP	11/10/2016
SO112816B02 (Oil - 1611004)	No Prep	BA	11/28/2016 4:00:00 AM	11/28/2016		0.1	2	0.5	1	True				0.1	BA	11/28/2016
SO112816PRM02 (Oil - 1611004)	No Prep	BA	11/28/2016 4:00:00 AM	11/28/2016		0.04945	2	0.5	1	True				0.1	BA	11/28/2016

Alpha Woods Hole Lab
Batch Prep Report

11/10/2016 1611004OIL - OP Steranes/Triterpanes

Lab ID	Notes
1611004-01 (Oil - 1611004)	1st Prep
1611004-02D (Oil - 1611004)	1st Prep
1611004-02 (Oil - 1611004)	1st Prep
1611004-03 (Oil - 1611004)	1st Prep
SO111016B02 (Oil - 1611004)	1st Prep
SO111016LCS02 (Oil - 1611004)	1st Prep
SO111016LCSD02 (Oil - 1611004)	1st Prep
SO112816B02 (Oil - 1611004)	1st Prep
SO112816PRM02 (Oil - 1611004)	1st Prep

Alpha Woods Hole Lab
Batch Prep Spike Report

11/10/2016 1611004OIL - OP Steranes/Tri Analyst: JP Witness: TJ

Lab ID	QC Type	OP Steranes/Tri - surr	Vol OP Steranes/Tri - surr	Units OP Steranes/Tri - surr	OP Steranes/Tri - spk 1	Vol OP Steranes/Tri - spk 1	Units OP Steranes/Tri - spk 1	OP Steranes/Tri - spk 2	Vol OP Steranes/Tri - spk 2	Units OP Steranes/Tri - spk 2
1611004-01	SAM	FRAX07	100	µl	FRAX88	50	µl			
1611004-02	D	FRAX07	100	µl	FRAX88	50	µl			
1611004-02	SAM	FRAX07	100	µl	FRAX88	50	µl			
1611004-03	SAM	FRAX07	100	µl	FRAX88	50	µl			
SO111016B02	B	FRAX07	100	µl	FRAX88	50	µl			
SO111016LCS02	LCS									
SO111016LCSD02	LCSD									
SO112816B02	B	FRAX07	100	µl	FRAX88	50	µl			
SO112816PRM02	PRM				FRAX88	50	µl			

STD ID	TITLE	CONTENTS	SOLVENT	LOT
FRAX07	Biomarker Surrogate	5b(H)Cholane = 10 ug/mL	dcm	DN770
FRAX88	PAH/SHC RIS Spiking Solution	5 Alpha Androstane = 500 ug/mL Acenaphthene D10, Chrysene D12 = 5 ug/mL	DCM	dp785

Alpha Woods Hole Lab
Batch Clean Up Report

11/10/2016 1611004OIL - OP Steranes/Triterpanes

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1611004-01	SAM	3630F1	BA	11/28/2016							10	2	5	1		True
1611004-02	D	3630F1	BA	11/28/2016							10	2	5	1		True
1611004-02	SAM	3630F1	BA	11/28/2016							10	2	5	1		True
1611004-03	SAM	3630F1	BA	11/28/2016							10	2	5	1		True
SO111016B02	B	3630F1	BA	11/28/2016							10	2	5	1		True
SO111016LCS02	LCS	3630F1														True
SO111016LCSD02	LCSD	3630F1														True
SO112816B02	B	3630F1	BA	11/28/2016							1	1	1	1		True
SO112816PRM02	PRM	3630F1	BA	11/28/2016							1	1	1	1		True

Alpha Woods Hole Lab
Batch Clean Up Report

11/10/2016 1611004OIL - OP Steranes/Triterpanes

Lab ID	Notes
1611004-01	
1611004-02	
1611004-02	
1611004-03	
SO111016B02	
SO111016LCS02	
SO111016LCSD02	
SO112816B02	
SO112816PRM02	

Alpha Woods Hole Lab
Batch Clean Up Report

11/10/2016 1611004OIL - OP Steranes/Triterpanes

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1611004-01	SAM	split	BA	11/28/2016							0.9	0.45	2			True
1611004-02	D	split	BA	11/28/2016							0.9	0.45	2			True
1611004-02	SAM	split	BA	11/28/2016							0.9	0.45	2			True
1611004-03	SAM	split	BA	11/28/2016							0.9	0.45	2			True
SO111016B02	B	split	BA	11/28/2016							0.9	0.45	2			True
SO111016LCS02	LCS	split														True
SO111016LCSD02	LCSD	split														True
SO112816B02	B	split	BA	11/28/2016							0.9	0.45	2			True
SO112816PRM02	PRM	split	BA	11/28/2016							0.9	0.45	2			True

Alpha Woods Hole Lab
Batch Clean Up Report

11/10/2016 1611004OIL - OP Steranes/Triterpanes

Lab ID	Notes
1611004-01	
1611004-02	
1611004-02	
1611004-03	
SO111016B02	
SO111016LCS02	
SO111016LCSD02	
SO112816B02	
SO112816PRM02	

Alpha Woods Hole Lab
Batch Prep Report
11/11/2016 1611004SHEEN - OP Steranes/Triterpanes

Lab ID	Prep Method	Analyst	Prep Start Date	Prep Completed Date	TCLP	Initial Amount (g or ml)	Split	PIV (ml)	Final Volume (ml)	Solvent Ex	Conc. Analyst	Conc. Date	Conc. Method	Transfer Volume (ml)	Vialed By	Vialed Date
1611004-04 (Oil - 1611004)	3580A	JP	11/11/2016 9:00:00 AM	11/28/2016		0.02312	2	0.5	1	True					BA	11/28/2016
1611004-05D (Oil - 1611004)	3580A	JP	11/11/2016 9:00:00 AM	11/28/2016		0.01113	2	0.5	1	True					BA	11/28/2016
1611004-05 (Oil - 1611004)	3580A	JP	11/11/2016 9:00:00 AM	11/28/2016		0.00857	2	0.5	1	True					BA	11/28/2016
1611004-06 (Oil - 1611004)	3580A	JP	11/11/2016 9:00:00 AM	11/28/2016		0.00491	2	0.5	1	True					BA	11/28/2016
SO111116B03 (Oil - 1611004)	3580A	JP	11/11/2016 9:00:00 AM	11/28/2016		0.004	2	0.5	1	True					BA	11/28/2016
SO111116LCS02 (Oil - 1611004)		JP	11/11/2016 9:00:00 AM	11/11/2016		0.004	1	1	1	False					JP	11/11/2016
SO111116LCSD02 (Oil - 1611004)		JP	11/11/2016 9:00:00 AM	11/11/2016		0.004	1	1	1	False					JP	11/11/2016
SO112816B03 (Oil - 1611004)	No Prep	BA	11/28/2016 4:00:00 AM	11/28/2016		0.0122	2	0.5	1	True					BA	11/28/2016
SO112816PRM03 (Oil - 1611004)	No Prep	BA	11/28/2016 4:00:00 AM	11/28/2016		0.04945	2	0.5	1	True					BA	11/28/2016

Alpha Woods Hole Lab
Batch Prep Report
11/11/2016 1611004SHEEN - OP Steranes/Triterpanes

Lab ID	Notes
1611004-04 (Oil - 1611004)	1st Prep
1611004-05D (Oil - 1611004)	1st Prep
1611004-05 (Oil - 1611004)	1st Prep
1611004-06 (Oil - 1611004)	1st Prep
SO111116B03 (Oil - 1611004)	1st Prep
SO111116LCS02 (Oil - 1611004)	1st Prep
SO111116LCSD02 (Oil - 1611004)	1st Prep
SO112816B03 (Oil - 1611004)	1st Prep
SO112816PRM03 (Oil - 1611004)	1st Prep

Alpha Woods Hole Lab
Batch Prep Spike Report

11/11/2016 1611004SHEEN - OP Steranes/Tri Analyst: JP Witness: JP

Lab ID	QC Type	OP Steranes/Tri - surr	Vol OP Steranes/Tri - surr	Units OP Steranes/Tri - surr	OP Steranes/Tri - spk 1	Vol OP Steranes/Tri - spk 1	Units OP Steranes/Tri - spk 1	OP Steranes/Tri - spk 2	Vol OP Steranes/Tri - spk 2	Units OP Steranes/Tri - spk 2
1611004-04	SAM	FRAX07	100	µl	FRAX88	50	µl			
1611004-05	D	FRAX07	100	µl	FRAX88	50	µl			
1611004-05	SAM	FRAX07	100	µl	FRAX88	50	µl			
1611004-06	SAM	FRAX07	100	µl	FRAX88	50	µl			
SO111116B03	B	FRAX07	100	µl	FRAX88	50	µl			
SO111116LCS02	LCS									
SO111116LCSD02	LCSD									
SO112816B03	B	FRAX07	100	µl	FRAX88	50	µl			
SO112816PRM03	PRM				FRAX88	50	µl			

STD ID	TITLE	CONTENTS	SOLVENT	LOT
FRAX07	Biomarker Surrogate	5b(H)Cholane = 10 ug/mL	dcm	DN770
FRAX88	PAH/SHC RIS Spiking Solution	5 Alpha Androstane = 500 ug/mL Acenaphthene D10, Chrysene D12 = 5 ug/mL	DCM	dp785

ETR 1611004SHEEN

Analyst JP

Date 11/11/2016

Alpha Analytical

- [ ] Pre-Alumina
- [ ] Post-Alumina
- [ ] Pre-Silica
- [x] Oily Material Prep.
- [ ] Other

ETR	Lab ID	QC	Extract Volume (µL)	Aliquot Removed (µL)	Aliquot Weight (mg)	Total Extract Weight (mg)	Volume Removed for Column (µl)	Extract Weight to Column (mg)	Split Factor	QC (%R)
	FRAX35	Gravimetric Standard	10000	50	0.257	51.40	N/A	N/A	N/A	100%
1611004	4		10000	50	0.578	115.60	2000	23.12	5.00	
1611004	5	D	10000	50	0.074	14.80	7500	11.13	1.33	26%RPD
1611004	5		10000	50	0.057	11.40	7500	8.57	1.33	
1611004	6		10000	50	0.041	8.20	6000	4.91	1.67	

Note:

Total Extract Weight (mg) = (Extract Volume ÷ Aliquot Removed) (Aliquot Weight)

Gravimetric Standard = 5 mg/mL

LCS Acceptance Criteria: 95% - 105%

Verified by: _____

Date: _____

Alpha Woods Hole Lab
Batch Clean Up Report

11/11/2016 1611004SHEEN - OP Steranes/Triterpanes

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1611004-04	SAM	3630F1	BA	11/28/2016							10	2	5	1		True
1611004-05	D	3630F1	BA	11/28/2016							10	7.5	1.33333	1		True
1611004-05	SAM	3630F1	BA	11/28/2016							10	7.5	1.33333	1		True
1611004-06	SAM	3630F1	BA	11/28/2016							10	6	1.66667	1		True
SO111116B03	B	3630F1	BA	11/28/2016							10	2	5	1		True
SO111116LCS02	LCS	3630F1														True
SO111116LCSD02	LCSD	3630F1														True
SO112816B03	B	3630F1	BA	11/28/2016							1	1	1	1		True
SO112816PRM03	PRM	3630F1	BA	11/28/2016							1	1	1	1		True

Alpha Woods Hole Lab
Batch Clean Up Report

11/11/2016 1611004SHEEN - OP Steranes/Triterpanes

Lab ID	Notes
1611004-04	
1611004-05	
1611004-05	
1611004-06	
SO111116B03	
SO111116LCS02	
SO111116LCSD02	
SO112816B03	
SO112816PRM03	

Alpha Woods Hole Lab
Batch Clean Up Report

11/11/2016 1611004SHEEN - OP Steranes/Triterpanes

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1611004-04	SAM	split	BA	11/28/2016							0.9	0.45	2			True
1611004-05	D	split	BA	11/28/2016							0.9	0.45	2			True
1611004-05	SAM	split	BA	11/28/2016							0.9	0.45	2			True
1611004-06	SAM	split	BA	11/28/2016							0.9	0.45	2			True
SO111116B03	B	split	BA	11/28/2016							0.9	0.45	2			True
SO111116LCS02	LCS	split														True
SO111116LCSD02	LCSD	split														True
SO112816B03	B	split	BA	11/28/2016							0.9	0.45	2			True
SO112816PRM03	PRM	split	BA	11/28/2016							0.9	0.45	2			True

Alpha Woods Hole Lab
Batch Clean Up Report
11/11/2016 1611004SHEEN - OP Steranes/Triterpanes

Lab ID	Notes
1611004-04	
1611004-05	
1611004-05	
1611004-06	
SO111116B03	
SO111116LCS02	
SO111116LCSD02	
SO112816B03	
SO112816PRM03	

Alpha Woods Hole Lab
Batch Prep Report

11/07/2016 1611004 - OP Steranes/Triterpanes

Lab ID	Prep Method	Analyst	Prep Start Date	Prep Completed	TCLP Date	Initial Amount (g or ml)	Split	PIV (ml)	Final Volume (ml)	Solvent Ex	Conc. Analyst	Conc. Date	Conc. Method	Transfer Volume (ml)	Vialed By	Vialed Date
1611004-07 (Water - 1611004)	3510C	TS	11/7/2016 5:30:00 PM	11/28/2016		1000	4	0.5	2	False	TJ	11/9/2016	KD Flask	0.1	BA	11/28/2016
1611004-08 (Water - 1611004)	3510C	TS	11/7/2016 5:30:00 PM	11/28/2016		1000	4	0.5	2	False	TJ	11/9/2016	KD Flask	0.1	BA	11/28/2016
1611004-09D (Water - 1611004)	3510C	TS	11/7/2016 5:30:00 PM	11/28/2016		1000	4	0.5	2	False	TJ	11/9/2016	KD Flask	0.1	BA	11/28/2016
1611004-09 (Water - 1611004)	3510C	TS	11/7/2016 5:30:00 PM	11/28/2016		1000	4	0.5	2	False	TJ	11/9/2016	KD Flask	0.1	BA	11/28/2016
SW110716B01 (Water - 1611004)	3510C	TS	11/7/2016 5:30:00 PM	11/28/2016		1000	4	0.5	2	False	TJ	11/9/2016	KD Flask	0.1	BA	11/28/2016
SW110716LCS01 (Water - 1611004)		TS	11/7/2016 5:30:00 PM	11/7/2016		1000	4	0.5	2	False	TJ	11/9/2016	KD Flask	0.1	TJ	11/9/2016
SW110716LCSD01 (Water - 1611004)		TS	11/7/2016 5:30:00 PM	11/7/2016		1000	4	0.5	2	False	TJ	11/9/2016	KD Flask	0.1	TJ	11/9/2016
SW112816B01 (Water - 1611004)	No Prep	BA	11/28/2016 4:00:00 AM	11/28/2016		1000	2	0.5	1						BA	11/28/2016
SW112816PRM01 (Water - 1611004)	No Prep	BA	11/28/2016 4:00:00 AM	11/28/2016		0.04945	2	0.5	1						BA	11/28/2016

Alpha Woods Hole Lab
Batch Prep Report

11/07/2016 1611004 - OP Steranes/Triterpanes

Lab ID	Notes
1611004-07 (Water - 1611004)	1st Prep
1611004-08 (Water - 1611004)	1st Prep
1611004-09D (Water - 1611004)	1st Prep
1611004-09 (Water - 1611004)	1st Prep
SW110716B01 (Water - 1611004)	1st Prep
SW110716LCS01 (Water - 1611004)	1st Prep
SW110716LCSD01 (Water - 1611004)	1st Prep
SW112816B01 (Water - 1611004)	1st Prep
SW112816PRM01 (Water - 1611004)	1st Prep

Alpha Woods Hole Lab
Batch Weight Report
11/07/2016

Lab ID	QC Type	1611004 - Sample
1611004-07	SAM	1000
1611004-08	SAM	1000
1611004-09	D	1000
1611004-09	SAM	1000
SW110716B01	B	1000
SW110716LCS01LCS	OP NEWFIE	1000
SW110716LCS01LCS	OP SHC	1000
SW110716LCS01LCS	OP Steranes/Triterpanes	
SW110716LCSD01LCSD	OP NEWFIE	1000
SW110716LCSD01LCSD	OP SHC	1000
SW110716LCSD01LCSD	OP Steranes/Triterpanes	
SW112816B01	B	1000
SW112816PRM01	PRM	0.04945

Alpha Woods Hole Lab
Batch Prep Spike Report

11/07/2016 1611004 - OP Steranes/Tri Analyst: TS Witness: SMB

Lab ID	QC Type	OP Steranes/Tri - surr	Vol OP Steranes/Tri - surr	Units OP Steranes/Tri - surr	OP Steranes/Tri - spk 1	Vol OP Steranes/Tri - spk 1	Units OP Steranes/Tri - spk 1	OP Steranes/Tri - spk 2	Vol OP Steranes/Tri - spk 2	Units OP Steranes/Tri - spk 2
1611004-07	SAM	FRAX07	100	µl	FRAX88	50	µl			
1611004-08	SAM	FRAX07	500	µl	FRAX88	50	µl			
1611004-09	D	FRAX07	500	µl	FRAX88	50	µl			
1611004-09	SAM	FRAX07	500	µl	FRAX88	50	µl			
SW110716B01	B	FRAX07	100	µl	FRAX88	50	µl			
SW110716LCS01	LCS									
SW110716LCSD01	LCSD									
SW112816B01	B	FRAX07	100	µl	FRAX88	50	µl			
SW112816PRM01	PRM				FRAX88	50	µl			

STD ID	TITLE	CONTENTS	SOLVENT	LOT
FRAX07	Biomarker Surrogate	5b(H)Cholane = 10 ug/mL	dcm	DN770
FRAX88	PAH/SHC RIS Spiking Solution	5 Alpha Androstane = 500 ug/mL Acenaphthene D10, Chrysene D12 = 5 ug/mL	DCM	dp785

Alpha Woods Hole Lab
Batch Clean Up Report

11/07/2016 1611004 - OP Steranes/Triterpanes

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1611004-07	SAM	3630F1	BA	11/28/2016							0.9	0.45	2	1		True
1611004-08	SAM	3630F1	BA	11/28/2016							0.9	0.45	2	1		True
1611004-09	D	3630F1	BA	11/28/2016							0.9	0.45	2	1		True
1611004-09	SAM	3630F1	BA	11/28/2016							0.9	0.45	2	1		True
SW110716B01	B	3630F1	BA	11/28/2016							0.9	0.45	2	1		True
SW110716LCS01	LCS	3630F1														True
SW110716LCSD01	LCSD	3630F1														True
SW112816B01	B	3630F1	BA	11/28/2016							1	1	1	1		True
SW112816PRM01	PRM	3630F1	BA	11/28/2016							1	1	1	1		True

Alpha Woods Hole Lab
Batch Clean Up Report
11/07/2016 1611004 - OP Steranes/Triterpanes

Lab ID	Notes
1611004-07	
1611004-08	
1611004-09	
1611004-09	
SW110716B01	
SW110716LCS01	
SW110716LCSD01	
SW112816B01	
SW112816PRM01	

Alpha Woods Hole Lab
Batch Clean Up Report

11/07/2016 1611004 - OP Steranes/Triterpanes

Lab ID	QC Type	Clean Up Method	Analyst	Clean Up Date	Flow Rate	Coll. Start	Coll. End	Concentration Analyst	Conc. Date	Solvent Ex.	Pre Vol (ml)	Frac Amt (ml)	Frac Split	Frac Fact	Tran Vol (ml)	Active
1611004-07	SAM	split	BA	11/28/2016							0.9	0.45	2			True
1611004-08	SAM	split	BA	11/28/2016							0.9	0.45	2			True
1611004-09	D	split	BA	11/28/2016							0.9	0.45	2			True
1611004-09	SAM	split	BA	11/28/2016							0.9	0.45	2			True
SW110716B01	B	split	BA	11/28/2016							0.9	0.45	2			True
SW110716LCS01	LCS	split														True
SW110716LCSD01	LCSD	split														True
SW112816B01	B	split	BA	11/28/2016							0.9	0.45	2			True
SW112816PRM01	PRM	split	BA	11/28/2016							0.9	0.45	2			True

Alpha Woods Hole Lab
Batch Clean Up Report
11/07/2016 1611004 - OP Steranes/Triterpanes

Lab ID	Notes
1611004-07	
1611004-08	
1611004-09	
1611004-09	
SW110716B01	
SW110716LCS01	
SW110716LCSD01	
SW112816B01	
SW112816PRM01	

Batch ID: 1611004 F1 Client: Newfields Project: National Grid Water St.

Anomalies are noted in the Prep Process Notes section below.

Test(s) Spiked for:
Choose from the following:
F1B, POIB, POIH, POIHX, POITAS, TPH+A

Extraction HT:

Identify Matrix:
Filter • Filter (L) • NAPL • Net • Oil Product • PUF • Sediment • Sheen Soil • Solid • SPMD • Tissue Pom Pom • 1L Water • 4L Water • Floc Water

	Date:	Initials:
COC/ETR Check:		
1st Extraction:		
2nd Extraction:	11/28	16
3rd Extraction:		

Cleanup Methods:	Date/ Initials:
No Cleanup Required	
Alumina Column (3610)	
Silica Column (3630)	
Fractionation Column (3630F1) X	11/28/16 RA
GPC (3640)	
Copper (3660B)	
Water pH<2 verified	

	Date/Initials:	ID & Amount:
RIS Spike Analyst:	11/28/16 RA	FRAX 33
RIS Spike Witness:	11/28/16 JP	50ul

Prep Process Notes

original paperwork can be referenced for extraction information
2.5mL FRAX 33 (19.78mg/mL) used for analysis of pencil pitch.
RA 11/28/16

REAGENT	LOT #
DCM	DQ341
SODIUM SULFATE	0000144042
SILICA GEL	BC8294285V
ALUMINA	N/A

REAGENT	LOT #
COPPER	N/A
GLASS WOOL	1114400

BATCH COMPLETE Analyst:	RA	Date:	11/28/16

BATCH REVIEWED Analyst:	EP	Date:	11/30/16

Steranes and Triterpanes by GC/MS-SIM

Form I
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-02(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-01F1**
Associated Blank: **SO111016B02F1**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/28/16	100	0.1084	5	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**5.92**	
C24 Tricyclic Terpane	**2.88**	
C25 Tricyclic Terpane	**1.83**	
C24 Tetracyclic Terpane	**1.16**	
C26 Tricyclic Terpane-22S	**0.568**	
C26 Tricyclic Terpane-22R	**0.515**	
C28 Tricyclic Terpane-22S	**0.384**	J
C28 Tricyclic Terpane-22R	**0.457**	J
C29 Tricyclic Terpane-22S	**0.367**	J
C29 Tricyclic Terpane-22R	**0.343**	J
18a-22,29,30-Trisnorneohopane-TS	**1.31**	
C30 Tricyclic Terpane-22S	**0.255**	J
C30 Tricyclic Terpane-22R	**0.159**	J
17a(H)-22,29,30-Trisnorhopane-TM	**1.42**	
17a/b,21b/a 28,30-Bisnorhopane	**0.337**	J
17a(H),21b(H)-25-Norhopane	**0.148**	J
30-Norhopane	**2.76**	
18a(H)-30-Norneohopane-C29Ts	**1.06**	
17a(H)-Diahopane	**0.326**	J
30-Normoretane	**0.585**	
18a(H)&18b(H)-Oleananes	**0.388**	J
Hopane	**4.15**	
Moretane	**0.727**	
30-Homohopane-22S	**0.902**	
30-Homohopane-22R	**0.767**	
30,31-Bishomohopane-22S	**0.540**	

Parameter	Result	
30,31-Bishomohopane-22R	**0.375**	J
30,31-Trishomohopane-22S	**0.306**	J
30,31-Trishomohopane-22R	**0.193**	J
Tetrakishomohopane-22S	0.461	U
Tetrakishomohopane-22R	0.461	U
Pentakishomohopane-22S	0.461	U
Pentakishomohopane-22R	0.461	U
13b(H),17a(H)-20S-Diacholestane	**1.96**	
13b(H),17a(H)-20R-Diacholestane	**1.03**	
13b,17a-20S-Methyldiacholestane	**0.911**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**2.07**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**1.97**	
Unknown Sterane (S18)	**0.372**	J
13a,17b-20S-Ethyldiacholestane	0.461	U
14a,17a-20S-Methylcholestane	**0.784**	
14a,17a-20R-Methylcholestane	**0.731**	
14a(H),17a(H)-20S-Ethylcholestane	**0.500**	
14a(H),17a(H)-20R-Ethylcholestane	**0.564**	
14b(H),17b(H)-20R-Cholestane	**1.04**	
14b(H),17b(H)-20S-Cholestane	**0.997**	
14b,17b-20R-Methylcholestane	**0.784**	
14b,17b-20S-Methylcholestane	**1.04**	
14b(H),17b(H)-20R-Ethylcholestane	**0.929**	
14b(H),17b(H)-20S-Ethylcholestane	**0.894**	
T22a-Gammacerane/C32-diahopane	**0.227**	J

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	104	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 08:47

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251646.D
Acq On : 28 Nov 2016 9:27 pm
Operator : PAH14:AC
Sample : 1611004-01-RF1
Misc : oil
ALS Vial : 44 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 06 11:19:07 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	42931	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.797	217	13528	1040.137	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 104.01%			
Target Compounds						Qvalue
2) Hopane (T19)	52.238	191	2214	89.973	ng/mL#	89
4) C23 Tricyclic Terpane (T4	40.828	191	3158	128.336	ng/ml	100
5) C24 Tricyclic Terpane (T5	41.551	191	1536	62.420	ng/ml	100
6) C25 Tricyclic Terpane (T6	43.028	191	974M4	39.582	ng/ml	
7) C24 Tetracyclic Terpane (	44.355	191	616	25.033	ng/ml	100
8) C26 Tricyclic Terpane-22S	44.083	191	303	12.313	ng/ml	100
9) C26 Tricyclic Terpane-22R	44.181	191	275	11.176	ng/ml	100
10) C28 Tricyclic Terpane-22S	46.457	191	205M4	8.331	ng/ml	
11) C28 Tricyclic Terpane-22R	46.623	191	244	9.916	ng/ml	100
12) C29 Tricyclic Terpane-22S	47.136	191	196	7.965	ng/ml	100
13) C29 Tricyclic Terpane-22R	47.339	191	183M4	7.437	ng/ml	
14) 18a-22,29,30-Trisnorneoho	48.470	191	699	28.406	ng/ml	100
15) C30 Tricyclic Terpane-22S	48.553	191	136	5.527	ng/mL	100
16) C30 Tricyclic Terpane-22R	48.794	191	85M3	3.454	ng/mL	
17) 17a(H)-22,29,30-Trisnorho	49.012	191	755	30.682	ng/ml	100
18) 17a/b,21b/a 28,30-Bisnorh	50.188	191	180M4	7.315	ng/ml	
19) 17a(H),21b(H)-25-Norhopan	50.000	191	79M3	3.210	ng/ml	
20) 30-Norhopane (T15)	50.874	191	1474M4	59.901	ng/ml	
21) 18a(H)-30-Norneohopane-C2	50.979	191	564M4	22.920	ng/ml	
22) 17a(H)-Diahopane (X)	51.092	191	174	7.071	ng/ml	100
23) 30-Normoretane (T17)	51.650	191	312	12.679	ng/ml	100
24) 18a(H)&18b(H)-Oleananes (	52.057	191	207	8.412	ng/ml	100
25) Moretane (T20)	52.924	191	388M4	15.768	ng/ml	
26) 30-Homohopane-22S (T21)	54.024	191	481	19.547	ng/ml	100
27) 30-Homohopane-22R (T22)	54.250	191	409	16.621	ng/ml	100
28) Gammacerane/C32-diahopane	54.800	191	121	4.917	ng/mL	100
29) 30,31-Bishomohopane-22S (	55.576	191	288	11.704	ng/ml	100
30) 30,31-Bishomohopane-22R (	55.953	191	200	8.128	ng/ml	100
31) 30,31-Trishomohopane-22S	57.702	191	163	6.624	ng/ml	100
32) 30,31-Trishomohopane-22R	58.327	191	103M2	4.186	ng/ml	
38) 13b(H),17a(H)-20S-Diachol	45.297	217	553M4	42.519	ng/ml	
39) 13b(H),17a(H)-20R-Diachol	45.719	217	290M4	22.297	ng/ml	
40) 13b,17a-20S-Methyldiachol	46.420	217	257M4	19.760	ng/ml	
41) 14a,17a-20S-Chol/13b,17a-	47.279	217	584	44.902	ng/ml	100
42) 14a,17a-20R-Chol/13b,17a-	47.799	217	555	42.673	ng/ml	100
43) Unknown Sterane (S18)	48.078	217	105M3	8.073	ng/ml	
45) 14a,17a-20S-Methylcholest	48.485	217	221M4	16.992	ng/ml	
46) 14a,17a-20R-Methylcholest	49.208	217	206M4	15.839	ng/ml	
47) 14a(H),17a(H)-20S-Ethylch	49.555	217	141M4	10.841	ng/ml	
48) 14a(H),17a(H)-20R-Ethylch	50.467	217	159	12.225	ng/ml	100
49) 14b(H),17b(H)-20R-Cholest	47.369	218	293M4	22.528	ng/ml	
50) 14b(H),17b(H)-20S-Cholest	47.452	218	281M4	21.605	ng/ml	
51) 14b,17b-20R-Methylcholest	48.673	218	221M4	16.992	ng/ml	
52) 14b,17b-20S-Methylcholest	48.748	218	294M4	22.605	ng/ml	
53) 14b(H),17b(H)-20R-Ethylch	49.811	218	262	20.145	ng/ml	100
54) 14b(H),17b(H)-20S-Ethylch	49.849	218	252M3	19.376	ng/ml	

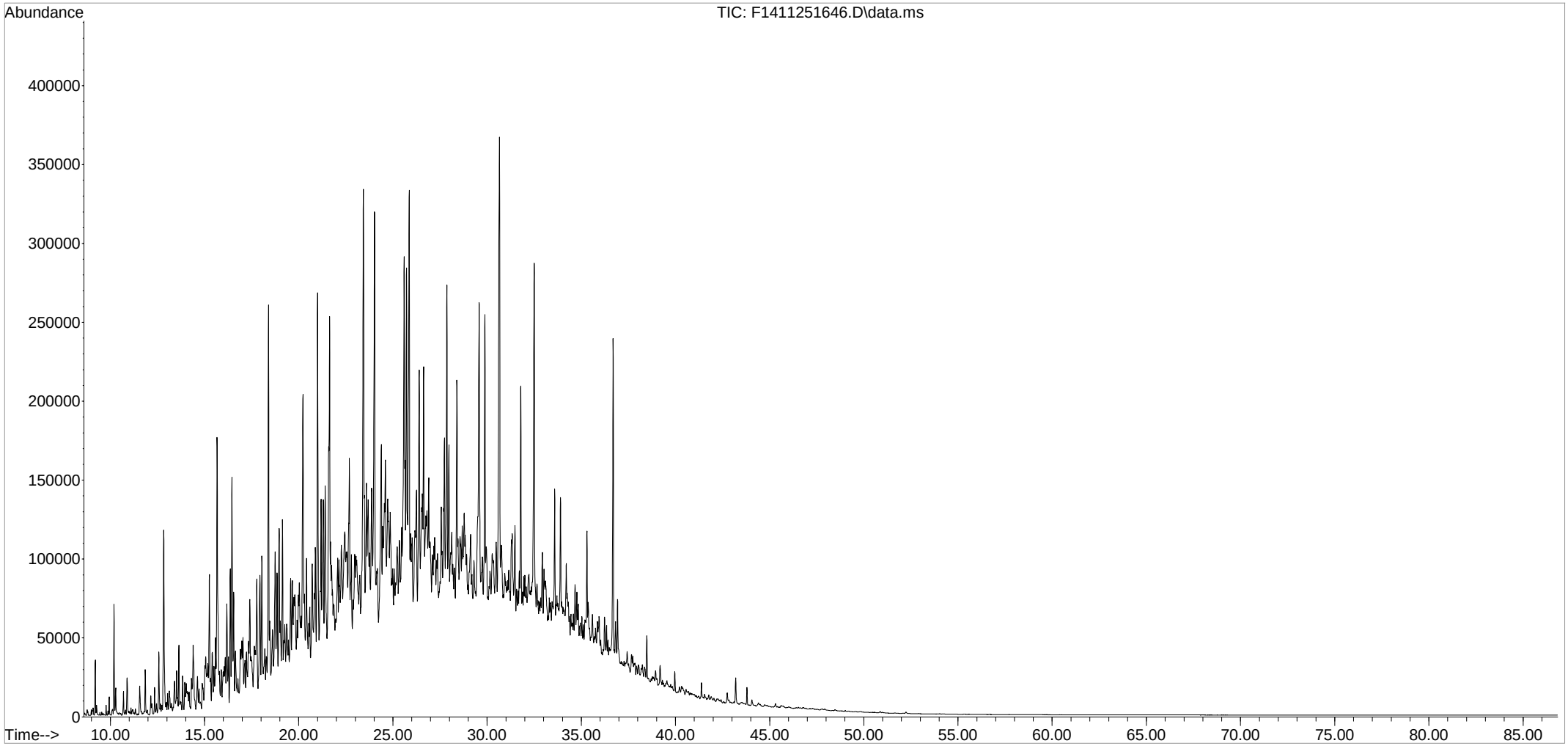
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251646.D
Acq On : 28 Nov 2016 9:27 pm
Operator : PAH14:AC
Sample : 1611004-01-RF1
Misc : oil
ALS Vial : 44 Sample Multiplier: 1

Quant Time: Dec 06 11:19:07 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Form I
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02F1**
Associated Blank: **SO111016B02F1**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/28/16	100	0.1084	5	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**4.52**	
C24 Tricyclic Terpane	**2.39**	
C25 Tricyclic Terpane	**1.84**	
C24 Tetracyclic Terpane	**1.56**	
C26 Tricyclic Terpane-22S	**0.725**	
C26 Tricyclic Terpane-22R	**0.688**	
C28 Tricyclic Terpane-22S	**0.797**	
C28 Tricyclic Terpane-22R	**0.819**	
C29 Tricyclic Terpane-22S	**0.712**	
C29 Tricyclic Terpane-22R	**0.735**	
18a-22,29,30-Trisnorneohopane-TS	**3.14**	
C30 Tricyclic Terpane-22S	**0.706**	
C30 Tricyclic Terpane-22R	**0.450**	J
17a(H)-22,29,30-Trisnorhopane-TM	**3.44**	
17a/b,21b/a 28,30-Bisnorhopane	**0.747**	
17a(H),21b(H)-25-Norhopane	**0.293**	J
30-Norhopane	**7.93**	
18a(H)-30-Norneohopane-C29Ts	**3.06**	
17a(H)-Diahopane	**0.866**	
30-Normoretane	**1.86**	
18a(H)&18b(H)-Oleananes	**1.38**	
Hopane	**14.4**	
Moretane	**2.34**	
30-Homohopane-22S	**3.21**	
30-Homohopane-22R	**2.93**	
30,31-Bishomohopane-22S	**2.12**	
30,31-Bishomohopane-22R	**1.46**	
30,31-Trishomohopane-22S	**1.14**	
30,31-Trishomohopane-22R	**0.710**	
Tetrakishomohopane-22S	**0.676**	
Tetrakishomohopane-22R	**0.420**	J
Pentakishomohopane-22S	**0.412**	J
Pentakishomohopane-22R	**0.303**	J
13b(H),17a(H)-20S-Diacholestane	**2.86**	
13b(H),17a(H)-20R-Diacholestane	**1.43**	
13b,17a-20S-Methyldiacholestane	**1.51**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**3.77**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**4.04**	
Unknown Sterane (S18)	**0.705**	
13a,17b-20S-Ethyldiacholestane	**0.124**	J
14a,17a-20S-Methylcholestane	**1.72**	
14a,17a-20R-Methylcholestane	**1.49**	
14a(H),17a(H)-20S-Ethylcholestane	**1.38**	
14a(H),17a(H)-20R-Ethylcholestane	**1.65**	
14b(H),17b(H)-20R-Cholestane	**2.37**	
14b(H),17b(H)-20S-Cholestane	**2.35**	
14b,17b-20R-Methylcholestane	**1.91**	
14b,17b-20S-Methylcholestane	**2.68**	
14b(H),17b(H)-20R-Ethylcholestane	**3.21**	
14b(H),17b(H)-20S-Ethylcholestane	**2.03**	
T22a-Gammacerane/C32-diahopane	**0.844**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	102	50-130

J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 08:48

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251647.D
Acq On : 28 Nov 2016 11:02 pm
Operator : PAH14:AC
Sample : 1611004-02-RF1
Misc : oil
ALS Vial : 45 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Dec 06 17:47:29 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	40600	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	12573	1022.212	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 102.22%			
Target Compounds						Qvalue
2) Hopane (T19)	52.237	191	7286	313.090	ng/mL#	87
4) C23 Tricyclic Terpane (T4	40.820	191	2282	98.061	ng/ml	100
5) C24 Tricyclic Terpane (T5	41.543	191	1206	51.824	ng/ml	100
6) C25 Tricyclic Terpane (T6	43.028	191	931M4	40.006	ng/ml	
7) C24 Tetracyclic Terpane (	44.347	191	788	33.862	ng/ml	100
8) C26 Tricyclic Terpane-22S	44.083	191	366	15.728	ng/ml	100
9) C26 Tricyclic Terpane-22R	44.181	191	347	14.911	ng/ml	100
10) C28 Tricyclic Terpane-22S	46.457	191	402	17.275	ng/ml	100
11) C28 Tricyclic Terpane-22R	46.623	191	413M4	17.747	ng/ml	
12) C29 Tricyclic Terpane-22S	47.135	191	359	15.427	ng/ml	100
13) C29 Tricyclic Terpane-22R	47.339	191	371M4	15.942	ng/ml	
14) 18a-22,29,30-Trisnorneoho	48.469	191	1585	68.110	ng/ml	100
15) C30 Tricyclic Terpane-22S	48.552	191	356M4	15.298	ng/mL	
16) C30 Tricyclic Terpane-22R	48.793	191	227M4	9.755	ng/mL	
17) 17a(H)-22,29,30-Trisnorho	49.012	191	1738	74.684	ng/ml	100
18) 17a/b,21b/a 28,30-Bisnorh	50.187	191	377M4	16.200	ng/ml	
19) 17a(H),21b(H)-25-Norhopan	49.992	191	148	6.360	ng/ml	100
20) 30-Norhopane (T15)	50.866	191	4000M4	171.886	ng/ml	
21) 18a(H)-30-Norneohopane-C2	50.971	191	1546M4	66.434	ng/ml	
22) 17a(H)-Diahopane (X)	51.092	191	437	18.779	ng/ml	100
23) 30-Normoretane (T17)	51.650	191	937	40.264	ng/ml	100
24) 18a(H)&18b(H)-Oleananes (	52.056	191	694M4	29.822	ng/ml	
25) Moretane (T20)	52.923	191	1182M4	50.792	ng/ml	
26) 30-Homohopane-22S (T21)	54.023	191	1620	69.614	ng/ml	100
27) 30-Homohopane-22R (T22)	54.250	191	1477	63.469	ng/ml	100
28) Gammacerane/C32-diahopane	54.800	191	426M4	18.306	ng/mL	
29) 30,31-Bishomohopane-22S (	55.576	191	1069	45.936	ng/ml	100
30) 30,31-Bishomohopane-22R (	55.960	191	736	31.627	ng/ml	100
31) 30,31-Trishomohopane-22S	57.709	191	573	24.623	ng/ml	100
32) 30,31-Trishomohopane-22R	58.319	191	358M4	15.384	ng/ml	
33) Tetrakishomohopane-22S (T	60.347	191	341	14.653	ng/ml	100
34) Tetrakishomohopane-22R (T	61.236	191	212	9.110	ng/ml	100
35) Pentakishomohopane-22S (T	63.459	191	208M2	8.938	ng/ml	
36) Pentakishomohopane-22R (T	64.748	191	153M2	6.575	ng/ml	
38) 13b(H),17a(H)-20S-Diachol	45.296	217	763	62.034	ng/ml	100
39) 13b(H),17a(H)-20R-Diachol	45.718	217	381	30.976	ng/ml	100
40) 13b,17a-20S-Methyldiachol	46.412	217	402M4	32.683	ng/ml	
41) 14a,17a-20S-Chol/13b,17a-	47.278	217	1005	81.709	ng/ml	100
42) 14a,17a-20R-Chol/13b,17a-	47.798	217	1078	87.644	ng/ml	100
43) Unknown Sterane (S18)	48.077	217	188	15.285	ng/ml	100
44) 13a,17b-20S-Ethyldiachole	48.334	217	33M3	2.683	ng/ml	
45) 14a,17a-20S-Methylcholest	48.492	217	458M4	37.236	ng/ml	
46) 14a,17a-20R-Methylcholest	49.208	217	398M4	32.358	ng/ml	
47) 14a(H),17a(H)-20S-Ethylch	49.554	217	367M4	29.838	ng/ml	
48) 14a(H),17a(H)-20R-Ethylch	50.474	217	441M4	35.854	ng/ml	
49) 14b(H),17b(H)-20R-Cholest	47.369	218	633M4	51.464	ng/ml	
50) 14b(H),17b(H)-20S-Cholest	47.452	218	627M4	50.976	ng/ml	
51) 14b,17b-20R-Methylcholest	48.665	218	509	41.383	ng/ml	100
52) 14b,17b-20S-Methylcholest	48.748	218	716M4	58.212	ng/ml	
53) 14b(H),17b(H)-20R-Ethylch	49.818	218	856M3	69.595	ng/ml	
54) 14b(H),17b(H)-20S-Ethylch	49.841	218	542M3	44.066	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251647.D
Acq On : 28 Nov 2016 11:02 pm
Operator : PAH14:AC
Sample : 1611004-02-RF1
Misc : oil
ALS Vial : 45 Sample Multiplier: 1

Quant Time: Dec 06 17:47:29 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

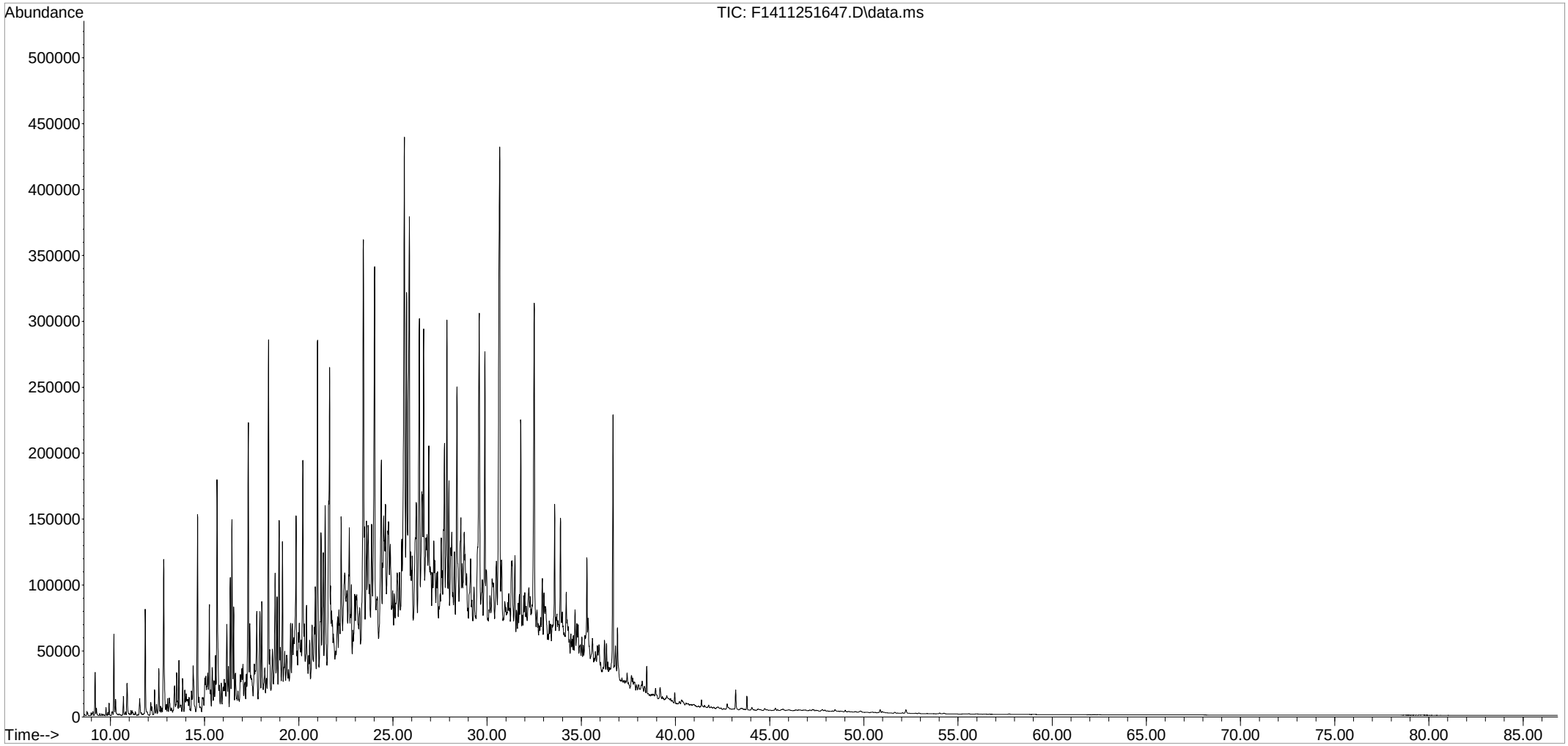
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251647.D
Acq On : 28 Nov 2016 11:02 pm
Operator : PAH14:AC
Sample : 1611004-02-RF1
Misc : oil
ALS Vial : 45 Sample Multiplier: 1

Quant Time: Dec 06 17:47:29 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Form I
Duplicate
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02F1 D**
Associated Blank: **SO111016B02F1**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/29/16	100	0.1095	5	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**4.76**	
C24 Tricyclic Terpane	**2.43**	
C25 Tricyclic Terpane	**1.91**	
C24 Tetracyclic Terpane	**1.69**	
C26 Tricyclic Terpane-22S	**0.790**	
C26 Tricyclic Terpane-22R	**0.751**	
C28 Tricyclic Terpane-22S	**0.732**	
C28 Tricyclic Terpane-22R	**0.833**	
C29 Tricyclic Terpane-22S	**0.763**	
C29 Tricyclic Terpane-22R	**0.847**	
18a-22,29,30-Trisnorneohopane-TS	**3.27**	
C30 Tricyclic Terpane-22S	**0.697**	
C30 Tricyclic Terpane-22R	**0.482**	
17a(H)-22,29,30-Trisnorhopane-TM	**3.64**	
17a/b,21b/a 28,30-Bisnorhopane	**0.720**	
17a(H),21b(H)-25-Norhopane	**0.355**	J
30-Norhopane	**8.44**	
18a(H)-30-Norneohopane-C29Ts	**3.29**	
17a(H)-Diahopane	**0.967**	
30-Normoretane	**2.01**	
18a(H)&18b(H)-Oleananes	**1.27**	
Hopane	**14.9**	
Moretane	**2.57**	
30-Homohopane-22S	**3.46**	
30-Homohopane-22R	**3.17**	
30,31-Bishomohopane-22S	**2.29**	
30,31-Bishomohopane-22R	**1.60**	
30,31-Trishomohopane-22S	**1.26**	
30,31-Trishomohopane-22R	**0.748**	
Tetrakishomohopane-22S	**0.814**	
Tetrakishomohopane-22R	**0.501**	
Pentakishomohopane-22S	**0.443**	J
Pentakishomohopane-22R	**0.346**	J
13b(H),17a(H)-20S-Diacholestane	**2.99**	
13b(H),17a(H)-20R-Diacholestane	**1.58**	
13b,17a-20S-Methyldiacholestane	**1.55**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**3.97**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**4.23**	
Unknown Sterane (S18)	**0.760**	
13a,17b-20S-Ethyldiacholestane	**0.103**	J
14a,17a-20S-Methylcholestane	**1.88**	
14a,17a-20R-Methylcholestane	**1.57**	
14a(H),17a(H)-20S-Ethylcholestane	**1.51**	
14a(H),17a(H)-20R-Ethylcholestane	**1.86**	
14b(H),17b(H)-20R-Cholestane	**2.48**	
14b(H),17b(H)-20S-Cholestane	**2.42**	
14b,17b-20R-Methylcholestane	**2.07**	
14b,17b-20S-Methylcholestane	**2.76**	
14b(H),17b(H)-20R-Ethylcholestane	**3.47**	
14b(H),17b(H)-20S-Ethylcholestane	**2.15**	
T22a-Gammacerane/C32-diahopane	**0.897**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	106	50-130

J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 08:48

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251648.D
Acq On : 29 Nov 2016 12:36 am
Operator : PAH14:AC
Sample : 1611004-02d-RF1
Misc : oil
ALS Vial : 46 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 06 17:48:01 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	41028	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	13223	1063.844	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 106.38%			
Target Compounds						Qvalue
2) Hopane (T19)	52.230	191	7670M4	326.153	ng/mL	
4) C23 Tricyclic Terpane (T4	40.820	191	2453	104.309	ng/ml	100
5) C24 Tricyclic Terpane (T5	41.543	191	1252	53.239	ng/ml	100
6) C25 Tricyclic Terpane (T6	43.028	191	982M1	41.758	ng/ml	
7) C24 Tetracyclic Terpane (	44.347	191	872	37.080	ng/ml	100
8) C26 Tricyclic Terpane-22S	44.083	191	407	17.307	ng/ml	100
9) C26 Tricyclic Terpane-22R	44.173	191	387M4	16.456	ng/ml	
10) C28 Tricyclic Terpane-22S	46.457	191	377M4	16.031	ng/ml	
11) C28 Tricyclic Terpane-22R	46.623	191	429M4	18.242	ng/ml	
12) C29 Tricyclic Terpane-22S	47.135	191	393	16.712	ng/ml	100
13) C29 Tricyclic Terpane-22R	47.331	191	436M4	18.540	ng/ml	
14) 18a-22,29,30-Trisnorneoho	48.469	191	1686	71.694	ng/ml	100
15) C30 Tricyclic Terpane-22S	48.552	191	359M4	15.266	ng/mL	
16) C30 Tricyclic Terpane-22R	48.793	191	248M4	10.546	ng/mL	
17) 17a(H)-22,29,30-Trisnorho	49.012	191	1876M4	79.773	ng/ml	
18) 17a/b,21b/a 28,30-Bisnorh	50.195	191	371M4	15.776	ng/ml	
19) 17a(H),21b(H)-25-Norhopan	49.984	191	183	7.782	ng/ml	100
20) 30-Norhopane (T15)	50.866	191	4349M4	184.933	ng/ml	
21) 18a(H)-30-Norneohopane-C2	50.971	191	1695M4	72.077	ng/ml	
22) 17a(H)-Diahopane (X)	51.092	191	498	21.177	ng/ml	100
23) 30-Normoretane (T17)	51.650	191	1033	43.926	ng/ml	100
24) 18a(H)&18b(H)-Oleananes (	52.049	191	656M4	27.895	ng/ml	
25) Moretane (T20)	52.931	191	1323M4	56.258	ng/ml	
26) 30-Homohopane-22S (T21)	54.016	191	1781	75.734	ng/ml	100
27) 30-Homohopane-22R (T22)	54.250	191	1632	69.398	ng/ml	100
28) Gammacerane/C32-diahopane	54.807	191	462M4	19.646	ng/mL	
29) 30,31-Bishomohopane-22S (	55.576	191	1178M4	50.092	ng/ml	
30) 30,31-Bishomohopane-22R (	55.960	191	824	35.039	ng/ml	100
31) 30,31-Trishomohopane-22S	57.709	191	651	27.683	ng/ml	100
32) 30,31-Trishomohopane-22R	58.327	191	385	16.371	ng/ml	100
33) Tetrakishomohopane-22S (T	60.347	191	419	17.817	ng/ml	100
34) Tetrakishomohopane-22R (T	61.236	191	258	10.971	ng/ml	100
35) Pentakishomohopane-22S (T	63.482	191	228M4	9.695	ng/ml	
36) Pentakishomohopane-22R (T	64.763	191	178M4	7.569	ng/ml	
38) 13b(H),17a(H)-20S-Diachol	45.296	217	813	65.409	ng/ml	100
39) 13b(H),17a(H)-20R-Diachol	45.718	217	430	34.595	ng/ml	100
40) 13b,17a-20S-Methyldiachol	46.412	217	421M4	33.871	ng/ml	
41) 14a,17a-20S-Chol/13b,17a-	47.278	217	1081	86.971	ng/ml	100
42) 14a,17a-20R-Chol/13b,17a-	47.798	217	1151	92.603	ng/ml	100
43) Unknown Sterane (S18)	48.077	217	207	16.654	ng/ml	100
44) 13a,17b-20S-Ethyldiachole	48.334	217	28M3	2.253	ng/ml	
45) 14a,17a-20S-Methylcholest	48.492	217	512M4	41.192	ng/ml	
46) 14a,17a-20R-Methylcholest	49.208	217	428M4	34.434	ng/ml	
47) 14a(H),17a(H)-20S-Ethylch	49.554	217	411M4	33.067	ng/ml	
48) 14a(H),17a(H)-20R-Ethylch	50.466	217	505M4	40.629	ng/ml	
49) 14b(H),17b(H)-20R-Cholest	47.369	218	675M4	54.306	ng/ml	
50) 14b(H),17b(H)-20S-Cholest	47.452	218	658M4	52.939	ng/ml	
51) 14b,17b-20R-Methylcholest	48.665	218	563	45.296	ng/ml	100
52) 14b,17b-20S-Methylcholest	48.748	218	751M4	60.421	ng/ml	
53) 14b(H),17b(H)-20R-Ethylch	49.803	218	944	75.949	ng/ml	100
54) 14b(H),17b(H)-20S-Ethylch	49.848	218	586M3	47.146	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251648.D
Acq On : 29 Nov 2016 12:36 am
Operator : PAH14:AC
Sample : 1611004-02d-RF1
Misc : oil
ALS Vial : 46 Sample Multiplier: 1

Quant Time: Dec 06 17:48:01 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

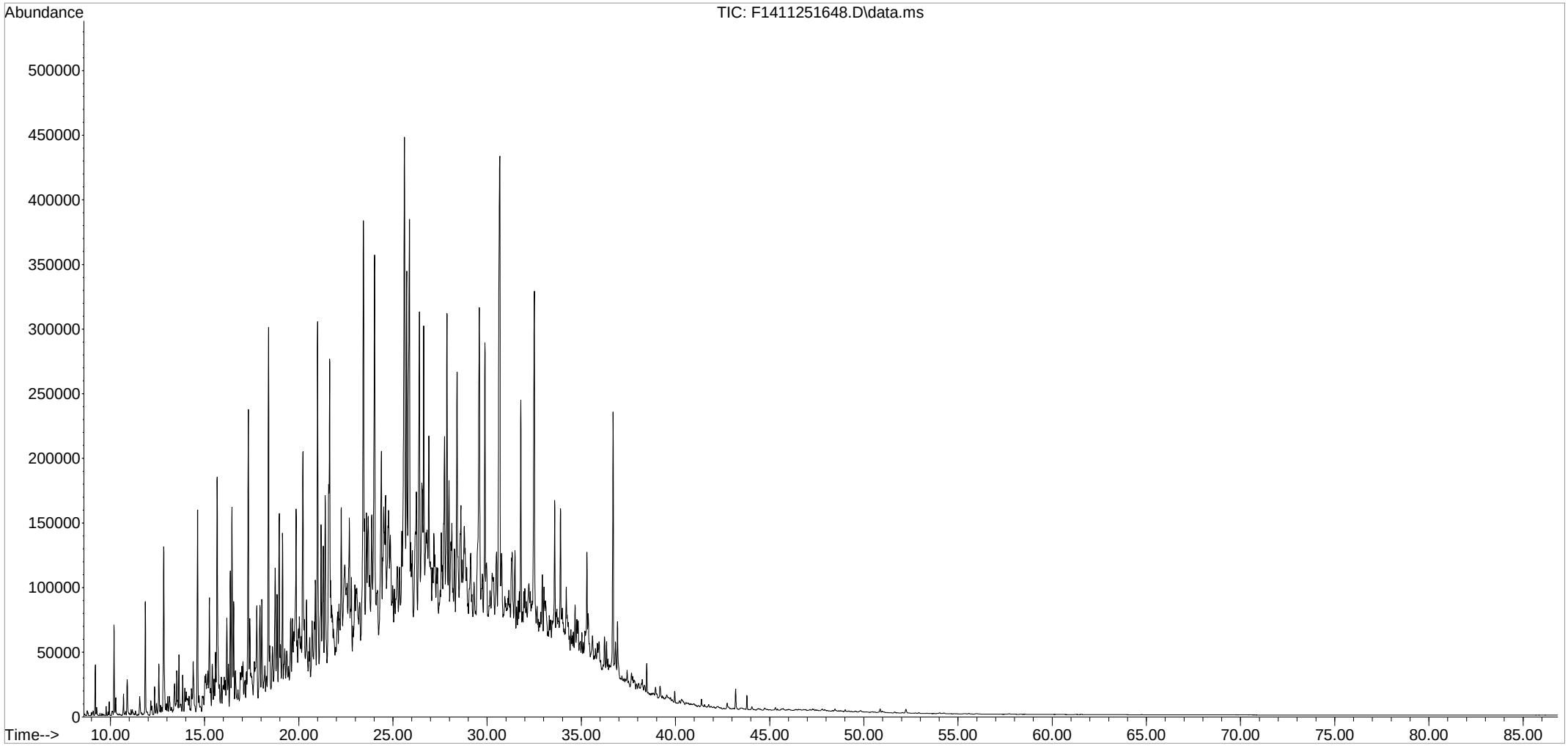
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251648.D
Acq On : 29 Nov 2016 12:36 am
Operator : PAH14:AC
Sample : 1611004-02d-RF1
Misc : oil
ALS Vial : 46 Sample Multiplier: 1

Quant Time: Dec 06 17:48:01 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Duplicate
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02F1**
Associated Blank: **SO111016B02F1**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/10/16	100	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
C23 Tricyclic Terpane	**4.52**	**4.76**	5	30
C24 Tricyclic Terpane	**2.39**	**2.43**	2	30
C25 Tricyclic Terpane	**1.84**	**1.91**	3	30
C24 Tetracyclic Terpane	**1.56**	**1.69**	8	30
C26 Tricyclic Terpane-22S	**0.725**	**0.790**	9	30
C26 Tricyclic Terpane-22R	**0.688**	**0.751**	9	30
C28 Tricyclic Terpane-22S	**0.797**	**0.732**	8	30
C28 Tricyclic Terpane-22R	**0.819**	**0.833**	2	30
C29 Tricyclic Terpane-22S	**0.712**	**0.763**	7	30
C29 Tricyclic Terpane-22R	**0.735**	**0.847**	14	30
18a-22,29,30-Trisnorneohopane-TS	**3.14**	**3.27**	4	30
C30 Tricyclic Terpane-22S	**0.706**	**0.697**	1	30
C30 Tricyclic Terpane-22R	**0.450** J	**0.482**	7	30
17a(H)-22,29,30-Trisnorhopane-TM	**3.44**	**3.64**	6	30
17a/b,21b/a 28,30-Bisnorhopane	**0.747**	**0.720**	4	30
17a(H),21b(H)-25-Norhopane	**0.293** J	**0.355** J	19	30
30-Norhopane	**7.93**	**8.44**	6	30
18a(H)-30-Norneohopane-C29Ts	**3.06**	**3.29**	7	30
17a(H)-Diahopane	**0.866**	**0.967**	11	30
30-Normoretane	**1.86**	**2.01**	8	30
18a(H)&18b(H)-Oleananes	**1.38**	**1.27**	8	30
Hopane	**14.4**	**14.9**	3	30
Moretane	**2.34**	**2.57**	9	30
30-Homohopane-22S	**3.21**	**3.46**	7	30
30-Homohopane-22R	**2.93**	**3.17**	8	30
30,31-Bishomohopane-22S	**2.12**	**2.29**	8	30
30,31-Bishomohopane-22R	**1.46**	**1.60**	9	30
30,31-Trishomohopane-22S	**1.14**	**1.26**	11	30
30,31-Trishomohopane-22R	**0.710**	**0.748**	5	30
Tetrakishomohopane-22S	**0.676**	**0.814**	18	30
Tetrakishomohopane-22R	**0.420** J	**0.501**	18	30
Pentakishomohopane-22S	**0.412** J	**0.443** J	7	30
Pentakishomohopane-22R	**0.303** J	**0.346** J	13	30
13b(H),17a(H)-20S-Diacholestane	**2.86**	**2.99**	4	30
13b(H),17a(H)-20R-Diacholestane	**1.43**	**1.58**	10	30

J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 08:57

Duplicate
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-9MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-02F1**
Associated Blank: **SO111016B02F1**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/10/16	100	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
13b,17a-20S-Methyldiacholestane	**1.51**	**1.55**	3	30
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**3.77**	**3.97**	5	30
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**4.04**	**4.23**	4	30
Unknown Sterane (S18)	**0.705**	**0.760**	8	30
13a,17b-20S-Ethyldiacholestane	**0.124** J	**0.103** J	18	30
14a,17a-20S-Methylcholestane	**1.72**	**1.88**	9	30
14a,17a-20R-Methylcholestane	**1.49**	**1.57**	5	30
14a(H),17a(H)-20S-Ethylcholestane	**1.38**	**1.51**	9	30
14a(H),17a(H)-20R-Ethylcholestane	**1.65**	**1.86**	11	30
14b(H),17b(H)-20R-Cholestane	**2.37**	**2.48**	4	30
14b(H),17b(H)-20S-Cholestane	**2.35**	**2.42**	3	30
14b,17b-20R-Methylcholestane	**1.91**	**2.07**	8	30
14b,17b-20S-Methylcholestane	**2.68**	**2.76**	3	30
14b(H),17b(H)-20R-Ethylcholestane	**3.21**	**3.47**	8	30
14b(H),17b(H)-20S-Ethylcholestane	**2.03**	**2.15**	6	30
T22a-Gammacerane/C32-diahopane	**0.844**	**0.897**	6	30

Surrogate	% Recovery		Acceptance Range (%)
5B(H)Cholane	102	106	50-130

J - Estimated value, below quantitation limit.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 08:57

Form I
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **ENV-3MW**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-03F1**
Associated Blank: **SO111016B02F1**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/10/16	11/29/16	100	0.1021	5	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**7.64**	
C24 Tricyclic Terpane	**3.96**	
C25 Tricyclic Terpane	**3.32**	
C24 Tetracyclic Terpane	**1.97**	
C26 Tricyclic Terpane-22S	**1.06**	
C26 Tricyclic Terpane-22R	**0.987**	
C28 Tricyclic Terpane-22S	**0.914**	
C28 Tricyclic Terpane-22R	**1.04**	
C29 Tricyclic Terpane-22S	**0.934**	
C29 Tricyclic Terpane-22R	**0.945**	
18a-22,29,30-Trisnorneohopane-TS	**3.06**	
C30 Tricyclic Terpane-22S	**0.705**	
C30 Tricyclic Terpane-22R	**0.545**	
17a(H)-22,29,30-Trisnorhopane-TM	**3.43**	
17a/b,21b/a 28,30-Bisnorhopane	**0.924**	
17a(H),21b(H)-25-Norhopane	**0.363**	J
30-Norhopane	**6.92**	
18a(H)-30-Norneohopane-C29Ts	**2.62**	
17a(H)-Diahopane	**0.737**	
30-Normoretane	**1.36**	
18a(H)&18b(H)-Oleananes	**1.01**	
Hopane	**10.8**	
Moretane	**1.65**	
30-Homohopane-22S	**2.50**	
30-Homohopane-22R	**2.25**	
30,31-Bishomohopane-22S	**1.46**	
30,31-Bishomohopane-22R	**1.06**	
30,31-Trishomohopane-22S	**0.781**	
30,31-Trishomohopane-22R	**0.541**	
Tetrakishomohopane-22S	**0.492**	
Tetrakishomohopane-22R	**0.340**	J
Pentakishomohopane-22S	**0.385**	J
Pentakishomohopane-22R	**0.257**	J
13b(H),17a(H)-20S-Diacholestane	**3.62**	
13b(H),17a(H)-20R-Diacholestane	**2.04**	
13b,17a-20S-Methyldiacholestane	**2.01**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**4.82**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**5.87**	
Unknown Sterane (S18)	**0.721**	
13a,17b-20S-Ethyldiacholestane	**0.0966**	J
14a,17a-20S-Methylcholestane	**2.23**	
14a,17a-20R-Methylcholestane	**2.76**	
14a(H),17a(H)-20S-Ethylcholestane	**1.60**	
14a(H),17a(H)-20R-Ethylcholestane	**2.21**	
14b(H),17b(H)-20R-Cholestane	**3.16**	
14b(H),17b(H)-20S-Cholestane	**2.93**	
14b,17b-20R-Methylcholestane	**2.64**	
14b,17b-20S-Methylcholestane	**3.24**	
14b(H),17b(H)-20R-Ethylcholestane	**2.90**	
14b(H),17b(H)-20S-Ethylcholestane	**2.45**	
T22a-Gammacerane/C32-diahopane	**0.635**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	95	50-130

J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 08:48

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251649.D
Acq On : 29 Nov 2016 2:10 am
Operator : PAH14:AC
Sample : 1611004-03-RF1
Misc : oil
ALS Vial : 47 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 06 11:19:29 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	50198	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	14455	950.517	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 95.05%			
Target Compounds						Qvalue
2) Hopane (T19)	52.238	191	6325M4	219.827	ng/mL	
4) C23 Tricyclic Terpane (T4	40.827	191	4492	156.120	ng/ml	100
5) C24 Tricyclic Terpane (T5	41.543	191	2325	80.806	ng/ml	100
6) C25 Tricyclic Terpane (T6	43.028	191	1951M1	67.807	ng/ml	
7) C24 Tetracyclic Terpane (	44.347	191	1159M4	40.281	ng/ml	
8) C26 Tricyclic Terpane-22S	44.083	191	625M4	21.722	ng/ml	
9) C26 Tricyclic Terpane-22R	44.181	191	580	20.158	ng/ml	100
10) C28 Tricyclic Terpane-22S	46.457	191	537M4	18.664	ng/ml	
11) C28 Tricyclic Terpane-22R	46.623	191	614M4	21.340	ng/ml	
12) C29 Tricyclic Terpane-22S	47.135	191	549	19.081	ng/ml	100
13) C29 Tricyclic Terpane-22R	47.339	191	555M4	19.289	ng/ml	
14) 18a-22,29,30-Trisnorneoho	48.462	191	1796M4	62.420	ng/ml	
15) C30 Tricyclic Terpane-22S	48.552	191	414M4	14.389	ng/mL	
16) C30 Tricyclic Terpane-22R	48.793	191	320M4	11.122	ng/mL	
17) 17a(H)-22,29,30-Trisnorho	49.012	191	2015	70.032	ng/ml	100
18) 17a/b,21b/a 28,30-Bisnorh	50.188	191	543M4	18.872	ng/ml	
19) 17a(H),21b(H)-25-Norhopan	49.992	191	213	7.403	ng/ml	100
20) 30-Norhopane (T15)	50.873	191	4064M4	141.245	ng/ml	
21) 18a(H)-30-Norneohopane-C2	50.971	191	1542M4	53.593	ng/ml	
22) 17a(H)-Diahopane (X)	51.092	191	433M4	15.049	ng/ml	
23) 30-Normoretane (T17)	51.650	191	799	27.769	ng/ml	100
24) 18a(H)&18b(H)-Oleananes (	52.057	191	594M4	20.645	ng/ml	
25) Moretane (T20)	52.923	191	971M4	33.747	ng/ml	
26) 30-Homohopane-22S (T21)	54.016	191	1472	51.160	ng/ml	100
27) 30-Homohopane-22R (T22)	54.250	191	1322	45.946	ng/ml	100
28) Gammacerane/C32-diahopane	54.800	191	373	12.964	ng/mL	100
29) 30,31-Bishomohopane-22S (	55.569	191	861M4	29.924	ng/ml	
30) 30,31-Bishomohopane-22R (	55.968	191	625	21.722	ng/ml	100
31) 30,31-Trishomohopane-22S	57.709	191	459	15.953	ng/ml	100
32) 30,31-Trishomohopane-22R	58.319	191	318	11.052	ng/ml	100
33) Tetrakishomohopane-22S (T	60.317	191	289M2	10.044	ng/ml	
34) Tetrakishomohopane-22R (T	61.244	191	200	6.951	ng/ml	100
35) Pentakishomohopane-22S (T	63.474	191	226M1	7.855	ng/ml	
36) Pentakishomohopane-22R (T	64.755	191	151M2	5.248	ng/ml	
38) 13b(H),17a(H)-20S-Diachol	45.297	217	1124	73.911	ng/ml	100
39) 13b(H),17a(H)-20R-Diachol	45.719	217	634	41.690	ng/ml	100
40) 13b,17a-20S-Methyldiachol	46.412	217	625M4	41.098	ng/ml	
41) 14a,17a-20S-Chol/13b,17a-	47.279	217	1496	98.372	ng/ml	100
42) 14a,17a-20R-Chol/13b,17a-	47.799	217	1823	119.875	ng/ml	100
43) Unknown Sterane (S18)	48.077	217	224	14.730	ng/ml	100
44) 13a,17b-20S-Ethyldiachole	48.341	217	30M3	1.973	ng/ml	
45) 14a,17a-20S-Methylcholest	48.492	217	693M4	45.570	ng/ml	
46) 14a,17a-20R-Methylcholest	49.208	217	856	56.288	ng/ml	100
47) 14a(H),17a(H)-20S-Ethylch	49.555	217	496M4	32.615	ng/ml	
48) 14a(H),17a(H)-20R-Ethylch	50.467	217	685M4	45.044	ng/ml	
49) 14b(H),17b(H)-20R-Cholest	47.369	218	981M4	64.508	ng/ml	
50) 14b(H),17b(H)-20S-Cholest	47.452	218	909M4	59.773	ng/ml	
51) 14b,17b-20R-Methylcholest	48.665	218	821	53.986	ng/ml	100
52) 14b,17b-20S-Methylcholest	48.741	218	1006M4	66.152	ng/ml	
53) 14b(H),17b(H)-20R-Ethylch	49.803	218	899	59.116	ng/ml	100
54) 14b(H),17b(H)-20S-Ethylch	49.841	218	760M3	49.975	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251649.D
Acq On : 29 Nov 2016 2:10 am
Operator : PAH14:AC
Sample : 1611004-03-RF1
Misc : oil
ALS Vial : 47 Sample Multiplier: 1

Quant Time: Dec 06 11:19:29 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

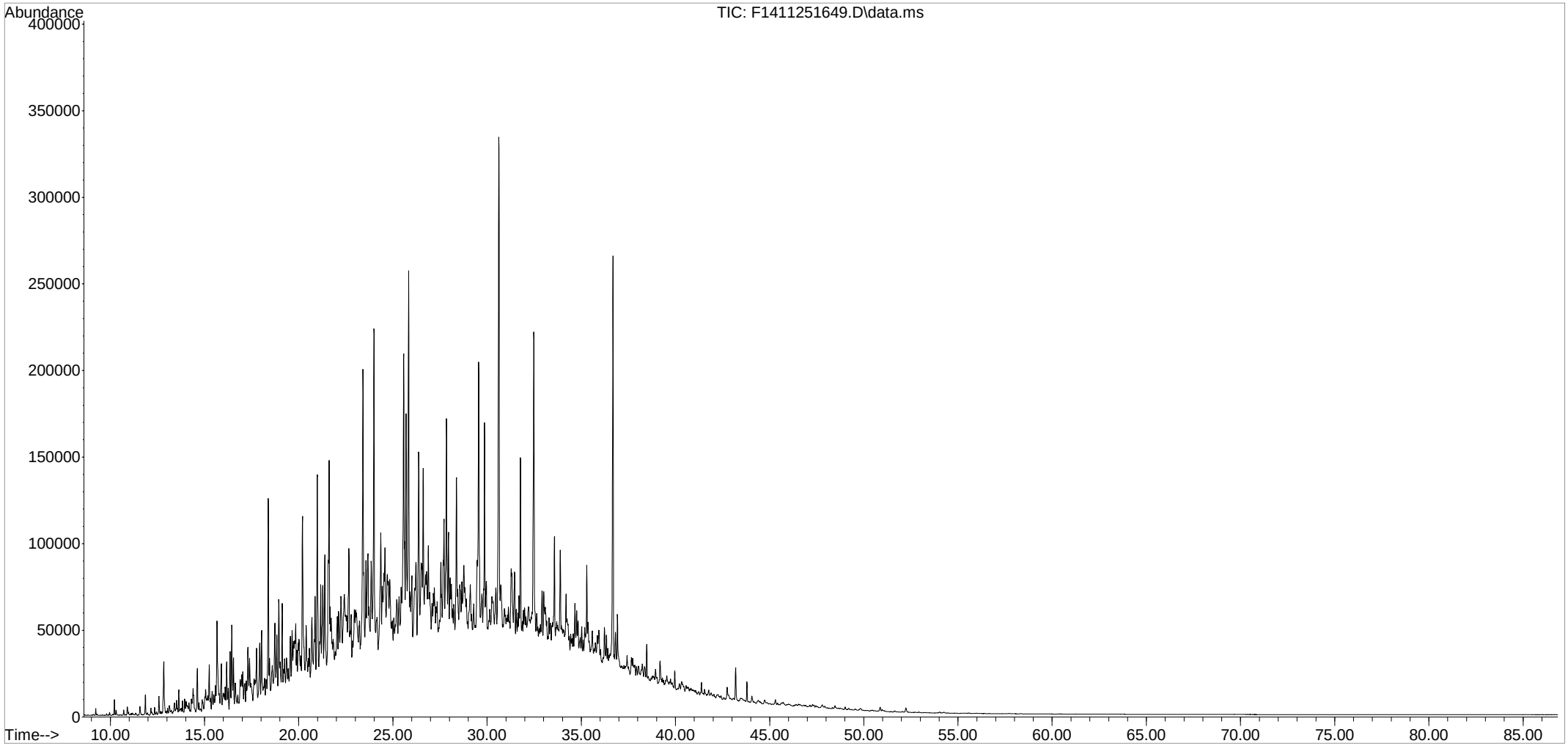
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251649.D
Acq On : 29 Nov 2016 2:10 am
Operator : PAH14:AC
Sample : 1611004-03-RF1
Misc : oil
ALS Vial : 47 Sample Multiplier: 1

Quant Time: Dec 06 11:19:29 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Form I
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-01**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-04F1**
Associated Blank: **SO111116B03F1**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.02312	1	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**0.350**	J
C24 Tricyclic Terpane	**0.228**	J
C25 Tricyclic Terpane	**0.190**	J
C24 Tetracyclic Terpane	**0.257**	J
C26 Tricyclic Terpane-22S	**0.0884**	J
C26 Tricyclic Terpane-22R	**0.0836**	J
C28 Tricyclic Terpane-22S	**0.0900**	J
C28 Tricyclic Terpane-22R	**0.111**	J
C29 Tricyclic Terpane-22S	**0.113**	J
C29 Tricyclic Terpane-22R	**0.0997**	J
18a-22,29,30-Trisnorneohopane-TS	**0.817**	
C30 Tricyclic Terpane-22S	0.433	U
C30 Tricyclic Terpane-22R	0.433	U
17a(H)-22,29,30-Trisnorhopane-TM	**0.733**	
17a/b,21b/a 28,30-Bisnorhopane	**0.180**	J
17a(H),21b(H)-25-Norhopane	0.433	U
30-Norhopane	**1.61**	
18a(H)-30-Norneohopane-C29Ts	**0.897**	
17a(H)-Diahopane	**0.341**	J
30-Normoretane	**0.457**	
18a(H)&18b(H)-Oleananes	**0.431**	J
Hopane	**2.83**	
Moretane	**0.508**	
30-Homohopane-22S	**0.593**	
30-Homohopane-22R	**0.522**	
30,31-Bishomohopane-22S	**0.357**	J

Parameter	Result	
30,31-Bishomohopane-22R	**0.265**	J
30,31-Trishomohopane-22S	**0.183**	J
30,31-Trishomohopane-22R	**0.154**	J
Tetrakishomohopane-22S	0.433	U
Tetrakishomohopane-22R	0.433	U
Pentakishomohopane-22S	0.433	U
Pentakishomohopane-22R	0.433	U
13b(H),17a(H)-20S-Diacholestane	**0.432**	J
13b(H),17a(H)-20R-Diacholestane	**0.249**	J
13b,17a-20S-Methyldiacholestane	**0.237**	J
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**0.490**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**0.590**	
Unknown Sterane (S18)	**0.103**	J
13a,17b-20S-Ethyldiacholestane	0.433	U
14a,17a-20S-Methylcholestane	**0.289**	J
14a,17a-20R-Methylcholestane	**0.231**	J
14a(H),17a(H)-20S-Ethylcholestane	**0.176**	J
14a(H),17a(H)-20R-Ethylcholestane	**0.234**	J
14b(H),17b(H)-20R-Cholestane	**0.289**	J
14b(H),17b(H)-20S-Cholestane	**0.295**	J
14b,17b-20R-Methylcholestane	**0.255**	J
14b,17b-20S-Methylcholestane	**0.338**	J
14b(H),17b(H)-20R-Ethylcholestane	**0.350**	J
14b(H),17b(H)-20S-Ethylcholestane	**0.286**	J
T22a-Gammacerane/C32-diahopane	**0.162**	J

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	107	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 08:48

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251650.D
Acq On : 29 Nov 2016 3:45 am
Operator : PAH14:AC
Sample : 1611004-04-RF1
Misc : sheen
ALS Vial : 48 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 06 17:48:53 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	46942	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	15220	1070.240	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 107.02%			
Target Compounds						Qvalue
2) Hopane (T19)	52.238	191	1763M4	65.523	ng/mL	
4) C23 Tricyclic Terpane (T4	40.820	191	218M4	8.102	ng/ml	
5) C24 Tricyclic Terpane (T5	41.544	191	142	5.278	ng/ml	100
6) C25 Tricyclic Terpane (T6	43.028	191	118M2	4.386	ng/ml	
7) C24 Tetracyclic Terpane (	44.347	191	160	5.947	ng/ml	100
8) C26 Tricyclic Terpane-22S	44.083	191	55M3	2.044	ng/ml	
9) C26 Tricyclic Terpane-22R	44.174	191	52M3	1.933	ng/ml	
10) C28 Tricyclic Terpane-22S	46.465	191	56M2	2.081	ng/ml	
11) C28 Tricyclic Terpane-22R	46.623	191	69M2	2.564	ng/ml	
12) C29 Tricyclic Terpane-22S	47.136	191	70M2	2.602	ng/ml	
13) C29 Tricyclic Terpane-22R	47.339	191	62M2	2.304	ng/ml	
14) 18a-22,29,30-Trisnorneoho	48.462	191	508M4	18.880	ng/ml	
17) 17a(H)-22,29,30-Trisnorho	49.012	191	456M4	16.948	ng/ml	
18) 17a/b,21b/a 28,30-Bisnorh	50.188	191	112M4	4.163	ng/ml	
20) 30-Norhopane (T15)	50.866	191	999M4	37.129	ng/ml	
21) 18a(H)-30-Norneohopane-C2	50.979	191	558M4	20.739	ng/ml	
22) 17a(H)-Diahopane (X)	51.092	191	212M4	7.879	ng/ml	
23) 30-Normoretane (T17)	51.642	191	284	10.555	ng/ml	100
24) 18a(H)&18b(H)-Oleananes (	52.049	191	268	9.960	ng/ml	100
25) Moretane (T20)	52.931	191	316M4	11.744	ng/ml	
26) 30-Homohopane-22S (T21)	54.024	191	369	13.714	ng/ml	100
27) 30-Homohopane-22R (T22)	54.242	191	325	12.079	ng/ml	100
28) Gammacerane/C32-diahopane	54.792	191	101M4	3.754	ng/mL	
29) 30,31-Bishomohopane-22S (	55.584	191	222	8.251	ng/ml	100
30) 30,31-Bishomohopane-22R (	55.953	191	165M4	6.132	ng/ml	
31) 30,31-Trishomohopane-22S	57.702	191	114M4	4.237	ng/ml	
32) 30,31-Trishomohopane-22R	58.312	191	96M2	3.568	ng/ml	
38) 13b(H),17a(H)-20S-Diachol	45.297	217	142M4	9.985	ng/ml	
39) 13b(H),17a(H)-20R-Diachol	45.719	217	82M3	5.766	ng/ml	
40) 13b,17a-20S-Methyldiachol	46.420	217	78M2	5.485	ng/ml	
41) 14a,17a-20S-Chol/13b,17a-	47.271	217	161	11.321	ng/ml	100
42) 14a,17a-20R-Chol/13b,17a-	47.799	217	194	13.642	ng/ml	100
43) Unknown Sterane (S18)	48.070	217	34M3	2.391	ng/ml	
45) 14a,17a-20S-Methylcholest	48.485	217	95M2	6.680	ng/ml	
46) 14a,17a-20R-Methylcholest	49.200	217	76M2	5.344	ng/ml	
47) 14a(H),17a(H)-20S-Ethylch	49.547	217	58M3	4.078	ng/ml	
48) 14a(H),17a(H)-20R-Ethylch	50.474	217	77M2	5.414	ng/ml	
49) 14b(H),17b(H)-20R-Cholest	47.369	218	95M3	6.680	ng/ml	
50) 14b(H),17b(H)-20S-Cholest	47.452	218	97M3	6.821	ng/ml	
51) 14b,17b-20R-Methylcholest	48.665	218	84M2	5.907	ng/ml	
52) 14b,17b-20S-Methylcholest	48.741	218	111M2	7.805	ng/ml	
53) 14b(H),17b(H)-20R-Ethylch	49.818	218	115	8.087	ng/ml	100
54) 14b(H),17b(H)-20S-Ethylch	49.841	218	94M3	6.610	ng/ml	

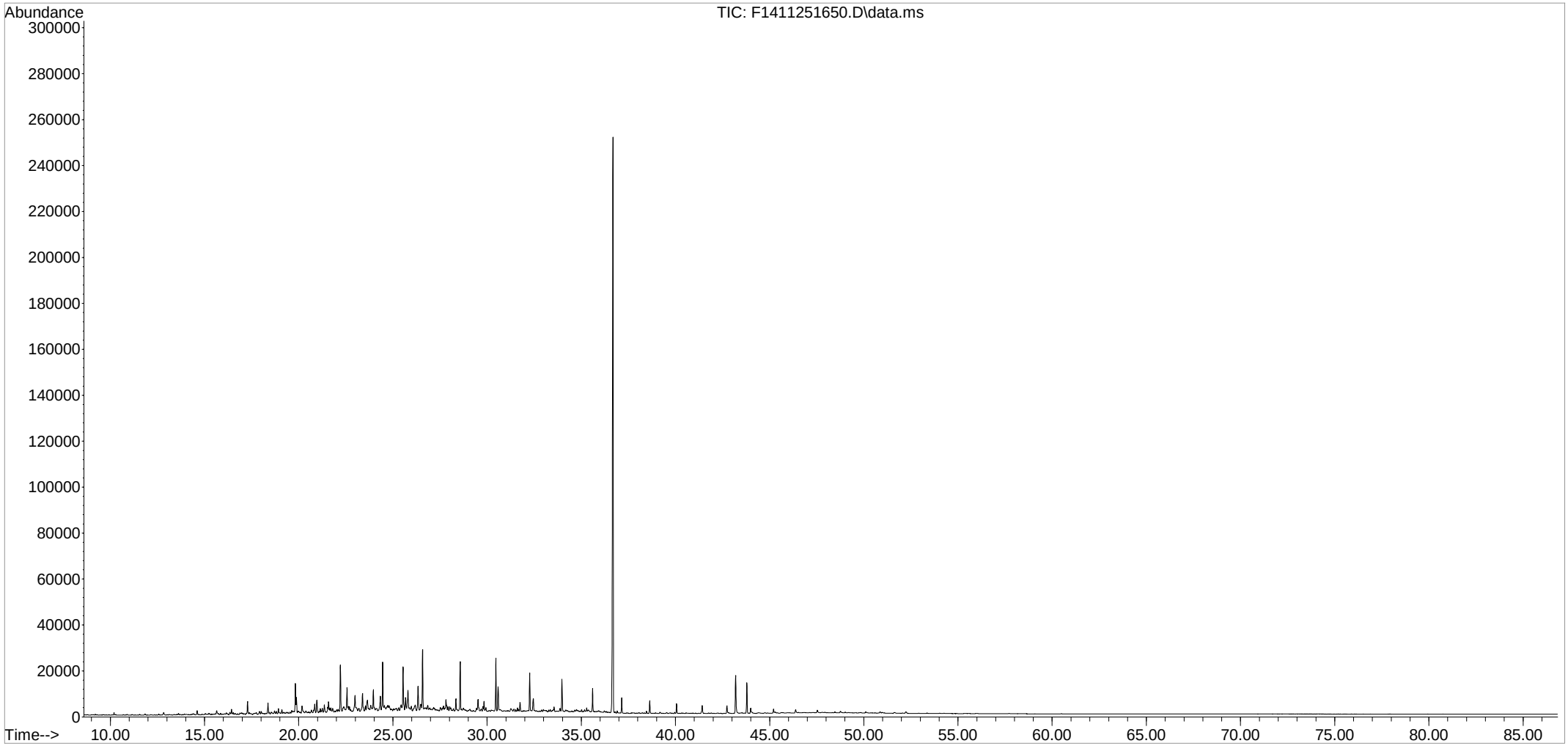
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251650.D
Acq On : 29 Nov 2016 3:45 am
Operator : PAH14:AC
Sample : 1611004-04-RF1
Misc : sheen
ALS Vial : 48 Sample Multiplier: 1

Quant Time: Dec 06 17:48:53 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Form I
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05F1**
Associated Blank: **SO111116B03F1**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.00857	1	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**8.74**	
C24 Tricyclic Terpane	**4.45**	
C25 Tricyclic Terpane	**3.41**	
C24 Tetracyclic Terpane	**2.93**	
C26 Tricyclic Terpane-22S	**1.28**	
C26 Tricyclic Terpane-22R	**1.22**	
C28 Tricyclic Terpane-22S	**1.37**	
C28 Tricyclic Terpane-22R	**1.44**	
C29 Tricyclic Terpane-22S	**1.38**	
C29 Tricyclic Terpane-22R	**1.52**	
18a-22,29,30-Trisnorneohopane-TS	**5.69**	
C30 Tricyclic Terpane-22S	**1.39**	
C30 Tricyclic Terpane-22R	**0.883**	J
17a(H)-22,29,30-Trisnorhopane-TM	**6.09**	
17a/b,21b/a 28,30-Bisnorhopane	**1.38**	
17a(H),21b(H)-25-Norhopane	**0.570**	J
30-Norhopane	**13.8**	
18a(H)-30-Norneohopane-C29Ts	**5.17**	
17a(H)-Diahopane	**1.40**	
30-Normoretane	**2.94**	
18a(H)&18b(H)-Oleananes	**1.97**	
Hopane	**23.4**	
Moretane	**4.16**	
30-Homohopane-22S	**5.66**	
30-Homohopane-22R	**4.96**	
30,31-Bishomohopane-22S	**3.81**	

Parameter	Result	
30,31-Bishomohopane-22R	**2.64**	
30,31-Trishomohopane-22S	**2.12**	
30,31-Trishomohopane-22R	**1.38**	
Tetrakishomohopane-22S	**1.35**	
Tetrakishomohopane-22R	**0.897**	J
Pentakishomohopane-22S	**0.975**	J
Pentakishomohopane-22R	**0.832**	J
13b(H),17a(H)-20S-Diacholestane	**4.90**	
13b(H),17a(H)-20R-Diacholestane	**2.59**	
13b,17a-20S-Methyldiacholestane	**2.55**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**6.75**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**6.99**	
Unknown Sterane (S18)	**1.28**	
13a,17b-20S-Ethyldiacholestane	**0.304**	J
14a,17a-20S-Methylcholestane	**3.11**	
14a,17a-20R-Methylcholestane	**2.71**	
14a(H),17a(H)-20S-Ethylcholestane	**2.68**	
14a(H),17a(H)-20R-Ethylcholestane	**3.04**	
14b(H),17b(H)-20R-Cholestane	**4.07**	
14b(H),17b(H)-20S-Cholestane	**4.21**	
14b,17b-20R-Methylcholestane	**3.32**	
14b,17b-20S-Methylcholestane	**4.83**	
14b(H),17b(H)-20R-Ethylcholestane	**5.17**	
14b(H),17b(H)-20S-Ethylcholestane	**4.24**	
T22a-Gammacerane/C32-diahopane	**1.45**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	115	50-130

J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 08:48

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251651.D
Acq On : 29 Nov 2016 5:19 am
Operator : PAH14:AC
Sample : 1611004-05-RF1
Misc : sheen
ALS Vial : 49 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 06 17:49:33 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	44273	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.790	217	15429	1150.342	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 115.03%			
Target Compounds						Qvalue
2) Hopane (T19)	52.230	191	5091M4	200.618	ng/mL	
4) C23 Tricyclic Terpane (T4	40.820	191	1901	74.912	ng/ml	100
5) C24 Tricyclic Terpane (T5	41.536	191	968	38.145	ng/ml	100
6) C25 Tricyclic Terpane (T6	43.021	191	741M1	29.200	ng/ml	
7) C24 Tetracyclic Terpane (	44.347	191	638	25.141	ng/ml	100
8) C26 Tricyclic Terpane-22S	44.076	191	279	10.994	ng/ml	100
9) C26 Tricyclic Terpane-22R	44.174	191	265	10.443	ng/ml	100
10) C28 Tricyclic Terpane-22S	46.457	191	298	11.743	ng/ml	100
11) C28 Tricyclic Terpane-22R	46.616	191	312M4	12.295	ng/ml	
12) C29 Tricyclic Terpane-22S	47.136	191	301	11.861	ng/ml	100
13) C29 Tricyclic Terpane-22R	47.332	191	331	13.044	ng/ml	100
14) 18a-22,29,30-Trisnorneoho	48.462	191	1237	48.746	ng/ml	100
15) C30 Tricyclic Terpane-22S	48.553	191	303M4	11.940	ng/mL	
16) C30 Tricyclic Terpane-22R	48.786	191	192	7.566	ng/mL	100
17) 17a(H)-22,29,30-Trisnorho	49.012	191	1325	52.214	ng/ml	100
18) 17a/b,21b/a 28,30-Bisnorh	50.196	191	300M4	11.822	ng/ml	
19) 17a(H),21b(H)-25-Norhopan	49.984	191	124M4	4.886	ng/ml	
20) 30-Norhopane (T15)	50.866	191	2996M4	118.062	ng/ml	
21) 18a(H)-30-Norneohopane-C2	50.972	191	1124M4	44.293	ng/ml	
22) 17a(H)-Diahopane (X)	51.092	191	304	11.980	ng/ml	100
23) 30-Normoretane (T17)	51.642	191	639	25.181	ng/ml	100
24) 18a(H)&18b(H)-Oleananes (	52.049	191	428M4	16.866	ng/ml	
25) Moretane (T20)	52.916	191	904M4	35.623	ng/ml	
26) 30-Homohopane-22S (T21)	54.016	191	1232	48.549	ng/ml	100
27) 30-Homohopane-22R (T22)	54.250	191	1079M4	42.520	ng/ml	
28) Gammacerane/C32-diahopane	54.800	191	316M4	12.452	ng/mL	
29) 30,31-Bishomohopane-22S (	55.576	191	828	32.629	ng/ml	100
30) 30,31-Bishomohopane-22R (	55.953	191	573M4	22.580	ng/ml	
31) 30,31-Trishomohopane-22S	57.709	191	460M4	18.127	ng/ml	
32) 30,31-Trishomohopane-22R	58.312	191	299	11.783	ng/ml	100
33) Tetrakishomohopane-22S (T	60.339	191	293	11.546	ng/ml	100
34) Tetrakishomohopane-22R (T	61.229	191	195	7.684	ng/ml	100
35) Pentakishomohopane-22S (T	63.467	191	212	8.354	ng/ml	100
36) Pentakishomohopane-22R (T	64.748	191	181M4	7.133	ng/ml	
38) 13b(H),17a(H)-20S-Diachol	45.289	217	563	41.976	ng/ml	100
39) 13b(H),17a(H)-20R-Diachol	45.719	217	298	22.218	ng/ml	100
40) 13b,17a-20S-Methyldiachol	46.412	217	293M4	21.845	ng/ml	
41) 14a,17a-20S-Chol/13b,17a-	47.271	217	776	57.856	ng/ml	100
42) 14a,17a-20R-Chol/13b,17a-	47.799	217	803	59.869	ng/ml	100
43) Unknown Sterane (S18)	48.078	217	147	10.960	ng/ml	100
44) 13a,17b-20S-Ethyldiachole	48.334	217	35M3	2.609	ng/ml	
45) 14a,17a-20S-Methylcholest	48.485	217	358M4	26.691	ng/ml	
46) 14a,17a-20R-Methylcholest	49.201	217	312M4	23.262	ng/ml	
47) 14a(H),17a(H)-20S-Ethylch	49.555	217	308M4	22.964	ng/ml	
48) 14a(H),17a(H)-20R-Ethylch	50.474	217	350M4	26.095	ng/ml	
49) 14b(H),17b(H)-20R-Cholest	47.369	218	468M4	34.893	ng/ml	
50) 14b(H),17b(H)-20S-Cholest	47.452	218	484M4	36.086	ng/ml	
51) 14b,17b-20R-Methylcholest	48.666	218	382	28.481	ng/ml	100
52) 14b,17b-20S-Methylcholest	48.741	218	555M4	41.379	ng/ml	
53) 14b(H),17b(H)-20R-Ethylch	49.804	218	594	44.287	ng/ml	100
54) 14b(H),17b(H)-20S-Ethylch	49.841	218	487M3	36.309	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251651.D
Acq On : 29 Nov 2016 5:19 am
Operator : PAH14:AC
Sample : 1611004-05-RF1
Misc : sheen
ALS Vial : 49 Sample Multiplier: 1

Quant Time: Dec 06 17:49:33 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

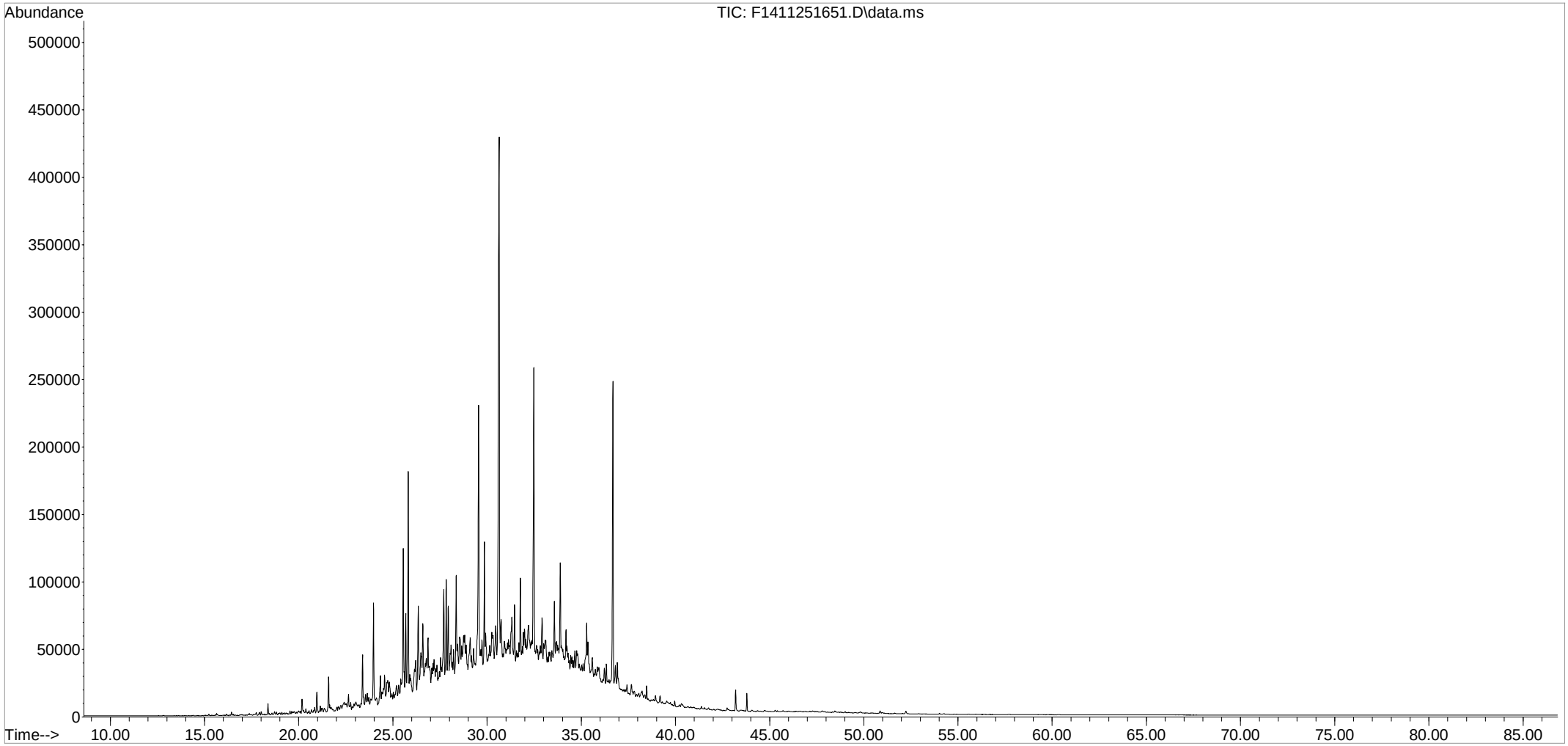
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251651.D
Acq On : 29 Nov 2016 5:19 am
Operator : PAH14:AC
Sample : 1611004-05-RF1
Misc : sheen
ALS Vial : 49 Sample Multiplier: 1

Quant Time: Dec 06 17:49:33 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Form I
Duplicate
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05F1 D**
Associated Blank: **SO111116B03F1**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.01113	1	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**12.4**	
C24 Tricyclic Terpane	**6.36**	
C25 Tricyclic Terpane	**4.98**	
C24 Tetracyclic Terpane	**4.19**	
C26 Tricyclic Terpane-22S	**1.98**	
C26 Tricyclic Terpane-22R	**1.95**	
C28 Tricyclic Terpane-22S	**1.94**	
C28 Tricyclic Terpane-22R	**2.13**	
C29 Tricyclic Terpane-22S	**1.93**	
C29 Tricyclic Terpane-22R	**2.03**	
18a-22,29,30-Trisnorneohopane-TS	**8.41**	
C30 Tricyclic Terpane-22S	**1.97**	
C30 Tricyclic Terpane-22R	**1.40**	
17a(H)-22,29,30-Trisnorhopane-TM	**8.92**	
17a/b,21b/a 28,30-Bisnorhopane	**2.12**	
17a(H),21b(H)-25-Norhopane	**0.780**	J
30-Norhopane	**21.1**	
18a(H)-30-Norneohopane-C29Ts	**8.30**	
17a(H)-Diahopane	**2.93**	
30-Normoretane	**4.55**	
18a(H)&18b(H)-Oleananes	**3.01**	
Hopane	**34.8**	
Moretane	**5.85**	
30-Homohopane-22S	**8.57**	
30-Homohopane-22R	**7.80**	
30,31-Bishomohopane-22S	**6.08**	

Parameter	Result	
30,31-Bishomohopane-22R	**4.11**	
30,31-Trishomohopane-22S	**3.37**	
30,31-Trishomohopane-22R	**2.04**	
Tetrakishomohopane-22S	**2.14**	
Tetrakishomohopane-22R	**1.40**	
Pentakishomohopane-22S	**1.21**	
Pentakishomohopane-22R	**0.964**	
13b(H),17a(H)-20S-Diacholestane	**7.61**	
13b(H),17a(H)-20R-Diacholestane	**4.30**	
13b,17a-20S-Methyldiacholestane	**3.80**	
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**10.0**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**10.6**	
Unknown Sterane (S18)	**1.84**	
13a,17b-20S-Ethyldiacholestane	**0.294**	J
14a,17a-20S-Methylcholestane	**4.53**	
14a,17a-20R-Methylcholestane	**4.15**	
14a(H),17a(H)-20S-Ethylcholestane	**3.81**	
14a(H),17a(H)-20R-Ethylcholestane	**4.84**	
14b(H),17b(H)-20R-Cholestane	**6.12**	
14b(H),17b(H)-20S-Cholestane	**6.36**	
14b,17b-20R-Methylcholestane	**5.33**	
14b,17b-20S-Methylcholestane	**7.43**	
14b(H),17b(H)-20R-Ethylcholestane	**6.64**	
14b(H),17b(H)-20S-Ethylcholestane	**7.52**	
T22a-Gammacerane/C32-diahopane	**2.15**	

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	115	50-130

J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 08:48

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251652.D
Acq On : 29 Nov 2016 6:53 am
Operator : PAH14:AC
Sample : 1611004-05d-RF1
Misc : sheen
ALS Vial : 50 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 06 11:20:05 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	42422	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	14776	1149.725	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 114.97%			
Target Compounds						Qvalue
2) Hopane (T19)	52.238	191	9420M4	387.406	ng/mL	
4) C23 Tricyclic Terpane (T4	40.827	191	3362	138.265	ng/ml	100
5) C24 Tricyclic Terpane (T5	41.543	191	1721	70.778	ng/ml	100
6) C25 Tricyclic Terpane (T6	43.028	191	1348M1	55.438	ng/ml	
7) C24 Tetracyclic Terpane (	44.347	191	1135	46.678	ng/ml	100
8) C26 Tricyclic Terpane-22S	44.076	191	535	22.002	ng/ml	100
9) C26 Tricyclic Terpane-22R	44.174	191	528M4	21.714	ng/ml	
10) C28 Tricyclic Terpane-22S	46.457	191	524M4	21.550	ng/ml	
11) C28 Tricyclic Terpane-22R	46.623	191	576M4	23.688	ng/ml	
12) C29 Tricyclic Terpane-22S	47.135	191	523	21.509	ng/ml	100
13) C29 Tricyclic Terpane-22R	47.331	191	549M4	22.578	ng/ml	
14) 18a-22,29,30-Trisnorneoho	48.462	191	2277	93.644	ng/ml	100
15) C30 Tricyclic Terpane-22S	48.545	191	534M4	21.961	ng/mL	
16) C30 Tricyclic Terpane-22R	48.793	191	380	15.628	ng/mL	100
17) 17a(H)-22,29,30-Trisnorho	49.012	191	2414	99.278	ng/ml	100
18) 17a/b,21b/a 28,30-Bisnorh	50.180	191	575M4	23.647	ng/ml	
19) 17a(H),21b(H)-25-Norhopan	49.984	191	211	8.678	ng/ml	100
20) 30-Norhopane (T15)	50.866	191	5722M4	235.322	ng/ml	
21) 18a(H)-30-Norneohopane-C2	50.971	191	2245M4	92.328	ng/ml	
22) 17a(H)-Diahopane (X)	51.092	191	793M4	32.613	ng/ml	
23) 30-Normoretane (T17)	51.650	191	1231	50.626	ng/ml	100
24) 18a(H)&18b(H)-Oleananes (	52.049	191	814M4	33.476	ng/ml	
25) Moretane (T20)	52.923	191	1582M4	65.061	ng/ml	
26) 30-Homohopane-22S (T21)	54.016	191	2320	95.412	ng/ml	100
27) 30-Homohopane-22R (T22)	54.250	191	2111	86.817	ng/ml	100
28) Gammacerane/C32-diahopane	54.800	191	583M4	23.976	ng/mL	
29) 30,31-Bishomohopane-22S (	55.569	191	1645	67.652	ng/ml	100
30) 30,31-Bishomohopane-22R (	55.961	191	1112	45.732	ng/ml	100
31) 30,31-Trishomohopane-22S	57.709	191	911M4	37.466	ng/ml	
32) 30,31-Trishomohopane-22R	58.319	191	552M4	22.701	ng/ml	
33) Tetrakishomohopane-22S (T	60.339	191	580	23.853	ng/ml	100
34) Tetrakishomohopane-22R (T	61.228	191	378	15.546	ng/ml	100
35) Pentakishomohopane-22S (T	63.452	191	327	13.448	ng/ml	100
36) Pentakishomohopane-22R (T	64.763	191	261M4	10.734	ng/ml	
38) 13b(H),17a(H)-20S-Diachol	45.297	217	1089	84.735	ng/ml	100
39) 13b(H),17a(H)-20R-Diachol	45.719	217	615	47.853	ng/ml	100
40) 13b,17a-20S-Methyldiachol	46.412	217	544M4	42.329	ng/ml	
41) 14a,17a-20S-Chol/13b,17a-	47.279	217	1430	111.269	ng/ml	100
42) 14a,17a-20R-Chol/13b,17a-	47.799	217	1515M4	117.883	ng/ml	
43) Unknown Sterane (S18)	48.077	217	263	20.464	ng/ml	100
44) 13a,17b-20S-Ethyldiachole	48.334	217	42M3	3.268	ng/ml	
45) 14a,17a-20S-Methylcholest	48.492	217	648M4	50.421	ng/ml	
46) 14a,17a-20R-Methylcholest	49.208	217	593M4	46.141	ng/ml	
47) 14a(H),17a(H)-20S-Ethylch	49.547	217	545M4	42.407	ng/ml	
48) 14a(H),17a(H)-20R-Ethylch	50.466	217	692M4	53.845	ng/ml	
49) 14b(H),17b(H)-20R-Cholest	47.369	218	875M4	68.084	ng/ml	
50) 14b(H),17b(H)-20S-Cholest	47.452	218	909M4	70.730	ng/ml	
51) 14b,17b-20R-Methylcholest	48.665	218	763	59.369	ng/ml	100
52) 14b,17b-20S-Methylcholest	48.748	218	1063M4	82.712	ng/ml	
53) 14b(H),17b(H)-20R-Ethylch	49.811	218	949	73.842	ng/ml	100
54) 14b(H),17b(H)-20S-Ethylch	49.841	218	1076M3	83.724	ng/ml	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251652.D
Acq On : 29 Nov 2016 6:53 am
Operator : PAH14:AC
Sample : 1611004-05d-RF1
Misc : sheen
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Dec 06 11:20:05 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

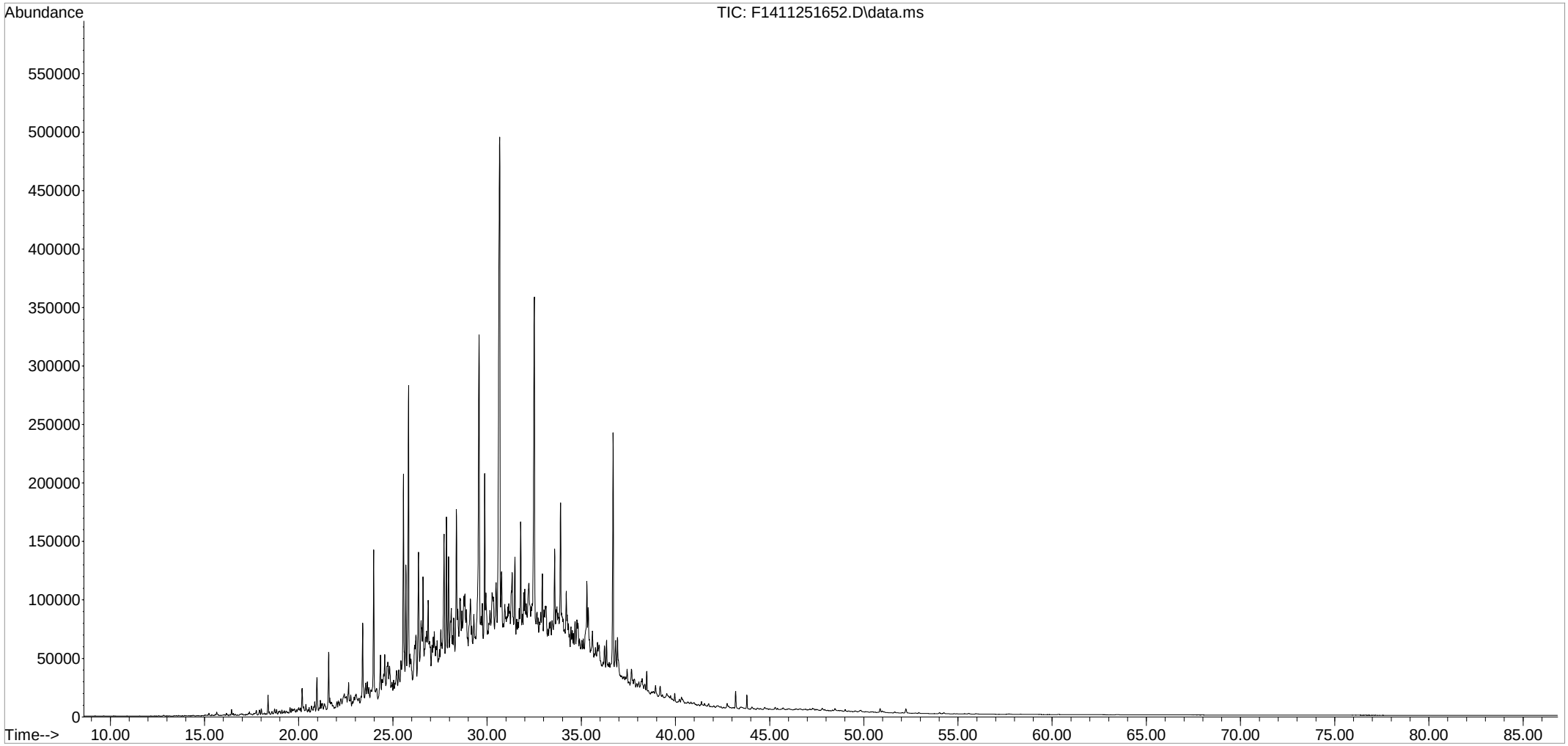
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251652.D
Acq On : 29 Nov 2016 6:53 am
Operator : PAH14:AC
Sample : 1611004-05d-RF1
Misc : sheen
ALS Vial : 50 Sample Multiplier: 1

Quant Time: Dec 06 11:20:05 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Duplicate
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05F1**
Associated Blank: **SO111116B03F1**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/11/16	100	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
C23 Tricyclic Terpane	**8.74**	**12.4**	35[a]	30
C24 Tricyclic Terpane	**4.45**	**6.36**	35[a]	30
C25 Tricyclic Terpane	**3.41**	**4.98**	38[a]	30
C24 Tetracyclic Terpane	**2.93**	**4.19**	35[a]	30
C26 Tricyclic Terpane-22S	**1.28**	**1.98**	43[a]	30
C26 Tricyclic Terpane-22R	**1.22**	**1.95**	46[a]	30
C28 Tricyclic Terpane-22S	**1.37**	**1.94**	34[a]	30
C28 Tricyclic Terpane-22R	**1.44**	**2.13**	39[a]	30
C29 Tricyclic Terpane-22S	**1.38**	**1.93**	33[a]	30
C29 Tricyclic Terpane-22R	**1.52**	**2.03**	29	30
18a-22,29,30-Trisnorneohopane-TS	**5.69**	**8.41**	39[a]	30
C30 Tricyclic Terpane-22S	**1.39**	**1.97**	34[a]	30
C30 Tricyclic Terpane-22R	**0.883** J	**1.40**	46[a]	30
17a(H)-22,29,30-Trisnorhopane-TM	**6.09**	**8.92**	38[a]	30
17a/b,21b/a 28,30-Bisnorhopane	**1.38**	**2.12**	43[a]	30
17a(H),21b(H)-25-Norhopane	**0.570** J	**0.780** J	31[a]	30
30-Norhopane	**13.8**	**21.1**	42[a]	30
18a(H)-30-Norneohopane-C29Ts	**5.17**	**8.30**	46[a]	30
17a(H)-Diahopane	**1.40**	**2.93**	71[a]	30
30-Normoretane	**2.94**	**4.55**	43[a]	30
18a(H)&18b(H)-Oleananes	**1.97**	**3.01**	42[a]	30
Hopane	**23.4**	**34.8**	39[a]	30
Moretane	**4.16**	**5.85**	34[a]	30
30-Homohopane-22S	**5.66**	**8.57**	41[a]	30
30-Homohopane-22R	**4.96**	**7.80**	44[a]	30
30,31-Bishomohopane-22S	**3.81**	**6.08**	46[a]	30
30,31-Bishomohopane-22R	**2.64**	**4.11**	44[a]	30
30,31-Trishomohopane-22S	**2.12**	**3.37**	46[a]	30
30,31-Trishomohopane-22R	**1.38**	**2.04**	39[a]	30
Tetrakishomohopane-22S	**1.35**	**2.14**	46[a]	30
Tetrakishomohopane-22R	**0.897** J	**1.40**	44[a]	30
Pentakishomohopane-22S	**0.975** J	**1.21**	21	30
Pentakishomohopane-22R	**0.832** J	**0.964**	15	30
13b(H),17a(H)-20S-Diacholestane	**4.90**	**7.61**	43[a]	30
13b(H),17a(H)-20R-Diacholestane	**2.59**	**4.30**	50[a]	30

[a] - Value outside of QC Limits.
J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 08:58

Duplicate
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-02**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-05F1**
Associated Blank: **SO111116B03F1**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
11/01/16	11/02/16	11/11/16	100	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
13b,17a-20S-Methyldiacholestane	**2.55**	**3.80**	39[a]	30
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**6.75**	**10.0**	39[a]	30
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**6.99**	**10.6**	41[a]	30
Unknown Sterane (S18)	**1.28**	**1.84**	36[a]	30
13a,17b-20S-Ethyldiacholestane	**0.304** J	**0.294** J	4	30
14a,17a-20S-Methylcholestane	**3.11**	**4.53**	37[a]	30
14a,17a-20R-Methylcholestane	**2.71**	**4.15**	42[a]	30
14a(H),17a(H)-20S-Ethylcholestane	**2.68**	**3.81**	35[a]	30
14a(H),17a(H)-20R-Ethylcholestane	**3.04**	**4.84**	45[a]	30
14b(H),17b(H)-20R-Cholestane	**4.07**	**6.12**	40[a]	30
14b(H),17b(H)-20S-Cholestane	**4.21**	**6.36**	41[a]	30
14b,17b-20R-Methylcholestane	**3.32**	**5.33**	46[a]	30
14b,17b-20S-Methylcholestane	**4.83**	**7.43**	42[a]	30
14b(H),17b(H)-20R-Ethylcholestane	**5.17**	**6.64**	25	30
14b(H),17b(H)-20S-Ethylcholestane	**4.24**	**7.52**	56[a]	30
T22a-Gammacerane/C32-diahopane	**1.45**	**2.15**	39[a]	30

Surrogate	% Recovery		Acceptance Range (%)
5B(H)Cholane	115	115	50-130

[a] - Value outside of QC Limits.
J - Estimated value, below quantitation limit.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 08:58

Form I
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFNP-03**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-06F1**
Associated Blank: **SO111116B03F1**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/11/16	11/29/16	100	0.00491	1	1	AC

Parameter	Result	
C23 Tricyclic Terpane	**9.31**	
C24 Tricyclic Terpane	**4.12**	
C25 Tricyclic Terpane	**2.29**	
C24 Tetracyclic Terpane	**2.35**	
C26 Tricyclic Terpane-22S	**0.736**	J
C26 Tricyclic Terpane-22R	**0.686**	J
C28 Tricyclic Terpane-22S	**0.455**	J
C28 Tricyclic Terpane-22R	**0.614**	J
C29 Tricyclic Terpane-22S	**0.527**	J
C29 Tricyclic Terpane-22R	**0.477**	J
18a-22,29,30-Trisnorneohopane-TS	**3.05**	
C30 Tricyclic Terpane-22S	2.04	U
C30 Tricyclic Terpane-22R	2.04	U
17a(H)-22,29,30-Trisnorhopane-TM	**3.36**	
17a/b,21b/a 28,30-Bisnorhopane	**0.722**	J
17a(H),21b(H)-25-Norhopane	2.04	U
30-Norhopane	**6.92**	
18a(H)-30-Norneohopane-C29Ts	**2.89**	
17a(H)-Diahopane	**0.787**	J
30-Normoretane	**1.74**	J
18a(H)&18b(H)-Oleananes	**1.16**	J
Hopane	**11.4**	
Moretane	**2.01**	J
30-Homohopane-22S	**2.53**	
30-Homohopane-22R	**2.12**	
30,31-Bishomohopane-22S	**1.54**	J

Parameter	Result	
30,31-Bishomohopane-22R	**1.16**	J
30,31-Trishomohopane-22S	**0.751**	J
30,31-Trishomohopane-22R	2.04	U
Tetrakishomohopane-22S	2.04	U
Tetrakishomohopane-22R	2.04	U
Pentakishomohopane-22S	2.04	U
Pentakishomohopane-22R	2.04	U
13b(H),17a(H)-20S-Diacholestane	**2.76**	
13b(H),17a(H)-20R-Diacholestane	**1.37**	J
13b,17a-20S-Methyldiacholestane	**1.11**	J
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**2.80**	
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**2.60**	
Unknown Sterane (S18)	**0.615**	J
13a,17b-20S-Ethyldiacholestane	2.04	U
14a,17a-20S-Methylcholestane	**1.05**	J
14a,17a-20R-Methylcholestane	**0.874**	J
14a(H),17a(H)-20S-Ethylcholestane	**0.833**	J
14a(H),17a(H)-20R-Ethylcholestane	**0.888**	J
14b(H),17b(H)-20R-Cholestane	**1.24**	J
14b(H),17b(H)-20S-Cholestane	**1.26**	J
14b,17b-20R-Methylcholestane	**1.08**	J
14b,17b-20S-Methylcholestane	**1.31**	J
14b(H),17b(H)-20R-Ethylcholestane	**1.69**	J
14b(H),17b(H)-20S-Ethylcholestane	**1.35**	J
T22a-Gammacerane/C32-diahopane	**0.744**	J

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	109	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
J - Estimated value, below quantitation limit.
N/A - Not Applicable

12/07/16 08:48

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251653.D
Acq On : 29 Nov 2016 8:28 am
Operator : PAH14:AC
Sample : 1611004-06-RF1
Misc : sheen
ALS Vial : 51 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 06 17:52:41 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	49218	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.790	217	16212	1087.278	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 108.73%			
Target Compounds						Qvalue
2) Hopane (T19)	52.230	191	1573	55.758	ng/mL#	85
4) C23 Tricyclic Terpane (T4	40.820	191	1289	45.691	ng/ml	100
5) C24 Tricyclic Terpane (T5	41.544	191	570	20.205	ng/ml	100
6) C25 Tricyclic Terpane (T6	43.021	191	317M1	11.237	ng/ml	
7) C24 Tetracyclic Terpane (	44.347	191	325	11.520	ng/ml	100
8) C26 Tricyclic Terpane-22S	44.076	191	102	3.616	ng/ml	100
9) C26 Tricyclic Terpane-22R	44.174	191	95M4	3.367	ng/ml	
10) C28 Tricyclic Terpane-22S	46.458	191	63M2	2.233	ng/ml	
11) C28 Tricyclic Terpane-22R	46.616	191	85M2	3.013	ng/ml	
12) C29 Tricyclic Terpane-22S	47.136	191	73M2	2.588	ng/ml	
13) C29 Tricyclic Terpane-22R	47.339	191	66M2	2.340	ng/ml	
14) 18a-22,29,30-Trisnorneoho	48.462	191	422	14.959	ng/ml	100
17) 17a(H)-22,29,30-Trisnorho	49.012	191	466M4	16.518	ng/ml	
18) 17a/b,21b/a 28,30-Bisnorh	50.196	191	100M3	3.545	ng/ml	
20) 30-Norhopane (T15)	50.866	191	959M4	33.994	ng/ml	
21) 18a(H)-30-Norneohopane-C2	50.972	191	400M4	14.179	ng/ml	
22) 17a(H)-Diahopane (X)	51.092	191	109	3.864	ng/ml	100
23) 30-Normoretane (T17)	51.643	191	241M4	8.543	ng/ml	
24) 18a(H)&18b(H)-Oleananes (	52.050	191	161M4	5.707	ng/ml	
25) Moretane (T20)	52.916	191	279M4	9.890	ng/ml	
26) 30-Homohopane-22S (T21)	54.017	191	351	12.442	ng/ml	100
27) 30-Homohopane-22R (T22)	54.250	191	293	10.386	ng/ml	100
28) Gammacerane/C32-diahopane	54.800	191	103	3.651	ng/mL	100
29) 30,31-Bishomohopane-22S (	55.577	191	214	7.586	ng/ml	100
30) 30,31-Bishomohopane-22R (	55.976	191	161	5.707	ng/ml	100
31) 30,31-Trishomohopane-22S	57.702	191	104M4	3.687	ng/ml	
38) 13b(H),17a(H)-20S-Diachol	45.289	217	202	13.547	ng/ml	100
39) 13b(H),17a(H)-20R-Diachol	45.719	217	100M3	6.707	ng/ml	
40) 13b,17a-20S-Methyldiachol	46.412	217	81M2	5.432	ng/ml	
41) 14a,17a-20S-Chol/13b,17a-	47.279	217	205	13.749	ng/ml	100
42) 14a,17a-20R-Chol/13b,17a-	47.799	217	190	12.743	ng/ml	100
43) Unknown Sterane (S18)	48.070	217	45M3	3.018	ng/ml	
45) 14a,17a-20S-Methylcholest	48.485	217	77M2	5.164	ng/ml	
46) 14a,17a-20R-Methylcholest	49.201	217	64M2	4.292	ng/ml	
47) 14a(H),17a(H)-20S-Ethylch	49.547	217	61M3	4.091	ng/ml	
48) 14a(H),17a(H)-20R-Ethylch	50.459	217	65M2	4.359	ng/ml	
49) 14b(H),17b(H)-20R-Cholest	47.369	218	91M3	6.103	ng/ml	
50) 14b(H),17b(H)-20S-Cholest	47.452	218	92M3	6.170	ng/ml	
51) 14b,17b-20R-Methylcholest	48.666	218	79M2	5.298	ng/ml	
52) 14b,17b-20S-Methylcholest	48.741	218	96M2	6.438	ng/ml	
53) 14b(H),17b(H)-20R-Ethylch	49.804	218	124M3	8.316	ng/ml	
54) 14b(H),17b(H)-20S-Ethylch	49.826	218	99M3	6.640	ng/ml	

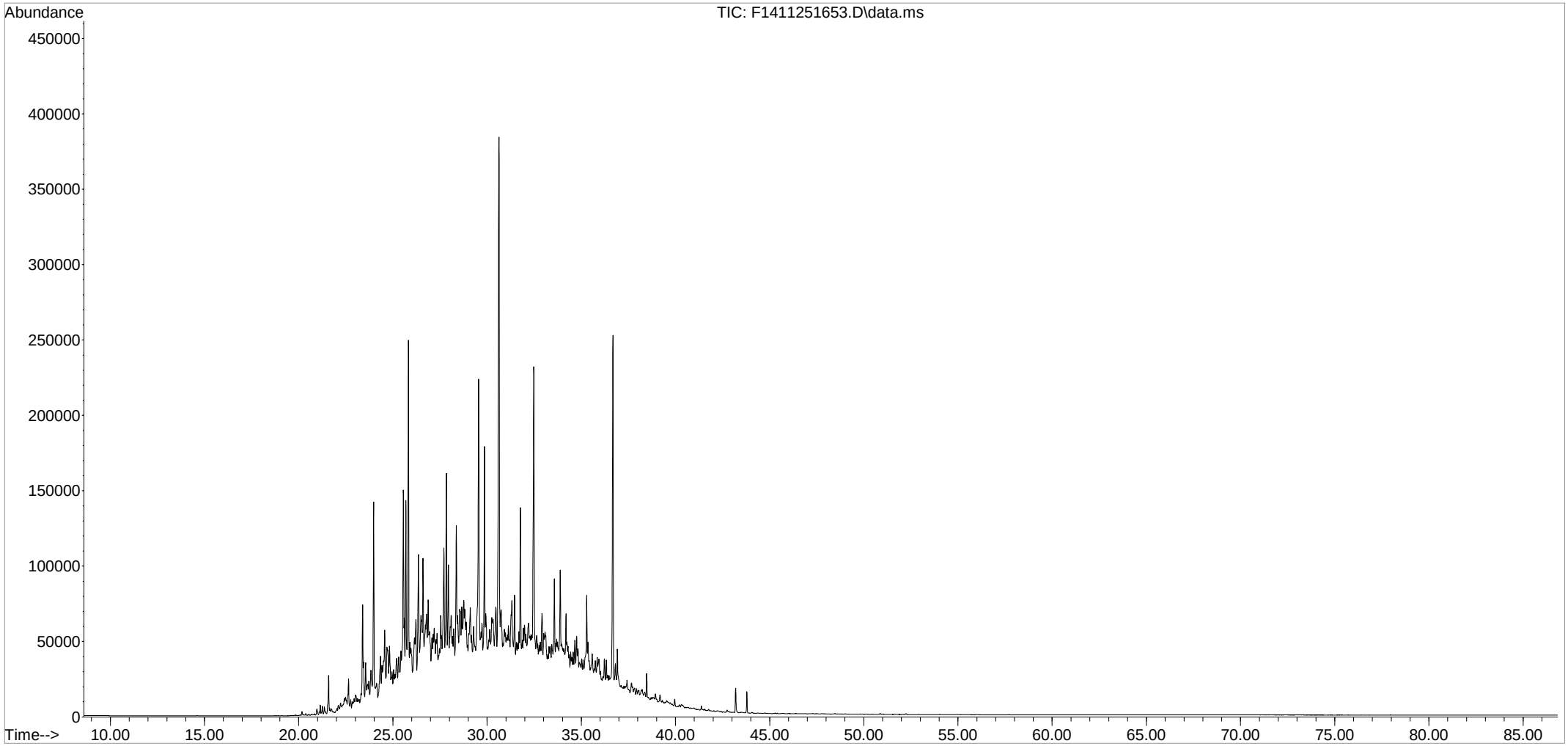
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251653.D
Acq On : 29 Nov 2016 8:28 am
Operator : PAH14:AC
Sample : 1611004-06-RF1
Misc : sheen
ALS Vial : 51 Sample Multiplier: 1

Quant Time: Dec 06 17:52:41 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Form I
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-08(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-07F1**
Associated Blank: **SW110716B01F1**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/29/16	1000	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	20.0	U
C24 Tricyclic Terpane	20.0	U
C25 Tricyclic Terpane	20.0	U
C24 Tetracyclic Terpane	20.0	U
C26 Tricyclic Terpane-22S	20.0	U
C26 Tricyclic Terpane-22R	20.0	U
C28 Tricyclic Terpane-22S	20.0	U
C28 Tricyclic Terpane-22R	20.0	U
C29 Tricyclic Terpane-22S	20.0	U
C29 Tricyclic Terpane-22R	20.0	U
18a-22,29,30-Trisnorneohopane-TS	20.0	U
C30 Tricyclic Terpane-22S	20.0	U
C30 Tricyclic Terpane-22R	20.0	U
17a(H)-22,29,30-Trisnorhopane-TM	20.0	U
17a/b,21b/a 28,30-Bisnorhopane	20.0	U
17a(H),21b(H)-25-Norhopane	20.0	U
30-Norhopane	20.0	U
18a(H)-30-Norneohopane-C29Ts	20.0	U
17a(H)-Diahopane	20.0	U
30-Normoretane	20.0	U
18a(H)&18b(H)-Oleananes	20.0	U
Hopane	20.0	U
Moretane	20.0	U
30-Homohopane-22S	20.0	U
30-Homohopane-22R	20.0	U
30,31-Bishomohopane-22S	20.0	U
30,31-Bishomohopane-22R	20.0	U
30,31-Trishomohopane-22S	20.0	U
30,31-Trishomohopane-22R	20.0	U
Tetrakishomohopane-22S	20.0	U
Tetrakishomohopane-22R	20.0	U
Pentakishomohopane-22S	20.0	U
Pentakishomohopane-22R	20.0	U
13b(H),17a(H)-20S-Diacholestane	20.0	U
13b(H),17a(H)-20R-Diacholestane	20.0	U
13b,17a-20S-Methyldiacholestane	20.0	U
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	20.0	U
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	20.0	U
Unknown Sterane (S18)	20.0	U
13a,17b-20S-Ethyldiacholestane	20.0	U
14a,17a-20S-Methylcholestane	20.0	U
14a,17a-20R-Methylcholestane	20.0	U
14a(H),17a(H)-20S-Ethylcholestane	20.0	U
14a(H),17a(H)-20R-Ethylcholestane	20.0	U
14b(H),17b(H)-20R-Cholestane	20.0	U
14b(H),17b(H)-20S-Cholestane	20.0	U
14b,17b-20R-Methylcholestane	20.0	U
14b,17b-20S-Methylcholestane	20.0	U
14b(H),17b(H)-20R-Ethylcholestane	20.0	U
14b(H),17b(H)-20S-Ethylcholestane	20.0	U
T22a-Gammacerane/C32-diahopane	20.0	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	97	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 08:48

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251659.D
Acq On : 29 Nov 2016 5:56 pm
Operator : PAH14:AC
Sample : 1611004-07-RF1
Misc : water
ALS Vial : 57 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 06 11:20:53 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	41409	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	6094	485.776	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 48.58%#			

Target Compounds	Qvalue

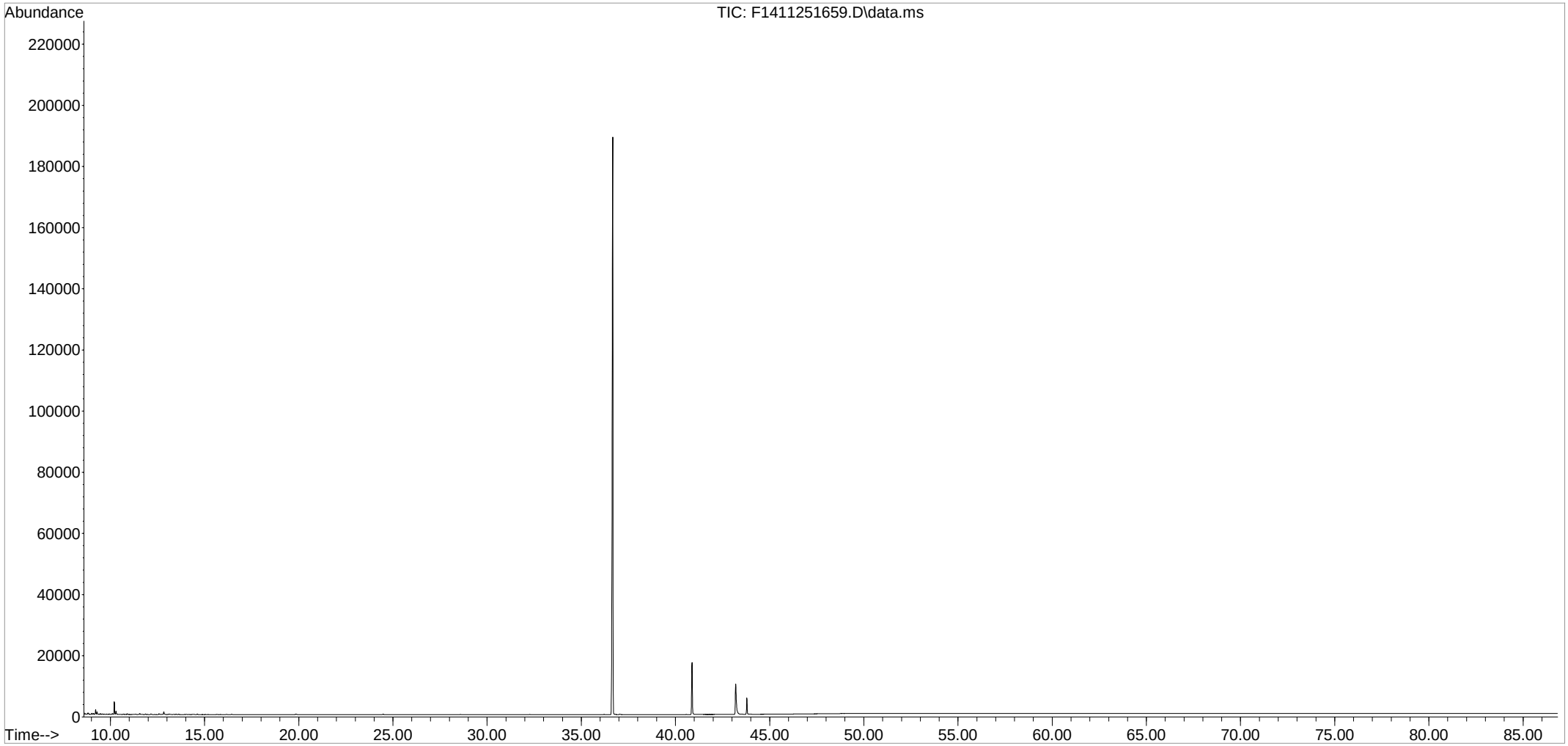
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251659.D
Acq On : 29 Nov 2016 5:56 pm
Operator : PAH14:AC
Sample : 1611004-07-RF1
Misc : water
ALS Vial : 57 Sample Multiplier: 1

Quant Time: Dec 06 11:20:53 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Form I
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **NFSB-01(MW)**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-08F1**
Associated Blank: **SW110716B01F1**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/29/16	1000	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	20.0	U
C24 Tricyclic Terpane	20.0	U
C25 Tricyclic Terpane	20.0	U
C24 Tetracyclic Terpane	20.0	U
C26 Tricyclic Terpane-22S	20.0	U
C26 Tricyclic Terpane-22R	20.0	U
C28 Tricyclic Terpane-22S	20.0	U
C28 Tricyclic Terpane-22R	20.0	U
C29 Tricyclic Terpane-22S	20.0	U
C29 Tricyclic Terpane-22R	20.0	U
18a-22,29,30-Trisnorneohopane-TS	20.0	U
C30 Tricyclic Terpane-22S	20.0	U
C30 Tricyclic Terpane-22R	20.0	U
17a(H)-22,29,30-Trisnorhopane-TM	20.0	U
17a/b,21b/a 28,30-Bisnorhopane	20.0	U
17a(H),21b(H)-25-Norhopane	20.0	U
30-Norhopane	20.0	U
18a(H)-30-Norneohopane-C29Ts	20.0	U
17a(H)-Diahopane	20.0	U
30-Normoretane	20.0	U
18a(H)&18b(H)-Oleananes	20.0	U
Hopane	20.0	U
Moretane	20.0	U
30-Homohopane-22S	20.0	U
30-Homohopane-22R	20.0	U
30,31-Bishomohopane-22S	20.0	U
30,31-Bishomohopane-22R	20.0	U
30,31-Trishomohopane-22S	20.0	U
30,31-Trishomohopane-22R	20.0	U
Tetrakishomohopane-22S	20.0	U
Tetrakishomohopane-22R	20.0	U
Pentakishomohopane-22S	20.0	U
Pentakishomohopane-22R	20.0	U
13b(H),17a(H)-20S-Diacholestane	20.0	U
13b(H),17a(H)-20R-Diacholestane	20.0	U
13b,17a-20S-Methyldiacholestane	20.0	U
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	20.0	U
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	20.0	U
Unknown Sterane (S18)	20.0	U
13a,17b-20S-Ethyldiacholestane	20.0	U
14a,17a-20S-Methylcholestane	20.0	U
14a,17a-20R-Methylcholestane	20.0	U
14a(H),17a(H)-20S-Ethylcholestane	20.0	U
14a(H),17a(H)-20R-Ethylcholestane	20.0	U
14b(H),17b(H)-20R-Cholestane	20.0	U
14b(H),17b(H)-20S-Cholestane	20.0	U
14b,17b-20R-Methylcholestane	20.0	U
14b,17b-20S-Methylcholestane	20.0	U
14b(H),17b(H)-20R-Ethylcholestane	20.0	U
14b(H),17b(H)-20S-Ethylcholestane	20.0	U
T22a-Gammacerane/C32-diahopane	20.0	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	107	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 08:48

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251660.D
Acq On : 29 Nov 2016 7:30 pm
Operator : PAH14:AC
Sample : 1611004-08-RF1
Misc : water
ALS Vial : 58 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Dec 06 11:20:59 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	43521	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	35307	2677.874	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 267.79%#			

Target Compounds Qvalue

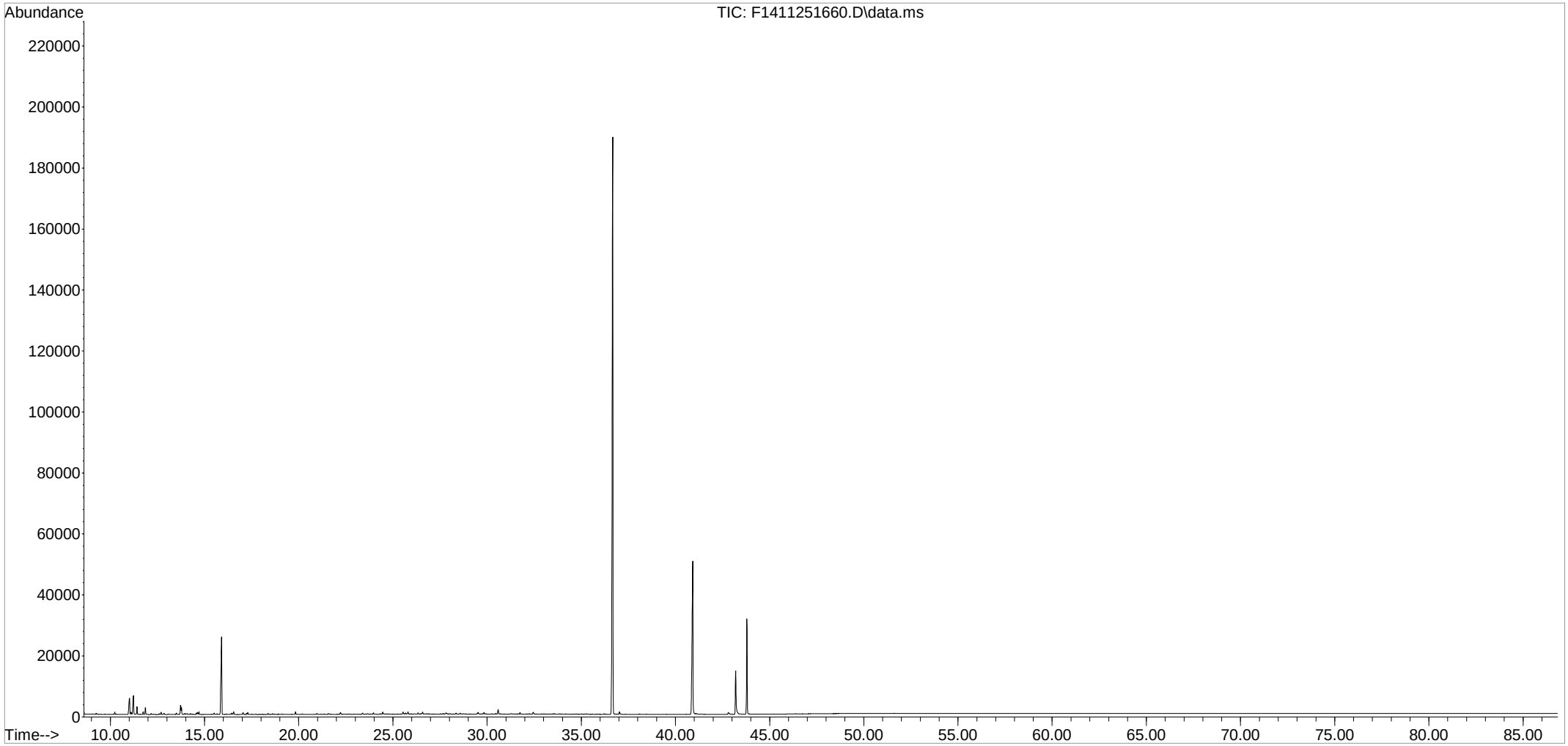
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251660.D
Acq On : 29 Nov 2016 7:30 pm
Operator : PAH14:AC
Sample : 1611004-08-RF1
Misc : water
ALS Vial : 58 Sample Multiplier: 1

Quant Time: Dec 06 11:20:59 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Form I
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09F1**
Associated Blank: **SW110716B01F1**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/29/16	1000	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	20.0	U
C24 Tricyclic Terpane	20.0	U
C25 Tricyclic Terpane	20.0	U
C24 Tetracyclic Terpane	20.0	U
C26 Tricyclic Terpane-22S	20.0	U
C26 Tricyclic Terpane-22R	20.0	U
C28 Tricyclic Terpane-22S	20.0	U
C28 Tricyclic Terpane-22R	20.0	U
C29 Tricyclic Terpane-22S	20.0	U
C29 Tricyclic Terpane-22R	20.0	U
18a-22,29,30-Trisnorneohopane-TS	20.0	U
C30 Tricyclic Terpane-22S	20.0	U
C30 Tricyclic Terpane-22R	20.0	U
17a(H)-22,29,30-Trisnorhopane-TM	20.0	U
17a/b,21b/a 28,30-Bisnorhopane	20.0	U
17a(H),21b(H)-25-Norhopane	20.0	U
30-Norhopane	20.0	U
18a(H)-30-Norneohopane-C29Ts	20.0	U
17a(H)-Diahopane	20.0	U
30-Normoretane	20.0	U
18a(H)&18b(H)-Oleananes	20.0	U
Hopane	20.0	U
Moretane	20.0	U
30-Homohopane-22S	20.0	U
30-Homohopane-22R	20.0	U
30,31-Bishomohopane-22S	20.0	U

Parameter	Result	
30,31-Bishomohopane-22R	20.0	U
30,31-Trishomohopane-22S	20.0	U
30,31-Trishomohopane-22R	20.0	U
Tetrakishomohopane-22S	20.0	U
Tetrakishomohopane-22R	20.0	U
Pentakishomohopane-22S	20.0	U
Pentakishomohopane-22R	20.0	U
13b(H),17a(H)-20S-Diacholestane	20.0	U
13b(H),17a(H)-20R-Diacholestane	20.0	U
13b,17a-20S-Methyldiacholestane	20.0	U
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	20.0	U
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	20.0	U
Unknown Sterane (S18)	20.0	U
13a,17b-20S-Ethyldiacholestane	20.0	U
14a,17a-20S-Methylcholestane	20.0	U
14a,17a-20R-Methylcholestane	20.0	U
14a(H),17a(H)-20S-Ethylcholestane	20.0	U
14a(H),17a(H)-20R-Ethylcholestane	20.0	U
14b(H),17b(H)-20R-Cholestane	20.0	U
14b(H),17b(H)-20S-Cholestane	20.0	U
14b,17b-20R-Methylcholestane	20.0	U
14b,17b-20S-Methylcholestane	20.0	U
14b(H),17b(H)-20R-Ethylcholestane	20.0	U
14b(H),17b(H)-20S-Ethylcholestane	20.0	U
T22a-Gammacerane/C32-diahopane	20.0	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	110	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 08:48

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251661.D
Acq On : 29 Nov 2016 9:05 pm
Operator : PAH14:AC
Sample : 1611004-09-RF1
Misc : water
ALS Vial : 59 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Dec 06 11:21:07 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	41704	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	34719	2748.006	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 274.80%#			

Target Compounds	Qvalue

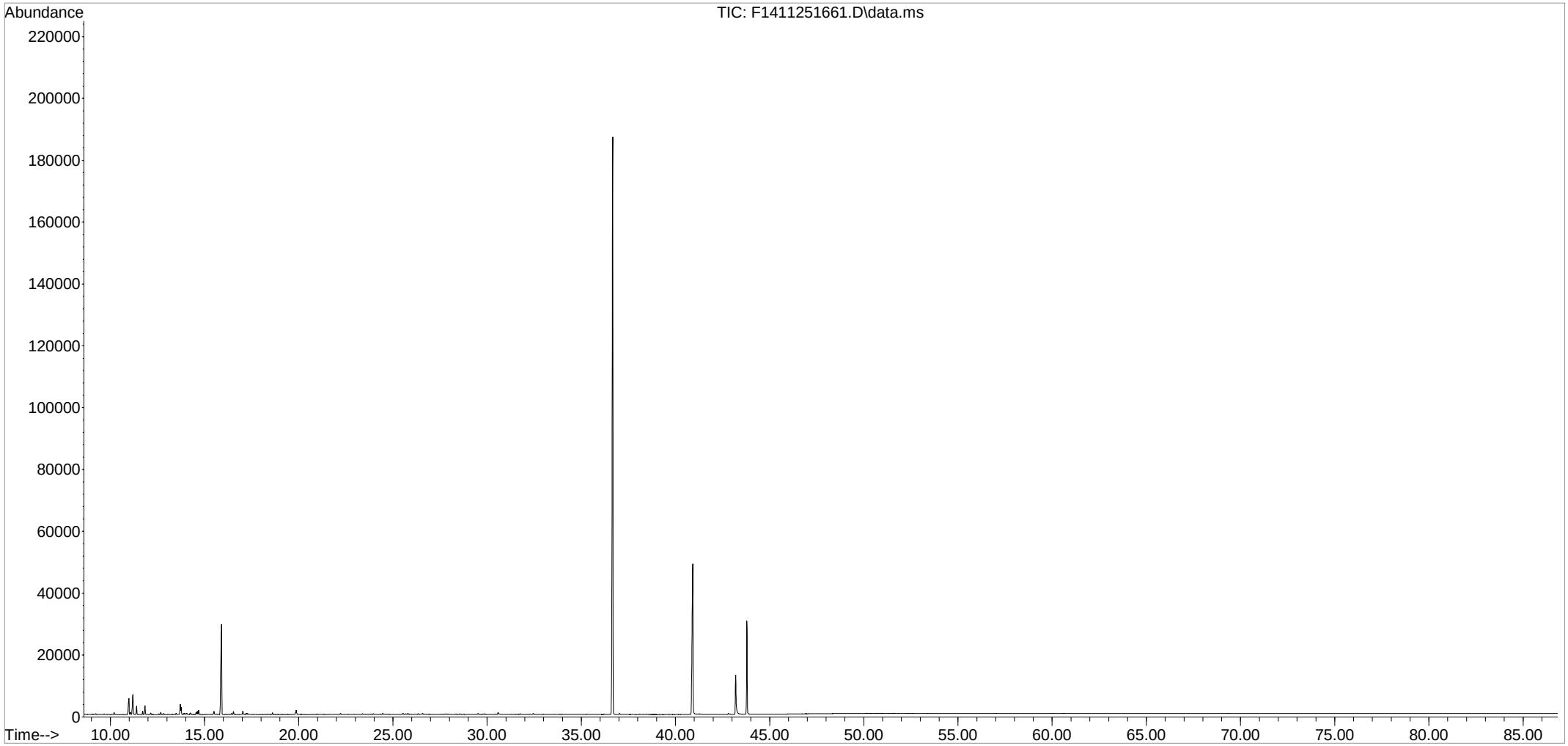
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251661.D
Acq On : 29 Nov 2016 9:05 pm
Operator : PAH14:AC
Sample : 1611004-09-RF1
Misc : water
ALS Vial : 59 Sample Multiplier: 1

Quant Time: Dec 06 11:21:07 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Form I
Duplicate
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09F1 D**
Associated Blank: **SW110716B01F1**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
11/01/16	11/02/16	11/07/16	11/29/16	1000	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	20.0	U
C24 Tricyclic Terpane	20.0	U
C25 Tricyclic Terpane	20.0	U
C24 Tetracyclic Terpane	20.0	U
C26 Tricyclic Terpane-22S	20.0	U
C26 Tricyclic Terpane-22R	20.0	U
C28 Tricyclic Terpane-22S	20.0	U
C28 Tricyclic Terpane-22R	20.0	U
C29 Tricyclic Terpane-22S	20.0	U
C29 Tricyclic Terpane-22R	20.0	U
18a-22,29,30-Trisnorneohopane-TS	20.0	U
C30 Tricyclic Terpane-22S	20.0	U
C30 Tricyclic Terpane-22R	20.0	U
17a(H)-22,29,30-Trisnorhopane-TM	20.0	U
17a/b,21b/a 28,30-Bisnorhopane	20.0	U
17a(H),21b(H)-25-Norhopane	20.0	U
30-Norhopane	20.0	U
18a(H)-30-Norneohopane-C29Ts	20.0	U
17a(H)-Diahopane	20.0	U
30-Normoretane	20.0	U
18a(H)&18b(H)-Oleananes	20.0	U
Hopane	20.0	U
Moretane	20.0	U
30-Homohopane-22S	20.0	U
30-Homohopane-22R	20.0	U
30,31-Bishomohopane-22S	20.0	U

Parameter	Result	
30,31-Bishomohopane-22R	20.0	U
30,31-Trishomohopane-22S	20.0	U
30,31-Trishomohopane-22R	20.0	U
Tetrakishomohopane-22S	20.0	U
Tetrakishomohopane-22R	20.0	U
Pentakishomohopane-22S	20.0	U
Pentakishomohopane-22R	20.0	U
13b(H),17a(H)-20S-Diacholestane	20.0	U
13b(H),17a(H)-20R-Diacholestane	20.0	U
13b,17a-20S-Methyldiacholestane	20.0	U
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	20.0	U
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	20.0	U
Unknown Sterane (S18)	20.0	U
13a,17b-20S-Ethyldiacholestane	20.0	U
14a,17a-20S-Methylcholestane	20.0	U
14a,17a-20R-Methylcholestane	20.0	U
14a(H),17a(H)-20S-Ethylcholestane	20.0	U
14a(H),17a(H)-20R-Ethylcholestane	20.0	U
14b(H),17b(H)-20R-Cholestane	20.0	U
14b(H),17b(H)-20S-Cholestane	20.0	U
14b,17b-20R-Methylcholestane	20.0	U
14b,17b-20S-Methylcholestane	20.0	U
14b(H),17b(H)-20R-Ethylcholestane	20.0	U
14b(H),17b(H)-20S-Ethylcholestane	20.0	U
T22a-Gammacerane/C32-diahopane	20.0	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	100	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 08:48

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251662.D
Acq On : 29 Nov 2016 10:39 pm
Operator : PAH14:AC
Sample : 1611004-09d-RF1
Misc : water
ALS Vial : 60 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 06 11:21:18 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	46462	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	35285	2506.804	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 250.68%#			

Target Compounds Qvalue

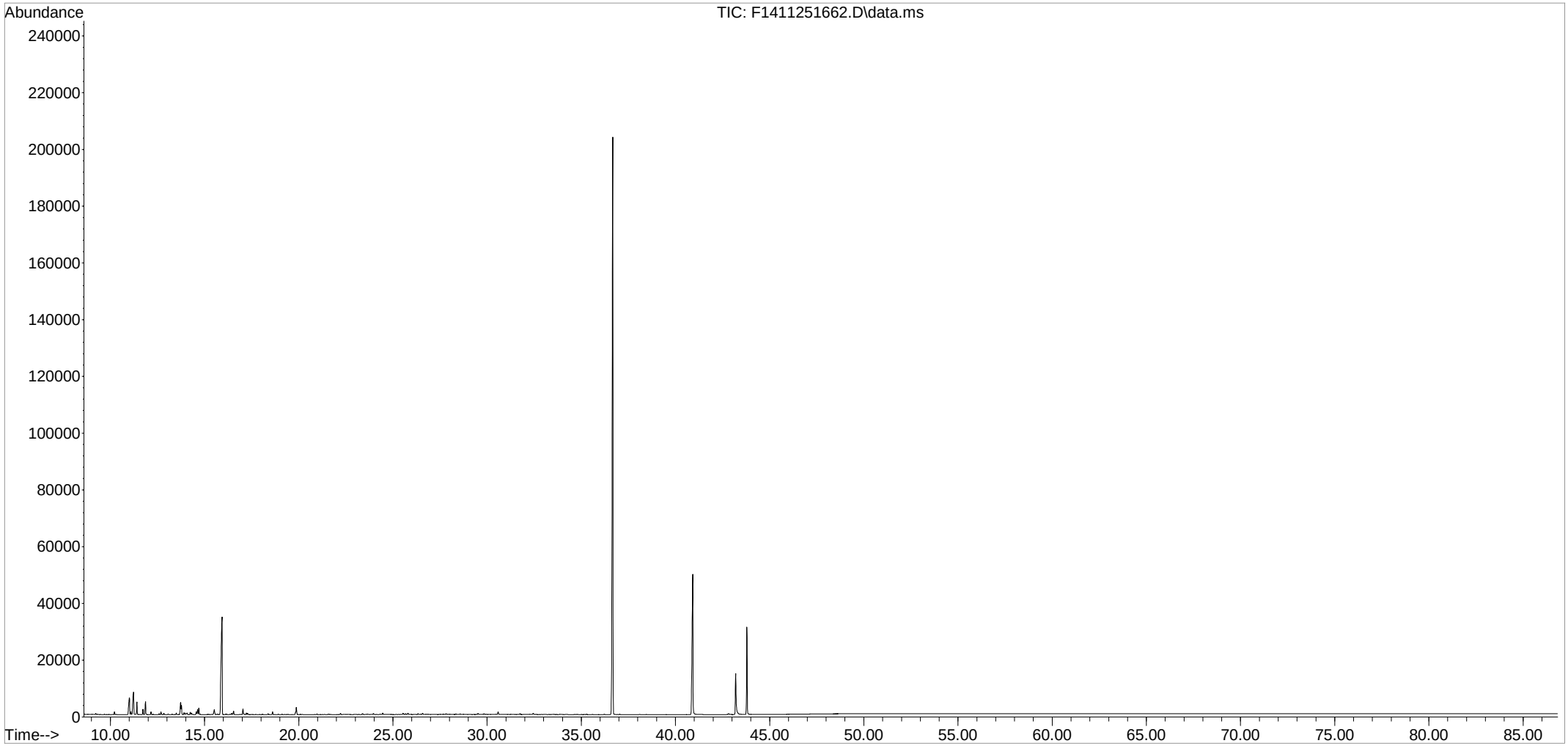
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251662.D
Acq On : 29 Nov 2016 10:39 pm
Operator : PAH14:AC
Sample : 1611004-09d-RF1
Misc : water
ALS Vial : 60 Sample Multiplier: 1

Quant Time: Dec 06 11:21:18 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Duplicate
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09F1**
Associated Blank: **SW110716B01F1**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Analyst
11/01/16	11/02/16	11/07/16	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
C23 Tricyclic Terpane	20.0 U	20.0 U	N/A	30
C24 Tricyclic Terpane	20.0 U	20.0 U	N/A	30
C25 Tricyclic Terpane	20.0 U	20.0 U	N/A	30
C24 Tetracyclic Terpane	20.0 U	20.0 U	N/A	30
C26 Tricyclic Terpane-22S	20.0 U	20.0 U	N/A	30
C26 Tricyclic Terpane-22R	20.0 U	20.0 U	N/A	30
C28 Tricyclic Terpane-22S	20.0 U	20.0 U	N/A	30
C28 Tricyclic Terpane-22R	20.0 U	20.0 U	N/A	30
C29 Tricyclic Terpane-22S	20.0 U	20.0 U	N/A	30
C29 Tricyclic Terpane-22R	20.0 U	20.0 U	N/A	30
18a-22,29,30-Trisnorneohopane-TS	20.0 U	20.0 U	N/A	30
C30 Tricyclic Terpane-22S	20.0 U	20.0 U	N/A	30
C30 Tricyclic Terpane-22R	20.0 U	20.0 U	N/A	30
17a(H)-22,29,30-Trisnorhopane-TM	20.0 U	20.0 U	N/A	30
17a/b,21b/a 28,30-Bisnorhopane	20.0 U	20.0 U	N/A	30
17a(H),21b(H)-25-Norhopane	20.0 U	20.0 U	N/A	30
30-Norhopane	20.0 U	20.0 U	N/A	30
18a(H)-30-Norneohopane-C29Ts	20.0 U	20.0 U	N/A	30
17a(H)-Diahopane	20.0 U	20.0 U	N/A	30
30-Normoretane	20.0 U	20.0 U	N/A	30
18a(H)&18b(H)-Oleananes	20.0 U	20.0 U	N/A	30
Hopane	20.0 U	20.0 U	N/A	30
Moretane	20.0 U	20.0 U	N/A	30
30-Homohopane-22S	20.0 U	20.0 U	N/A	30
30-Homohopane-22R	20.0 U	20.0 U	N/A	30
30,31-Bishomohopane-22S	20.0 U	20.0 U	N/A	30
30,31-Bishomohopane-22R	20.0 U	20.0 U	N/A	30
30,31-Trishomohopane-22S	20.0 U	20.0 U	N/A	30
30,31-Trishomohopane-22R	20.0 U	20.0 U	N/A	30
Tetrakishomohopane-22S	20.0 U	20.0 U	N/A	30
Tetrakishomohopane-22R	20.0 U	20.0 U	N/A	30
Pentakishomohopane-22S	20.0 U	20.0 U	N/A	30
Pentakishomohopane-22R	20.0 U	20.0 U	N/A	30
13b(H),17a(H)-20S-Diacholestane	20.0 U	20.0 U	N/A	30
13b(H),17a(H)-20R-Diacholestane	20.0 U	20.0 U	N/A	30

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 08:48

Duplicate
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **DUP-1**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **1611004-09F1**
Associated Blank: **SW110716B01F1**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Analyst
11/01/16	11/02/16	11/07/16	AC

Parameter	Sample Result	Duplicate Result	RPD	RPD Limit
13b,17a-20S-Methyldiacholestane	20.0 U	20.0 U	N/A	30
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	20.0 U	20.0 U	N/A	30
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	20.0 U	20.0 U	N/A	30
Unknown Sterane (S18)	20.0 U	20.0 U	N/A	30
13a,17b-20S-Ethyldiacholestane	20.0 U	20.0 U	N/A	30
14a,17a-20S-Methylcholestane	20.0 U	20.0 U	N/A	30
14a,17a-20R-Methylcholestane	20.0 U	20.0 U	N/A	30
14a(H),17a(H)-20S-Ethylcholestane	20.0 U	20.0 U	N/A	30
14a(H),17a(H)-20R-Ethylcholestane	20.0 U	20.0 U	N/A	30
14b(H),17b(H)-20R-Cholestane	20.0 U	20.0 U	N/A	30
14b(H),17b(H)-20S-Cholestane	20.0 U	20.0 U	N/A	30
14b,17b-20R-Methylcholestane	20.0 U	20.0 U	N/A	30
14b,17b-20S-Methylcholestane	20.0 U	20.0 U	N/A	30
14b(H),17b(H)-20R-Ethylcholestane	20.0 U	20.0 U	N/A	30
14b(H),17b(H)-20S-Ethylcholestane	20.0 U	20.0 U	N/A	30
T22a-Gammacerane/C32-diahopane	20.0 U	20.0 U	N/A	30

Surrogate	% Recovery		Acceptance Range (%)
5B(H)Cholane	110	100	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. RPD values are reported based on the unrounded calculated result.

12/07/16 08:48

Form I
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016B02F1**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/10/16	11/28/16	100	0.10	5	1	AC

Parameter	Result	
C23 Tricyclic Terpane	0.500	U
C24 Tricyclic Terpane	0.500	U
C25 Tricyclic Terpane	0.500	U
C24 Tetracyclic Terpane	0.500	U
C26 Tricyclic Terpane-22S	0.500	U
C26 Tricyclic Terpane-22R	0.500	U
C28 Tricyclic Terpane-22S	0.500	U
C28 Tricyclic Terpane-22R	0.500	U
C29 Tricyclic Terpane-22S	0.500	U
C29 Tricyclic Terpane-22R	0.500	U
18a-22,29,30-Trisnorneohopane-TS	0.500	U
C30 Tricyclic Terpane-22S	0.500	U
C30 Tricyclic Terpane-22R	0.500	U
17a(H)-22,29,30-Trisnorhopane-TM	0.500	U
17a/b,21b/a 28,30-Bisnorhopane	0.500	U
17a(H),21b(H)-25-Norhopane	0.500	U
30-Norhopane	0.500	U
18a(H)-30-Norneohopane-C29Ts	0.500	U
17a(H)-Diahopane	0.500	U
30-Normoretane	0.500	U
18a(H)&18b(H)-Oleananes	0.500	U
Hopane	0.500	U
Moretane	0.500	U
30-Homohopane-22S	0.500	U
30-Homohopane-22R	0.500	U
30,31-Bishomohopane-22S	0.500	U

Parameter	Result	
30,31-Bishomohopane-22R	0.500	U
30,31-Trishomohopane-22S	0.500	U
30,31-Trishomohopane-22R	0.500	U
Tetrakishomohopane-22S	0.500	U
Tetrakishomohopane-22R	0.500	U
Pentakishomohopane-22S	0.500	U
Pentakishomohopane-22R	0.500	U
13b(H),17a(H)-20S-Diacholestane	0.500	U
13b(H),17a(H)-20R-Diacholestane	0.500	U
13b,17a-20S-Methyldiacholestane	0.500	U
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	0.500	U
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	0.500	U
Unknown Sterane (S18)	0.500	U
13a,17b-20S-Ethyldiacholestane	0.500	U
14a,17a-20S-Methylcholestane	0.500	U
14a,17a-20R-Methylcholestane	0.500	U
14a(H),17a(H)-20S-Ethylcholestane	0.500	U
14a(H),17a(H)-20R-Ethylcholestane	0.500	U
14b(H),17b(H)-20R-Cholestane	0.500	U
14b(H),17b(H)-20S-Cholestane	0.500	U
14b,17b-20R-Methylcholestane	0.500	U
14b,17b-20S-Methylcholestane	0.500	U
14b(H),17b(H)-20R-Ethylcholestane	0.500	U
14b(H),17b(H)-20S-Ethylcholestane	0.500	U
T22a-Gammacerane/C32-diahopane	0.500	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	129	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 08:47

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251643.D
Acq On : 28 Nov 2016 4:44 pm
Operator : PAH14:AC
Sample : so111016b02-RF1
Misc : oil
ALS Vial : 41 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Dec 06 11:18:37 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.209	240	31184	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	12190	1290.328	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 129.03%			

Target Compounds Qvalue

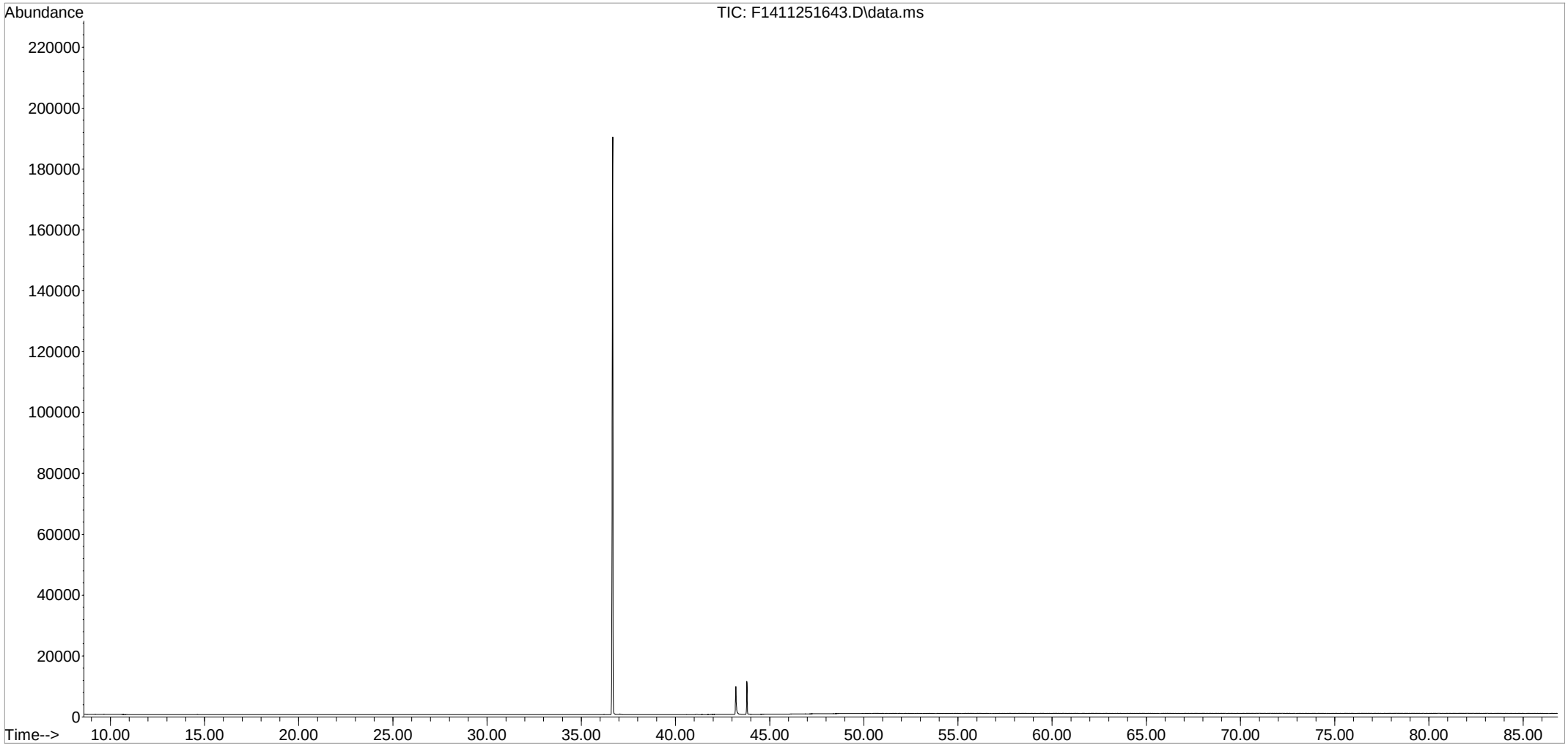
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251643.D
Acq On : 28 Nov 2016 4:44 pm
Operator : PAH14:AC
Sample : so111016b02-RF1
Misc : oil
ALS Vial : 41 Sample Multiplier: 1

Quant Time: Dec 06 11:18:37 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Form I
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116B03F1**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/11/16	11/28/16	100	0.0040	1	1	AC

Parameter	Result	
C23 Tricyclic Terpane	2.50	U
C24 Tricyclic Terpane	2.50	U
C25 Tricyclic Terpane	2.50	U
C24 Tetracyclic Terpane	2.50	U
C26 Tricyclic Terpane-22S	2.50	U
C26 Tricyclic Terpane-22R	2.50	U
C28 Tricyclic Terpane-22S	2.50	U
C28 Tricyclic Terpane-22R	2.50	U
C29 Tricyclic Terpane-22S	2.50	U
C29 Tricyclic Terpane-22R	2.50	U
18a-22,29,30-Trisnorneohopane-TS	2.50	U
C30 Tricyclic Terpane-22S	2.50	U
C30 Tricyclic Terpane-22R	2.50	U
17a(H)-22,29,30-Trisnorhopane-TM	2.50	U
17a/b,21b/a 28,30-Bisnorhopane	2.50	U
17a(H),21b(H)-25-Norhopane	2.50	U
30-Norhopane	2.50	U
18a(H)-30-Norneohopane-C29Ts	2.50	U
17a(H)-Diahopane	2.50	U
30-Normoretane	2.50	U
18a(H)&18b(H)-Oleananes	2.50	U
Hopane	2.50	U
Moretane	2.50	U
30-Homohopane-22S	2.50	U
30-Homohopane-22R	2.50	U
30,31-Bishomohopane-22S	2.50	U

Parameter	Result	
30,31-Bishomohopane-22R	2.50	U
30,31-Trishomohopane-22S	2.50	U
30,31-Trishomohopane-22R	2.50	U
Tetrakishomohopane-22S	2.50	U
Tetrakishomohopane-22R	2.50	U
Pentakishomohopane-22S	2.50	U
Pentakishomohopane-22R	2.50	U
13b(H),17a(H)-20S-Diacholestane	2.50	U
13b(H),17a(H)-20R-Diacholestane	2.50	U
13b,17a-20S-Methyldiacholestane	2.50	U
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	2.50	U
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	2.50	U
Unknown Sterane (S18)	2.50	U
13a,17b-20S-Ethyldiacholestane	2.50	U
14a,17a-20S-Methylcholestane	2.50	U
14a,17a-20R-Methylcholestane	2.50	U
14a(H),17a(H)-20S-Ethylcholestane	2.50	U
14a(H),17a(H)-20R-Ethylcholestane	2.50	U
14b(H),17b(H)-20R-Cholestane	2.50	U
14b(H),17b(H)-20S-Cholestane	2.50	U
14b,17b-20R-Methylcholestane	2.50	U
14b,17b-20S-Methylcholestane	2.50	U
14b(H),17b(H)-20R-Ethylcholestane	2.50	U
14b(H),17b(H)-20S-Ethylcholestane	2.50	U
T22a-Gammacerane/C32-diahopane	2.50	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	117	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 08:47

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251644.D
Acq On : 28 Nov 2016 6:18 pm
Operator : PAH14:AC
Sample : so111116b03-RF1
Misc : sheen
ALS Vial : 42 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Dec 06 11:18:48 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.209	240	31491	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	11175	1171.357	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 117.14%			

Target Compounds	Qvalue

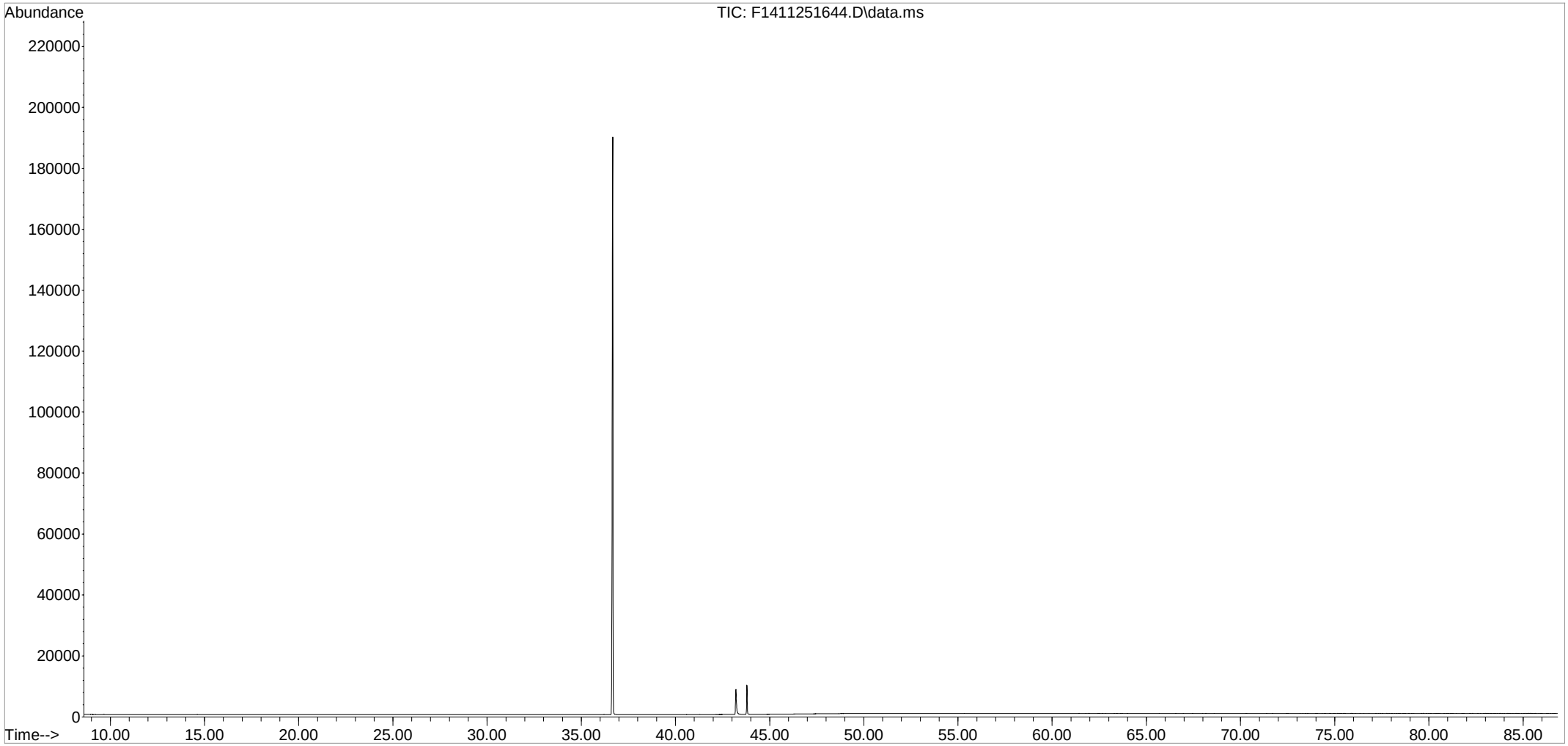
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251644.D
Acq On : 28 Nov 2016 6:18 pm
Operator : PAH14:AC
Sample : so111116b03-RF1
Misc : sheen
ALS Vial : 42 Sample Multiplier: 1

Quant Time: Dec 06 11:18:48 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Form I
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Blank**
Case: **N/A** SDG: **N/A**
Matrix: **Water**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716B01F1**
Associated Blank: **N/A**
Concentration Units: **ng/L**

Date Collected	Date Received	Date Extracted	Date Analyzed	Sample Amount (ml)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	11/07/16	11/28/16	1000	2	1	AC

Parameter	Result	
C23 Tricyclic Terpane	20.0	U
C24 Tricyclic Terpane	20.0	U
C25 Tricyclic Terpane	20.0	U
C24 Tetracyclic Terpane	20.0	U
C26 Tricyclic Terpane-22S	20.0	U
C26 Tricyclic Terpane-22R	20.0	U
C28 Tricyclic Terpane-22S	20.0	U
C28 Tricyclic Terpane-22R	20.0	U
C29 Tricyclic Terpane-22S	20.0	U
C29 Tricyclic Terpane-22R	20.0	U
18a-22,29,30-Trisnorneohopane-TS	20.0	U
C30 Tricyclic Terpane-22S	20.0	U
C30 Tricyclic Terpane-22R	20.0	U
17a(H)-22,29,30-Trisnorhopane-TM	20.0	U
17a/b,21b/a 28,30-Bisnorhopane	20.0	U
17a(H),21b(H)-25-Norhopane	20.0	U
30-Norhopane	20.0	U
18a(H)-30-Norneohopane-C29Ts	20.0	U
17a(H)-Diahopane	20.0	U
30-Normoretane	20.0	U
18a(H)&18b(H)-Oleananes	20.0	U
Hopane	20.0	U
Moretane	20.0	U
30-Homohopane-22S	20.0	U
30-Homohopane-22R	20.0	U
30,31-Bishomohopane-22S	20.0	U
30,31-Bishomohopane-22R	20.0	U
30,31-Trishomohopane-22S	20.0	U
30,31-Trishomohopane-22R	20.0	U
Tetrakishomohopane-22S	20.0	U
Tetrakishomohopane-22R	20.0	U
Pentakishomohopane-22S	20.0	U
Pentakishomohopane-22R	20.0	U
13b(H),17a(H)-20S-Diacholestane	20.0	U
13b(H),17a(H)-20R-Diacholestane	20.0	U
13b,17a-20S-Methyldiacholestane	20.0	U
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	20.0	U
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	20.0	U
Unknown Sterane (S18)	20.0	U
13a,17b-20S-Ethyldiacholestane	20.0	U
14a,17a-20S-Methylcholestane	20.0	U
14a,17a-20R-Methylcholestane	20.0	U
14a(H),17a(H)-20S-Ethylcholestane	20.0	U
14a(H),17a(H)-20R-Ethylcholestane	20.0	U
14b(H),17b(H)-20R-Cholestane	20.0	U
14b(H),17b(H)-20S-Cholestane	20.0	U
14b,17b-20R-Methylcholestane	20.0	U
14b,17b-20S-Methylcholestane	20.0	U
14b(H),17b(H)-20R-Ethylcholestane	20.0	U
14b(H),17b(H)-20S-Ethylcholestane	20.0	U
T22a-Gammacerane/C32-diahopane	20.0	U

Surrogate	% Recovery	Acceptance Range (%)
5B(H)Cholane	88	50-130

U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

12/07/16 08:47

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251645.D
Acq On : 28 Nov 2016 7:53 pm
Operator : PAH14:AC
Sample : sw110716b01-RF1
Misc : water
ALS Vial : 43 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 06 11:18:55 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.202	240	34226	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	4545	438.335	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 43.83%#			

Target Compounds	Qvalue

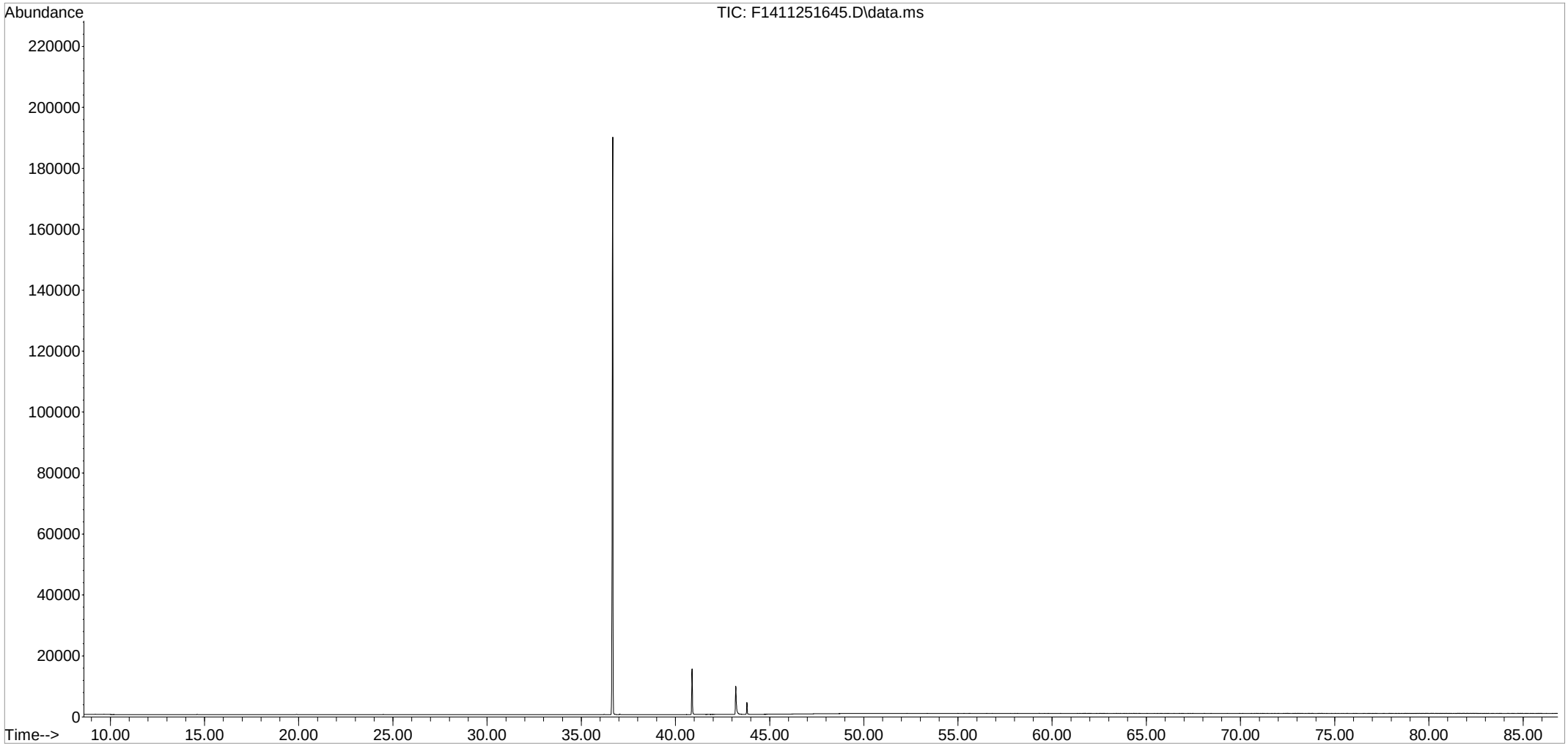
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251645.D
Acq On : 28 Nov 2016 7:53 pm
Operator : PAH14:AC
Sample : sw110716b01-RF1
Misc : water
ALS Vial : 43 Sample Multiplier: 1

Quant Time: Dec 06 11:18:55 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Biomarkers_F1 - ALL Biomarkers except TAS



Form III
Spike Recovery Summary
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SS112816ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
C23 Tricyclic Terpane	67.3	85.0	126	65-135
C24 Tricyclic Terpane	43.0	48.4	113	65-135
C25 Tricyclic Terpane	42.0	46.8	111	65-135
C24 Tetracyclic Terpane	14.8	15.4	104	65-135
C26 Tricyclic Terpane-22S	17.7	18.0	102	65-135
C26 Tricyclic Terpane-22R	15.4	16.6	108	65-135
C28 Tricyclic Terpane-22S	16.8	15.6	93	65-135
C28 Tricyclic Terpane-22R	18.1	17.8	98	65-135
C29 Tricyclic Terpane-22S	20.8	21.4	103	65-135
C29 Tricyclic Terpane-22R	22.6	23.6	104	65-135
18a-22,29,30-Trisnorneohopane-TS	31.3	31.4	100	65-135
C30 Tricyclic Terpane-22S	16.2	17.4	107	65-135
C30 Tricyclic Terpane-22R	16.4	17.9	109	65-135
17a(H)-22,29,30-Trisnorhopane-TM	37.8	39.8	105	65-135
17a/b,21b/a 28,30-Bisnorhopane	7.00	7.23	103	65-135
17a(H),21b(H)-25-Norhopane	8.7	8.45	97	65-135
30-Norhopane	99.7	106	106	65-135
18a(H)-30-Norneohopane-C29Ts	25.2	26.9	107	65-135
17a(H)-Diahopane	14.2	15.2	107	65-135
30-Normoretane	11.6	12.4	107	65-135
Hopane	173.6	190	110	65-135
Moretane	17.5	19.0	108	65-135
30-Homohopane-22S	75.1	76.7	102	65-135
30-Homohopane-22R	64.1	64.9	101	65-135
30,31-Bishomohopane-22S	53.6	55.0	103	65-135
30,31-Bishomohopane-22R	39.6	40.2	102	65-135
30,31-Trishomohopane-22S	41.8	44.4	106	65-135
30,31-Trishomohopane-22R	27.2	28.6	105	65-135
Tetrakishomohopane-22S	29.8	30.1	101	65-135
Tetrakishomohopane-22R	21.2	21.2	100	65-135
Pentakishomohopane-22S	30.2	30.0	99	65-135
Pentakishomohopane-22R	23.5	23.4	100	65-135
13b(H),17a(H)-20S-Diacholestane	50.0	48.3	97	65-135

12/07/16 09:07

Form III
Spike Recovery Summary
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SS112816ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Percent Solid	Analyst
N/A	N/A	N/A	100	AC

Parameter	True Conc.	Conc.	% Recovery	% Recovery Limits
13b(H),17a(H)-20R-Diacholestane	26.3	28.0	106	65-135
13b,17a-20S-Methyldiacholestane	25.7	24.4	95	65-135
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	65.0	64.6	99	65-135
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	75.8	77.5	102	65-135
Unknown Sterane (S18)	21.3	19.9	93	65-135
13a,17b-20S-Ethyldiacholestane	3.9	3.45	88	65-135
14a,17a-20S-Methylcholestane	37.3	35.6	95	65-135
14a,17a-20R-Methylcholestane	34.5	34.7	101	65-135
14a(H),17a(H)-20S-Ethylcholestane	51.0	48.5	95	65-135
14a(H),17a(H)-20R-Ethylcholestane	39.5	44.4	112	65-135
14b(H),17b(H)-20R-Cholestane	41.5	50.2	121	65-135
14b(H),17b(H)-20S-Cholestane	42.5	50.1	118	65-135
14b,17b-20R-Methylcholestane	44.8	52.3	117	65-135
14b,17b-20S-Methylcholestane	55.4	64.8	117	65-135
14b(H),17b(H)-20R-Ethylcholestane	60.9	66.3	109	65-135
14b(H),17b(H)-20S-Ethylcholestane	40.3	50.6	125	65-135

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded result.

12/07/16 09:07

Form I
Alaska North Slope Crude
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**
Client ID: **Alaska North Slope Crude**
Case: **N/A** SDG: **N/A**
Matrix: **Oil**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SS112816ANC02**
Associated Blank: **N/A**
Concentration Units: **mg/Kg**

Date Collected	Date Received	Date Extracted	Date Analyzed	Percent Solid	Sample Amount (g)	Final Volume (ml)	Dilution Factor	Analyst
N/A	N/A	N/A	11/24/16	100	0.0502	10	1	AC

Parameter	Result
C23 Tricyclic Terpane	**85.0**
C24 Tricyclic Terpane	**48.4**
C25 Tricyclic Terpane	**46.8**
C24 Tetracyclic Terpane	**15.4**
C26 Tricyclic Terpane-22S	**18.0**
C26 Tricyclic Terpane-22R	**16.6**
C28 Tricyclic Terpane-22S	**15.6**
C28 Tricyclic Terpane-22R	**17.8**
C29 Tricyclic Terpane-22S	**21.4**
C29 Tricyclic Terpane-22R	**23.6**
18a-22,29,30-Trisnorneohopane-TS	**31.4**
C30 Tricyclic Terpane-22S	**17.4**
C30 Tricyclic Terpane-22R	**17.9**
17a(H)-22,29,30-Trisnorhopane-TM	**39.8**
17a/b,21b/a 28,30-Bisnorhopane	**7.23**
17a(H),21b(H)-25-Norhopane	**8.45**
30-Norhopane	**106**
18a(H)-30-Norneohopane-C29Ts	**26.9**
17a(H)-Diahopane	**15.2**
30-Normoretane	**12.4**
18a(H)&18b(H)-Oleananes	**2.71**
Hopane	**190**
Moretane	**19.0**
30-Homohopane-22S	**76.7**
30-Homohopane-22R	**64.9**
30,31-Bishomohopane-22S	**55.0**

Parameter	Result
30,31-Bishomohopane-22R	**40.2**
30,31-Trishomohopane-22S	**44.4**
30,31-Trishomohopane-22R	**28.6**
Tetrakishomohopane-22S	**30.1**
Tetrakishomohopane-22R	**21.2**
Pentakishomohopane-22S	**30.0**
Pentakishomohopane-22R	**23.4**
13b(H),17a(H)-20S-Diacholestane	**48.3**
13b(H),17a(H)-20R-Diacholestane	**28.0**
13b,17a-20S-Methyldiacholestane	**24.4**
14a(H),17a(H)-20S-Cholestane/ 13b(H),17a(H)-20S-Ethyldiacholestane (S12)	**64.6**
14a(H),17a(H)-20R-Cholestane/ 13b(H),17a(H)-20R-Ethyldiacholestane (S17)	**77.5**
Unknown Sterane (S18)	**19.9**
13a,17b-20S-Ethyldiacholestane	**3.45**
14a,17a-20S-Methylcholestane	**35.6**
14a,17a-20R-Methylcholestane	**34.7**
14a(H),17a(H)-20S-Ethylcholestane	**48.5**
14a(H),17a(H)-20R-Ethylcholestane	**44.4**
14b(H),17b(H)-20R-Cholestane	**50.2**
14b(H),17b(H)-20S-Cholestane	**50.1**
14b,17b-20R-Methylcholestane	**52.3**
14b,17b-20S-Methylcholestane	**64.8**
14b(H),17b(H)-20R-Ethylcholestane	**66.3**
14b(H),17b(H)-20S-Ethylcholestane	**50.6**
T22a-Gammacerane/C32-diahopane	**13.0**

N/A - Not Applicable

12/07/16 09:07

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231610.D
Acq On : 24 Nov 2016 1:28 am
Operator : PAH14:AC
Sample : SS112816ANC02
Misc : frax36 5.02
ALS Vial : 10 Sample Multiplier: 1

NAL
11/28/16

Quant Time: Nov 25 11:07:25 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.201	240	45542	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.804	217	16789	1216.861	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 121.69%			
Target Compounds						Qvalue
2) Hopane (T19)	52.253	191	24967	956.446	ng/mL#	85
3) 17a(H),21B(H)-hopane - C3	52.253	191	24967	956.446	ng/mL#	85
4) C23 Tricyclic Terpane (T4	40.827	191	11137M4	426.641	ng/ml	
5) C24 Tricyclic Terpane (T5	41.551	191	6348	243.182	ng/ml	100
6) C25 Tricyclic Terpane (T6	43.036	191	6126M1	234.677	ng/ml	
7) C24 Tetracyclic Terpane (	44.362	191	2017	77.268	ng/ml	100
8) C26 Tricyclic Terpane-22S	44.091	191	2355	90.216	ng/ml	100
9) C26 Tricyclic Terpane-22R	44.189	191	2180	83.512	ng/ml	100
10) C28 Tricyclic Terpane-22S	46.472	191	2051M4	78.571	ng/ml	
11) C28 Tricyclic Terpane-22R	46.630	191	2336	89.488	ng/ml	100
12) C29 Tricyclic Terpane-22S	47.151	191	2804	107.417	ng/ml	100
13) C29 Tricyclic Terpane-22R	47.346	191	3088	118.296	ng/ml	100
14) 18a-22,29,30-Trisnorneoho	48.477	191	4116	157.677	ng/ml	100
15) C30 Tricyclic Terpane-22S	48.560	191	2276	87.190	ng/mL	100
16) C30 Tricyclic Terpane-22R	48.801	191	2345M4	89.833	ng/mL	
17) 17a(H)-22,29,30-Trisnorho	49.027	191	5216	199.817	ng/ml	100
18) 17a/b,21b/a 28,30-Bisnorh	50.218	191	948	36.316	ng/ml	100
19) 17a(H),21b(H)-25-Norhopan	50.007	191	1107	42.407	ng/ml	100
20) 30-Norhopane (T15)	50.889	191	13847M4	530.456	ng/ml	
21) 18a(H)-30-Norneohopane-C2	50.987	191	3530M4	135.229	ng/ml	
22) 17a(H)-Diahopane (X)	51.115	191	1985M4	76.042	ng/ml	
23) 30-Normoretane (T17)	51.657	191	1619	62.021	ng/ml	100
24) 18a(H)&18b(H)-Oleananes (	52.049	191	355M4	13.599	ng/ml	
25) Moretane (T20)	52.938	191	2488M4	95.311	ng/ml	
26) 30-Homohopane-22S (T21)	54.039	191	10056	385.229	ng/ml	100
27) 30-Homohopane-22R (T22)	54.272	191	8509	325.966	ng/ml	100
28) Gammacerane/C32-diahopane	54.823	191	1704M4	65.278	ng/mL	
29) 30,31-Bishomohopane-22S (	55.599	191	7204	275.974	ng/ml	100
30) 30,31-Bishomohopane-22R (	55.983	191	5269	201.847	ng/ml	100
31) 30,31-Trishomohopane-22S	57.724	191	5814	222.725	ng/ml	100
32) 30,31-Trishomohopane-22R	58.350	191	3746	143.503	ng/ml	100
33) Tetrakishomohopane-22S (T	60.369	191	3945	151.127	ng/ml	100
34) Tetrakishomohopane-22R (T	61.266	191	2775	106.306	ng/ml	100
35) Pentakishomohopane-22S (T	63.497	191	3937	150.820	ng/ml	100
36) Pentakishomohopane-22R (T	64.801	191	3071M4	117.645	ng/ml	
38) 13b(H),17a(H)-20S-Diachol	45.304	217	3343	242.299	ng/ml	100
39) 13b(H),17a(H)-20R-Diachol	45.726	217	1936	140.321	ng/ml	100
40) 13b,17a-20S-Methyldiachol	46.419	217	1690M4	122.491	ng/ml	
41) 14a,17a-20S-Chol/13b,17a-	47.286	217	4474	324.274	ng/ml	100
42) 14a,17a-20R-Chol/13b,17a-	47.806	217	5366M4	388.926	ng/ml	
43) Unknown Sterane (S18)	48.085	217	1376	99.732	ng/ml	100
44) 13a,17b-20S-Ethyldiachole	48.349	217	239	17.323	ng/ml	100
45) 14a,17a-20S-Methylcholest	48.507	217	2463M4	178.517	ng/ml	
46) 14a,17a-20R-Methylcholest	49.223	217	2404M4	174.241	ng/ml	
47) 14a(H),17a(H)-20S-Ethylch	49.577	217	3362M4	243.677	ng/ml	
48) 14a(H),17a(H)-20R-Ethylch	50.482	217	3076M4	222.947	ng/ml	
49) 14b(H),17b(H)-20R-Cholest	47.377	218	3477M4	252.012	ng/ml	
50) 14b(H),17b(H)-20S-Cholest	47.467	218	3469M4	251.432	ng/ml	
51) 14b,17b-20R-Methylcholest	48.680	218	3625	262.739	ng/ml	100
52) 14b,17b-20S-Methylcholest	48.756	218	4488M4	325.289	ng/ml	
53) 14b(H),17b(H)-20R-Ethylch	49.818	218	4592	332.827	ng/ml	100
54) 14b(H),17b(H)-20S-Ethylch	49.856	218	3501M3	253.751	ng/ml	
55) C26,20R- +C27,20S- triaro	49.532	231	19380M4	1404.655	ng/mL	

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231610.D
Acq On : 24 Nov 2016 1:28 am
Operator : PAH14:AC
Sample : SS112816ANC02
Misc : frax36 5.02
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 25 11:07:25 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Default - All compounds listed

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
56) C28,20S-triaromatic stero	50.399	231	12158	881.208	ng/mL	100
57) C27,20R-triaromatic stero	50.851	231	11949	866.059	ng/mL	100
58) C28,20R-triaromatic stero	52.049	231	9860	714.649	ng/mL	100

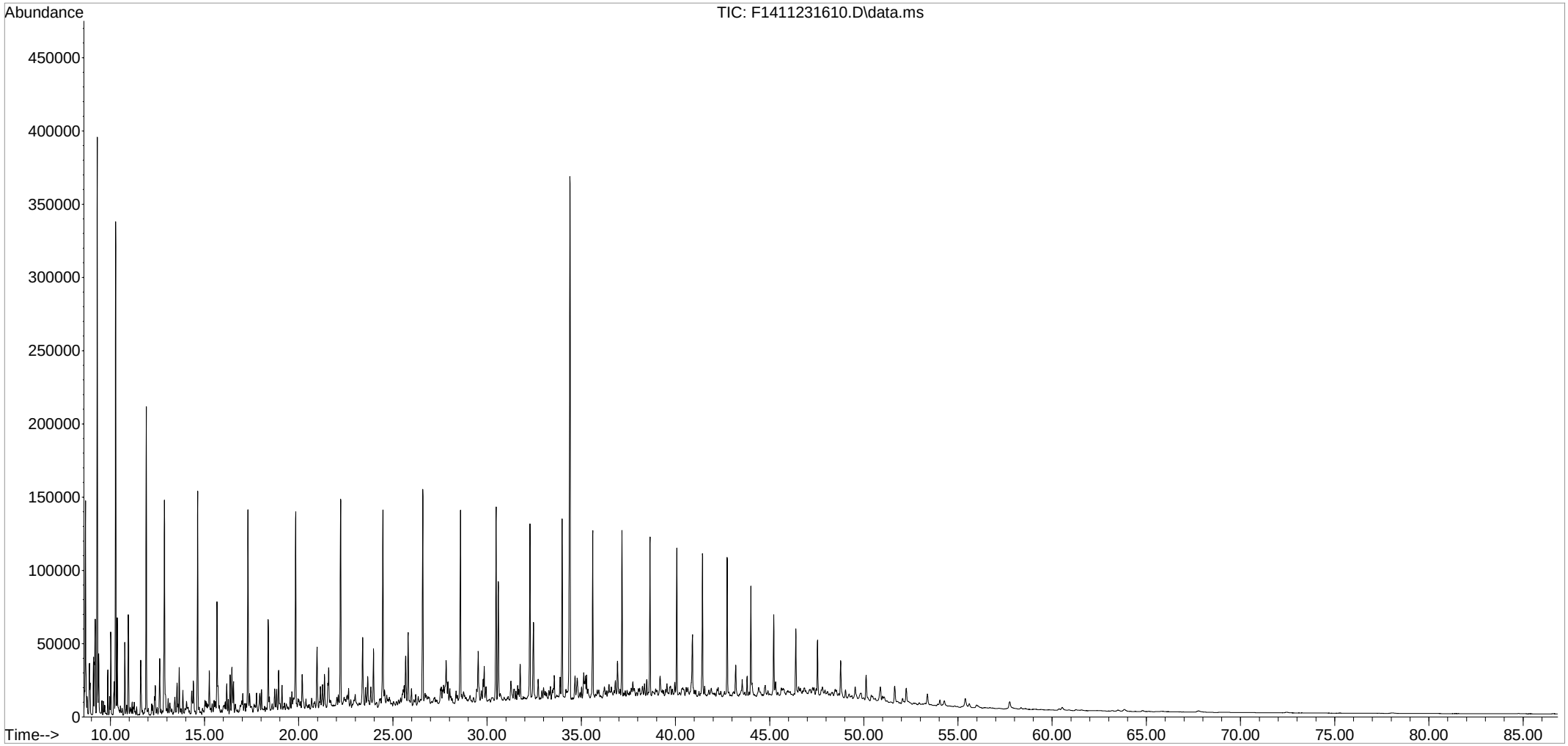
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231610.D
Acq On : 24 Nov 2016 1:28 am
Operator : PAH14:AC
Sample : SS112816ANC02
Misc : frax36 5.02
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Nov 25 11:07:25 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : Default - All compounds listed



Analysis log File

Total Files Reported in Log : 67
Log Generated From Directory: O:\Forensics\Data\PAH14\2016\Nov16\nov25\

No.	DATA FILE	INJ METH	SAMPLE NAME	MISC	DATE INJ'D
1	F1411251601.D	FRBIO14A.M	PRIME	1x	11/25/2016 9:55 am
2	F1411251602.D	FRBIO14A.M	C1411251601	CC FRAX92	11/25/2016 11:29 am
3	F1411251603.D	FRBIO14A.M	dcm	1x	11/25/2016 1:03 pm
4	F1411251604.D	FRBIO14A.M	dcm	1x	11/25/2016 2:37 pm
5	F1411251605.D	FRBIO14A.M	ss112316b01	1x	11/25/2016 4:11 pm
6	F1411251606.D	FRBIO14A.M	ss110116b01-RF1	1x	11/25/2016 5:45 pm
7	F1411251607.D	FRBIO14A.M	1610010-01-RF1	1x	11/25/2016 7:19 pm
8	F1411251608.D	FRBIO14A.M	1610010-02-RF1	1x	11/25/2016 8:52 pm
9	F1411251609.D	FRBIO14A.M	1610010-04-RF1	1x	11/25/2016 10:26 pm
10	F1411251610.D	FRBIO14A.M	1610010-05-RF1	1x	11/26/2016 12:00 am
11	F1411251611.D	FRBIO14A.M	1610010-06-RF1	1x	11/26/2016 1:34 am
12	F1411251612.D	FRBIO14A.M	1610010-08-RF1	1x	11/26/2016 3:08 am
13	F1411251613.D	FRBIO14A.M	1610010-09-RF1	1x	11/26/2016 4:42 am
14	F1411251614.D	FRBIO14A.M	C1411251602	CC FRAX92	11/26/2016 6:15 am
15	F1411251615.D	FRBIO14A.M	1610010-10-RF1	1x	11/26/2016 7:49 am
16	F1411251616.D	FRBIO14A.M	1610010-11-RF1	1x	11/26/2016 9:23 am
17	F1411251617.D	FRBIO14A.M	1610010-12-RF1	1x	11/26/2016 10:57 am
18	F1411251618.D	FRBIO14A.M	1610010-14-RF1	1x	11/26/2016 12:30 pm
19	F1411251619.D	FRBIO14A.M	1610010-14D-RF1	1x	11/26/2016 2:04 pm
20	F1411251620.D	FRBIO14A.M	1610010-15-RF1	1x	11/26/2016 3:38 pm
21	F1411251621.D	FRBIO14A.M	SS112916PRM01	1x	11/26/2016 5:12 pm
22	F1411251622.D	FRBIO14A.M	C1411251603	CC FRAX92	11/26/2016 6:46 pm
23	F1411251623.D	FRBIO14A.M	C1411251604	CC FRAX92	11/26/2016 8:20 pm
24	F1411251624.D	FRBIO14A.M	C1411251605	1x	11/27/2016 8:35 am
25	F1411251625.D	FRBIO14A.M	dcm	dcm	11/27/2016 10:09 am
26	F1411251626.D	FRBIO14A.M	dcm	dcm	11/27/2016 11:43 am
27	F1411251627.D	FRBIO14A.M	ss112616b01	1x	11/27/2016 1:17 pm
28	F1411251628.D	FRBIO14A.M	ss110116b03-RF1	1x	11/27/2016 2:51 pm
29	F1411251629.D	FRBIO14A.M	1610011-01-RF1	1x	11/27/2016 4:25 pm
30	F1411251630.D	FRBIO14A.M	1610011-04-RF1	1x	11/27/2016 5:59 pm
31	F1411251631.D	FRBIO14A.M	1610011-04d-RF1	1x	11/27/2016 7:33 pm
32	F1411251632.D	FRBIO14A.M	1610011-09-RF1	1x	11/27/2016 9:07 pm
33	F1411251633.D	FRBIO14A.M	1610011-10-RF1	1x	11/27/2016 10:41 pm
34	F1411251634.D	FRBIO14A.M	1610011-11-RF1	1x	11/28/2016 12:15 am
35	F1411251635.D	FRBIO14A.M	1610011-12-RF1	1x	11/28/2016 1:49 am
36	F1411251636.D	FRBIO14A.M	1610011-14-RF1	1x	11/28/2016 3:22 am
37	F1411251637.D	FRBIO14A.M	1610011-15-RF1	1x	11/28/2016 4:56 am
38	F1411251638.D	FRBIO14A.M	ss112516prm01	1x	11/28/2016 6:30 am
39	F1411251639.D	FRBIO14A.M	✓C1411251606 pass	cc frax92	11/28/2016 8:03 am
40	F1411251640.D	FRNC14A.M		1x	11/28/2016 9:37 am
41	F1411251641.D	FRBIO14A.M	dcm	dcm	11/28/2016 11:01 am
42	F1411251642.D	FRBIO14A.M	dcm	dcm	11/28/2016 12:35 pm
43	F1411251643.D	FRBIO14A.M	✓so111016b02-RF1	oil	11/28/2016 4:44 pm
44	F1411251644.D	FRBIO14A.M	✓so11116b03-RF1	sheen	11/28/2016 6:18 pm
45	F1411251645.D	FRBIO14A.M	✓sw110716b01-RF1	water	11/28/2016 7:53 pm
46	F1411251646.D	FRBIO14A.M	✓1611004-01-RF1	oil	11/28/2016 9:27 pm
47	F1411251647.D	FRBIO14A.M	✓1611004-02-RF1	oil	11/28/2016 11:02 pm
48	F1411251648.D	FRBIO14A.M	✓1611004-02d-RF1	oil	11/29/2016 12:36 am
49	F1411251649.D	FRBIO14A.M	✓1611004-03-RF1	oil	11/29/2016 2:10 am
50	F1411251650.D	FRBIO14A.M	✓1611004-04-RF1	sheen	11/29/2016 3:45 am
51	F1411251651.D	FRBIO14A.M	✓1611004-05-RF1	sheen	11/29/2016 5:19 am
52	F1411251652.D	FRBIO14A.M	✓1611004-05d-RF1	sheen	11/29/2016 6:53 am
53	F1411251653.D	FRBIO14A.M	✓1611004-06-RF1	sheen	11/29/2016 8:28 am
54	F1411251654.D	FRBIO14A.M	✓C1411251607 pass	cc frax92 500ng/ml	11/29/2016 10:02 am
55	F1411251655.D	FRBIO14A.M	dcm	dcm	11/29/2016 11:37 am
56	F1411251656.D	FRBIO14A.M	sw112816b01F1	1x	11/29/2016 1:12 pm
57	F1411251657.D	FRBIO14A.M	1610010-11-RF1	recolumn	11/29/2016 2:47 pm
58	F1411251658.D	FRBIO14A.M	sw112816srm01-RF1	water	11/29/2016 4:22 pm
59	F1411251659.D	FRBIO14A.M	✓1611004-07-RF1	water	11/29/2016 5:56 pm
60	F1411251660.D	FRBIO14A.M	✓1611004-08-RF1	water	11/29/2016 7:30 pm

SeqLog 1.0 - (c) 2009 Abacus Database Applications

Analysis log File

Total Files Reported in Log : 67
Log Generated From Directory: O:\Forensics\Data\PAH14\2016\Nov16\nov25\

No.	DATA FILE	INJ METH	SAMPLE NAME	MISC	DATE INJ'D
61	F1411251661.D	FRBIO14A.M ✓	1611004-09-RF1	water	11/29/2016 9:05 pm
62	F1411251662.D	FRBIO14A.M ✓	1611004-09d-RF1	water	11/29/2016 10:39 pm
63	F1411251663.D	FRBIO14A.M ✓	c1411251608 pass	cc frax92 500ng/ml	11/30/2016 12:13 am
64	F1411251664.D	FRBIO14A.M	c1411251609	cc frax92 500ng/ml	11/30/2016 1:51 pm
65	F1411251665.D	FRBIO14A.M	c1411251610	cc frax92 500ng/ml	12/1/2016 7:16 am
66	F1411251666.D	FRBIO14A.M	1610011-05-RF1	1x	12/1/2016 8:50 am
67	F1411251667.D	FRBIO14A.M	c1411251611	cc frax92 500ng/ml	12/1/2016 10:24 am

BIO14112316.M

NAL
12/7/16

Supporting Quality Control Results

Form IV
Method Blank Summary
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111016B02F1**
Date Analyzed: **11/28/16 16:44**

Client ID	Lab ID	Date/Time Analyzed
NFSB-02(MW)	1611004-01F1	11/28/16 21:27
ENV-9MW	1611004-02F1	11/28/16 23:02
ENV-9MW	1611004-02F1 D	11/29/16 00:36
ENV-3MW	1611004-03F1	11/29/16 02:10

N/A - Not Applicable

320 Forbes Blvd, Mansfield, MA 02048, (508) 822-9300, Fax (508) 822-3288

Form IV
Method Blank Summary
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SO111116B03F1**
Date Analyzed: **11/28/16 18:18**

Client ID	Lab ID	Date/Time Analyzed
NFNP-01	1611004-04F1	11/29/16 03:45
NFNP-02	1611004-05F1	11/29/16 05:19
NFNP-02	1611004-05F1 D	11/29/16 06:53
NFNP-03	1611004-06F1	11/29/16 08:28

N/A - Not Applicable

320 Forbes Blvd, Mansfield, MA 02048, (508) 822-9300, Fax (508) 822-3288

Form IV
Method Blank Summary
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Case: **N/A** SDG: **N/A**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **SW110716B01F1**
Date Analyzed: **11/28/16 19:53**

Client ID	Lab ID	Date/Time Analyzed
NFSB-08(MW)	1611004-07F1	11/29/16 17:56
NFSB-01(MW)	1611004-08F1	11/29/16 19:30
DUP-1	1611004-09F1	11/29/16 21:05
DUP-1	1611004-09F1 D	11/29/16 22:39

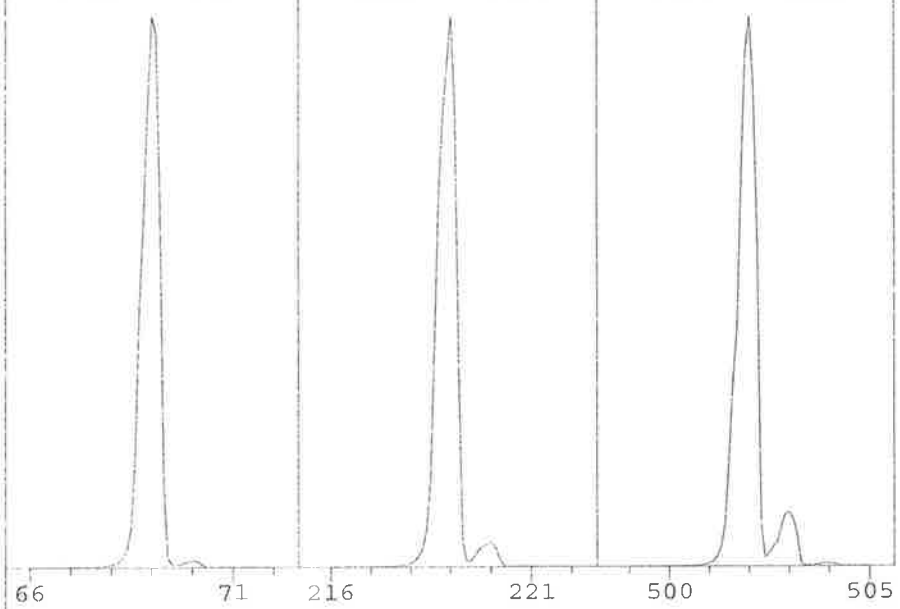
N/A - Not Applicable

320 Forbes Blvd, Mansfield, MA 02048, (508) 822-9300, Fax (508) 822-3288

Tue Nov 22 14:08:02 2016
C:\MSDCHEM\1\5975\pftba.u

Instrument: PAH 14
US10223404

Mass	69.00	Mass	219.00	Mass	502.00
Ab	484611	Ab	284763	Ab	50629
Pw50	0.51	Pw50	0.55	Pw50	0.50

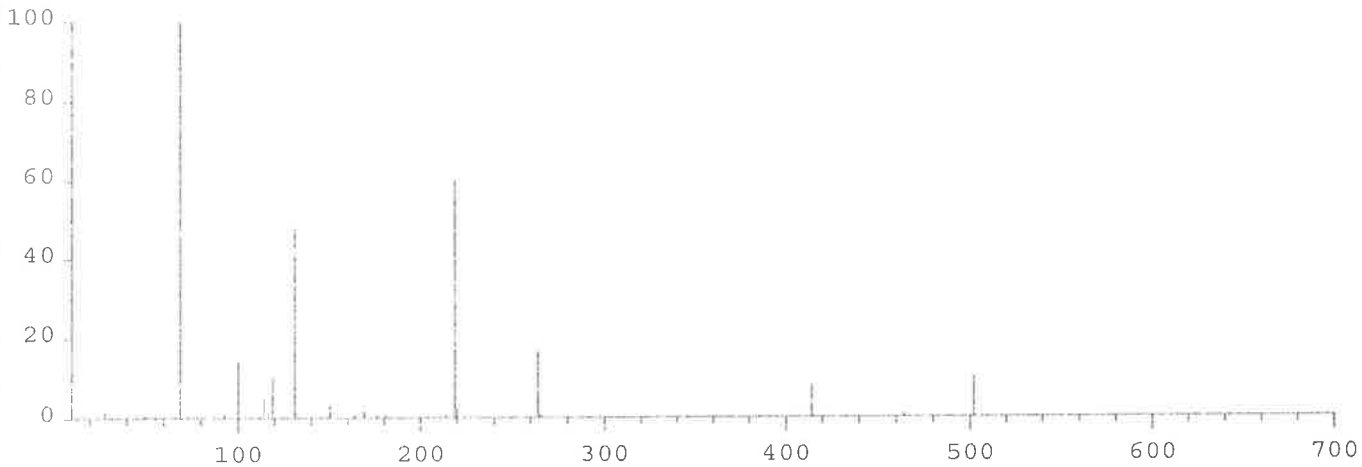


Ion Pol	Pos	MassGain	-1067
		MassOffs	-42
Emission	34.6	AmuGain	1191
EIEnrgy	69.9	AmuOffs	130.75
Filament	1	Wid219	-0.022
		DC Pol	Pos
Repeller	34.81		
IonFcus	90.2	HEDEnab	On
EntLens	0.0	EMVolts	1576
EntOffs	Var		
		Samples	8
PFTBA	Open	Averages	3
		Stepsize	0.10

Temperatures and Pressures:

MS Source	230	TurboSpd	100
MS Quad	150	HiVac	0.00e00

Scan: 10.00 - 701.00 Samples: 8 Thresh: 100 Step: 0.10
125 peaks Base: 69.00 Abundance: 439360



Mass	Abund	Rel Abund	Iso Mass	Iso Abund	Iso Ratio
69.00	439360	100.00	70.00	4942	1.12
219.00	263296	59.93	220.00	11441	4.35
502.00	44792	10.19	503.00	4701	10.50

Air/Water Check: H20~0.13% N2~1.60% O2~0.36% CO2~0.13% N2/H2O~1263.44%

Ramp Criteria:
Ion Focus Maximum 90 volts using ion 502; EM Gain 17054
Repeller Maximum 35 volts using ion 219; Gain Factor 0.17

MassGain Values(Samples): -1059(3) -1052(2) -1051(1) -1027(0) -984(FS)

TARGET MASS:	50	69	131	219	414	502	1050
Amu Offset:	130.8	130.8	130.8	130.8	130.8	130.8	130.8
Entrance Lens Offset:	19.6	18.8	20.3	17.6	23.8	24.6	24.6
Target Abund(%):	1.0	100.0	45.0	55.0	8.0	10.0	
Actual Tune Abund(%):	0.8	100.0	48.6	59.9	8.2	10.2	

Analysis log File

Total Files Reported in Log : 10
Log Generated From Directory: O:\Forensics\Data\PAH14\2016\Nov16\nov23\

No.	DATA FILE	INJ METH	SAMPLE NAME	MISC	DATE INJ'D
1	F1411231601.D	FRBIO14A.M	PRIME	1x	11/23/2016 11:23 am
2	F1411231602.D	FRBIO14A.M	dcm	1x	11/23/2016 12:57 pm
3	F1411231603.D	FRBIO14A.M	I1411251601	1x frax28	11/23/2016 2:31 pm
4	F1411231604.D	FRBIO14A.M	I1411251602	1x frax29	11/23/2016 4:05 pm
5	F1411231605.D	FRBIO14A.M	I1411251603	1x frax30	11/23/2016 5:39 pm
6	F1411231606.D	FRBIO14A.M	I1411251604	1x frax92	11/23/2016 7:13 pm
7	F1411231607.D	FRBIO14A.M	I1411251605	1x frax32	11/23/2016 8:47 pm
8	F1411231608.D	FRBIO14A.M	I1411251606	1x frax33	11/23/2016 10:21 pm
9	F1411231609.D	FRBIO14A.M	dcm	dcm	11/23/2016 11:55 pm
10	F1411231610.D	FRBIO14A.M	SS112816ANC02	frax36 5.02	11/24/2016 1:28 am

NAL
11/28/16

Response Factor Report PAH 14

Method Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Method File : BIO14112316.M
Title : Decalins & Alkylated PAH's
Last Update : Thu Nov 24 07:37:14 2016
Response Via : Initial Calibration

Calibration Files
10 =F1411231603.D 25 =F1411231604.D 100 =F1411231605.D 500 =F1411231606.D 5000=F1411231607.D 1e4 =F1411231608.D

		Compound	10	25	100	500	5000	1e4	Avg	%RSD
1)	i	Chrysene-d12	----------ISTD----------							
2)	A1	Hopane (T19)	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
3)	A2	17a(H),21B(H)-...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
4)	A2	C23 Tricyclic ...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
5)	A2	C24 Tricyclic ...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
6)	A2	C25 Tricyclic ...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
7)	A2	C24 Tetracycli...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
8)	A2	C26 Tricyclic ...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
9)	A2	C26 Tricyclic ...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
10)	A2	C28 Tricyclic ...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
11)	A2	C28 Tricyclic ...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
12)	A2	C29 Tricyclic ...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
13)	A2	C29 Tricyclic ...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
14)	A2	18a-22,29,30-T...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
15)	A2	C30 Tricyclic ...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
16)	A2	C30 Tricyclic ...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
17)	A2	17a(H)-22,29,3...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
18)	A2	17a/b,21b/a 28...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
19)	A2	17a(H),21b(H)-...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
20)	A2	30-Norhopane (...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
21)	A2	18a(H)-30-Norn...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
22)	A2	17a(H)-Diahopa...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
23)	A2	30-Normoretane...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
24)	A2	18a(H)&18b(H)-...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
25)	A2	Moretane (T20)	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
26)	A2	30-Homohopane-...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
27)	A2	30-Homohopane-...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
28)	A2	Gammacerane/C3...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
29)	A2	30,31-Bishomoh...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
30)	A2	30,31-Bishomoh...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
31)	A2	30,31-Trishomo...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
32)	A2	30,31-Trishomo...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
33)	A2	Tetrakishomoho...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
34)	A2	Tetrakishomoho...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
35)	A2	Pentakishomoho...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
36)	A2	Pentakishomoho...	0.324	0.299	0.271	0.254	0.280	0.291	0.287	8.40
37)	SA1	5B(H)Cholane -...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
38)	A2	13b(H),17a(H)-...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
39)	A2	13b(H),17a(H)-...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
40)	A2	13b,17a-20S-Me...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
41)	A2	14a,17a-20S-Ch...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
42)	A2	14a,17a-20R-Ch...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33

Response Factor Report PAH 14

Method Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Method File : BIO14112316.M
Title : Decalins & Alkylated PAH's
Last Update : Thu Nov 24 07:37:14 2016
Response Via : Initial Calibration

Calibration Files
10 =F1411231603.D 25 =F1411231604.D 100 =F1411231605.D 500 =F1411231606.D 5000=F1411231607.D 1e4 =F1411231608.D

	Compound	10	25	100	500	5000	1e4	Avg	%RSD
43) A2	Unknown Steran...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
44) A2	13a,17b-20S-Et...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
45) A2	14a,17a-20S-Me...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
46) A2	14a,17a-20R-Me...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
47) A2	14a(H),17a(H)-...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
48) A2	14a(H),17a(H)-...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
49) A2	14b(H),17b(H)-...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
50) A2	14b(H),17b(H)-...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
51) A2	14b,17b-20R-Me...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
52) A2	14b,17b-20S-Me...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
53) A2	14b(H),17b(H)-...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
54) A2	14b(H),17b(H)-...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
55) A2	C26,20R- +C27,...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
56) A2	C28,20S-triaro...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
57) A2	C27,20R-triaro...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33
58) A2	C28,20R-triaro...	0.144	0.132	0.131	0.150	0.175	0.176	0.151	13.33

(#) = Out of Range

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231603.D
Acq On : 23 Nov 2016 2:31 pm
Operator : PAH14:AC
Sample : I1411251601
Misc : 1x frax28
ALS Vial : 3 Sample Multiplier: 1

NAL
11/28/16

Quant Time: Nov 25 11:06:48 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Aug 11 09:53:10 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.201	240	35651	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.797	217	103M4	8.858	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	0.89%#		
Target Compounds						Qvalue
2) Hopane (T19)	52.245	191	231	9.763	ng/mL#	67
3) 17a(H),21B(H)-hopane - C3	52.245	191	231	9.763	ng/mL#	67

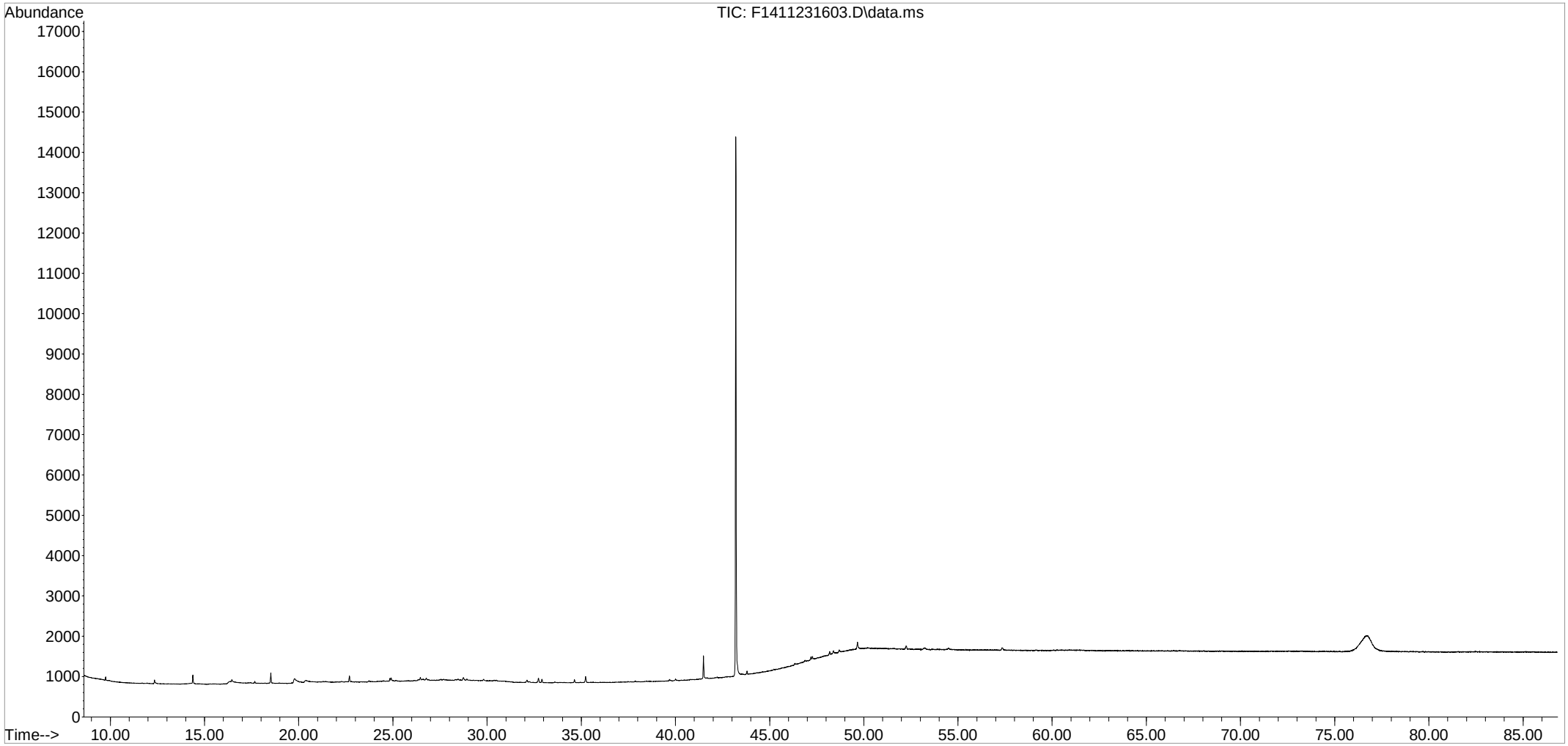
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231603.D
Acq On : 23 Nov 2016 2:31 pm
Operator : PAH14:AC
Sample : I1411251601
Misc : 1x frax28
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 25 11:06:48 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Aug 11 09:53:10 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231604.D
Acq On : 23 Nov 2016 4:05 pm
Operator : PAH14:AC
Sample : I1411251602
Misc : 1x frax29
ALS Vial : 4 Sample Multiplier: 1

NAL
11/28/16

Quant Time: Nov 25 11:06:54 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:28:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.201	240	35832	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.797	217	236	20.193	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery =	2.02%#		
Target Compounds						Qvalue
2) Hopane (T19)	52.252	191	535	22.498	ng/mL#	67
3) 17a(H),21B(H)-hopane - C3	52.252	191	535	22.498	ng/mL#	67

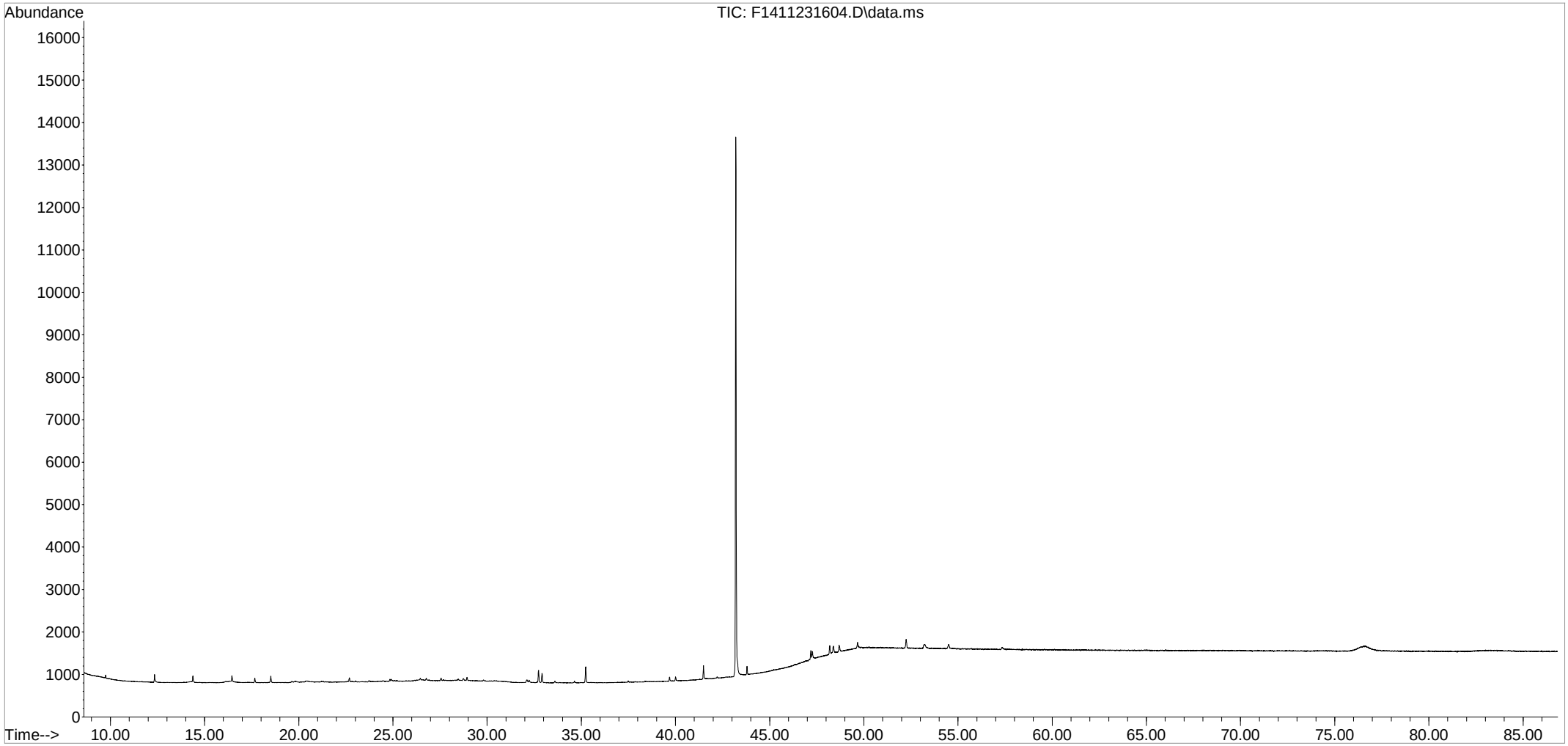
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231604.D
Acq On : 23 Nov 2016 4:05 pm
Operator : PAH14:AC
Sample : I1411251602
Misc : 1x frax29
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 25 11:06:54 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:28:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231605.D
Acq On : 23 Nov 2016 5:39 pm
Operator : PAH14:AC
Sample : I1411251603
Misc : 1x frax30
ALS Vial : 5 Sample Multiplier: 1

NAL
11/28/16

Quant Time: Nov 25 11:06:59 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:28:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.201	240	35806	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.797	217	940	80.487	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 8.05%#			
Target Compounds						Qvalue
2) Hopane (T19)	52.245	191	1942	81.725	ng/mL#	90
3) 17a(H),21B(H)-hopane - C3	52.245	191	1942	81.725	ng/mL#	90

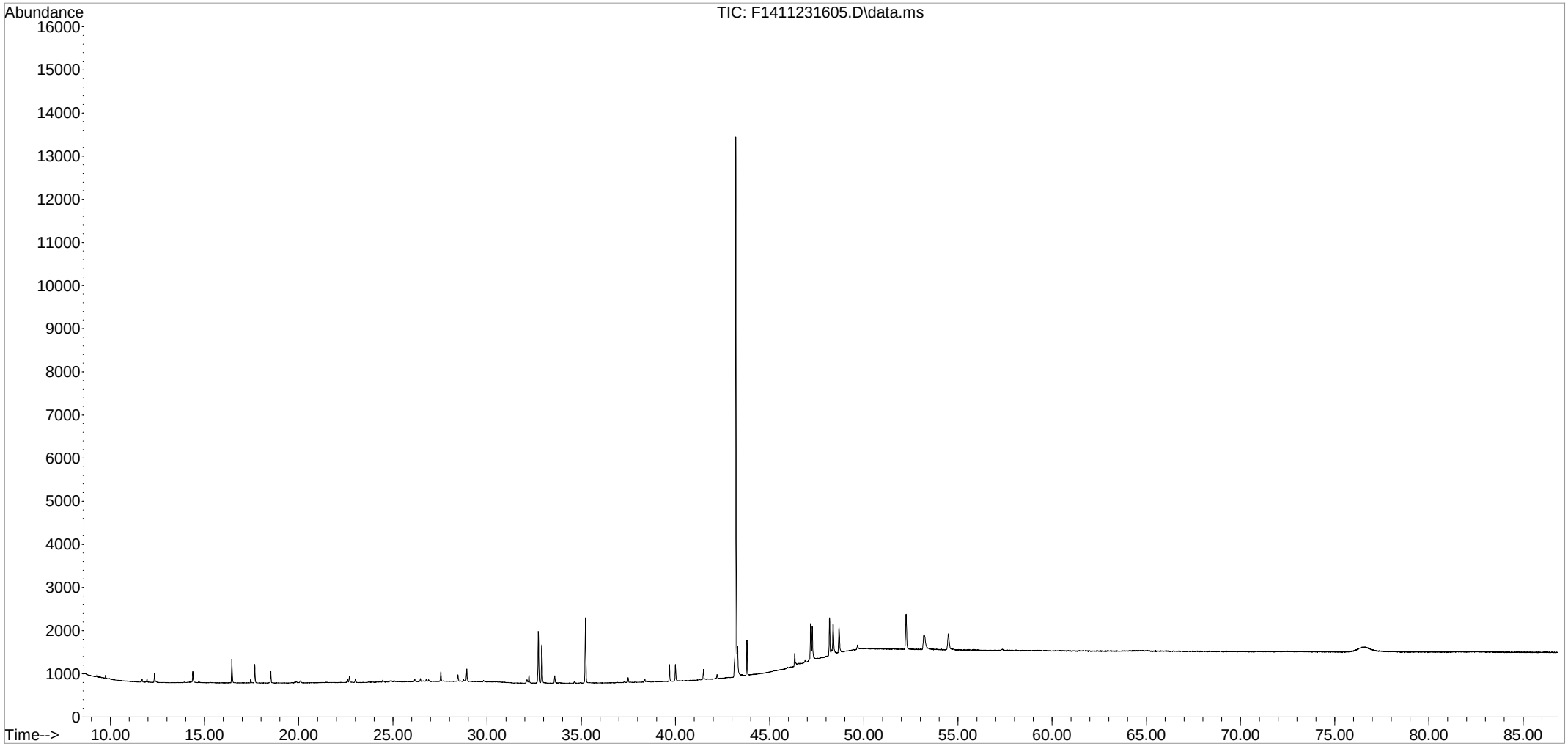
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231605.D
Acq On : 23 Nov 2016 5:39 pm
Operator : PAH14:AC
Sample : I1411251603
Misc : 1x frax30
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 25 11:06:59 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:28:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231606.D
Acq On : 23 Nov 2016 7:13 pm
Operator : PAH14:AC
Sample : I1411251604
Misc : 1x frax92
ALS Vial : 6 Sample Multiplier: 1

MAL
11/28/16

Quant Time: Nov 25 11:07:06 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:28:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.201	240	39350	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.797	217	5891	458.987	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 45.90%#			
Target Compounds						Qvalue
2) Hopane (T19)	52.245	191	9998	382.850	ng/mL#	87
3) 17a(H),21B(H)-hopane - C3	52.245	191	9998	382.850	ng/mL#	87

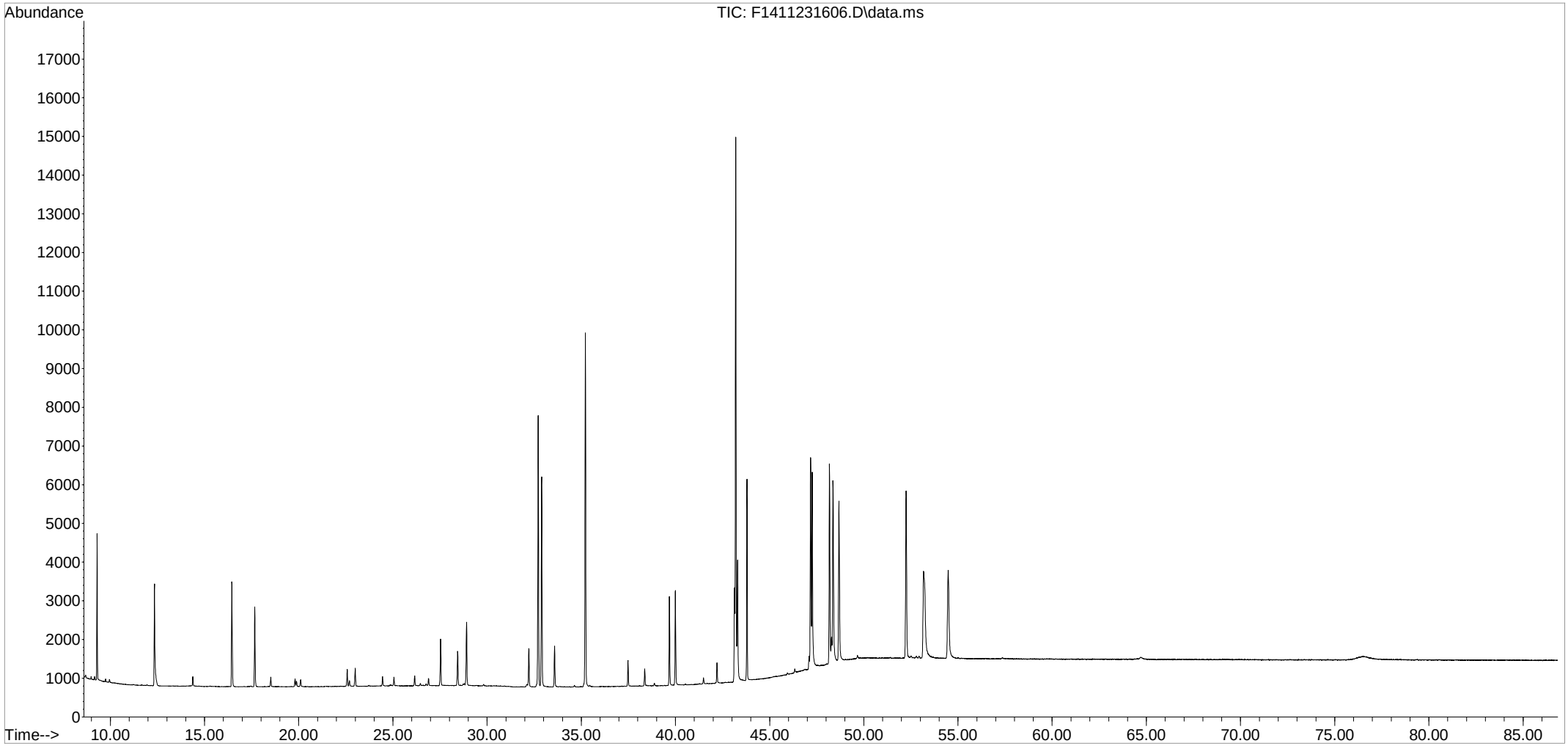
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231606.D
Acq On : 23 Nov 2016 7:13 pm
Operator : PAH14:AC
Sample : I1411251604
Misc : 1x frax92
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 25 11:07:06 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:28:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231607.D
Acq On : 23 Nov 2016 8:47 pm
Operator : PAH14:AC
Sample : I1411251605
Misc : 1x frax32
ALS Vial : 7 Sample Multiplier: 1

MAL
11/28/16

Quant Time: Nov 25 11:07:14 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:28:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.201	240	47932	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.797	217	84116	5380.332	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 538.03%#			
Target Compounds						Qvalue
2) Hopane (T19)	52.252	191	134349M3	4223.471	ng/mL	
3) 17a(H),21B(H)-hopane - C3	52.252	191	134248M3	4220.296	ng/mL	

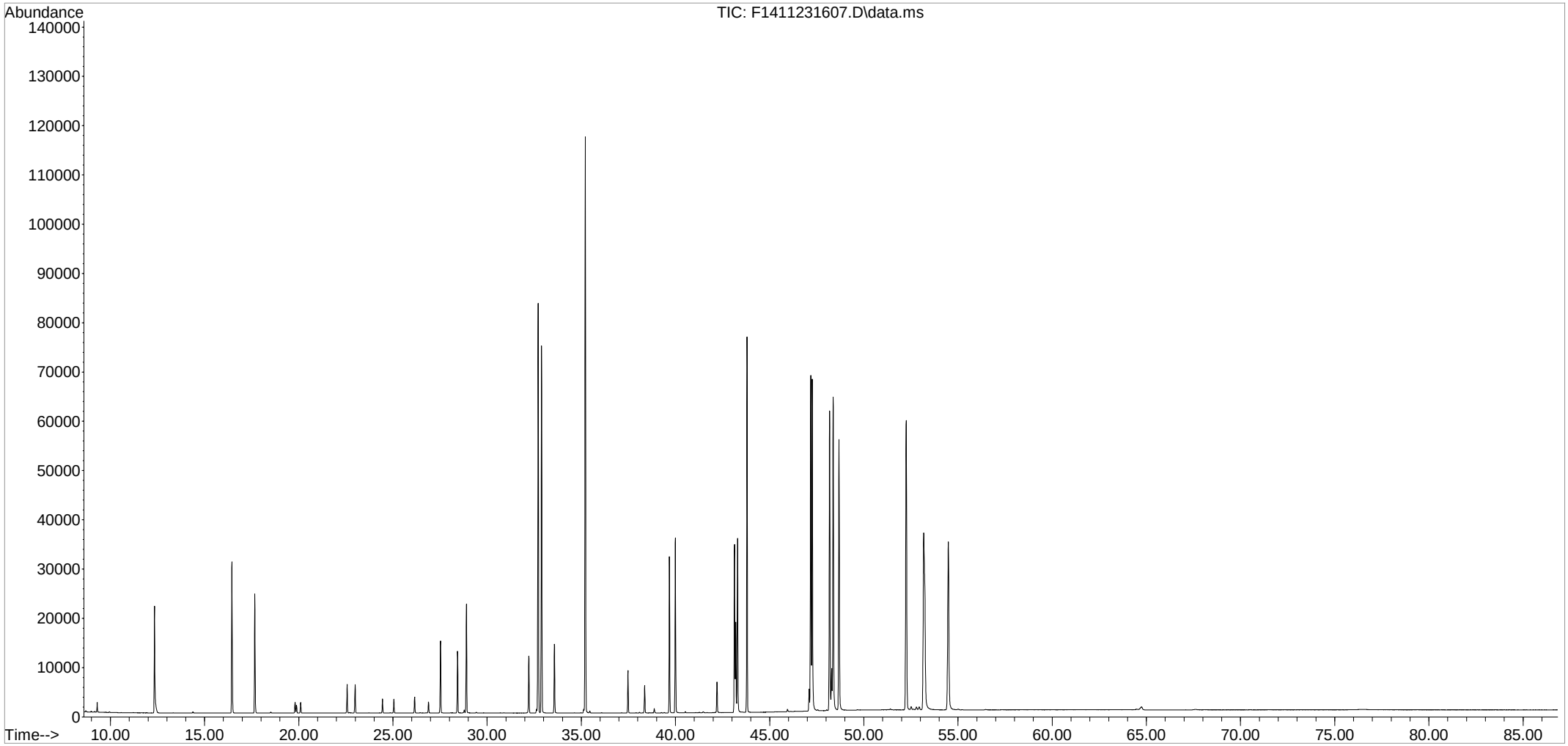
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231607.D
Acq On : 23 Nov 2016 8:47 pm
Operator : PAH14:AC
Sample : I1411251605
Misc : 1x frax32
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 25 11:07:14 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:28:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231608.D
Acq On : 23 Nov 2016 10:21 pm
Operator : PAH14:AC
Sample : I1411251606
Misc : 1x frax33
ALS Vial : 8 Sample Multiplier: 1

NAL
11/28/16

Quant Time: Nov 25 11:07:18 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:28:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.202	240	51091	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.805	217	180054	10804.741	ng/ml	0.00
Spiked Amount 1000.000	Range 50 - 130		Recovery = 1080.47%#			
Target Compounds						Qvalue
2) Hopane (T19)	52.253	191	297767	8781.988	ng/mL#	86
3) 17a(H),21B(H)-hopane - C3	52.253	191	297767	8781.988	ng/mL#	86

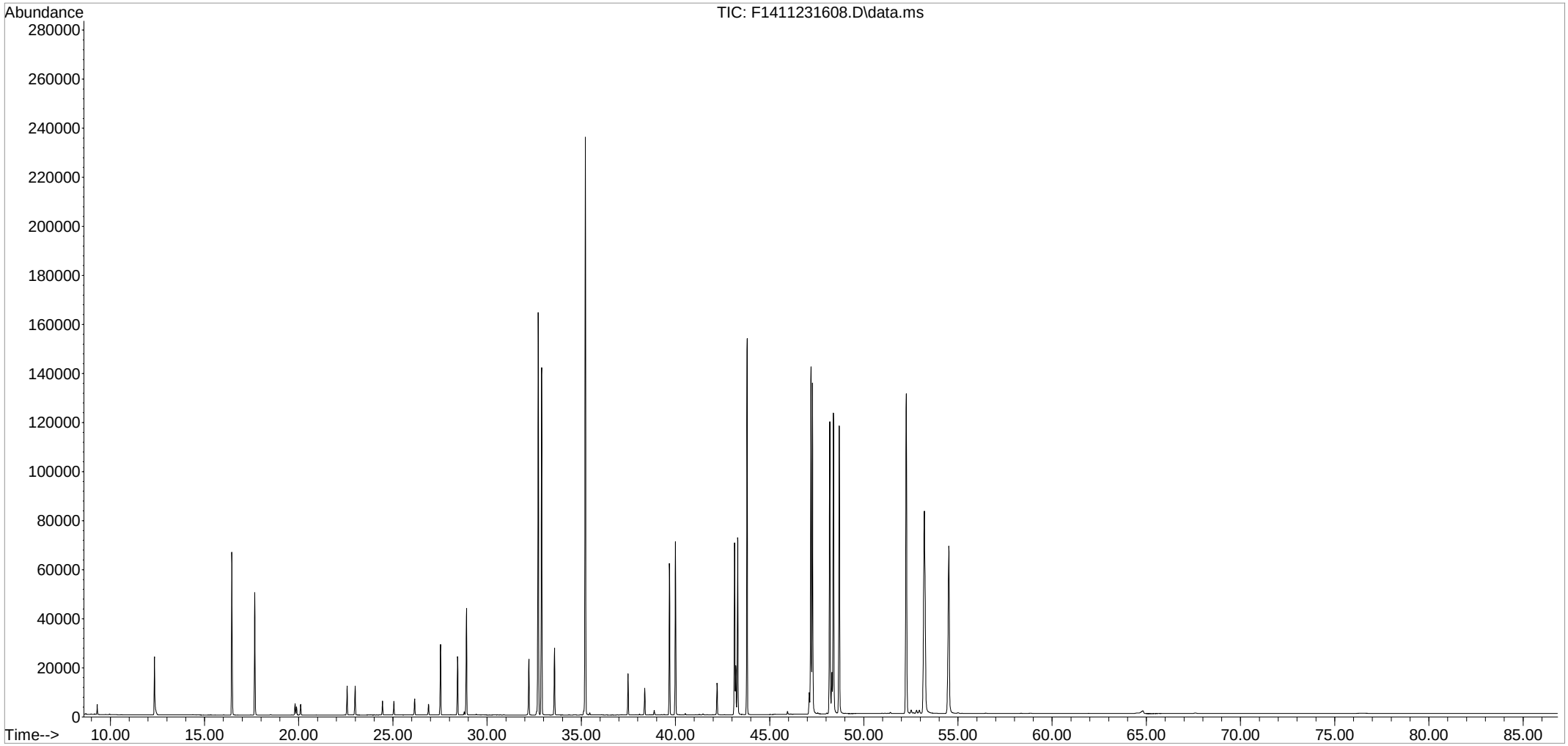
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov23\
Data File : F1411231608.D
Acq On : 23 Nov 2016 10:21 pm
Operator : PAH14:AC
Sample : I1411251606
Misc : 1x frax33
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Nov 25 11:07:18 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:28:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251639.D
Acq On : 28 Nov 2016 8:03 am
Operator : PAH14:AC
Sample : C1411251606
Misc : cc frax92
ALS Vial : 38 Sample Multiplier: 1

Quant Time: Nov 29 13:47:34 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Chrysene-d12	1.000	1.000	0.0	98	0.00
2	A1	Hopane (T19)	0.287	0.261	9.1	100	-0.02
3	A2	17a(H),21B(H)-hopane - C30H	0.287	0.261	9.1	100	-0.02
37	SA1	5B(H)Cholane - Surr	0.151	0.155	-2.6	101	-0.01

* Evaluation of CC level amount vs concentration.
(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251639.D
Acq On : 28 Nov 2016 8:03 am
Operator : PAH14:AC
Sample : C1411251606
Misc : cc frax92
ALS Vial : 38 Sample Multiplier: 1

NAL
12/7/16

Quant Time: Nov 29 13:47:34 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	38424	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	5937	510.026	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.00%			
Target Compounds						Qvalue
2) Hopane (T19)	52.237	191	10011	454.549	ng/mL#	86
3) 17a(H),21B(H)-hopane - C3	52.237	191	10011	454.549	ng/mL#	86

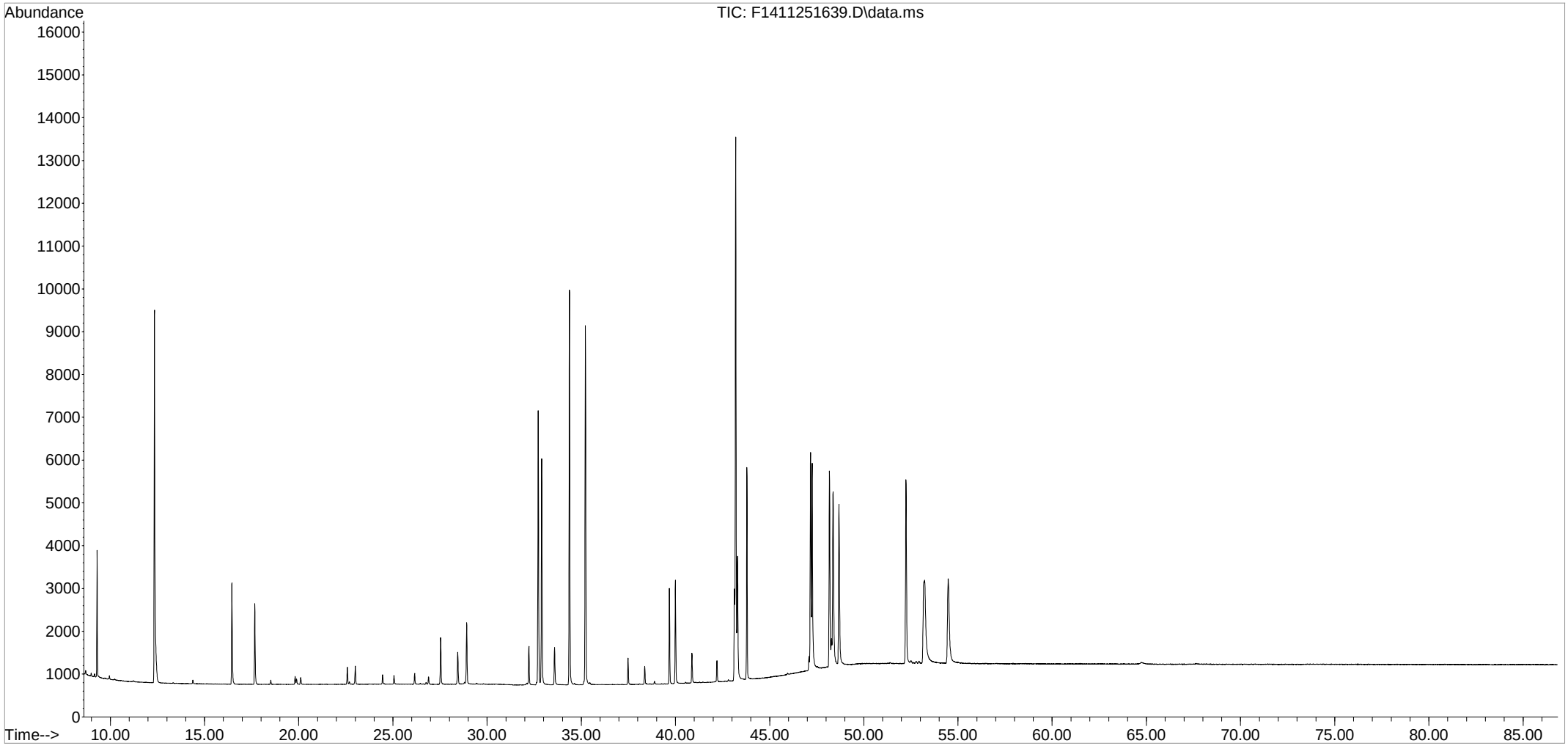
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251639.D
Acq On : 28 Nov 2016 8:03 am
Operator : PAH14:AC
Sample : C1411251606
Misc : cc frax92
ALS Vial : 38 Sample Multiplier: 1

Quant Time: Nov 29 13:47:34 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251654.D
Acq On : 29 Nov 2016 10:02 am
Operator : PAH14:AC
Sample : C1411251607
Misc : cc frax92 500ng/ml
ALS Vial : 52 Sample Multiplier: 1

Quant Time: Dec 01 15:44:42 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Chrysene-d12	1.000	1.000	0.0	96	0.00
2	A1	Hopane (T19)	0.287	0.273	4.9	103	-0.02
3	A2	17a(H),21B(H)-hopane - C30H	0.287	0.273	4.9	103	-0.02
37	SA1	5B(H)Cholane - Surr	0.151	0.157	-4.0	100	-0.01

* Evaluation of CC level amount vs concentration.
(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251654.D
Acq On : 29 Nov 2016 10:02 am
Operator : PAH14:AC
Sample : C1411251607
Misc : cc frax92 500ng/ml
ALS Vial : 52 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 01 15:44:42 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	37630	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	5916	518.946	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 51.89%			
Target Compounds						Qvalue
2) Hopane (T19)	52.238	191	10262	475.777	ng/mL#	86
3) 17a(H),21B(H)-hopane - C3	52.238	191	10262	475.777	ng/mL#	86

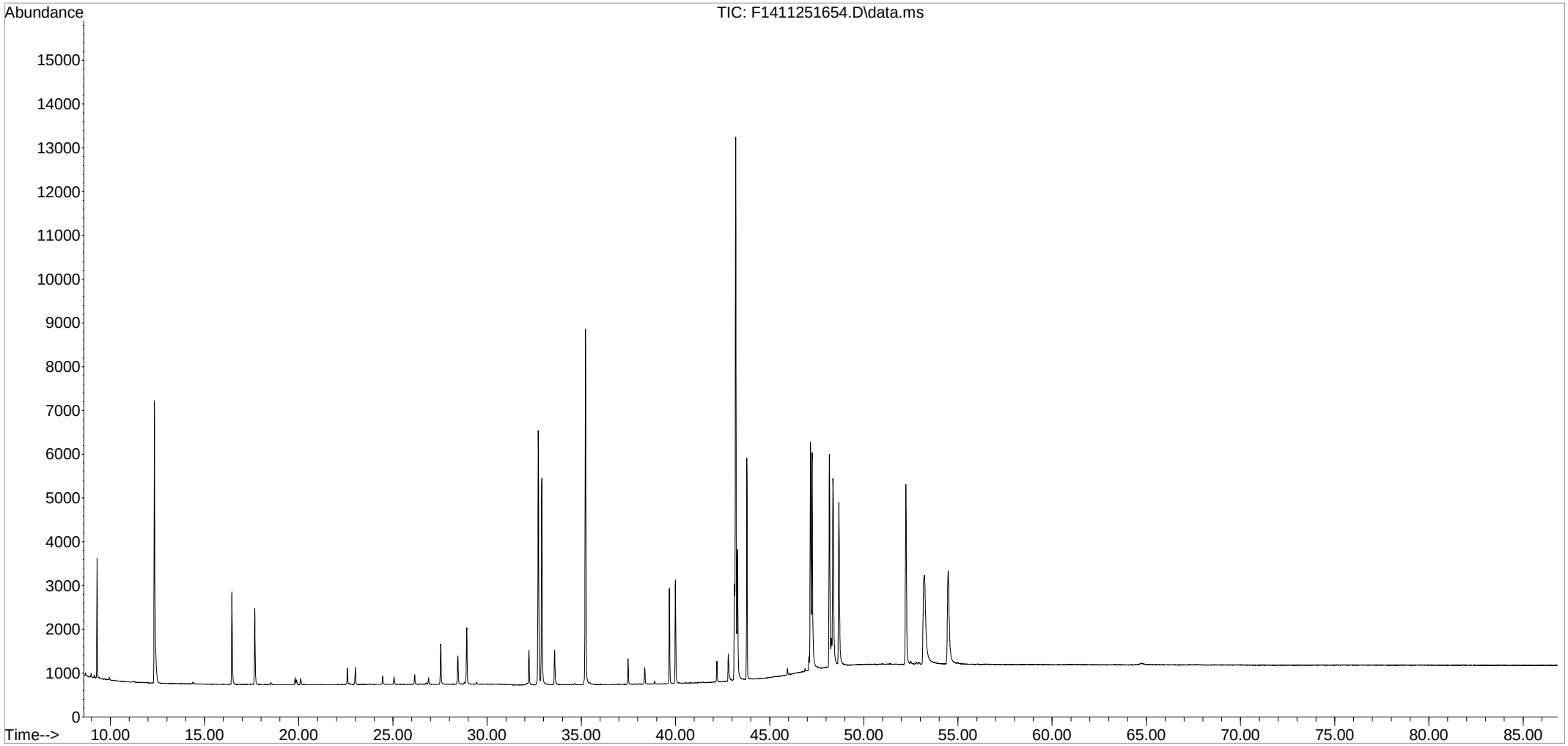
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251654.D
Acq On : 29 Nov 2016 10:02 am
Operator : PAH14:AC
Sample : C1411251607
Misc : cc frax92 500ng/ml
ALS Vial : 52 Sample Multiplier: 1

Quant Time: Dec 01 15:44:42 2016
Quant Method : C:\msdchem\1\METHODS\PAH14\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Evaluate Continuing Calibration Report

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251663.D
Acq On : 30 Nov 2016 12:13 am
Operator : PAH14:AC
Sample : c1411251608
Misc : cc frax92 500ng/ml
ALS Vial : 61 Sample Multiplier: 1

Quant Time: Dec 01 15:45:00 2016
Quant Method : O:\FORENSICS\DATA\PAH14\2016\NOV16\NOV25\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 10% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	i	Chrysene-d12	1.000	1.000	0.0	114	0.00
2	A1	Hopane (T19)	0.287	0.255	11.1	114	-0.02
3	A2	17a(H),21B(H)-hopane - C30H	0.287	0.255	11.1	114	-0.02
37	SA1	5B(H)Cholane - Surr	0.151	0.149	1.3	114	-0.01

* Evaluation of CC level amount vs concentration.
(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251663.D
Acq On : 30 Nov 2016 12:13 am
Operator : PAH14:AC
Sample : c1411251608
Misc : cc frax92 500ng/ml
ALS Vial : 61 Sample Multiplier: 1

MAL
12/7/16

Quant Time: Dec 01 15:45:00 2016
Quant Method : O:\FORENSICS\DATA\PAH14\2016\NOV16\NOV25\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Chrysene-d12	43.194	240	44878	500.000	ng/mL	# 0.00
System Monitoring Compounds						
37) 5B(H)Cholane - Surr	43.789	217	6696	492.504	ng/ml	-0.01
Spiked Amount 1000.000	Range 50 - 130		Recovery = 49.25%#			
Target Compounds						Qvalue
2) Hopane (T19)	52.230	191	11437	444.616	ng/mL#	87
3) 17a(H),21B(H)-hopane - C3	52.230	191	11437	444.616	ng/mL#	87

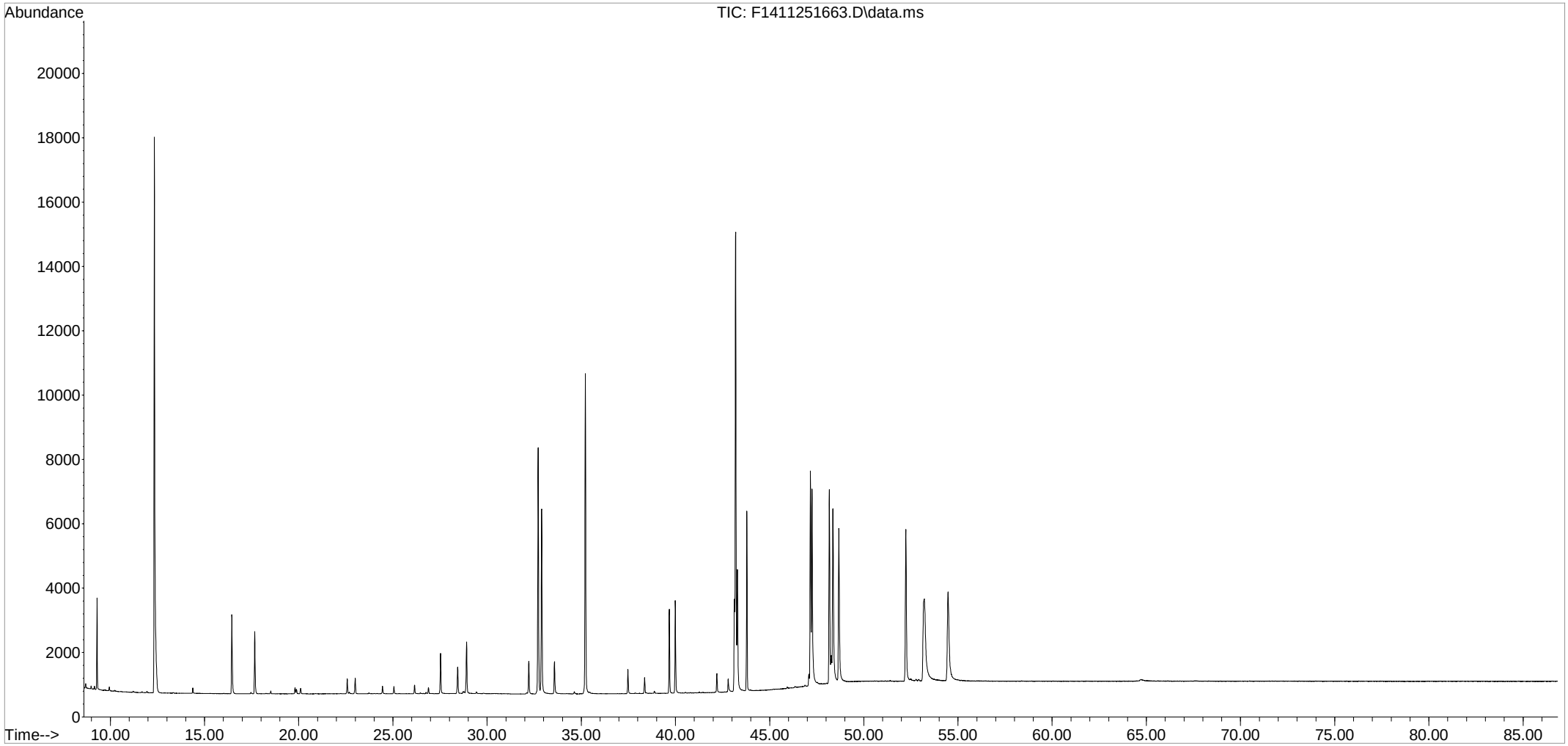
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : O:\Forensics\Data\PAH14\2016\Nov16\nov25\
Data File : F1411251663.D
Acq On : 30 Nov 2016 12:13 am
Operator : PAH14:AC
Sample : c1411251608
Misc : cc frax92 500ng/ml
ALS Vial : 61 Sample Multiplier: 1

Quant Time: Dec 01 15:45:00 2016
Quant Method : O:\FORENSICS\DATA\PAH14\2016\NOV16\NOV25\BIO14112316.M
Quant Title : Decalins & Alkylated PAH's
QLast Update : Thu Nov 24 07:37:36 2016
Response via : Initial Calibration

Sub List : ICAL_CCALT_REV2 - CC with five surrogates



Form VIII
Internal Standard Summary
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **C1411251606**

Case: **N/A** SDG: **N/A**

		Chrysene-d12	
		Area	**RT**
Standard:		38424	43.19
Upper Limit:		76848	43.69
Lower Limit:		19212	42.69
Client ID	**Lab ID**		
Blank	SO111016B02F1	31184	43.21
Blank	SO111116B03F1	31491	43.21
Blank	SW110716B01F1	34226	43.20
NFSB-02(MW)	1611004-01F1	42931	43.19
ENV-9MW	1611004-02F1	40600	43.19
ENV-9MW	1611004-02F1 D	41028	43.19
ENV-3MW	1611004-03F1	50198	43.19
NFNP-01	1611004-04F1	46942	43.19
NFNP-02	1611004-05F1	44273	43.19
NFNP-02	1611004-05F1 D	42422	43.19
NFNP-03	1611004-06F1	49218	43.19
CCV	C1411251607	37630	43.19

N/A - Not Applicable

Area Upper Limit = +100% of internal standard.
Area Lower Limit = -50% of internal standard.
RT = Retention Time.
RT Upper Limit = +0.5 minutes of internal standard RT.
RT Lower Limit = -0.5 minutes of internal standard RT.

12/07/16 08:40

Form VIII
Internal Standard Summary
Steranes and Triterpanes

Client: **NewFields**
Project: **National Grid Winter St. Haverhill**

Lab Code: **MA00030**
ETR: **1611004**
Lab ID: **C1411251607**

Case: **N/A** SDG: **N/A**

		Chrysene-d12	
		Area	**RT**
Standard:		37630	43.19
Upper Limit:		75260	43.69
Lower Limit:		18815	42.69
Client ID	**Lab ID**		
NFSB-08(MW)	1611004-07F1	41409	43.19
NFSB-01(MW)	1611004-08F1	43521	43.19
DUP-1	1611004-09F1	41704	43.19
DUP-1	1611004-09F1 D	46462	43.19
CCV	C1411251608	44878	43.19

N/A - Not Applicable

Area Upper Limit = +100% of internal standard.
Area Lower Limit = -50% of internal standard.
RT = Retention Time.
RT Upper Limit = +0.5 minutes of internal standard RT.
RT Lower Limit = -0.5 minutes of internal standard RT.

12/07/16 08:40

Chain of Custody Records

NewFields
Perspective. Vision. Solutions.

Chain of Custody

ETR # 1611004

Environmental Forensics Practice LLC

Proj. No	Proj. Name
01.0172397.00	Winter St

SAMPLERS: Signature: Andy Sogal, Maria Fistanley

ANALYSIS REQUESTED→ "NUMBER OF CONTANIERS"

DATE	TIME	LAB ID	CLIENT ID	SAMPLE DESCRIPTION	MATRIX (Oil/Soil/Water)	GC-FID-TPH (C_8+)	GCMS-Alkyl PAH	GCMS-Biomarkers	PIANO - VOA	Organic Lead	METALS	~~PCB~~ HRHF-FID	Pesticides	PRESERVED	Total Number of Containers
11-1-16	14:05	1611004-01	NFSB-02(MW)	LNAPL in monitoring well	oil	X	X	X				X			
11-1-16	14:40	-02	ENV-4MW	LNAPL in monitoring well	oil	X	X	X				X			
11-1-16	14:54	-03	ENV-3MW	LNAPL in monitoring well	oil	X	X	X				X			
11-1-16	16:30	-04	NFNP-01	NAPL taken from drainage pipe	oil	X	X	X				X			
11-1-16	15:50	-05	NFNP-02	Sheen seepage from base of streewall	oil	X	X	X				X			
11-1-16	15:35	-06	NFNP-03	Sheen on river surface	oil	X	X	X				X			

Relinquished by:	Date/Time	Received by:	Date/Time
Andy Sogal	11-1-16 20:30	AAC	11-2-16 12:50
AAC	11-2-16 13:21	Beth Bedard	11/2/16 13:21

Comments: Samples to be shipped to: Alpha Laboratory, 320 Forbes Blvd., Mansfield, MA 02048, Tel: (508) 822-9300, Attn: Sue O'Neil

* Extract + analyze samples, retain remaining sample volume. Contact PM prior to discarding remaining sample volume

NewFields
Perspective. Vision. Solutions.

Chain of Custody

FETR # 1611004

Environmental Forensics Practice LLC

Proj. No	Proj. Name
01.0172397.00	Winter St

SAMPLERS: Signature

ANALYSIS REQUESTED→ "NUMBER OF CONTANIERS"

DATE	TIME	LAB ID	CLIENT ID	SAMPLE DESCRIPTION	MATRIX (Oil/Soil/Water)	GC-FID-TPH (C_8+)	GCMS-Alkyl PAH	GCMS-Biomarkers	PIANO - VOA	Organic Lead	METALS	~~PCB~~ HRHF-FID	Pesticides	PRESERVED	Total Number of Containers
11-1-16	12:33	1611004-07	NFSB-08 (MW)	GW from monitoring well	GW	X	X	X				X			2
11-1-16	14:45	-08	NFSB-01 (MW	GW from monitoring well	GW	X	X	X				X			2
11-1-16	PM	-09	DUP-1	GW from monitoring well	GW	X	X	X				X			2

Relinquished by:	Date/Time		Received by:	Date/Time	
	11-1-16	20:30		11-2-16	12:50
Relinquished by:	Date/Time		Received by:	Date/Time	
	11-2-16	13:21		11/2/16	13:21

Comments: Samples to be shipped to: Alpha Laboratory
320 Forbes Blvd.
Mansfield, MA 02048
Tel: (508) 822-9300
Attn: Sue O'Neil

Laboratory Job No: 1611004 **Client:** Newfields
Receipt Date/Time: 11/2/16 13:21 **SDG Reviewer:** Bethany Bedard

Samples Delivered By:
[✓] Alpha Courier [ ] Client [ ] UPS [ ] FedEx [ ] Other _____
Bill of Laden: [ ]Yes [ ] Unavailable Tracking #: N/A

Chain of Custody: [✓] Present [ ] Absent:_____
Custody Seals: [✓] Absent [ ] Present/Intact [ ] Present/Broken

Cooler/Sample Temperature:
Is Ice/Blue Ice present? [✓] Yes [ ] No [ ] N/A_____

Temp taken from: Temp Blank:(a)_____ (b)_____ (c)_____ (d)_____ (e)_____
IR Gun: (a) 4.4 (b) 4.0 (c)_____ (d)_____ (e)_____
IR Gun Serial #: 9849
Was Temp: [✓] 2-6 Celsius
[ ] <2 Celsius ... were samples frozen upon receipt? [ ] Yes [ ] No
[ ] >6 Celsius ... were samples delivered direct from site? [ ] Yes [ ] No

Containers Received: [✓] Intact
[ ] Broken/Leaking Sample IDs:_____
Sample IDs:_____

All Containers Accounted For? [✓] Yes
[ ] No: _____
Extra Samples Received? [✓] No
[ ] Yes: _____
Do Sample Labels and COC agree? [✓] Yes
[ ] No: _____

Are Samples in Appropriate Containers? [✓] Yes
[ ] No: _____
Are samples rec'd within holding time? [✓] Yes
[ ] No:_____
* Please note: the analysis of pH will always be performed beyond the regulatory-required holding time of 15 min. from the time of collection.

pH of samples upon receipt: [✓] N/A [ ] <2 [ ] >12 and/or [ ] _____
Are samples properly preserved? [ ] Yes [ ] No If No then.....
Initial pH= _____ preserved In-House with [ ] HCL [ ] H_2SO_4 [ ] HNO_3 [ ] NAOH <<Final pH = _____>>
Other Issues:_____
Chlorine Check: [ ] N/A [ ] Present [ ] Absent

VOA/VPH vials: [ ] Yes [✓] No Preserved? [ ] Yes [ ] No If yes: [ ] HCL, [ ] _____
Aqueous: vials contain head space? [ ] No [ ] Yes :_____
Soils: MeOH covering soil? [ ] Yes [ ] No :_____
Reagent H_2O Preserved vials Frozen @ date/time: _____
Frozen by Client? [ ] No [ ] Yes @ date/time:_____

Was Client notified of any discrepancies listed above? [ ] Yes [ ] No [X] N/A
If Yes: Call Tracker #_____

ANALYTICAL REPORT

Lab Number:	L2006490
Client:	GZA GeoEnvironmental, Inc. 249 Vanderbilt Ave. Norwood, MA 02062
ATTN:	Kyle Maxfield
Phone:	(781) 278-5845
Project Name:	284 WINTER ST
Project Number:	01.0172397.10
Report Date:	02/20/20

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508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2006490
Report Date: 02/20/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2006490-01	B102	WATER	HAVERHILL, MA	02/12/20 09:55	02/13/20
L2006490-02	ENV-1MW	WATER	HAVERHILL, MA	02/12/20 11:40	02/13/20
L2006490-03	B106	WATER	HAVERHILL, MA	02/12/20 08:30	02/13/20
L2006490-04	MW-2	WATER	HAVERHILL, MA	02/12/20 12:21	02/13/20
L2006490-05	ENV-5MW	WATER	HAVERHILL, MA	02/12/20 13:55	02/13/20
L2006490-06	MW-3	WATER	HAVERHILL, MA	02/12/20 16:40	02/13/20

Project Name: 284 WINTER ST **Lab Number:** L2006490

Project Number: 01.0172397.10 **Report Date:** 02/20/20

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	YES
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	NO
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	284 WINTER ST	**Lab Number:**	L2006490
Project Number:	01.0172397.10	**Report Date:**	02/20/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	284 WINTER ST	**Lab Number:**	L2006490
Project Number:	01.0172397.10	**Report Date:**	02/20/20

Case Narrative (continued)

MCP Related Narratives

EPH

In reference to question G:

L2006490-01 and -05: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

L2006490-01: The surrogate recoveries are below the acceptance criteria for chloro-octadecane (0%) and o-terphenyl (0%) due to the dilution required to quantitate the sample. Re-extraction was not required; therefore, the results of the original analysis are reported.

VPH

In reference to question G:

L2006490-01 through -05: One or more of the target analytes did not achieve the requested CAM reporting limits.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Caitlin Walukevich

Caitlin Walukevich

Title: Technical Director/Representative

Date: 02/20/20

QC OUTLIER SUMMARY REPORT

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2006490
Report Date: 02/20/20

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
Extractable Petroleum Hydrocarbons - Westborough Lab								
EPH-04-1.1	B102	L2006490-01 D	Chloro-Octadecane	Surrogate	0	40-140	-	- - not applicable - -
EPH-04-1.1	B102	L2006490-01 D	o-Terphenyl	Surrogate	0	40-140	-	- - not applicable - -

ORGANICS

PETROLEUM HYDROCARBONS

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-01	D	Date Collected:	02/12/20 09:55
Client ID:	B102		Date Received:	02/13/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	02/15/20 16:34
Analyst:	BAD

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	5000	--	50
C9-C12 Aliphatics	29600		ug/l	5000	--	50
C9-C10 Aromatics	19900		ug/l	5000	--	50
C5-C8 Aliphatics, Adjusted	ND		ug/l	5000	--	50
C9-C12 Aliphatics, Adjusted	ND		ug/l	5000	--	50
Benzene	ND		ug/l	100	--	50
Toluene	ND		ug/l	100	--	50
Ethylbenzene	2180		ug/l	100	--	50
p/m-Xylene	5150		ug/l	100	--	50
o-Xylene	2720		ug/l	100	--	50
Methyl tert butyl ether	ND		ug/l	150	--	50
Naphthalene	4910		ug/l	200	--	50

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	111		70-130
2,5-Dibromotoluene-FID	102		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-01	D	Date Collected:	02/12/20 09:55
Client ID:	B102		Date Received:	02/13/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Water		Extraction Method:	EPA 3510C
Analytical Method:	98,EPH-04-1.1		Extraction Date:	02/15/20 09:43
Analytical Date:	02/18/20 16:21		Cleanup Method1:	EPH-04-1
Analyst:	SC		Cleanup Date1:	02/15/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	2000	--	20
C19-C36 Aliphatics	ND		ug/l	2000	--	20
C11-C22 Aromatics	3510		ug/l	2000	--	20
C11-C22 Aromatics, Adjusted	ND		ug/l	2000	--	20
Naphthalene	2000		ug/l	200	--	20
2-Methylnaphthalene	220		ug/l	200	--	20
Acenaphthylene	ND		ug/l	200	--	20
Acenaphthene	ND		ug/l	200	--	20
Fluorene	ND		ug/l	200	--	20
Phenanthrene	ND		ug/l	200	--	20
Anthracene	ND		ug/l	200	--	20
Fluoranthene	ND		ug/l	200	--	20
Pyrene	ND		ug/l	200	--	20
Benzo(a)anthracene	ND		ug/l	200	--	20
Chrysene	ND		ug/l	200	--	20
Benzo(b)fluoranthene	ND		ug/l	200	--	20
Benzo(k)fluoranthene	ND		ug/l	200	--	20
Benzo(a)pyrene	ND		ug/l	200	--	20
Indeno(1,2,3-cd)Pyrene	ND		ug/l	200	--	20
Dibenzo(a,h)anthracene	ND		ug/l	200	--	20
Benzo(ghi)perylene	ND		ug/l	200	--	20

Project Name: 284 WINTER ST **Lab Number:** L2006490

Project Number: 01.0172397.10 **Report Date:** 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-01	D	Date Collected:	02/12/20 09:55
Client ID:	B102		Date Received:	02/13/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**0**	Q	40-140
o-Terphenyl	**0**	Q	40-140
2-Fluorobiphenyl	64		40-140
2-Bromonaphthalene	66		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-02	Date Collected:	02/12/20 11:40
Client ID:	ENV-1MW	Date Received:	02/13/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/15/20 09:43
Analytical Date:	02/16/20 13:23	Cleanup Method1:	EPH-04-1
Analyst:	SC	Cleanup Date1:	02/15/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	172		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1
Naphthalene	ND		ug/l	10.0	--	1
2-Methylnaphthalene	ND		ug/l	10.0	--	1
Acenaphthylene	ND		ug/l	10.0	--	1
Acenaphthene	ND		ug/l	10.0	--	1
Fluorene	ND		ug/l	10.0	--	1
Phenanthrene	ND		ug/l	10.0	--	1
Anthracene	ND		ug/l	10.0	--	1
Fluoranthene	ND		ug/l	10.0	--	1
Pyrene	ND		ug/l	10.0	--	1
Benzo(a)anthracene	ND		ug/l	10.0	--	1
Chrysene	ND		ug/l	10.0	--	1
Benzo(b)fluoranthene	ND		ug/l	10.0	--	1
Benzo(k)fluoranthene	ND		ug/l	10.0	--	1
Benzo(a)pyrene	ND		ug/l	10.0	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	10.0	--	1
Dibenzo(a,h)anthracene	ND		ug/l	10.0	--	1
Benzo(ghi)perylene	ND		ug/l	10.0	--	1

Project Name: 284 WINTER ST **Lab Number:** L2006490

Project Number: 01.0172397.10 **Report Date:** 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-02	Date Collected:	02/12/20 11:40
Client ID:	ENV-1MW	Date Received:	02/13/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	60		40-140
o-Terphenyl	75		40-140
2-Fluorobiphenyl	83		40-140
2-Bromonaphthalene	84		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-02	D	Date Collected:	02/12/20 11:40
Client ID:	ENV-1MW		Date Received:	02/13/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	02/15/20 17:05
Analyst:	BAD

Trap: EST, Carbopack B/Carboxen 1000&1001

Analytical Column: Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	2000	--	20
C9-C12 Aliphatics	12000		ug/l	2000	--	20
C9-C10 Aromatics	6150		ug/l	2000	--	20
C5-C8 Aliphatics, Adjusted	ND		ug/l	2000	--	20
C9-C12 Aliphatics, Adjusted	ND		ug/l	2000	--	20
Benzene	ND		ug/l	40.0	--	20
Toluene	308		ug/l	40.0	--	20
Ethylbenzene	2280		ug/l	40.0	--	20
p/m-Xylene	1410		ug/l	40.0	--	20
o-Xylene	1300		ug/l	40.0	--	20
Methyl tert butyl ether	ND		ug/l	60.0	--	20
Naphthalene	2220		ug/l	80.0	--	20

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	111		70-130
2,5-Dibromotoluene-FID	101		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-03	Date Collected:	02/12/20 08:30
Client ID:	B106	Date Received:	02/13/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/15/20 09:43
Analytical Date:	02/16/20 13:55	Cleanup Method1:	EPH-04-1
Analyst:	SC	Cleanup Date1:	02/15/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	616		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	660		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	547		ug/l	100	--	1
Naphthalene	48.9		ug/l	10.0	--	1
2-Methylnaphthalene	ND		ug/l	10.0	--	1
Acenaphthylene	20.0		ug/l	10.0	--	1
Acenaphthene	15.8		ug/l	10.0	--	1
Fluorene	10.3		ug/l	10.0	--	1
Phenanthrene	18.2		ug/l	10.0	--	1
Anthracene	ND		ug/l	10.0	--	1
Fluoranthene	ND		ug/l	10.0	--	1
Pyrene	ND		ug/l	10.0	--	1
Benzo(a)anthracene	ND		ug/l	10.0	--	1
Chrysene	ND		ug/l	10.0	--	1
Benzo(b)fluoranthene	ND		ug/l	10.0	--	1
Benzo(k)fluoranthene	ND		ug/l	10.0	--	1
Benzo(a)pyrene	ND		ug/l	10.0	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	10.0	--	1
Dibenzo(a,h)anthracene	ND		ug/l	10.0	--	1
Benzo(ghi)perylene	ND		ug/l	10.0	--	1

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

SAMPLE RESULTS

Lab ID: L2006490-03
Client ID: B106
Sample Location: HAVERHILL, MA
Date Collected: 02/12/20 08:30
Date Received: 02/13/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	57		40-140
o-Terphenyl	60		40-140
2-Fluorobiphenyl	69		40-140
2-Bromonaphthalene	70		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-03	D	Date Collected:	02/12/20 08:30
Client ID:	B106		Date Received:	02/13/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	02/15/20 17:35
Analyst:	BAD

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	6910		ug/l	5000	--	50
C9-C12 Aliphatics	17000		ug/l	5000	--	50
C9-C10 Aromatics	10200		ug/l	5000	--	50
C5-C8 Aliphatics, Adjusted	ND		ug/l	5000	--	50
C9-C12 Aliphatics, Adjusted	ND		ug/l	5000	--	50
Benzene	3680		ug/l	100	--	50
Toluene	688		ug/l	100	--	50
Ethylbenzene	2570		ug/l	100	--	50
p/m-Xylene	2180		ug/l	100	--	50
o-Xylene	1580		ug/l	100	--	50
Methyl tert butyl ether	ND		ug/l	150	--	50
Naphthalene	9950		ug/l	200	--	50

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	106		70-130
2,5-Dibromotoluene-FID	99		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-04	Date Collected:	02/12/20 12:21
Client ID:	MW-2	Date Received:	02/13/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/15/20 09:43
Analytical Date:	02/20/20 08:20	Cleanup Method1:	EPH-04-1
Analyst:	LL	Cleanup Date1:	02/15/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	449		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	250		ug/l	100	--	1
Naphthalene	165		ug/l	10.0	--	1
2-Methylnaphthalene	33.8		ug/l	10.0	--	1
Acenaphthylene	ND		ug/l	10.0	--	1
Acenaphthene	ND		ug/l	10.0	--	1
Fluorene	ND		ug/l	10.0	--	1
Phenanthrene	ND		ug/l	10.0	--	1
Anthracene	ND		ug/l	10.0	--	1
Fluoranthene	ND		ug/l	10.0	--	1
Pyrene	ND		ug/l	10.0	--	1
Benzo(a)anthracene	ND		ug/l	10.0	--	1
Chrysene	ND		ug/l	10.0	--	1
Benzo(b)fluoranthene	ND		ug/l	10.0	--	1
Benzo(k)fluoranthene	ND		ug/l	10.0	--	1
Benzo(a)pyrene	ND		ug/l	10.0	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	10.0	--	1
Dibenzo(a,h)anthracene	ND		ug/l	10.0	--	1
Benzo(ghi)perylene	ND		ug/l	10.0	--	1

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

SAMPLE RESULTS

Lab ID: L2006490-04
Client ID: MW-2
Sample Location: HAVERHILL, MA
Date Collected: 02/12/20 12:21
Date Received: 02/13/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	50		40-140
o-Terphenyl	61		40-140
2-Fluorobiphenyl	71		40-140
2-Bromonaphthalene	71		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-04	D	Date Collected:	02/12/20 12:21
Client ID:	MW-2		Date Received:	02/13/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	02/15/20 16:04
Analyst:	BAD

Trap: EST, Carbopack B/Carboxen 1000&1001

Analytical Column: Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	400	--	4
C9-C12 Aliphatics	867		ug/l	400	--	4
C9-C10 Aromatics	554		ug/l	400	--	4
C5-C8 Aliphatics, Adjusted	ND		ug/l	400	--	4
C9-C12 Aliphatics, Adjusted	ND		ug/l	400	--	4
Benzene	66.1		ug/l	8.00	--	4
Toluene	12.7		ug/l	8.00	--	4
Ethylbenzene	146		ug/l	8.00	--	4
p/m-Xylene	37.7		ug/l	8.00	--	4
o-Xylene	64.4		ug/l	8.00	--	4
Methyl tert butyl ether	34.5		ug/l	12.0	--	4
Naphthalene	402		ug/l	16.0	--	4

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	114		70-130
2,5-Dibromotoluene-FID	101		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-05	D	Date Collected:	02/12/20 13:55
Client ID:	ENV-5MW		Date Received:	02/13/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	02/15/20 18:06
Analyst:	BAD

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	13500		ug/l	5000	--	50
C9-C12 Aliphatics	7190		ug/l	5000	--	50
C9-C10 Aromatics	ND		ug/l	5000	--	50
C5-C8 Aliphatics, Adjusted	ND		ug/l	5000	--	50
C9-C12 Aliphatics, Adjusted	ND		ug/l	5000	--	50
Benzene	9730		ug/l	100	--	50
Toluene	382		ug/l	100	--	50
Ethylbenzene	1210		ug/l	100	--	50
p/m-Xylene	771		ug/l	100	--	50
o-Xylene	754		ug/l	100	--	50
Methyl tert butyl ether	ND		ug/l	150	--	50
Naphthalene	3700		ug/l	200	--	50

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	107		70-130
2,5-Dibromotoluene-FID	97		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-05	D	Date Collected:	02/12/20 13:55
Client ID:	ENV-5MW		Date Received:	02/13/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Water		Extraction Method:	EPA 3510C
Analytical Method:	98,EPH-04-1.1		Extraction Date:	02/15/20 09:43
Analytical Date:	02/17/20 15:15		Cleanup Method1:	EPH-04-1
Analyst:	SC		Cleanup Date1:	02/15/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	1000	--	10
C19-C36 Aliphatics	ND		ug/l	1000	--	10
C11-C22 Aromatics	3660		ug/l	1000	--	10
C11-C22 Aromatics, Adjusted	1750		ug/l	1000	--	10
Naphthalene	1580		ug/l	100	--	10
2-Methylnaphthalene	322		ug/l	100	--	10
Acenaphthylene	ND		ug/l	100	--	10
Acenaphthene	ND		ug/l	100	--	10
Fluorene	ND		ug/l	100	--	10
Phenanthrene	ND		ug/l	100	--	10
Anthracene	ND		ug/l	100	--	10
Fluoranthene	ND		ug/l	100	--	10
Pyrene	ND		ug/l	100	--	10
Benzo(a)anthracene	ND		ug/l	100	--	10
Chrysene	ND		ug/l	100	--	10
Benzo(b)fluoranthene	ND		ug/l	100	--	10
Benzo(k)fluoranthene	ND		ug/l	100	--	10
Benzo(a)pyrene	ND		ug/l	100	--	10
Indeno(1,2,3-cd)Pyrene	ND		ug/l	100	--	10
Dibenzo(a,h)anthracene	ND		ug/l	100	--	10
Benzo(ghi)perylene	ND		ug/l	100	--	10

Project Name: 284 WINTER ST **Lab Number:** L2006490

Project Number: 01.0172397.10 **Report Date:** 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-05	D	Date Collected:	02/12/20 13:55
Client ID:	ENV-5MW		Date Received:	02/13/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	69		40-140
o-Terphenyl	74		40-140
2-Fluorobiphenyl	85		40-140
2-Bromonaphthalene	86		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-06	Date Collected:	02/12/20 16:40
Client ID:	MW-3	Date Received:	02/13/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	02/15/20 15:33
Analyst:	BAD

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	134		ug/l	100	--	1
C9-C12 Aliphatics	493		ug/l	100	--	1
C9-C10 Aromatics	478		ug/l	100	--	1
C5-C8 Aliphatics, Adjusted	132		ug/l	100	--	1
C9-C12 Aliphatics, Adjusted	ND		ug/l	100	--	1
Benzene	2.80		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	3.23		ug/l	2.00	--	1
o-Xylene	4.48		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	195		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	114		70-130
2,5-Dibromotoluene-FID	98		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-06	Date Collected:	02/12/20 16:40
Client ID:	MW-3	Date Received:	02/13/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/15/20 09:43
Analytical Date:	02/16/20 15:30	Cleanup Method1:	EPH-04-1
Analyst:	SC	Cleanup Date1:	02/15/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	435		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	235		ug/l	100	--	1
Naphthalene	166		ug/l	10.0	--	1
2-Methylnaphthalene	33.9		ug/l	10.0	--	1
Acenaphthylene	ND		ug/l	10.0	--	1
Acenaphthene	ND		ug/l	10.0	--	1
Fluorene	ND		ug/l	10.0	--	1
Phenanthrene	ND		ug/l	10.0	--	1
Anthracene	ND		ug/l	10.0	--	1
Fluoranthene	ND		ug/l	10.0	--	1
Pyrene	ND		ug/l	10.0	--	1
Benzo(a)anthracene	ND		ug/l	10.0	--	1
Chrysene	ND		ug/l	10.0	--	1
Benzo(b)fluoranthene	ND		ug/l	10.0	--	1
Benzo(k)fluoranthene	ND		ug/l	10.0	--	1
Benzo(a)pyrene	ND		ug/l	10.0	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	10.0	--	1
Dibenzo(a,h)anthracene	ND		ug/l	10.0	--	1
Benzo(ghi)perylene	ND		ug/l	10.0	--	1

Project Name: 284 WINTER ST **Lab Number:** L2006490

Project Number: 01.0172397.10 **Report Date:** 02/20/20

SAMPLE RESULTS

Lab ID:	L2006490-06	Date Collected:	02/12/20 16:40
Client ID:	MW-3	Date Received:	02/13/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	56		40-140
o-Terphenyl	61		40-140
2-Fluorobiphenyl	71		40-140
2-Bromonaphthalene	71		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2006490
Report Date: 02/20/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 02/16/20 10:45
Analyst: SC

Extraction Method: EPA 3510C
Extraction Date: 02/15/20 09:43
Cleanup Method: EPH-04-1
Cleanup Date: 02/15/20

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-06 Batch: WG1341097-1					
C9-C18 Aliphatics	ND		ug/l	100	--
C19-C36 Aliphatics	ND		ug/l	100	--
C11-C22 Aromatics	ND		ug/l	100	--
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--
Naphthalene	ND		ug/l	10.0	--
2-Methylnaphthalene	ND		ug/l	10.0	--
Acenaphthylene	ND		ug/l	10.0	--
Acenaphthene	ND		ug/l	10.0	--
Fluorene	ND		ug/l	10.0	--
Phenanthrene	ND		ug/l	10.0	--
Anthracene	ND		ug/l	10.0	--
Fluoranthene	ND		ug/l	10.0	--
Pyrene	ND		ug/l	10.0	--
Benzo(a)anthracene	ND		ug/l	10.0	--
Chrysene	ND		ug/l	10.0	--
Benzo(b)fluoranthene	ND		ug/l	10.0	--
Benzo(k)fluoranthene	ND		ug/l	10.0	--
Benzo(a)pyrene	ND		ug/l	10.0	--
Indeno(1,2,3-cd)Pyrene	ND		ug/l	10.0	--
Dibenzo(a,h)anthracene	ND		ug/l	10.0	--
Benzo(ghi)perylene	ND		ug/l	10.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	64		40-140
o-Terphenyl	65		40-140
2-Fluorobiphenyl	72		40-140
2-Bromonaphthalene	73		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2006490
Report Date: 02/20/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 131,VPH-18-2.1
Analytical Date: 02/15/20 11:29
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-06 Batch: WG1342265-4					
C5-C8 Aliphatics	ND		ug/l	100	--
C9-C12 Aliphatics	ND		ug/l	100	--
C9-C10 Aromatics	ND		ug/l	100	--
C5-C8 Aliphatics, Adjusted	ND		ug/l	100	--
C9-C12 Aliphatics, Adjusted	ND		ug/l	100	--
Benzene	ND		ug/l	2.00	--
Toluene	ND		ug/l	2.00	--
Ethylbenzene	ND		ug/l	2.00	--
p/m-Xylene	ND		ug/l	2.00	--
o-Xylene	ND		ug/l	2.00	--
Methyl tert butyl ether	ND		ug/l	3.00	--
Naphthalene	ND		ug/l	4.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	96		70-130
2,5-Dibromotoluene-FID	88		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2006490
Report Date: 02/20/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-06 Batch: WG1341097-2 WG1341097-3								
C9-C18 Aliphatics	65		63		40-140	3		25
C19-C36 Aliphatics	68		67		40-140	1		25
C11-C22 Aromatics	60		66		40-140	10		25
Naphthalene	55		59		40-140	7		25
2-Methylnaphthalene	57		61		40-140	7		25
Acenaphthylene	56		59		40-140	5		25
Acenaphthene	60		64		40-140	6		25
Fluorene	59		63		40-140	7		25
Phenanthrene	60		65		40-140	8		25
Anthracene	61		66		40-140	8		25
Fluoranthene	60		67		40-140	11		25
Pyrene	60		67		40-140	11		25
Benzo(a)anthracene	60		67		40-140	11		25
Chrysene	61		67		40-140	9		25
Benzo(b)fluoranthene	59		65		40-140	10		25
Benzo(k)fluoranthene	60		66		40-140	10		25
Benzo(a)pyrene	60		65		40-140	8		25
Indeno(1,2,3-cd)Pyrene	58		64		40-140	10		25
Dibenzo(a,h)anthracene	59		64		40-140	8		25
Benzo(ghi)perylene	56		60		40-140	7		25
Nonane (C9)	53		52		30-140	2		25
Decane (C10)	59		58		40-140	2		25
Dodecane (C12)	63		62		40-140	2		25

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-06 Batch: WG1341097-2 WG1341097-3								
Tetradecane (C14)	64		62		40-140	3		25
Hexadecane (C16)	66		64		40-140	3		25
Octadecane (C18)	66		65		40-140	2		25
Nonadecane (C19)	65		64		40-140	2		25
Eicosane (C20)	66		65		40-140	2		25
Docosane (C22)	67		66		40-140	2		25
Tetracosane (C24)	65		65		40-140	0		25
Hexacosane (C26)	65		65		40-140	0		25
Octacosane (C28)	65		65		40-140	0		25
Triacontane (C30)	66		66		40-140	0		25
Hexatriacontane (C36)	70		69		40-140	1		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	61		62		40-140
o-Terphenyl	60		64		40-140
2-Fluorobiphenyl	66		75		40-140
2-Bromonaphthalene	67		76		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-06 Batch: WG1342265-2 WG1342265-3								
C5-C8 Aliphatics	99		109		70-130	10		25
C9-C12 Aliphatics	99		109		70-130	9		25
C9-C10 Aromatics	100		110		70-130	10		25
Benzene	95		104		70-130	9		25
Toluene	95		105		70-130	10		25
Ethylbenzene	99		109		70-130	10		25
p/m-Xylene	98		108		70-130	9		25
o-Xylene	97		107		70-130	9		25
Methyl tert butyl ether	97		104		70-130	7		25
Naphthalene	97		102		70-130	5		25
1,2,4-Trimethylbenzene	100		109		70-130	9		25
Pentane	101		110		70-130	9		25
2-Methylpentane	100		109		70-130	9		25
2,2,4-Trimethylpentane	97		106		70-130	9		25
n-Nonane	98		108		30-130	10		25
n-Decane	100		110		70-130	10		25
n-Butylcyclohexane	99		109		70-130	9		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,5-Dibromotoluene-PID	97		104		70-130
2,5-Dibromotoluene-FID	89		96		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2006490
Report Date: 02/20/20

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2006490-01A	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-01B	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-01C	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-01D	Amber 1000ml HCl preserved	A	<2	<2	2.1	Y	Absent		EPH-DELUX-10(14)
L2006490-01E	Amber 1000ml HCl preserved	A	<2	<2	2.1	Y	Absent		EPH-DELUX-10(14)
L2006490-02A	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-02B	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-02C	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-02D	Amber 1000ml HCl preserved	A	<2	<2	2.1	Y	Absent		EPH-DELUX-10(14)
L2006490-02E	Amber 1000ml HCl preserved	A	<2	<2	2.1	Y	Absent		EPH-DELUX-10(14)
L2006490-03A	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-03B	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-03C	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-03D	Amber 1000ml HCl preserved	A	<2	<2	2.1	Y	Absent		EPH-DELUX-10(14)
L2006490-03E	Amber 1000ml HCl preserved	A	<2	<2	2.1	Y	Absent		EPH-DELUX-10(14)
L2006490-04A	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-04B	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-04C	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-04D	Amber 1000ml HCl preserved	A	<2	<2	2.1	Y	Absent		EPH-DELUX-10(14)
L2006490-04E	Amber 1000ml HCl preserved	A	<2	<2	2.1	Y	Absent		EPH-DELUX-10(14)
L2006490-05A	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-05B	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-05C	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)

*Values in parentheses indicate holding time in days

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2006490
Report Date: 02/20/20

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2006490-05D	Amber 1000ml HCl preserved	A	<2	<2	2.1	Y	Absent		EPH-DELUX-10(14)
L2006490-05E	Amber 1000ml HCl preserved	A	<2	<2	2.1	Y	Absent		EPH-DELUX-10(14)
L2006490-06A	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-06B	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-06C	Vial HCl preserved	A	NA		2.1	Y	Absent		VPH-DELUX-18(14)
L2006490-06D	Amber 1000ml HCl preserved	A	<2	<2	2.1	Y	Absent		EPH-DELUX-10(14)
L2006490-06E	Amber 1000ml HCl preserved	A	<2	<2	2.1	Y	Absent		EPH-DELUX-10(14)

*Values in parentheses indicate holding time in days

Project Name:	284 WINTER ST	**Lab Number:**	L2006490
Project Number:	01.0172397.10	**Report Date:**	02/20/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

Report Format: Data Usability Report

Project Name:	284 WINTER ST	**Lab Number:**	L2006490
Project Number:	01.0172397.10	**Report Date:**	02/20/20

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2006490
Report Date: 02/20/20

Data Qualifiers

than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

Project Name: 284 WINTER ST **Lab Number:** L2006490
Project Number: 01.0172397.10 **Report Date:** 02/20/20

REFERENCES

98 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, May 2004, Revision 1.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, July 2010.

131 Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), MassDEP, February 2018, Revision 2.1 with QC Requirements & Performance Standards for the Analysis of VPH under the Massachusetts Contingency Plan, WSC-CAM-IVA, June 1, 2018.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
EPA TO-12 Non-methane organics
EPA 3C Fixed gases
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 2/13/20

ALPHA Job #: L2006490

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Client Information

Client: GZA GeoEnvironmental
Address: 249 Vanderbilt Ave, Norwood, MA
Phone: (781) 278-3700
Email: kyle.maxfield@gza.com

Additional Project Information:

Project Information

Project Name: 284 WINTER ST
Project Location: HAVERHILL, MA
Project #: 01.0172397.10
Project Manager: Kyle Maxfield
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)
Date Due:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☐ PCB ☐ PEST; TPH: ☐ Quant Only ☐ Fingerprint; EPH w/ targets; VPH

SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	EPH w/ targets	VPH	Sample Comments	Total # Bottles
06490-01	B102	2-12-20	955	GW	MDD	X	X		
02	ENV-1MW	↓	1140	↓	↓	X	X		
03	B106		0830			X	X		
04	MW-2		1221			X	X		
05	ENV-5MW		1355			X	X		
06	MW-3		1640			X	X		

ANALYTICAL REPORT

Lab Number:	L2019097
Client:	GZA GeoEnvironmental, Inc. 249 Vanderbilt Ave. Norwood, MA 02062
ATTN:	Kyle Maxfield
Phone:	(781) 278-5845
Project Name:	HAVERHILL FORMER MGP
Project Number:	01.0172397.10
Report Date:	05/15/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: HAVERHILL FORMER MGP
Project Number: 01.0172397.10

Lab Number: L2019097
Report Date: 05/15/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2019097-01	ENV-3MW	WATER	HAVERHILL, MA	05/07/20 09:35	05/08/20
L2019097-02	ENV-5MW	WATER	HAVERHILL, MA	05/07/20 09:40	05/08/20
L2019097-03	NFSB-01(MW)	WATER	HAVERHILL, MA	05/07/20 11:20	05/08/20
L2019097-04	MW-2	WATER	HAVERHILL, MA	05/07/20 11:45	05/08/20
L2019097-05	B106	WATER	HAVERHILL, MA	05/07/20 13:20	05/08/20
L2019097-06	B102	WATER	HAVERHILL, MA	05/07/20 13:45	05/08/20
L2019097-07	NFSB-08(MW)	WATER	HAVERHILL, MA	05/07/20 15:10	05/08/20

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	YES
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	NO
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	HAVERHILL FORMER MGP	**Lab Number:**	L2019097
Project Number:	01.0172397.10	**Report Date:**	05/15/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	HAVERHILL FORMER MGP	**Lab Number:**	L2019097
Project Number:	01.0172397.10	**Report Date:**	05/15/20

Case Narrative (continued)

MCP Related Narratives

VPH

In reference to question G:

L2019097-01 through -07: One or more of the target analytes did not achieve the requested CAM reporting limits.

EPH

In reference to question G:

L2019097-01 through -07: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

L2019097-01, -05, and -06: The surrogate recoveries are below the acceptance criteria for chloro-octadecane (0%) and o-terphenyl (0%) due to the dilution required to quantitate the sample. Re-extraction was not required; therefore, the results of the original analysis are reported.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Michelle M. Morris

Title: Technical Director/Representative

Date: 05/15/20

QC OUTLIER SUMMARY REPORT

Project Name: HAVERHILL FORMER MGP

Project Number: 01.0172397.10

Lab Number: L2019097

Report Date: 05/15/20

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
Extractable Petroleum Hydrocarbons - Westborough Lab								
EPH-19-2.1	ENV-3MW	L2019097-01 D	Chloro-Octadecane	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	ENV-3MW	L2019097-01 D	o-Terphenyl	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	B106	L2019097-05 D	Chloro-Octadecane	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	B106	L2019097-05 D	o-Terphenyl	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	B102	L2019097-06 D	Chloro-Octadecane	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	B102	L2019097-06 D	o-Terphenyl	Surrogate	0	40-140	-	- - not applicable - -

ORGANICS

PETROLEUM HYDROCARBONS

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-01	D	Date Collected:	05/07/20 09:35
Client ID:	ENV-3MW		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	05/12/20 20:27
Analyst:	BAD

Trap: EST, Carbopack B/Carboxen 1000&1001

Analytical Column: Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	11800		ug/l	5000	--	50
C9-C12 Aliphatics	14300		ug/l	5000	--	50
C9-C10 Aromatics	7930		ug/l	5000	--	50
C5-C8 Aliphatics, Adjusted	ND		ug/l	5000	--	50
C9-C12 Aliphatics, Adjusted	ND		ug/l	5000	--	50
Benzene	8820		ug/l	100	--	50
Toluene	ND		ug/l	100	--	50
Ethylbenzene	2900		ug/l	100	--	50
p/m-Xylene	1190		ug/l	100	--	50
o-Xylene	1590		ug/l	100	--	50
Methyl tert butyl ether	ND		ug/l	150	--	50
Naphthalene	8770		ug/l	200	--	50

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	111		70-130
2,5-Dibromotoluene-FID	104		70-130

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-01	D	Date Collected:	05/07/20 09:35
Client ID:	ENV-3MW		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Water		Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1		Extraction Date:	05/13/20 15:11
Analytical Date:	05/15/20 04:58		Cleanup Method1:	EPH-04-1
Analyst:	MEO		Cleanup Date1:	05/14/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	2000	--	20
C19-C36 Aliphatics	ND		ug/l	2000	--	20
C11-C22 Aromatics	5820		ug/l	2000	--	20
C11-C22 Aromatics, Adjusted	ND		ug/l	2000	--	20
Naphthalene	3630		ug/l	200	--	20
2-Methylnaphthalene	378		ug/l	200	--	20
Acenaphthylene	ND		ug/l	200	--	20
Acenaphthene	ND		ug/l	200	--	20
Fluorene	ND		ug/l	200	--	20
Phenanthrene	ND		ug/l	200	--	20
Anthracene	ND		ug/l	200	--	20
Fluoranthene	ND		ug/l	200	--	20
Pyrene	ND		ug/l	200	--	20
Benzo(a)anthracene	ND		ug/l	200	--	20
Chrysene	ND		ug/l	200	--	20
Benzo(b)fluoranthene	ND		ug/l	200	--	20
Benzo(k)fluoranthene	ND		ug/l	200	--	20
Benzo(a)pyrene	ND		ug/l	200	--	20
Indeno(1,2,3-cd)Pyrene	ND		ug/l	200	--	20
Dibenzo(a,h)anthracene	ND		ug/l	200	--	20
Benzo(ghi)perylene	ND		ug/l	200	--	20

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-01	D	Date Collected:	05/07/20 09:35
Client ID:	ENV-3MW		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**0**	Q	40-140
o-Terphenyl	**0**	Q	40-140
2-Fluorobiphenyl	56		40-140
2-Bromonaphthalene	59		40-140

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-02	D	Date Collected:	05/07/20 09:40
Client ID:	ENV-5MW		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	05/12/20 20:57
Analyst:	BAD

Trap: EST, Carbopack B/Carboxen 1000&1001

Analytical Column: Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	11300		ug/l	5000	--	50
C9-C12 Aliphatics	6030		ug/l	5000	--	50
C9-C10 Aromatics	5120		ug/l	5000	--	50
C5-C8 Aliphatics, Adjusted	ND		ug/l	5000	--	50
C9-C12 Aliphatics, Adjusted	ND		ug/l	5000	--	50
Benzene	8340		ug/l	100	--	50
Toluene	374		ug/l	100	--	50
Ethylbenzene	988		ug/l	100	--	50
p/m-Xylene	640		ug/l	100	--	50
o-Xylene	626		ug/l	100	--	50
Methyl tert butyl ether	ND		ug/l	150	--	50
Naphthalene	3200		ug/l	200	--	50

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	99		70-130
2,5-Dibromotoluene-FID	93		70-130

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-02	D	Date Collected:	05/07/20 09:40
Client ID:	ENV-5MW		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Water		Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1		Extraction Date:	05/13/20 15:11
Analytical Date:	05/15/20 05:23		Cleanup Method1:	EPH-04-1
Analyst:	MEO		Cleanup Date1:	05/14/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	1000	--	10
C19-C36 Aliphatics	ND		ug/l	1000	--	10
C11-C22 Aromatics	2790		ug/l	1000	--	10
C11-C22 Aromatics, Adjusted	1300		ug/l	1000	--	10
Naphthalene	1280		ug/l	100	--	10
2-Methylnaphthalene	215		ug/l	100	--	10
Acenaphthylene	ND		ug/l	100	--	10
Acenaphthene	ND		ug/l	100	--	10
Fluorene	ND		ug/l	100	--	10
Phenanthrene	ND		ug/l	100	--	10
Anthracene	ND		ug/l	100	--	10
Fluoranthene	ND		ug/l	100	--	10
Pyrene	ND		ug/l	100	--	10
Benzo(a)anthracene	ND		ug/l	100	--	10
Chrysene	ND		ug/l	100	--	10
Benzo(b)fluoranthene	ND		ug/l	100	--	10
Benzo(k)fluoranthene	ND		ug/l	100	--	10
Benzo(a)pyrene	ND		ug/l	100	--	10
Indeno(1,2,3-cd)Pyrene	ND		ug/l	100	--	10
Dibenzo(a,h)anthracene	ND		ug/l	100	--	10
Benzo(ghi)perylene	ND		ug/l	100	--	10

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-02	D	Date Collected:	05/07/20 09:40
Client ID:	ENV-5MW		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	64		40-140
o-Terphenyl	52		40-140
2-Fluorobiphenyl	55		40-140
2-Bromonaphthalene	57		40-140

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-03	D	Date Collected:	05/07/20 11:20
Client ID:	NFSB-01(MW)		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	05/12/20 21:27
Analyst:	BAD

Trap: EST, Carbopack B/Carboxen 1000&1001

Analytical Column: Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	1740		ug/l	1000	--	10
C9-C12 Aliphatics	3940		ug/l	1000	--	10
C9-C10 Aromatics	2730		ug/l	1000	--	10
C5-C8 Aliphatics, Adjusted	ND		ug/l	1000	--	10
C9-C12 Aliphatics, Adjusted	ND		ug/l	1000	--	10
Benzene	1020		ug/l	20.0	--	10
Toluene	37.4		ug/l	20.0	--	10
Ethylbenzene	620		ug/l	20.0	--	10
p/m-Xylene	183		ug/l	20.0	--	10
o-Xylene	207		ug/l	20.0	--	10
Methyl tert butyl ether	ND		ug/l	30.0	--	10
Naphthalene	477		ug/l	40.0	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	113		70-130
2,5-Dibromotoluene-FID	107		70-130

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-03	D	Date Collected:	05/07/20 11:20
Client ID:	NFSB-01(MW)		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Water		Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1		Extraction Date:	05/13/20 15:11
Analytical Date:	05/15/20 05:48		Cleanup Method1:	EPH-04-1
Analyst:	MEO		Cleanup Date1:	05/14/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	500	--	5
C19-C36 Aliphatics	ND		ug/l	500	--	5
C11-C22 Aromatics	1030		ug/l	500	--	5
C11-C22 Aromatics, Adjusted	828		ug/l	500	--	5
Naphthalene	200		ug/l	50.0	--	5
2-Methylnaphthalene	ND		ug/l	50.0	--	5
Acenaphthylene	ND		ug/l	50.0	--	5
Acenaphthene	ND		ug/l	50.0	--	5
Fluorene	ND		ug/l	50.0	--	5
Phenanthrene	ND		ug/l	50.0	--	5
Anthracene	ND		ug/l	50.0	--	5
Fluoranthene	ND		ug/l	50.0	--	5
Pyrene	ND		ug/l	50.0	--	5
Benzo(a)anthracene	ND		ug/l	50.0	--	5
Chrysene	ND		ug/l	50.0	--	5
Benzo(b)fluoranthene	ND		ug/l	50.0	--	5
Benzo(k)fluoranthene	ND		ug/l	50.0	--	5
Benzo(a)pyrene	ND		ug/l	50.0	--	5
Indeno(1,2,3-cd)Pyrene	ND		ug/l	50.0	--	5
Dibenzo(a,h)anthracene	ND		ug/l	50.0	--	5
Benzo(ghi)perylene	ND		ug/l	50.0	--	5

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-03	D	Date Collected:	05/07/20 11:20
Client ID:	NFSB-01(MW)		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	60		40-140
o-Terphenyl	51		40-140
2-Fluorobiphenyl	58		40-140
2-Bromonaphthalene	60		40-140

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-04	D	Date Collected:	05/07/20 11:45
Client ID:	MW-2		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 131,VPH-18-2.1
Analytical Date: 05/12/20 21:57
Analyst: BAD

Trap: EST, Carbopack B/Carboxen 1000&1001

Analytical Column: Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received: Satisfactory

Aqueous Preservative: Laboratory Provided Preserved Container

Sample Temperature upon receipt: Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	434		ug/l	400	--	4
C9-C12 Aliphatics	1140		ug/l	400	--	4
C9-C10 Aromatics	697		ug/l	400	--	4
C5-C8 Aliphatics, Adjusted	ND		ug/l	400	--	4
C9-C12 Aliphatics, Adjusted	ND		ug/l	400	--	4
Benzene	96.2		ug/l	8.00	--	4
Toluene	18.6		ug/l	8.00	--	4
Ethylbenzene	214		ug/l	8.00	--	4
p/m-Xylene	48.7		ug/l	8.00	--	4
o-Xylene	133		ug/l	8.00	--	4
Methyl tert butyl ether	41.6		ug/l	12.0	--	4
Naphthalene	558		ug/l	16.0	--	4

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	111		70-130
2,5-Dibromotoluene-FID	104		70-130

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-04	D	Date Collected:	05/07/20 11:45
Client ID:	MW-2		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Water		Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1		Extraction Date:	05/13/20 15:11
Analytical Date:	05/15/20 06:12		Cleanup Method1:	EPH-04-1
Analyst:	MEO		Cleanup Date1:	05/14/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	500	--	5
C19-C36 Aliphatics	ND		ug/l	500	--	5
C11-C22 Aromatics	667		ug/l	500	--	5
C11-C22 Aromatics, Adjusted	ND		ug/l	500	--	5
Naphthalene	220		ug/l	50.0	--	5
2-Methylnaphthalene	ND		ug/l	50.0	--	5
Acenaphthylene	ND		ug/l	50.0	--	5
Acenaphthene	ND		ug/l	50.0	--	5
Fluorene	ND		ug/l	50.0	--	5
Phenanthrene	ND		ug/l	50.0	--	5
Anthracene	ND		ug/l	50.0	--	5
Fluoranthene	ND		ug/l	50.0	--	5
Pyrene	ND		ug/l	50.0	--	5
Benzo(a)anthracene	ND		ug/l	50.0	--	5
Chrysene	ND		ug/l	50.0	--	5
Benzo(b)fluoranthene	ND		ug/l	50.0	--	5
Benzo(k)fluoranthene	ND		ug/l	50.0	--	5
Benzo(a)pyrene	ND		ug/l	50.0	--	5
Indeno(1,2,3-cd)Pyrene	ND		ug/l	50.0	--	5
Dibenzo(a,h)anthracene	ND		ug/l	50.0	--	5
Benzo(ghi)perylene	ND		ug/l	50.0	--	5

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-04	D	Date Collected:	05/07/20 11:45
Client ID:	MW-2		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	57		40-140
o-Terphenyl	52		40-140
2-Fluorobiphenyl	61		40-140
2-Bromonaphthalene	63		40-140

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-05	D	Date Collected:	05/07/20 13:20
Client ID:	B106		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 131,VPH-18-2.1
Analytical Date: 05/12/20 22:27
Analyst: BAD

Trap: EST, Carbopack B/Carboxen 1000&1001

Analytical Column: Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	5000	--	50
C9-C12 Aliphatics	9600		ug/l	5000	--	50
C9-C10 Aromatics	6840		ug/l	5000	--	50
C5-C8 Aliphatics, Adjusted	ND		ug/l	5000	--	50
C9-C12 Aliphatics, Adjusted	ND		ug/l	5000	--	50
Benzene	1720		ug/l	100	--	50
Toluene	ND		ug/l	100	--	50
Ethylbenzene	1210		ug/l	100	--	50
p/m-Xylene	579		ug/l	100	--	50
o-Xylene	803		ug/l	100	--	50
Methyl tert butyl ether	ND		ug/l	150	--	50
Naphthalene	9640		ug/l	200	--	50

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	98		70-130
2,5-Dibromotoluene-FID	92		70-130

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-05	D	Date Collected:	05/07/20 13:20
Client ID:	B106		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Water		Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1		Extraction Date:	05/13/20 15:11
Analytical Date:	05/15/20 13:33		Cleanup Method1:	EPH-04-1
Analyst:	MEO		Cleanup Date1:	05/14/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	4000	--	40
C19-C36 Aliphatics	ND		ug/l	4000	--	40
C11-C22 Aromatics	8200		ug/l	4000	--	40
C11-C22 Aromatics, Adjusted	ND		ug/l	4000	--	40
Naphthalene	4230		ug/l	400	--	40
2-Methylnaphthalene	479		ug/l	400	--	40
Acenaphthylene	ND		ug/l	400	--	40
Acenaphthene	ND		ug/l	400	--	40
Fluorene	ND		ug/l	400	--	40
Phenanthrene	ND		ug/l	400	--	40
Anthracene	ND		ug/l	400	--	40
Fluoranthene	ND		ug/l	400	--	40
Pyrene	ND		ug/l	400	--	40
Benzo(a)anthracene	ND		ug/l	400	--	40
Chrysene	ND		ug/l	400	--	40
Benzo(b)fluoranthene	ND		ug/l	400	--	40
Benzo(k)fluoranthene	ND		ug/l	400	--	40
Benzo(a)pyrene	ND		ug/l	400	--	40
Indeno(1,2,3-cd)Pyrene	ND		ug/l	400	--	40
Dibenzo(a,h)anthracene	ND		ug/l	400	--	40
Benzo(ghi)perylene	ND		ug/l	400	--	40

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-05	D	Date Collected:	05/07/20 13:20
Client ID:	B106		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**0**	Q	40-140
o-Terphenyl	**0**	Q	40-140
2-Fluorobiphenyl	55		40-140
2-Bromonaphthalene	59		40-140

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-06	D	Date Collected:	05/07/20 13:45
Client ID:	B102		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 131,VPH-18-2.1
Analytical Date: 05/12/20 22:57
Analyst: BAD

Trap: EST, Carbopack B/Carboxen 1000&1001

Analytical Column: Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received: Satisfactory

Aqueous Preservative: Laboratory Provided Preserved Container

Sample Temperature upon receipt: Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	2500	--	25
C9-C12 Aliphatics	21600		ug/l	2500	--	25
C9-C10 Aromatics	15200		ug/l	2500	--	25
C5-C8 Aliphatics, Adjusted	ND		ug/l	2500	--	25
C9-C12 Aliphatics, Adjusted	ND		ug/l	2500	--	25
Benzene	ND		ug/l	50.0	--	25
Toluene	ND		ug/l	50.0	--	25
Ethylbenzene	1500		ug/l	50.0	--	25
p/m-Xylene	3460		ug/l	50.0	--	25
o-Xylene	1950		ug/l	50.0	--	25
Methyl tert butyl ether	ND		ug/l	75.0	--	25
Naphthalene	4280		ug/l	100	--	25

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	106		70-130
2,5-Dibromotoluene-FID	97		70-130

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-06	D	Date Collected:	05/07/20 13:45
Client ID:	B102		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Water		Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1		Extraction Date:	05/13/20 15:11
Analytical Date:	05/15/20 07:02		Cleanup Method1:	EPH-04-1
Analyst:	MEO		Cleanup Date1:	05/14/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	2000	--	20
C19-C36 Aliphatics	ND		ug/l	2000	--	20
C11-C22 Aromatics	3310		ug/l	2000	--	20
C11-C22 Aromatics, Adjusted	ND		ug/l	2000	--	20
Naphthalene	1660		ug/l	200	--	20
2-Methylnaphthalene	ND		ug/l	200	--	20
Acenaphthylene	ND		ug/l	200	--	20
Acenaphthene	ND		ug/l	200	--	20
Fluorene	ND		ug/l	200	--	20
Phenanthrene	ND		ug/l	200	--	20
Anthracene	ND		ug/l	200	--	20
Fluoranthene	ND		ug/l	200	--	20
Pyrene	ND		ug/l	200	--	20
Benzo(a)anthracene	ND		ug/l	200	--	20
Chrysene	ND		ug/l	200	--	20
Benzo(b)fluoranthene	ND		ug/l	200	--	20
Benzo(k)fluoranthene	ND		ug/l	200	--	20
Benzo(a)pyrene	ND		ug/l	200	--	20
Indeno(1,2,3-cd)Pyrene	ND		ug/l	200	--	20
Dibenzo(a,h)anthracene	ND		ug/l	200	--	20
Benzo(ghi)perylene	ND		ug/l	200	--	20

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-06	D	Date Collected:	05/07/20 13:45
Client ID:	B102		Date Received:	05/08/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**0**	Q	40-140
o-Terphenyl	**0**	Q	40-140
2-Fluorobiphenyl	54		40-140
2-Bromonaphthalene	56		40-140

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-07	Date Collected:	05/07/20 15:10
Client ID:	NFSB-08(MW)	Date Received:	05/08/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	05/12/20 17:27
Analyst:	BAD

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	183		ug/l	100	--	1
C9-C12 Aliphatics	199		ug/l	100	--	1
C9-C10 Aromatics	170		ug/l	100	--	1
C5-C8 Aliphatics, Adjusted	183		ug/l	100	--	1
C9-C12 Aliphatics, Adjusted	ND		ug/l	100	--	1
Benzene	ND		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	ND		ug/l	2.00	--	1
o-Xylene	ND		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	ND		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	108		70-130
2,5-Dibromotoluene-FID	103		70-130

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-07	Date Collected:	05/07/20 15:10
Client ID:	NFSB-08(MW)	Date Received:	05/08/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1	Extraction Date:	05/13/20 15:11
Analytical Date:	05/15/20 04:34	Cleanup Method1:	EPH-04-1
Analyst:	MEO	Cleanup Date1:	05/14/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	109		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	109		ug/l	100	--	1
Naphthalene	ND		ug/l	10.0	--	1
2-Methylnaphthalene	ND		ug/l	10.0	--	1
Acenaphthylene	ND		ug/l	10.0	--	1
Acenaphthene	ND		ug/l	10.0	--	1
Fluorene	ND		ug/l	10.0	--	1
Phenanthrene	ND		ug/l	10.0	--	1
Anthracene	ND		ug/l	10.0	--	1
Fluoranthene	ND		ug/l	10.0	--	1
Pyrene	ND		ug/l	10.0	--	1
Benzo(a)anthracene	ND		ug/l	10.0	--	1
Chrysene	ND		ug/l	10.0	--	1
Benzo(b)fluoranthene	ND		ug/l	10.0	--	1
Benzo(k)fluoranthene	ND		ug/l	10.0	--	1
Benzo(a)pyrene	ND		ug/l	10.0	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	10.0	--	1
Dibenzo(a,h)anthracene	ND		ug/l	10.0	--	1
Benzo(ghi)perylene	ND		ug/l	10.0	--	1

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

SAMPLE RESULTS

Lab ID:	L2019097-07	Date Collected:	05/07/20 15:10
Client ID:	NFSB-08(MW)	Date Received:	05/08/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	57		40-140
o-Terphenyl	43		40-140
2-Fluorobiphenyl	51		40-140
2-Bromonaphthalene	58		40-140

Project Name: HAVERHILL FORMER MGP **Lab Number:** L2019097

Project Number: 01.0172397.10 **Report Date:** 05/15/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 131,VPH-18-2.1
Analytical Date: 05/12/20 14:56
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-07 Batch: WG1370308-4					
C5-C8 Aliphatics	ND		ug/l	100	--
C9-C12 Aliphatics	ND		ug/l	100	--
C9-C10 Aromatics	ND		ug/l	100	--
C5-C8 Aliphatics, Adjusted	ND		ug/l	100	--
C9-C12 Aliphatics, Adjusted	ND		ug/l	100	--
Benzene	ND		ug/l	2.00	--
Toluene	ND		ug/l	2.00	--
Ethylbenzene	ND		ug/l	2.00	--
p/m-Xylene	ND		ug/l	2.00	--
o-Xylene	ND		ug/l	2.00	--
Methyl tert butyl ether	ND		ug/l	3.00	--
Naphthalene	ND		ug/l	4.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	90		70-130
2,5-Dibromotoluene-FID	87		70-130

Project Name: HAVERHILL FORMER MGP
Project Number: 01.0172397.10

Lab Number: L2019097
Report Date: 05/15/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 135,EPH-19-2.1
Analytical Date: 05/14/20 09:42
Analyst: MEO

Extraction Method: EPA 3510C
Extraction Date: 05/13/20 15:11
Cleanup Method: EPH-04-1
Cleanup Date: 05/14/20

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-07 Batch: WG1370343-1					
C9-C18 Aliphatics	ND		ug/l	100	--
C19-C36 Aliphatics	ND		ug/l	100	--
C11-C22 Aromatics	ND		ug/l	100	--
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--
Naphthalene	ND		ug/l	10.0	--
2-Methylnaphthalene	ND		ug/l	10.0	--
Acenaphthylene	ND		ug/l	10.0	--
Acenaphthene	ND		ug/l	10.0	--
Fluorene	ND		ug/l	10.0	--
Phenanthrene	ND		ug/l	10.0	--
Anthracene	ND		ug/l	10.0	--
Fluoranthene	ND		ug/l	10.0	--
Pyrene	ND		ug/l	10.0	--
Benzo(a)anthracene	ND		ug/l	10.0	--
Chrysene	ND		ug/l	10.0	--
Benzo(b)fluoranthene	ND		ug/l	10.0	--
Benzo(k)fluoranthene	ND		ug/l	10.0	--
Benzo(a)pyrene	ND		ug/l	10.0	--
Indeno(1,2,3-cd)Pyrene	ND		ug/l	10.0	--
Dibenzo(a,h)anthracene	ND		ug/l	10.0	--
Benzo(ghi)perylene	ND		ug/l	10.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	62		40-140
o-Terphenyl	47		40-140
2-Fluorobiphenyl	56		40-140
2-Bromonaphthalene	58		40-140

Lab Control Sample Analysis
Batch Quality Control

Project Name: HAVERHILL FORMER MGP
Project Number: 01.0172397.10
Lab Number: L2019097
Report Date: 05/15/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-07 Batch: WG1370308-2 WG1370308-3								
C5-C8 Aliphatics	92		105		70-130	13		25
C9-C12 Aliphatics	94		107		70-130	13		25
C9-C10 Aromatics	95		107		70-130	12		25
Benzene	96		109		70-130	13		25
Toluene	94		108		70-130	13		25
Ethylbenzene	94		107		70-130	13		25
p/m-Xylene	94		107		70-130	13		25
o-Xylene	94		106		70-130	12		25
Methyl tert butyl ether	100		111		70-130	11		25
Naphthalene	101		111		70-130	9		25
1,2,4-Trimethylbenzene	95		107		70-130	12		25
Pentane	94		107		70-130	13		25
2-Methylpentane	93		106		70-130	13		25
2,2,4-Trimethylpentane	92		105		70-130	14		25
n-Nonane	94		107		30-130	13		25
n-Decane	93		105		70-130	13		25
n-Butylcyclohexane	95		109		70-130	13		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,5-Dibromotoluene-PID	98		110		70-130
2,5-Dibromotoluene-FID	95		105		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: HAVERHILL FORMER MGP
Project Number: 01.0172397.10
Lab Number: L2019097
Report Date: 05/15/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-07 Batch: WG1370343-2 WG1370343-3								
C9-C18 Aliphatics	57		60		40-140	5		25
C19-C36 Aliphatics	66		70		40-140	6		25
C11-C22 Aromatics	52		50		40-140	4		25
Naphthalene	46		44		40-140	4		25
2-Methylnaphthalene	48		46		40-140	4		25
Acenaphthylene	47		45		40-140	4		25
Acenaphthene	50		48		40-140	4		25
Fluorene	50		47		40-140	6		25
Phenanthrene	50		48		40-140	4		25
Anthracene	50		49		40-140	2		25
Fluoranthene	52		51		40-140	2		25
Pyrene	51		50		40-140	2		25
Benzo(a)anthracene	50		50		40-140	0		25
Chrysene	51		51		40-140	0		25
Benzo(b)fluoranthene	56		55		40-140	2		25
Benzo(k)fluoranthene	42		42		40-140	0		25
Benzo(a)pyrene	48		48		40-140	0		25
Indeno(1,2,3-cd)Pyrene	47		46		40-140	2		25
Dibenzo(a,h)anthracene	50		50		40-140	0		25
Benzo(ghi)perylene	46		45		40-140	2		25

Lab Control Sample Analysis
Batch Quality Control

Project Name: HAVERHILL FORMER MGP
Project Number: 01.0172397.10
Lab Number: L2019097
Report Date: 05/15/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-07 Batch: WG1370343-2 WG1370343-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	54		60		40-140
o-Terphenyl	48		47		40-140
2-Fluorobiphenyl	56		54		40-140
2-Bromonaphthalene	58		55		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Project Name: HAVERHILL FORMER MGP
Project Number: 01.0172397.10

Lab Number: L2019097
Report Date: 05/15/20

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2019097-01A	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-01B	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-01C	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-01D	Amber 1000ml HCl preserved	A	<2	<2	2.7	Y	Absent		EPH-DELUX-20(14)
L2019097-01E	Amber 1000ml HCl preserved	A	<2	<2	2.7	Y	Absent		EPH-DELUX-20(14)
L2019097-02A	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-02B	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-02C	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-02D	Amber 1000ml HCl preserved	A	<2	<2	2.7	Y	Absent		EPH-DELUX-20(14)
L2019097-02E	Amber 1000ml HCl preserved	A	<2	<2	2.7	Y	Absent		EPH-DELUX-20(14)
L2019097-03A	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-03B	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-03C	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-03D	Amber 1000ml HCl preserved	A	<2	<2	2.7	Y	Absent		EPH-DELUX-20(14)
L2019097-03E	Amber 1000ml HCl preserved	A	<2	<2	2.7	Y	Absent		EPH-DELUX-20(14)
L2019097-04A	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-04B	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-04C	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-04D	Amber 1000ml HCl preserved	A	<2	<2	2.7	Y	Absent		EPH-DELUX-20(14)
L2019097-04E	Amber 1000ml HCl preserved	A	<2	<2	2.7	Y	Absent		EPH-DELUX-20(14)
L2019097-05A	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-05B	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)

*Values in parentheses indicate holding time in days

Project Name: HAVERHILL FORMER MGP
Project Number: 01.0172397.10

Lab Number: L2019097
Report Date: 05/15/20

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2019097-05C	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-05D	Amber 1000ml HCl preserved	A	<2	<2	2.7	Y	Absent		EPH-DELUX-20(14)
L2019097-05E	Amber 1000ml HCl preserved	A	<2	<2	2.7	Y	Absent		EPH-DELUX-20(14)
L2019097-06A	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-06B	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-06C	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-06D	Amber 1000ml HCl preserved	A	<2	<2	2.7	Y	Absent		EPH-DELUX-20(14)
L2019097-06E	Amber 1000ml HCl preserved	A	<2	<2	2.7	Y	Absent		EPH-DELUX-20(14)
L2019097-07A	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-07B	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-07C	Vial HCl preserved	A	NA		2.7	Y	Absent		VPH-DELUX-18(14)
L2019097-07D	Amber 1000ml HCl preserved	A	<2	<2	2.7	Y	Absent		EPH-DELUX-20(14)
L2019097-07E	Amber 1000ml HCl preserved	A	<2	<2	2.7	Y	Absent		EPH-DELUX-20(14)

*Values in parentheses indicate holding time in days

Project Name:	HAVERHILL FORMER MGP	**Lab Number:**	L2019097
Project Number:	01.0172397.10	**Report Date:**	05/15/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

Report Format: Data Usability Report

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less

Project Name: HAVERHILL FORMER MGP
Project Number: 01.0172397.10
Lab Number: L2019097
Report Date: 05/15/20

Data Qualifiers

than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

Project Name:	HAVERHILL FORMER MGP	**Lab Number:**	L2019097
Project Number:	01.0172397.10	**Report Date:**	05/15/20

REFERENCES

131 Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), MassDEP, February 2018, Revision 2.1 with QC Requirements & Performance Standards for the Analysis of VPH under the Massachusetts Contingency Plan, WSC-CAM-IVA, June 1, 2018.

135 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, December 2019, Revision 2.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, March 1, 2020.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
EPA TO-12 Non-methane organics
EPA 3C Fixed gases
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL — World Class Chemistry

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 5/8/20

ALPHA Job #: L2019097

Project Information

Project Name: Haverhill Former MGP

Project Location: Haverhill, MA

Project #: 01.0172397.10

Project Manager: Kyle Maxfield

ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Client Information

Client: GZA GeoEnvironmental

Address: 249 Vanderbilt Avenue

Norwood, MA 02062

Phone: 781.278.3700

Fax: 781.278.5701

Email: kyle.maxfield@gza.com

☐ These samples have been Previously analyzed by Alpha

Report Information / Data Deliverables

☐ FAX ☒ EMAIL

☒ ADEx ☒ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program | Criteria

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

☒ Yes ☐ No Are MCP Analytical Methods Required?

☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

VPH container sample times may differ from the time on the CoC for samples ENV-3MW, MW-2, and B102. Please use time on CoC.

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☐ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	MADEP-EPH with targets	MADEP-VPH											Sample Specific Comments	TOTAL # BOTTLES
19097-01	ENV-3MW	05/07/20	0935	GW	MHB	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	See note	
02	ENV-5MW	05/07/20	0940	GW	JAI	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
03	NFSB-01(MW)	05/07/20	1120	GW	JAI	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
04	MW-2	05/07/20	1145	GW	MHB	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	See note	
05	B106	05/07/20	1320	GW	JAI	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
06	B102	05/07/20	1345	GW	MHB	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	See note	
07	NFSB-08(MW)	05/07/20	1510	GW	JAI	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						Container Type	A	V	-	-	-	-	-	-	-	-	-	-	
						Preservative	B	B	-	-	-	-	-	-	-	-	-	-	

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

FORM NO: 01-01(I) (rev 5-JAN-12)

Relinquished By:	Date/Time	Received By:	Date/Time
[illegible]	5/7/20@2000	GZA Sample Receiving	5/7/20 @ 2000
GZA Sample Receiving	5/8/20 1040	[illegible]	5/8/20 1040
[illegible]	5/8/20 1705	[illegible]	5/8/20 1705

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

ANALYTICAL REPORT

Lab Number:	L2038556
Client:	GZA GeoEnvironmental, Inc. 249 Vanderbilt Ave. Norwood, MA 02062
ATTN:	Kyle Maxfield
Phone:	(781) 278-5845
Project Name:	284 WINTER ST.
Project Number:	172397.10
Report Date:	09/23/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: 284 WINTER ST.
Project Number: 172397.10

Lab Number: L2038556
Report Date: 09/23/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2038556-01	GZA-1	WATER	HAVERHILL, MA	09/15/20 09:30	09/16/20
L2038556-02	GZA-1A	WATER	HAVERHILL, MA	09/15/20 11:30	09/16/20
L2038556-03	GZA-2	WATER	HAVERHILL, MA	09/15/20 12:55	09/16/20
L2038556-04	MW-1	WATER	HAVERHILL, MA	09/15/20 14:10	09/16/20

Project Name: 284 WINTER ST. **Lab Number:** L2038556

Project Number: 172397.10 **Report Date:** 09/23/20

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	YES
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	NO
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	284 WINTER ST.	**Lab Number:**	L2038556
Project Number:	172397.10	**Report Date:**	09/23/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	284 WINTER ST.	**Lab Number:**	L2038556
Project Number:	172397.10	**Report Date:**	09/23/20

Case Narrative (continued)

MCP Related Narratives

VPH

In reference to question G:

L2038556-04: One or more of the target analytes did not achieve the requested CAM reporting limits.

EPH

In reference to question G:

L2038556-04: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

L2038556-04: The surrogate recoveries are below the acceptance criteria for chloro-octadecane (0%), o-terphenyl (0%) and o-terphenyl-ms (0%) due to the dilution required to quantitate the sample. Re-extraction was not required; therefore, the results of the original analysis are reported.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Caitlin Walukevich

Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/23/20

QC OUTLIER SUMMARY REPORT

Project Name: 284 WINTER ST.
Project Number: 172397.10

Lab Number: L2038556
Report Date: 09/23/20

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
EPH w/Targets via GCMS-SIM - Westborough Lab								
EPH-19-2.1	MW-1	L2038556-04 D	Chloro-Octadecane	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	MW-1	L2038556-04 D	o-Terphenyl	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	MW-1	L2038556-04 D	O-Terphenyl-MS	Surrogate	0	40-140	-	- - not applicable - -

ORGANICS

PETROLEUM HYDROCARBONS

Project Name: 284 WINTER ST.
Project Number: 172397.10
Lab Number: L2038556
Report Date: 09/23/20

SAMPLE RESULTS

Lab ID:	L2038556-01	Date Collected:	09/15/20 09:30
Client ID:	GZA-1	Date Received:	09/16/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	09/19/20 12:12
Analyst:	BAD

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	100	--	1
C9-C12 Aliphatics	106		ug/l	100	--	1
C9-C10 Aromatics	ND		ug/l	100	--	1
C5-C8 Aliphatics, Adjusted	ND		ug/l	100	--	1
C9-C12 Aliphatics, Adjusted	103		ug/l	100	--	1
Benzene	ND		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	2.32		ug/l	2.00	--	1
o-Xylene	ND		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	ND		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	108		70-130
2,5-Dibromotoluene-FID	98		70-130

Project Name: 284 WINTER ST. **Lab Number:** L2038556

Project Number: 172397.10 **Report Date:** 09/23/20

SAMPLE RESULTS

Lab ID:	L2038556-01			Date Collected:	09/15/20 09:30
Client ID:	GZA-1			Date Received:	09/16/20
Sample Location:	HAVERHILL, MA			Field Prep:	Not Specified
Sample Depth:					
Matrix:	Water			Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1			Extraction Date:	09/20/20 13:42
Analytical Date:	09/21/20 19:17	M.S. Analytical Date:	09/22/20 13:50	Cleanup Method1:	EPH-04-1
Analyst:	SC	M.S. Analyst:	JJW	Cleanup Date1:	09/21/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
EPH w/Targets via GCMS-SIM - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1
Naphthalene	0.886		ug/l	0.400	--	1
2-Methylnaphthalene	ND		ug/l	0.400	--	1
Acenaphthylene	ND		ug/l	0.400	--	1
Acenaphthene	ND		ug/l	0.400	--	1
Fluorene	ND		ug/l	0.400	--	1
Phenanthrene	ND		ug/l	0.400	--	1
Anthracene	ND		ug/l	0.400	--	1
Fluoranthene	ND		ug/l	0.400	--	1
Pyrene	ND		ug/l	0.400	--	1
Benzo(a)anthracene	ND		ug/l	0.400	--	1
Chrysene	ND		ug/l	0.400	--	1
Benzo(b)fluoranthene	ND		ug/l	0.400	--	1
Benzo(k)fluoranthene	ND		ug/l	0.400	--	1
Benzo(a)pyrene	ND		ug/l	0.200	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	0.400	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.400	--	1
Benzo(ghi)perylene	ND		ug/l	0.400	--	1

Project Name: 284 WINTER ST. **Lab Number:** L2038556

Project Number: 172397.10 **Report Date:** 09/23/20

SAMPLE RESULTS

Lab ID:	L2038556-01	Date Collected:	09/15/20 09:30
Client ID:	GZA-1	Date Received:	09/16/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

EPH w/Targets via GCMS-SIM - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	54		40-140
o-Terphenyl	69		40-140
2-Fluorobiphenyl	77		40-140
2-Bromonaphthalene	79		40-140
O-Terphenyl-MS	67		40-140

Project Name: 284 WINTER ST.
Project Number: 172397.10
Lab Number: L2038556
Report Date: 09/23/20

SAMPLE RESULTS

Lab ID:	L2038556-02	Date Collected:	09/15/20 11:30
Client ID:	GZA-1A	Date Received:	09/16/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	09/19/20 12:42
Analyst:	BAD

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	114		ug/l	100	--	1
C9-C12 Aliphatics	104		ug/l	100	--	1
C9-C10 Aromatics	100		ug/l	100	--	1
C5-C8 Aliphatics, Adjusted	114		ug/l	100	--	1
C9-C12 Aliphatics, Adjusted	ND		ug/l	100	--	1
Benzene	ND		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	6.16		ug/l	2.00	--	1
o-Xylene	ND		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	ND		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	100		70-130
2,5-Dibromotoluene-FID	93		70-130

Project Name: 284 WINTER ST. **Lab Number:** L2038556

Project Number: 172397.10 **Report Date:** 09/23/20

SAMPLE RESULTS

Lab ID:	L2038556-02			Date Collected:	09/15/20 11:30
Client ID:	GZA-1A			Date Received:	09/16/20
Sample Location:	HAVERHILL, MA			Field Prep:	Not Specified
Sample Depth:					
Matrix:	Water			Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1			Extraction Date:	09/20/20 13:42
Analytical Date:	09/21/20 19:41	M.S. Analytical Date:	09/22/20 14:07	Cleanup Method1:	EPH-04-1
Analyst:	SC	M.S. Analyst:	JJW	Cleanup Date1:	09/21/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
EPH w/Targets via GCMS-SIM - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1
Naphthalene	1.22		ug/l	0.400	--	1
2-Methylnaphthalene	ND		ug/l	0.400	--	1
Acenaphthylene	ND		ug/l	0.400	--	1
Acenaphthene	ND		ug/l	0.400	--	1
Fluorene	ND		ug/l	0.400	--	1
Phenanthrene	ND		ug/l	0.400	--	1
Anthracene	ND		ug/l	0.400	--	1
Fluoranthene	ND		ug/l	0.400	--	1
Pyrene	ND		ug/l	0.400	--	1
Benzo(a)anthracene	ND		ug/l	0.400	--	1
Chrysene	ND		ug/l	0.400	--	1
Benzo(b)fluoranthene	ND		ug/l	0.400	--	1
Benzo(k)fluoranthene	ND		ug/l	0.400	--	1
Benzo(a)pyrene	ND		ug/l	0.200	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	0.400	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.400	--	1
Benzo(ghi)perylene	ND		ug/l	0.400	--	1

Project Name: 284 WINTER ST. **Lab Number:** L2038556

Project Number: 172397.10 **Report Date:** 09/23/20

SAMPLE RESULTS

Lab ID:	L2038556-02	Date Collected:	09/15/20 11:30
Client ID:	GZA-1A	Date Received:	09/16/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

EPH w/Targets via GCMS-SIM - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	55		40-140
o-Terphenyl	83		40-140
2-Fluorobiphenyl	90		40-140
2-Bromonaphthalene	93		40-140
O-Terphenyl-MS	72		40-140

Project Name: 284 WINTER ST.
Project Number: 172397.10
Lab Number: L2038556
Report Date: 09/23/20

SAMPLE RESULTS

Lab ID:	L2038556-03	Date Collected:	09/15/20 12:55
Client ID:	GZA-2	Date Received:	09/16/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	09/19/20 13:13
Analyst:	BAD

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	100	--	1
C9-C12 Aliphatics	ND		ug/l	100	--	1
C9-C10 Aromatics	ND		ug/l	100	--	1
C5-C8 Aliphatics, Adjusted	ND		ug/l	100	--	1
C9-C12 Aliphatics, Adjusted	ND		ug/l	100	--	1
Benzene	ND		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	ND		ug/l	2.00	--	1
o-Xylene	ND		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	ND		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	108		70-130
2,5-Dibromotoluene-FID	100		70-130

Project Name: 284 WINTER ST. **Lab Number:** L2038556

Project Number: 172397.10 **Report Date:** 09/23/20

SAMPLE RESULTS

Lab ID:	L2038556-03			Date Collected:	09/15/20 12:55
Client ID:	GZA-2			Date Received:	09/16/20
Sample Location:	HAVERHILL, MA			Field Prep:	Not Specified
Sample Depth:					
Matrix:	Water			Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1			Extraction Date:	09/20/20 13:42
Analytical Date:	09/21/20 20:06	M.S. Analytical Date:	09/22/20 14:24	Cleanup Method1:	EPH-04-1
Analyst:	SC	M.S. Analyst:	JJW	Cleanup Date1:	09/21/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
EPH w/Targets via GCMS-SIM - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1
Naphthalene	ND		ug/l	0.400	--	1
2-Methylnaphthalene	ND		ug/l	0.400	--	1
Acenaphthylene	ND		ug/l	0.400	--	1
Acenaphthene	ND		ug/l	0.400	--	1
Fluorene	ND		ug/l	0.400	--	1
Phenanthrene	ND		ug/l	0.400	--	1
Anthracene	ND		ug/l	0.400	--	1
Fluoranthene	ND		ug/l	0.400	--	1
Pyrene	ND		ug/l	0.400	--	1
Benzo(a)anthracene	ND		ug/l	0.400	--	1
Chrysene	ND		ug/l	0.400	--	1
Benzo(b)fluoranthene	ND		ug/l	0.400	--	1
Benzo(k)fluoranthene	ND		ug/l	0.400	--	1
Benzo(a)pyrene	ND		ug/l	0.200	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	0.400	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.400	--	1
Benzo(ghi)perylene	ND		ug/l	0.400	--	1

Project Name: 284 WINTER ST. **Lab Number:** L2038556

Project Number: 172397.10 **Report Date:** 09/23/20

SAMPLE RESULTS

Lab ID:	L2038556-03	Date Collected:	09/15/20 12:55
Client ID:	GZA-2	Date Received:	09/16/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

EPH w/Targets via GCMS-SIM - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	46		40-140
o-Terphenyl	77		40-140
2-Fluorobiphenyl	79		40-140
2-Bromonaphthalene	81		40-140
O-Terphenyl-MS	79		40-140

Project Name: 284 WINTER ST. **Lab Number:** L2038556

Project Number: 172397.10 **Report Date:** 09/23/20

SAMPLE RESULTS

Lab ID:	L2038556-04	D	Date Collected:	09/15/20 14:10
Client ID:	MW-1		Date Received:	09/16/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	09/19/20 14:13
Analyst:	MKS

Trap: EST, Carbopack B/Carboxen 1000&1001

Analytical Column: Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	29000		ug/l	10000	--	100
C9-C12 Aliphatics	ND		ug/l	10000	--	100
C9-C10 Aromatics	ND		ug/l	10000	--	100
C5-C8 Aliphatics, Adjusted	ND		ug/l	10000	--	100
C9-C12 Aliphatics, Adjusted	ND		ug/l	10000	--	100
Benzene	19500		ug/l	200	--	100
Toluene	4060		ug/l	200	--	100
Ethylbenzene	697		ug/l	200	--	100
p/m-Xylene	718		ug/l	200	--	100
o-Xylene	1450		ug/l	200	--	100
Methyl tert butyl ether	ND		ug/l	300	--	100
Naphthalene	9600		ug/l	400	--	100

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	107		70-130
2,5-Dibromotoluene-FID	98		70-130

Project Name: 284 WINTER ST. **Lab Number:** L2038556

Project Number: 172397.10 **Report Date:** 09/23/20

SAMPLE RESULTS

Lab ID:	L2038556-04 D			Date Collected:	09/15/20 14:10
Client ID:	MW-1			Date Received:	09/16/20
Sample Location:	HAVERHILL, MA			Field Prep:	Not Specified
Sample Depth:					
Matrix:	Water			Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1			Extraction Date:	09/20/20 13:42
Analytical Date:	09/22/20 21:14	M.S. Analytical Date:	09/23/20 11:59	Cleanup Method1:	EPH-04-1
Analyst:	MEO	M.S. Analyst:	JJW	Cleanup Date1:	09/22/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
EPH w/Targets via GCMS-SIM - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	5000	--	50
C19-C36 Aliphatics	ND		ug/l	5000	--	50
C11-C22 Aromatics	7560		ug/l	5000	--	50
C11-C22 Aromatics, Adjusted	ND		ug/l	5000	--	50
Naphthalene	6630		ug/l	100	--	250
2-Methylnaphthalene	549		ug/l	100	--	250
Acenaphthylene	140		ug/l	100	--	250
Acenaphthene	ND		ug/l	100	--	250
Fluorene	ND		ug/l	100	--	250
Phenanthrene	ND		ug/l	100	--	250
Anthracene	ND		ug/l	100	--	250
Fluoranthene	ND		ug/l	100	--	250
Pyrene	ND		ug/l	100	--	250
Benzo(a)anthracene	ND		ug/l	100	--	250
Chrysene	ND		ug/l	100	--	250
Benzo(b)fluoranthene	ND		ug/l	100	--	250
Benzo(k)fluoranthene	ND		ug/l	100	--	250
Benzo(a)pyrene	ND		ug/l	50.0	--	250
Indeno(1,2,3-cd)Pyrene	ND		ug/l	100	--	250
Dibenzo(a,h)anthracene	ND		ug/l	100	--	250
Benzo(ghi)perylene	ND		ug/l	100	--	250

Project Name: 284 WINTER ST. **Lab Number:** L2038556

Project Number: 172397.10 **Report Date:** 09/23/20

SAMPLE RESULTS

Lab ID:	L2038556-04	D	Date Collected:	09/15/20 14:10
Client ID:	MW-1		Date Received:	09/16/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

EPH w/Targets via GCMS-SIM - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**0**	Q	40-140
o-Terphenyl	**0**	Q	40-140
2-Fluorobiphenyl	60		40-140
2-Bromonaphthalene	62		40-140
O-Terphenyl-MS	**0**	Q	40-140

Project Name: 284 WINTER ST.
Project Number: 172397.10

Lab Number: L2038556
Report Date: 09/23/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 135,EPH-19-2.1
Analytical Date: 09/21/20 18:03
Analyst: SC

M.S. Analytical Date: 09/22/20 13:33
M.S. Analyst: JJW

Extraction Method: EPA 3510C
Extraction Date: 09/20/20 13:42
Cleanup Method: EPH-04-1
Cleanup Date: 09/21/20

Parameter	Result	Qualifier	Units	RL	MDL
EPH w/Targets via GCMS-SIM - Westborough Lab for sample(s): 01-04 Batch: WG1412264-1					
C9-C18 Aliphatics	ND		ug/l	100	--
C19-C36 Aliphatics	ND		ug/l	100	--
C11-C22 Aromatics	ND		ug/l	100	--
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--
Naphthalene	ND		ug/l	0.400	--
2-Methylnaphthalene	ND		ug/l	0.400	--
Acenaphthylene	ND		ug/l	0.400	--
Acenaphthene	ND		ug/l	0.400	--
Fluorene	ND		ug/l	0.400	--
Phenanthrene	ND		ug/l	0.400	--
Anthracene	ND		ug/l	0.400	--
Fluoranthene	ND		ug/l	0.400	--
Pyrene	ND		ug/l	0.400	--
Benzo(a)anthracene	ND		ug/l	0.400	--
Chrysene	ND		ug/l	0.400	--
Benzo(b)fluoranthene	ND		ug/l	0.400	--
Benzo(k)fluoranthene	ND		ug/l	0.400	--
Benzo(a)pyrene	ND		ug/l	0.200	--
Indeno(1,2,3-cd)Pyrene	ND		ug/l	0.400	--
Dibenzo(a,h)anthracene	ND		ug/l	0.400	--
Benzo(ghi)perylene	ND		ug/l	0.400	--

Project Name: 284 WINTER ST.
Project Number: 172397.10

Lab Number: L2038556
Report Date: 09/23/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 135,EPH-19-2.1
Analytical Date: 09/21/20 18:03
Analyst: SC

M.S. Analytical Date: 09/22/20 13:33
M.S. Analyst: JJW

Extraction Method: EPA 3510C
Extraction Date: 09/20/20 13:42
Cleanup Method: EPH-04-1
Cleanup Date: 09/21/20

Parameter	Result	Qualifier	Units	RL	MDL
EPH w/Targets via GCMS-SIM - Westborough Lab for sample(s): 01-04 Batch: WG1412264-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	57		40-140
o-Terphenyl	48		40-140
2-Fluorobiphenyl	51		40-140
2-Bromonaphthalene	53		40-140
O-Terphenyl-MS	89		40-140

Project Name: 284 WINTER ST.
Project Number: 172397.10
Lab Number: L2038556
Report Date: 09/23/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 131,VPH-18-2.1
Analytical Date: 09/19/20 10:45
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-04 Batch: WG1413058-4					
C5-C8 Aliphatics	ND		ug/l	100	--
C9-C12 Aliphatics	ND		ug/l	100	--
C9-C10 Aromatics	ND		ug/l	100	--
C5-C8 Aliphatics, Adjusted	ND		ug/l	100	--
C9-C12 Aliphatics, Adjusted	ND		ug/l	100	--
Benzene	ND		ug/l	2.00	--
Toluene	ND		ug/l	2.00	--
Ethylbenzene	ND		ug/l	2.00	--
p/m-Xylene	ND		ug/l	2.00	--
o-Xylene	ND		ug/l	2.00	--
Methyl tert butyl ether	ND		ug/l	3.00	--
Naphthalene	ND		ug/l	4.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	103		70-130
2,5-Dibromotoluene-FID	94		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST.
Project Number: 172397.10
Lab Number: L2038556
Report Date: 09/23/20

EPH w/Targets via GCMS-SIM - Westborough Lab Associated sample(s): 01-04 Batch: WG1412264-2 WG1412264-3

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
C9-C18 Aliphatics	54		57		40-140	5		25
C19-C36 Aliphatics	72		71		40-140	1		25
C11-C22 Aromatics	90		70		40-140	25		25
Naphthalene	58		62		40-140	7		25
2-Methylnaphthalene	60		63		40-140	5		25
Acenaphthylene	64		64		40-140	0		25
Acenaphthene	68		67		40-140	1		25
Fluorene	72		70		40-140	3		25
Phenanthrene	72		69		40-140	4		25
Anthracene	76		72		40-140	5		25
Fluoranthene	79		76		40-140	4		25
Pyrene	82		78		40-140	5		25
Benzo(a)anthracene	74		70		40-140	6		25
Chrysene	70		69		40-140	1		25
Benzo(b)fluoranthene	87		83		40-140	5		25
Benzo(k)fluoranthene	68		67		40-140	1		25
Benzo(a)pyrene	78		76		40-140	3		25
Indeno(1,2,3-cd)Pyrene	78		78		40-140	0		25
Dibenzo(a,h)anthracene	64		65		40-140	2		25
Benzo(ghi)perylene	58		59		40-140	2		25

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST.
Project Number: 172397.10
Lab Number: L2038556
Report Date: 09/23/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
EPH w/Targets via GCMS-SIM - Westborough Lab Associated sample(s): 01-04 Batch: WG1412264-2 WG1412264-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	57		53		40-140
o-Terphenyl	94		86		40-140
2-Fluorobiphenyl	81		80		40-140
2-Bromonaphthalene	87		84		40-140
O-Terphenyl-MS	65		62		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST.
Project Number: 172397.10
Lab Number: L2038556
Report Date: 09/23/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-04 Batch: WG1413058-2 WG1413058-3								
C5-C8 Aliphatics	96		101		70-130	5		25
C9-C12 Aliphatics	99		105		70-130	6		25
C9-C10 Aromatics	104		111		70-130	7		25
Benzene	106		113		70-130	6		25
Toluene	106		112		70-130	6		25
Ethylbenzene	106		112		70-130	6		25
p/m-Xylene	106		112		70-130	6		25
o-Xylene	105		112		70-130	6		25
Methyl tert butyl ether	112		118		70-130	5		25
Naphthalene	109		116		70-130	6		25
1,2,4-Trimethylbenzene	104		111		70-130	7		25
Pentane	95		101		70-130	6		25
2-Methylpentane	96		102		70-130	6		25
2,2,4-Trimethylpentane	98		103		70-130	5		25
n-Nonane	100		106		30-130	6		25
n-Decane	97		102		70-130	5		25
n-Butylcyclohexane	101		107		70-130	6		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,5-Dibromotoluene-PID	102		108		70-130
2,5-Dibromotoluene-FID	92		99		70-130

Project Name: 284 WINTER ST.
Project Number: 172397.10

Lab Number: L2038556
Report Date: 09/23/20

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2038556-01A	Vial HCl preserved	A	NA		3.1	Y	Absent		VPH-DELUX-18(14)
L2038556-01B	Vial HCl preserved	A	NA		3.1	Y	Absent		VPH-DELUX-18(14)
L2038556-01C	Vial HCl preserved	A	NA		3.1	Y	Absent		VPH-DELUX-18(14)
L2038556-01D	Amber 1000ml HCl preserved	A	<2	<2	3.1	Y	Absent		EPHD-GC-20(14),EPH-MS-20(14)
L2038556-01E	Amber 1000ml HCl preserved	A	<2	<2	3.1	Y	Absent		EPHD-GC-20(14),EPH-MS-20(14)
L2038556-02A	Vial HCl preserved	A	NA		3.1	Y	Absent		VPH-DELUX-18(14)
L2038556-02B	Vial HCl preserved	A	NA		3.1	Y	Absent		VPH-DELUX-18(14)
L2038556-02C	Vial HCl preserved	A	NA		3.1	Y	Absent		VPH-DELUX-18(14)
L2038556-02D	Amber 1000ml HCl preserved	A	<2	<2	3.1	Y	Absent		EPHD-GC-20(14),EPH-MS-20(14)
L2038556-02E	Amber 1000ml HCl preserved	A	<2	<2	3.1	Y	Absent		EPHD-GC-20(14),EPH-MS-20(14)
L2038556-03A	Vial HCl preserved	A	NA		3.1	Y	Absent		VPH-DELUX-18(14)
L2038556-03B	Vial HCl preserved	A	NA		3.1	Y	Absent		VPH-DELUX-18(14)
L2038556-03C	Vial HCl preserved	A	NA		3.1	Y	Absent		VPH-DELUX-18(14)
L2038556-03D	Amber 1000ml HCl preserved	A	<2	<2	3.1	Y	Absent		EPHD-GC-20(14),EPH-MS-20(14)
L2038556-03E	Amber 1000ml HCl preserved	A	<2	<2	3.1	Y	Absent		EPHD-GC-20(14),EPH-MS-20(14)
L2038556-04A	Vial HCl preserved	A	NA		3.1	Y	Absent		VPH-DELUX-18(14)
L2038556-04B	Vial HCl preserved	A	NA		3.1	Y	Absent		VPH-DELUX-18(14)
L2038556-04C	Vial HCl preserved	A	NA		3.1	Y	Absent		VPH-DELUX-18(14)
L2038556-04D	Amber 1000ml HCl preserved	A	<2	<2	3.1	Y	Absent		EPHD-GC-20(14),EPH-MS-20(14)
L2038556-04E	Amber 1000ml HCl preserved	A	<2	<2	3.1	Y	Absent		EPHD-GC-20(14),EPH-MS-20(14)

*Values in parentheses indicate holding time in days

Project Name:	284 WINTER ST.	**Lab Number:**	L2038556
Project Number:	172397.10	**Report Date:**	09/23/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

Report Format: Data Usability Report

Project Name:	284 WINTER ST.	**Lab Number:**	L2038556
Project Number:	172397.10	**Report Date:**	09/23/20

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration

Project Name:	284 WINTER ST.	**Lab Number:**	L2038556
Project Number:	172397.10	**Report Date:**	09/23/20

Data Qualifiers

Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

Report Format: Data Usability Report

Project Name:	284 WINTER ST.	**Lab Number:**	L2038556
Project Number:	172397.10	**Report Date:**	09/23/20

REFERENCES

131 Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), MassDEP, February 2018, Revision 2.1 with QC Requirements & Performance Standards for the Analysis of VPH under the Massachusetts Contingency Plan, WSC-CAM-IVA, June 1, 2018.

135 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, December 2019, Revision 2.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, March 1, 2020.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
EPA TO-12 Non-methane organics
EPA 3C Fixed gases
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 9/16/20

ALPHA Job #: L2038556

Project Information

Project Name: 284 Winter St.

Project Location: Haverhill, MA

Project #: 172397.10

Project Manager: Kyle Maxfield

ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Client Information

Client: GZA GeoEnvironmental Inc

Address: 249 Vanderbilt Ave

Norwood, MA 02062

Phone: 781-278-3700

Fax:

Email: kyle.maxfield@gza.com

☐ These samples have been Previously analyzed by Alpha

Report Information

☐ FAX ☒ EMAIL

☒ ADEx ☐ Add'l Deliverables

Data Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program Criteria

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

☒ Yes ☐ No Are MCP Analytical Methods Required?

☐ Yes ☐ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☐ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	EPH w/ Targets	VPH											Sample Specific Comments	TOTAL # BOTTLES
38556 01	GZA-1	9/15/20	930	GW	MLM	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		5
02	GZA-1A	9/15/20	1130	GW	MLM	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		5
03	GZA-2	9/15/20	1255	GW	MLM	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		5
04	MW-1	9/15/20	1410	GW	MLM	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		5
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		

Container Type	A	V	-	-	-	-	-	-	-	-	-	-	
Preservative	B	B	-	-	-	-	-	-	-	-	-	-	

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

FORM NO: 01-01(I) (rev 5-JAN-12)

Relinquished By:	Date/Time	Received By:	Date/Time
Matt McGavick	9/15/20 1720	[illegible] ALPHA	9/16/20 1105
[illegible]	9/16/20 1741	[illegible] NCL	9/16/20 1741

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

ANALYTICAL REPORT

Lab Number:	L2052184
Client:	GZA GeoEnvironmental, Inc. 249 Vanderbilt Ave. Norwood, MA 02062
ATTN:	Kyle Maxfield
Phone:	(781) 278-5845
Project Name:	NATIONAL GRID-284 WINTER ST.
Project Number:	172397.10
Report Date:	12/02/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: NATIONAL GRID-284 WINTER ST.
Project Number: 172397.10

Lab Number: L2052184
Report Date: 12/02/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2052184-01	GZA-1	WATER	HAVERHILL, MA	11/20/20 12:45	11/23/20
L2052184-02	GZA-1A	WATER	HAVERHILL, MA	11/20/20 11:20	11/23/20
L2052184-03	GZA-2	WATER	HAVERHILL, MA	11/20/20 10:00	11/23/20

Project Name: NATIONAL GRID-284 WINTER ST. **Lab Number:** L2052184

Project Number: 172397.10 **Report Date:** 12/02/20

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	YES
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	NATIONAL GRID-284 WINTER ST.	**Lab Number:**	L2052184
Project Number:	172397.10	**Report Date:**	12/02/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly Stenstrom

Title: Technical Director/Representative

Date: 12/02/20

QC OUTLIER SUMMARY REPORT

Project Name: NATIONAL GRID-284 WINTER ST.
Project Number: 172397.10

Lab Number: L2052184
Report Date: 12/02/20

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
EPH w/Targets via GCMS-SIM - Westborough Lab								
EPH-19-2.1	Batch QC	WG1439159-3	Naphthalene	LCSD	28	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	2-Methylnaphthalene	LCSD	29	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	Acenaphthylene	LCSD	30	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	Acenaphthene	LCSD	27	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	Fluorene	LCSD	30	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	Phenanthrene	LCSD	29	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	Anthracene	LCSD	29	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	Fluoranthene	LCSD	30	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	Pyrene	LCSD	31	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	Benzo(a)anthracene	LCSD	28	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	Chrysene	LCSD	34	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	Benzo(b)fluoranthene	LCSD	26	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	Benzo(a)pyrene	LCSD	30	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	Indeno(1,2,3-cd)Pyrene	LCSD	37	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	Dibenzo(a,h)anthracene	LCSD	34	25	01-03	non-directional bias
EPH-19-2.1	Batch QC	WG1439159-3	Benzo(ghi)perylene	LCSD	38	25	01-03	non-directional bias

ORGANICS

PETROLEUM HYDROCARBONS

Project Name: NATIONAL GRID-284 WINTER ST. **Lab Number:** L2052184

Project Number: 172397.10 **Report Date:** 12/02/20

SAMPLE RESULTS

Lab ID:	L2052184-01	Date Collected:	11/20/20 12:45
Client ID:	GZA-1	Date Received:	11/23/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	12/02/20 17:21
Analyst:	KJD

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	100	--	1
C9-C12 Aliphatics	ND		ug/l	100	--	1
C9-C10 Aromatics	ND		ug/l	100	--	1
C5-C8 Aliphatics, Adjusted	ND		ug/l	100	--	1
C9-C12 Aliphatics, Adjusted	ND		ug/l	100	--	1
Benzene	ND		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	ND		ug/l	2.00	--	1
o-Xylene	ND		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	ND		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	103		70-130
2,5-Dibromotoluene-FID	88		70-130

Project Name: NATIONAL GRID-284 WINTER ST. **Lab Number:** L2052184

Project Number: 172397.10 **Report Date:** 12/02/20

SAMPLE RESULTS

Lab ID:	L2052184-01			Date Collected:	11/20/20 12:45
Client ID:	GZA-1			Date Received:	11/23/20
Sample Location:	HAVERHILL, MA			Field Prep:	Not Specified
Sample Depth:					
Matrix:	Water			Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1			Extraction Date:	11/30/20 03:10
Analytical Date:	12/01/20 08:26	M.S. Analytical Date:	12/01/20 17:23	Cleanup Method1:	EPH-04-1
Analyst:	SR	M.S. Analyst:	RP	Cleanup Date1:	11/30/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
EPH w/Targets via GCMS-SIM - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1
Naphthalene	ND		ug/l	0.400	--	1
2-Methylnaphthalene	ND		ug/l	0.400	--	1
Acenaphthylene	ND		ug/l	0.400	--	1
Acenaphthene	ND		ug/l	0.400	--	1
Fluorene	ND		ug/l	0.400	--	1
Phenanthrene	ND		ug/l	0.400	--	1
Anthracene	ND		ug/l	0.400	--	1
Fluoranthene	ND		ug/l	0.400	--	1
Pyrene	ND		ug/l	0.400	--	1
Benzo(a)anthracene	ND		ug/l	0.400	--	1
Chrysene	ND		ug/l	0.400	--	1
Benzo(b)fluoranthene	ND		ug/l	0.400	--	1
Benzo(k)fluoranthene	ND		ug/l	0.400	--	1
Benzo(a)pyrene	ND		ug/l	0.200	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	0.400	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.400	--	1
Benzo(ghi)perylene	ND		ug/l	0.400	--	1

Project Name: NATIONAL GRID-284 WINTER ST. **Lab Number:** L2052184

Project Number: 172397.10 **Report Date:** 12/02/20

SAMPLE RESULTS

Lab ID:	L2052184-01	Date Collected:	11/20/20 12:45
Client ID:	GZA-1	Date Received:	11/23/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

EPH w/Targets via GCMS-SIM - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	70		40-140
o-Terphenyl	94		40-140
2-Fluorobiphenyl	104		40-140
2-Bromonaphthalene	112		40-140
O-Terphenyl-MS	71		40-140

Project Name: NATIONAL GRID-284 WINTER ST. **Lab Number:** L2052184

Project Number: 172397.10 **Report Date:** 12/02/20

SAMPLE RESULTS

Lab ID:	L2052184-02	Date Collected:	11/20/20 11:20
Client ID:	GZA-1A	Date Received:	11/23/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	12/02/20 17:52
Analyst:	KJD

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	100	--	1
C9-C12 Aliphatics	ND		ug/l	100	--	1
C9-C10 Aromatics	ND		ug/l	100	--	1
C5-C8 Aliphatics, Adjusted	ND		ug/l	100	--	1
C9-C12 Aliphatics, Adjusted	ND		ug/l	100	--	1
Benzene	ND		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	ND		ug/l	2.00	--	1
o-Xylene	ND		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	ND		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	103		70-130
2,5-Dibromotoluene-FID	89		70-130

Project Name: NATIONAL GRID-284 WINTER ST. **Lab Number:** L2052184

Project Number: 172397.10 **Report Date:** 12/02/20

SAMPLE RESULTS

Lab ID:	L2052184-02			Date Collected:	11/20/20 11:20
Client ID:	GZA-1A			Date Received:	11/23/20
Sample Location:	HAVERHILL, MA			Field Prep:	Not Specified
Sample Depth:					
Matrix:	Water			Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1			Extraction Date:	11/30/20 03:10
Analytical Date:	12/01/20 08:51	M.S. Analytical Date:	12/01/20 17:40	Cleanup Method1:	EPH-04-1
Analyst:	SR	M.S. Analyst:	RP	Cleanup Date1:	11/30/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
EPH w/Targets via GCMS-SIM - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1
Naphthalene	ND		ug/l	0.400	--	1
2-Methylnaphthalene	ND		ug/l	0.400	--	1
Acenaphthylene	ND		ug/l	0.400	--	1
Acenaphthene	ND		ug/l	0.400	--	1
Fluorene	ND		ug/l	0.400	--	1
Phenanthrene	ND		ug/l	0.400	--	1
Anthracene	ND		ug/l	0.400	--	1
Fluoranthene	ND		ug/l	0.400	--	1
Pyrene	ND		ug/l	0.400	--	1
Benzo(a)anthracene	ND		ug/l	0.400	--	1
Chrysene	ND		ug/l	0.400	--	1
Benzo(b)fluoranthene	ND		ug/l	0.400	--	1
Benzo(k)fluoranthene	ND		ug/l	0.400	--	1
Benzo(a)pyrene	ND		ug/l	0.200	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	0.400	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.400	--	1
Benzo(ghi)perylene	ND		ug/l	0.400	--	1

Project Name: NATIONAL GRID-284 WINTER ST. **Lab Number:** L2052184

Project Number: 172397.10 **Report Date:** 12/02/20

SAMPLE RESULTS

Lab ID:	L2052184-02	Date Collected:	11/20/20 11:20
Client ID:	GZA-1A	Date Received:	11/23/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

EPH w/Targets via GCMS-SIM - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	63		40-140
o-Terphenyl	58		40-140
2-Fluorobiphenyl	69		40-140
2-Bromonaphthalene	74		40-140
O-Terphenyl-MS	44		40-140

Project Name: NATIONAL GRID-284 WINTER ST.
Lab Number: L2052184
Project Number: 172397.10
Report Date: 12/02/20

SAMPLE RESULTS

Lab ID:	L2052184-03	Date Collected:	11/20/20 10:00
Client ID:	GZA-2	Date Received:	11/23/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	12/02/20 18:22
Analyst:	KJD

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	100	--	1
C9-C12 Aliphatics	ND		ug/l	100	--	1
C9-C10 Aromatics	ND		ug/l	100	--	1
C5-C8 Aliphatics, Adjusted	ND		ug/l	100	--	1
C9-C12 Aliphatics, Adjusted	ND		ug/l	100	--	1
Benzene	ND		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	ND		ug/l	2.00	--	1
o-Xylene	ND		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	ND		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	102		70-130
2,5-Dibromotoluene-FID	89		70-130

Project Name: NATIONAL GRID-284 WINTER ST. **Lab Number:** L2052184

Project Number: 172397.10 **Report Date:** 12/02/20

SAMPLE RESULTS

Lab ID:	L2052184-03			Date Collected:	11/20/20 10:00
Client ID:	GZA-2			Date Received:	11/23/20
Sample Location:	HAVERHILL, MA			Field Prep:	Not Specified
Sample Depth:					
Matrix:	Water			Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1			Extraction Date:	11/30/20 03:10
Analytical Date:	12/01/20 09:16	M.S. Analytical Date:	12/01/20 17:56	Cleanup Method1:	EPH-04-1
Analyst:	SR	M.S. Analyst:	RP	Cleanup Date1:	11/30/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
EPH w/Targets via GCMS-SIM - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1
Naphthalene	ND		ug/l	0.400	--	1
2-Methylnaphthalene	ND		ug/l	0.400	--	1
Acenaphthylene	ND		ug/l	0.400	--	1
Acenaphthene	ND		ug/l	0.400	--	1
Fluorene	ND		ug/l	0.400	--	1
Phenanthrene	ND		ug/l	0.400	--	1
Anthracene	ND		ug/l	0.400	--	1
Fluoranthene	ND		ug/l	0.400	--	1
Pyrene	ND		ug/l	0.400	--	1
Benzo(a)anthracene	ND		ug/l	0.400	--	1
Chrysene	ND		ug/l	0.400	--	1
Benzo(b)fluoranthene	ND		ug/l	0.400	--	1
Benzo(k)fluoranthene	ND		ug/l	0.400	--	1
Benzo(a)pyrene	ND		ug/l	0.200	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	0.400	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.400	--	1
Benzo(ghi)perylene	ND		ug/l	0.400	--	1

Project Name: NATIONAL GRID-284 WINTER ST. **Lab Number:** L2052184

Project Number: 172397.10 **Report Date:** 12/02/20

SAMPLE RESULTS

Lab ID:	L2052184-03	Date Collected:	11/20/20 10:00
Client ID:	GZA-2	Date Received:	11/23/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

EPH w/Targets via GCMS-SIM - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	55		40-140
o-Terphenyl	98		40-140
2-Fluorobiphenyl	110		40-140
2-Bromonaphthalene	120		40-140
O-Terphenyl-MS	66		40-140

Project Name: NATIONAL GRID-284 WINTER ST.
Project Number: 172397.10

Lab Number: L2052184
Report Date: 12/02/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 135,EPH-19-2.1
Analytical Date: 12/01/20 08:02
Analyst: SR

M.S. Analytical Date: 12/01/20 17:07
M.S. Analyst: RP

Extraction Method: EPA 3510C
Extraction Date: 11/30/20 03:10
Cleanup Method: EPH-04-1
Cleanup Date: 11/30/20

Parameter	Result	Qualifier	Units	RL	MDL
EPH w/Targets via GCMS-SIM - Westborough Lab for sample(s): 01-03 Batch: WG1439159-1					
C9-C18 Aliphatics	ND		ug/l	100	--
C19-C36 Aliphatics	ND		ug/l	100	--
C11-C22 Aromatics	ND		ug/l	100	--
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--
Naphthalene	ND		ug/l	0.400	--
2-Methylnaphthalene	ND		ug/l	0.400	--
Acenaphthylene	ND		ug/l	0.400	--
Acenaphthene	ND		ug/l	0.400	--
Fluorene	ND		ug/l	0.400	--
Phenanthrene	ND		ug/l	0.400	--
Anthracene	ND		ug/l	0.400	--
Fluoranthene	ND		ug/l	0.400	--
Pyrene	ND		ug/l	0.400	--
Benzo(a)anthracene	ND		ug/l	0.400	--
Chrysene	ND		ug/l	0.400	--
Benzo(b)fluoranthene	ND		ug/l	0.400	--
Benzo(k)fluoranthene	ND		ug/l	0.400	--
Benzo(a)pyrene	ND		ug/l	0.200	--
Indeno(1,2,3-cd)Pyrene	ND		ug/l	0.400	--
Dibenzo(a,h)anthracene	ND		ug/l	0.400	--
Benzo(ghi)perylene	ND		ug/l	0.400	--

Project Name: NATIONAL GRID-284 WINTER ST.
Project Number: 172397.10

Lab Number: L2052184
Report Date: 12/02/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 135,EPH-19-2.1
Analytical Date: 12/01/20 08:02
Analyst: SR

M.S. Analytical Date: 12/01/20 17:07
M.S. Analyst: RP

Extraction Method: EPA 3510C
Extraction Date: 11/30/20 03:10
Cleanup Method: EPH-04-1
Cleanup Date: 11/30/20

Parameter	Result	Qualifier	Units	RL	MDL
EPH w/Targets via GCMS-SIM - Westborough Lab for sample(s): 01-03 Batch: WG1439159-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	67		40-140
o-Terphenyl	81		40-140
2-Fluorobiphenyl	106		40-140
2-Bromonaphthalene	113		40-140
O-Terphenyl-MS	60		40-140

Project Name: NATIONAL GRID-284 WINTER ST. **Lab Number:** L2052184

Project Number: 172397.10 **Report Date:** 12/02/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 131,VPH-18-2.1
Analytical Date: 12/02/20 12:15
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-03 Batch: WG1440323-4					
C5-C8 Aliphatics	ND		ug/l	100	--
C9-C12 Aliphatics	ND		ug/l	100	--
C9-C10 Aromatics	ND		ug/l	100	--
C5-C8 Aliphatics, Adjusted	ND		ug/l	100	--
C9-C12 Aliphatics, Adjusted	ND		ug/l	100	--
Benzene	ND		ug/l	2.00	--
Toluene	ND		ug/l	2.00	--
Ethylbenzene	ND		ug/l	2.00	--
p/m-Xylene	ND		ug/l	2.00	--
o-Xylene	ND		ug/l	2.00	--
Methyl tert butyl ether	ND		ug/l	3.00	--
Naphthalene	ND		ug/l	4.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	84		70-130
2,5-Dibromotoluene-FID	73		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: NATIONAL GRID-284 WINTER ST.
Project Number: 172397.10
Lab Number: L2052184
Report Date: 12/02/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
EPH w/Targets via GCMS-SIM - Westborough Lab Associated sample(s): 01-03 Batch: WG1439159-2 WG1439159-3								
C9-C18 Aliphatics	56		65		40-140	15		25
C19-C36 Aliphatics	74		85		40-140	14		25
C11-C22 Aromatics	80		95		40-140	17		25
Naphthalene	65		86		40-140	**28**	Q	25
2-Methylnaphthalene	65		87		40-140	**29**	Q	25
Acenaphthylene	70		95		40-140	**30**	Q	25
Acenaphthene	68		89		40-140	**27**	Q	25
Fluorene	66		89		40-140	**30**	Q	25
Phenanthrene	69		92		40-140	**29**	Q	25
Anthracene	75		100		40-140	**29**	Q	25
Fluoranthene	73		99		40-140	**30**	Q	25
Pyrene	75		102		40-140	**31**	Q	25
Benzo(a)anthracene	70		93		40-140	**28**	Q	25
Chrysene	76		107		40-140	**34**	Q	25
Benzo(b)fluoranthene	77		100		40-140	**26**	Q	25
Benzo(k)fluoranthene	63		81		40-140	25		25
Benzo(a)pyrene	77		104		40-140	**30**	Q	25
Indeno(1,2,3-cd)Pyrene	63		92		40-140	**37**	Q	25
Dibenzo(a,h)anthracene	69		97		40-140	**34**	Q	25
Benzo(ghi)perylene	59		87		40-140	**38**	Q	25

Lab Control Sample Analysis

Batch Quality Control

Project Name: NATIONAL GRID-284 WINTER ST.

Project Number: 172397.10

Lab Number: L2052184

Report Date: 12/02/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
EPH w/Targets via GCMS-SIM - Westborough Lab Associated sample(s): 01-03 Batch: WG1439159-2 WG1439159-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	65		70		40-140
o-Terphenyl	79		87		40-140
2-Fluorobiphenyl	103		91		40-140
2-Bromonaphthalene	107		95		40-140
O-Terphenyl-MS	68		86		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis
Batch Quality Control

Project Name: NATIONAL GRID-284 WINTER ST.
Project Number: 172397.10

Lab Number: L2052184
Report Date: 12/02/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-03 Batch: WG1440323-2 WG1440323-3								
C5-C8 Aliphatics	93		99		70-130	6		25
C9-C12 Aliphatics	91		95		70-130	5		25
C9-C10 Aromatics	96		97		70-130	1		25
Benzene	97		100		70-130	3		25
Toluene	96		99		70-130	3		25
Ethylbenzene	96		100		70-130	4		25
p/m-Xylene	98		101		70-130	3		25
o-Xylene	95		97		70-130	2		25
Methyl tert butyl ether	93		93		70-130	0		25
Naphthalene	102		100		70-130	2		25
1,2,4-Trimethylbenzene	96		97		70-130	1		25
Pentane	94		100		70-130	6		25
2-Methylpentane	94		100		70-130	6		25
2,2,4-Trimethylpentane	91		97		70-130	6		25
n-Nonane	93		98		30-130	5		25
n-Decane	89		92		70-130	4		25
n-Butylcyclohexane	91		96		70-130	5		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,5-Dibromotoluene-PID	99		95		70-130
2,5-Dibromotoluene-FID	84		82		70-130

Project Name: NATIONAL GRID-284 WINTER ST.
Project Number: 172397.10

Lab Number: L2052184
Report Date: 12/02/20

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2052184-01A	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)
L2052184-01B	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)
L2052184-01C	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)
L2052184-01D	Amber 1000ml HCl preserved	A	<2	<2	3.6	Y	Absent		EPHD-GC-20(14),EPH-MS-20(14)
L2052184-01E	Amber 1000ml HCl preserved	A	<2	<2	3.6	Y	Absent		EPHD-GC-20(14),EPH-MS-20(14)
L2052184-02A	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)
L2052184-02B	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)
L2052184-02C	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)
L2052184-02D	Amber 1000ml HCl preserved	A	<2	<2	3.6	Y	Absent		EPHD-GC-20(14),EPH-MS-20(14)
L2052184-02E	Amber 1000ml HCl preserved	A	<2	<2	3.6	Y	Absent		EPHD-GC-20(14),EPH-MS-20(14)
L2052184-03A	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)
L2052184-03B	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)
L2052184-03C	Vial HCl preserved	A	NA		3.6	Y	Absent		VPH-DELUX-18(14)
L2052184-03D	Amber 1000ml HCl preserved	A	<2	<2	3.6	Y	Absent		EPHD-GC-20(14),EPH-MS-20(14)
L2052184-03E	Amber 1000ml HCl preserved	A	<2	<2	3.6	Y	Absent		EPHD-GC-20(14),EPH-MS-20(14)

*Values in parentheses indicate holding time in days

Project Name:	NATIONAL GRID-284 WINTER ST.	**Lab Number:**	L2052184
Project Number:	172397.10	**Report Date:**	12/02/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	NATIONAL GRID-284 WINTER ST.	**Lab Number:**	L2052184
Project Number:	172397.10	**Report Date:**	12/02/20

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Project Name:	NATIONAL GRID-284 WINTER ST.	**Lab Number:**	L2052184
Project Number:	172397.10	**Report Date:**	12/02/20

Data Qualifiers

the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

Report Format: Data Usability Report

Project Name:	NATIONAL GRID-284 WINTER ST.	**Lab Number:**	L2052184
Project Number:	172397.10	**Report Date:**	12/02/20

REFERENCES

131 Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), MassDEP, February 2018, Revision 2.1 with QC Requirements & Performance Standards for the Analysis of VPH under the Massachusetts Contingency Plan, WSC-CAM-IVA, June 1, 2018.

135 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, December 2019, Revision 2.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, March 1, 2020.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
EPA TO-12 Non-methane organics
EPA 3C Fixed gases
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

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ALPHA ANALYTICAL

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 11/23/20

ALPHA Job #: L2052184

Project Information

Project Name: National Grid - 284 Winter St

Project Location: Haverhill, MA

Project #: 172397.10

Project Manager: Kyle Maxfield

ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Client Information

Client: GZA GeoEnvironmental

Address: 249 Vanderbilt Ave

Norwood, MA

Phone: 781-278-3700

Fax:

Email: kyle.maxfield@gza.com

☐ These samples have been Previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

Report Information

☐ FAX ☒ EMAIL

☒ ADEx ☐ Add'l Deliverables

Data Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program Criteria

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

☒ Yes ☐ No Are MCP Analytical Methods Required?

☐ Yes ☐ No Are CT RCP (Reasonable Confidence Protocols) Required?

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☐ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Sample Specific Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VPH w/ Targets	EPH w/ Targets												
52184-01	GZA-1	11/20/20	1245	GW	MLM	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
02	GZA-1A	11/20/20	1120	GW	MLM	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
03	GZA-2	11/20/20	1000	GW	MLM	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
Container Type						-	-	-	-	-	-	-	-	-	-	-	-		
Preservative						-	-	-	-	-	-	-	-	-	-	-	-		

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

FORM NO: 01-01(I) (rev. 6-MAR-12)

Relinquished By:	Date/Time	Received By:	Date/Time
[illegible]	11/20/20, 1700	TGaye AAI	11.23.20 1159
TGaye AAI	11-23-20 1650	[illegible]	11/23/20 1650

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

CERTIFICATE OF ANALYSIS

GZA

Norwood, MA 02062

RE: 284 Winter St. (172397.10)
ESS Laboratory Work Order Number: F200015

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 9:02 am, Mar 24, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS Laboratory - Cranston, RI	Density, Specific Gravity, Viscosity - 3 Temp (10, 20 & 40 C)

CERTIFICATE OF ANALYSIS

Client Name: GZA
Client Project ID: 284 Winter St.

ESS Laboratory Work Order: F200015

SAMPLE RECEIPT

The following samples were received on for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F200015-01	NFSB-02 (MW)	OIL	3-POINT VISCOSITY, DENSITY
F200015-02	B-107	OIL	3-POINT VISCOSITY, DENSITY

CERTIFICATE OF ANALYSIS

Client Name: GZA
Client Project ID: 284 Winter St.

ESS Laboratory Work Order: F200015

PROJECT NARRATIVE

All quality control parameters met the specified criteria.

End of Project Narrative.

Triton Analytics Corp.
16840 Barker Springs, #302
Houston, TX 77084
(281) 578-2289

TAC Reference: 11000
Requested By: S. Morrell| ESS Laboratory
Project Reference: F200015
Date: 03/23/2020

Certificate of Analysis

Sample Name	F200015-01	F200015-02
Dynamic Visc @ 70 F, (mPa-s)	**5.20**	**4829.70**
Kinematic Visc @ 70 F, (mm2/s)	**5.69**	**4190.70**
Density @ 70 F, (g/cm3)	**0.9141**	**1.1525**
Dynamic Visc @ 100 F, (mPa-s)	**3.32**	**812.02**
Kinematic Visc @ 100 F, (mm2/s)	**3.68**	**711.27**
Density @ 100 F, (g/cm3)	**0.9021**	**1.1416**
Dynamic Visc @ 130 F, (mPa-s)	**2.32**	**219.09**
Kinematic Visc @ 130 F, (mm2/s)	**2.60**	**193.82**
Density @ 130 F, (g/cm3)	**0.8902**	**1.1304**
Density @ 60 F, (g/cm3)	**0.9181**	**1.5590**
API Gravity @ 60 F	**22.50**	**-9.20**
Specific Gravity @ 60 F	**0.9191**	**1.1570**

CERTIFICATE OF ANALYSIS

Client Name: GZA
Client Project ID: 284 Winter St.

ESS Laboratory Work Order: F200015

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

Client Sample ID:
Date Sampled:

ESS Laboratory Sample ID:
Sample Matrix:

CERTIFICATE OF ANALYSIS

Client Name: GZA
Client Project ID: 284 Winter St.
ESS Laboratory Work Order: F200015

Notes and Definitions

ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GZA
Client Project ID: 284 Winter St.

ESS Laboratory Work Order: F200015

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory
Division of Thielsch Engineering, Inc. 185 Frances Avenue, Cranston, RI 02910-2211 Tel. (401) 461-7181 Fax (401) 461-4486 www.esslaboratory.com

CHAIN OF CUSTODY

ESS LAB PROJECT ID: F2000015

Turn Time __X___Standard Rush_____ Approved By: _____

Reporting Limits -

State where samples were collected: ***MA*** **RI CT NH NJ NY ME** Othe

Is this project for any of the following: (please circle)
MA-MCP **CT-RCP RGP DOD** Other_____

Electonic Deliverable
Format: Excel_X_ Access___
PDF_X_ Other_____

GZA Project Manager: Kyle Maxfield

GZA GeoEnvironmental, Inc.
249 Vanderbilt Avenue
Norwood, MA 02062
(781) 278-3700
PRESUMPTIVE CERTAINTY REQUIRED

Project # 172397.10

Project Name: 284 Winter St

Contract Pricing _____

Special Pricing WO#: _____

ESS Lab Sample ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample Identification	# of Containers	3-point viscosity	density								Comment #
1	3/11/2020	1000	G	NAPL	NFSB-02 (MW)	2	X	X								
2	3/11/2020	1015	G	NAPL	B-107	2	X	X								
Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____							1	1								
Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA							V	V								

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ___Yes ___
Seals Intact _____ Yes ___No N
Cooler Temperature: 2.8

Sampled by : Matthew Dion

Comments:
EMAIL RESULTS TO KYLE.MAXFIELD@GZA.COM

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Matthew Dion	3/11/20 @ 15:00	GZA FRIDGE @ 15:00 3/11/20	Fridge 9:52	3/12/20	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	3/12/20 15:36	3/12/20 1536			

Please E-mail all changes to Chain of Custody in writing.

Page 1 of 1

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Norwood

Shipped/Delivered Via: ESS Courier

ESS Project ID: F200015
Date Received: 3/12/2020
Project Due Date: 3/19/2020
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

Samples rec'd in MeOH/DI vials 3/23/20

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
1					VOA Vial	MeOH	
1					VOA Vial	MeOH	
2					VOA Vial	MeOH	
2					VOA Vial	DI Water	

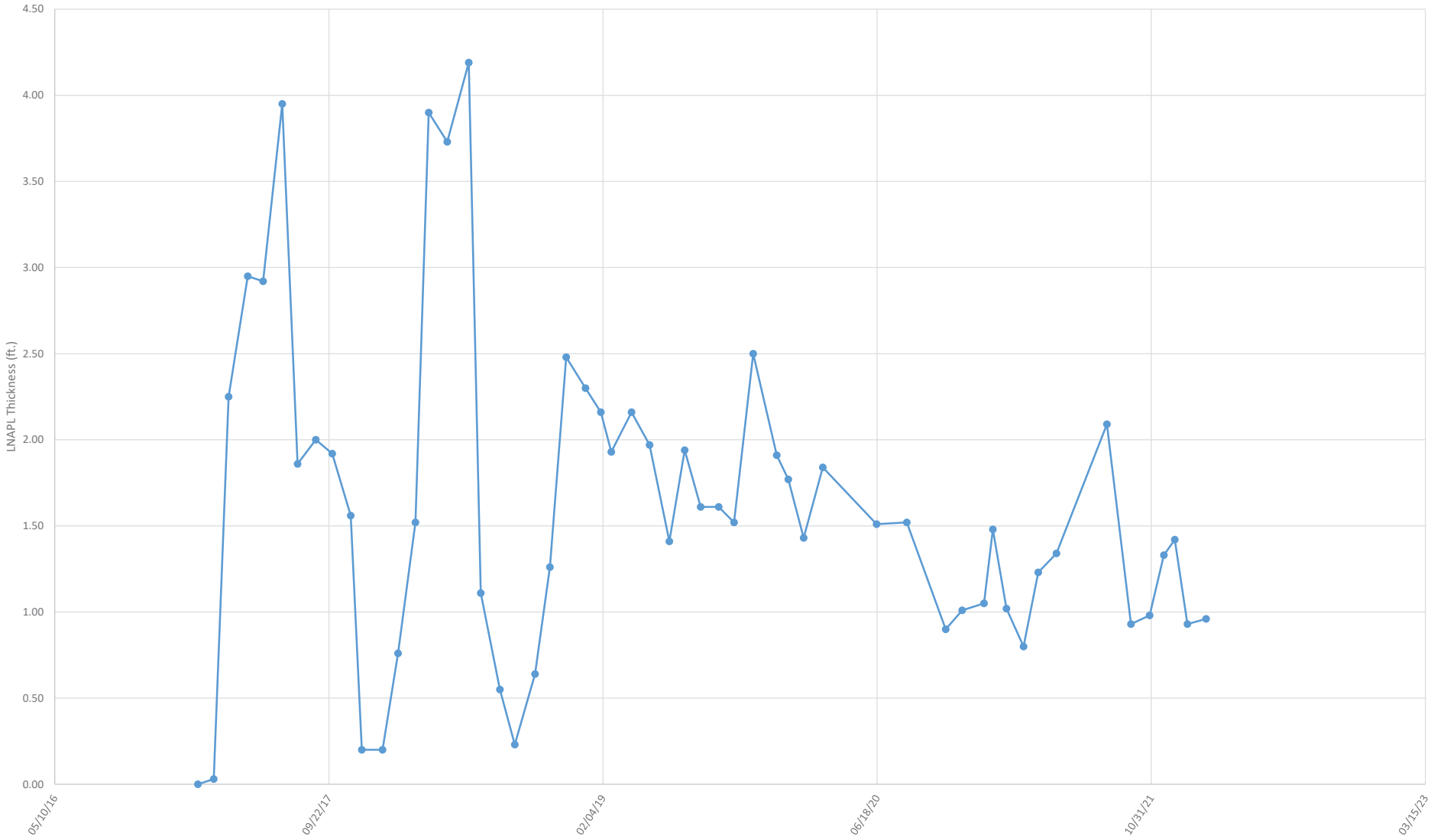
2nd Review

All containers scanned into storage/lab Initials:
Are barcode labels on correct containers? Yes / No
Are all necessary stickers attached? Yes / No

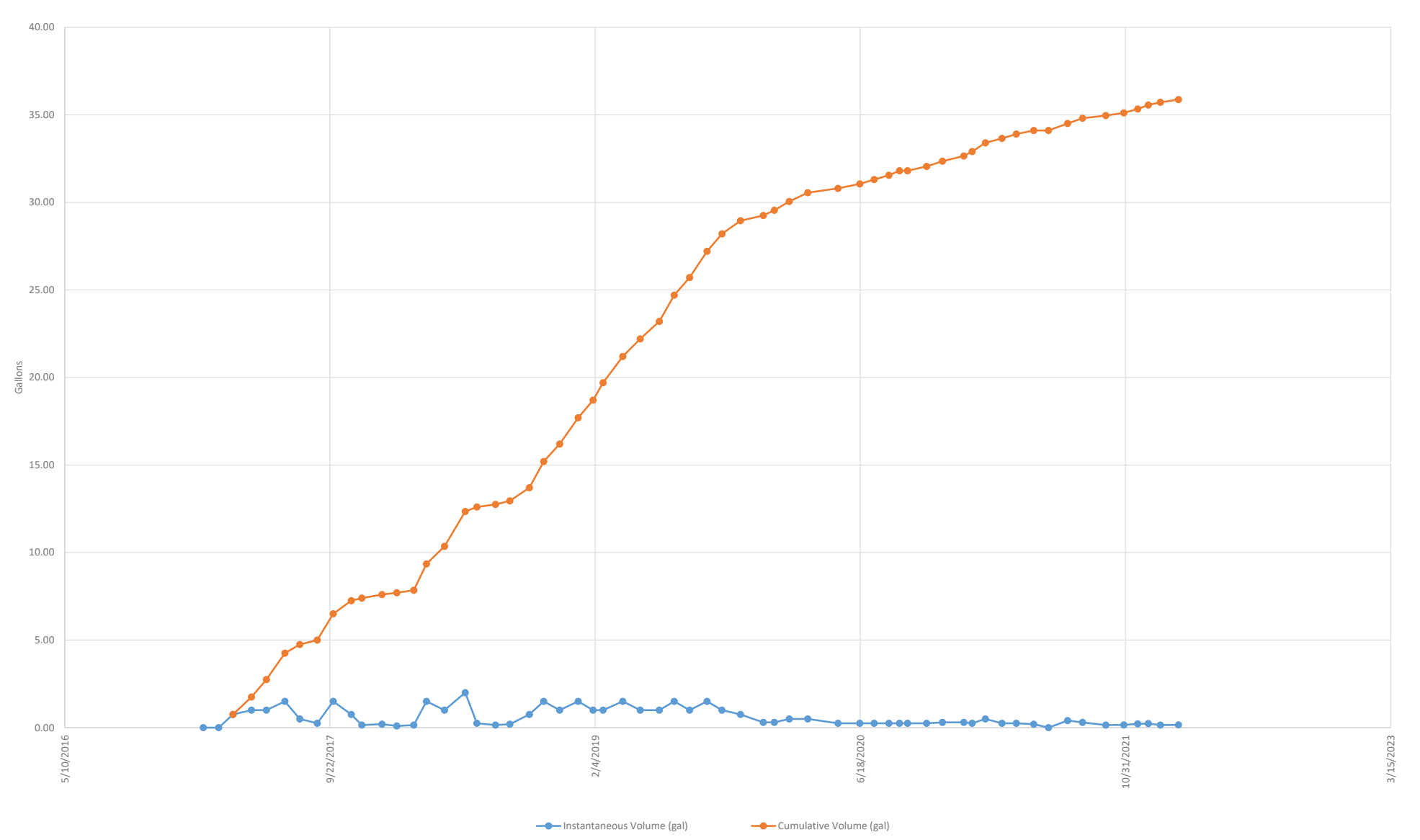
Completed By: Date & Time: 3/12/20 1814
Reviewed By: Date & Time: 3/23/20 @ 10:16
Delivered By:

Appendix L – NAPL Recovery and Feasibility Data

LNAPL THICKNESS - NFSB-02(MW)
284 Winter Street
Haverhill, Massachusetts



LNAPL RECOVERY - NFSB-02(MW)
284 Winter Street
Haverhill, Massachusetts



API LNAPL Transmissivity Workbook

Calculation of LNAPL Transmissivity from Baildown Test Data

STEP 1: RESET OUTPUT SUMMARY

STEP 2: ENTER DATA & VIEW FIGURES

STEP 3: CHOOSE WELL CONDITIONS

STEP 4: LNAPL TRANSMISSIVITY SUMMARY

Mean LNAPL Transmissivity (ft^2/d)

0.34

Standard Deviation (ft^2/d)

0.15

Coefficient of Variation

0.43

Well Designation:	NFSB-02	
Date:	11-Mar-20	

Ground Surface Elev (ft msl)	0.0	Enter These Data	**Drawdown Adjustment (ft)**
Top of Casing Elev (ft msl)	0.0		
Well Casing Radius, r_c (ft):	0.063	r_{e1}	
Well Radius, r_w (ft):	0.094		0
LNAPL Specific Yield, S_y:	0.175		
LNAPL Density Ratio, ρ_r:	0.920		
Top of Screen (ft bgs):	12.0		
Bottom of Screen (ft bgs):	22.0	ml	
LNAPL Baildown Vol. (gal.):	0.13	500	
Effective Radius, r_{e3} (ft):	0.069	Calculated Parameters	
Effective Radius, r_{e2} (ft):	0.068		
Initial Casing LNAPL Vol. (gal.):	0.16	587	
Initial Filter LNAPL Vol. (gal.):	0.03	128	
% purged (total)	70%		

LNAPL Transmissivity (ft^2/d)

B&R	C&J	CB&P
0.319	0.410	0.170

Enter Data Here

	Time (min)	DTP (ft btoc)	DTW (ft btoc)	DTP (ft bgs)	DTW (ft bgs)	Water Table Depth (ft)	LNAPL Drawdown s_n (ft)	Average Time (min)	LNAPL Discharge Q_n (ft^3/d)	s_n (ft)	b_n (ft)	r_e (ft)
Initial Fluid Levels:	0	13.30	14.99	13.300	14.990	13.44					1.69	
10:36:16												
10:42:59	6.71667	13.49	13.57	13.490	13.570	13.496	0.190				0.08	
10:44:41	8.41667	13.46	13.59	13.460	13.590	13.470	0.160	7.6	0.633	0.18	0.13	0.069
10:46:10	9.90000	13.45	13.60	13.600	13.600	13.600	0.300	9.2	-1.888	0.23	0.00	0.069
10:47:41	11.41667	13.45	13.61	13.610	13.610	13.610	0.310	10.7	0.000	0.30	0.00	0.069
10:50:59	14.71667	13.43	13.63	13.630	13.630	13.630	0.330	13.1	0.000	0.32	0.00	0.069
10:53:23	17.11667	13.43	13.66	13.660	13.660	13.660	0.360	15.9	0.000	0.35	0.00	0.069
10:58:39	22.38333	13.43	13.69	13.43	13.69	13.45	0.130	19.7	1.063	0.24	0.26	0.069
11:17:15	40.98333	13.45	13.77	13.45	13.77	13.48	0.150	31.7	0.069	0.14	0.32	0.069
11:25:11	48.91667	13.42	13.84	13.42	13.84	13.45	0.120	44.9	0.271	0.13	0.42	0.069
11:28:51	52.58333	13.42	13.85	13.42	13.85	13.45	0.120	50.8	0.059	0.12	0.43	0.069
11:36:21	60.08333	13.42	13.92	13.42	13.92	13.46	0.120	56.3	0.201	0.12	0.50	0.069
11:44:40	68.40000	13.42	13.95	13.42	13.95	13.46	0.120	64.2	0.078	0.12	0.53	0.069
12:00:21	84.08333	13.41	13.99	13.41	13.99	13.46	0.110	76.2	0.069	0.11	0.58	0.069
12:04:51	88.58333	13.40	14.00	13.40	14.00	13.45	0.087	86.3	0.096	0.10	0.60	0.069
12:16:59	100.71667	13.40	14.02	13.40	14.02	13.45	0.086	94.6	0.036	0.09	0.62	0.069
12:30:41	114.41667	13.40	14.07	13.40	14.07	13.45	0.082	107.6	0.079	0.08	0.67	0.069
				#N/A	#N/A	#N/A	#N/A	0.0	#N/A	#N/A	#N/A	0.000
				#N/A	#N/A	#N/A	#N/A	0.0	#N/A	#N/A	#N/A	0.000
				#N/A	#N/A	#N/A	#N/A	0.0	#N/A	#N/A	#N/A	0.000
				#N/A	#N/A	#N/A	#N/A	0.0	#N/A	#N/A	#N/A	0.000
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				#N/A	#N/A	#N/A	#N/A	0.0	#N/A	#N/A	#N/A	0.000
				#N/A	#N/A	#N/A	#N/A	0.0	#N/A	#N/A	#N/A	0.000
				#N/A	#N/A	#N/A	#N/A	0.0	#N/A	#N/A	#N/A	0.000
				#N/A	#N/A	#N/A	#N/A	0.0	#N/A	#N/A	#N/A	0.000
				#N/A	#N/A	#N/A	#N/A	0.0	#N/A	#N/A	#N/A	0.000
				#N/A	#N/A	#N/A	#N/A	0.0	#N/A	#N/A	#N/A	0.000
				#N/A	#N/A	#N/A	#N/A	0.0	#N/A	#N/A	#N/A	0.000
				#N/A	#N/A	#N/A	#N/A	0.0	#N/A	#N/A	#N/A	0.000
				#N/A	#N/A	#N/A	#N/A	0.0	#N/A	#N/A	#N/A	0.000

Figure 1

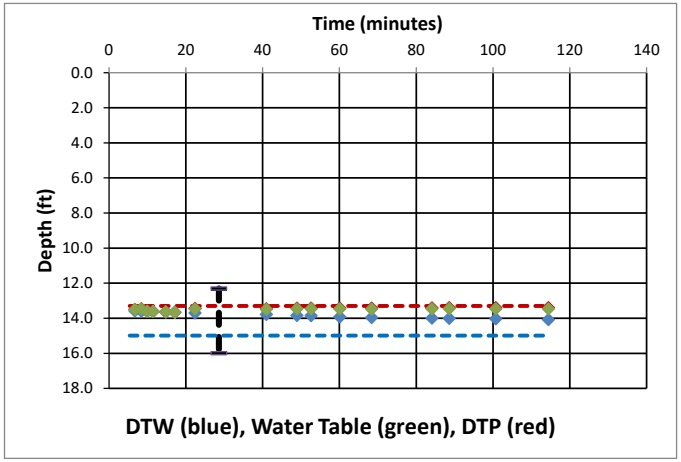
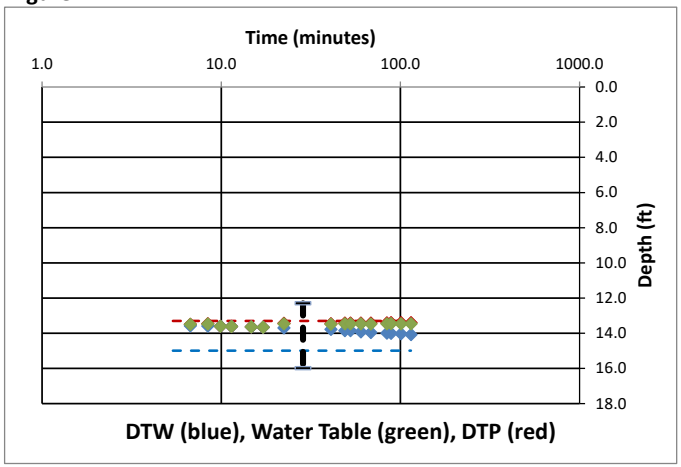


Figure 2



5.4	13.30
114	13.30
5.4	14.99
114	14.99

28.6	12.3
28.6	16.0

Figure 3

Q_n (ft^3/d)	s_n (ft)
0	0
0.02	0.13

Drawdown Adjust.	
Δs_n (ft)	0

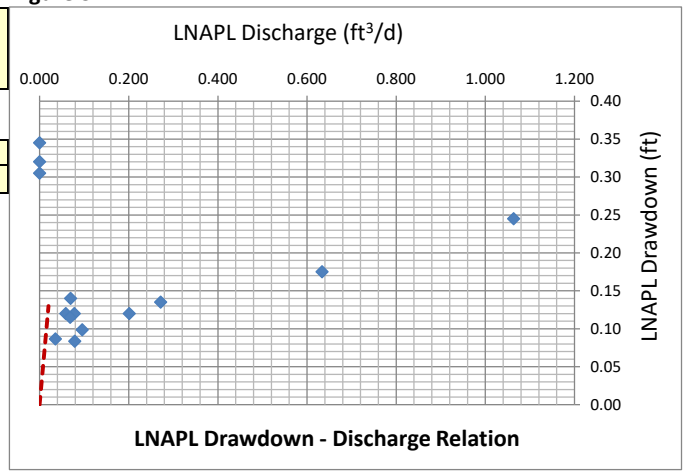
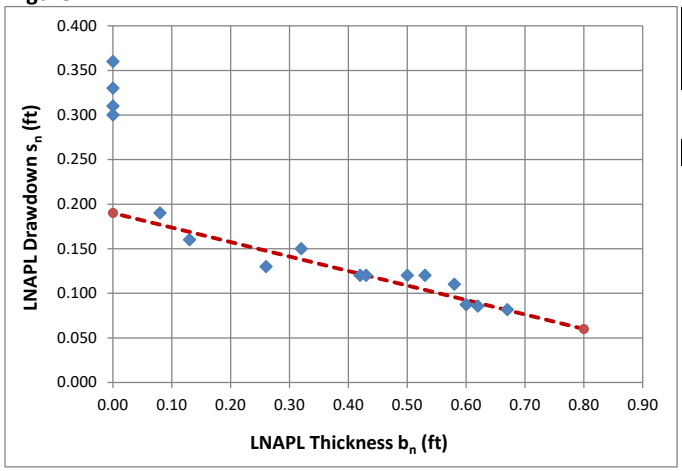


Figure 4



b_n	s_n
0.8	0.06
0	0.19

J-ratio	-0.163

Figure 5

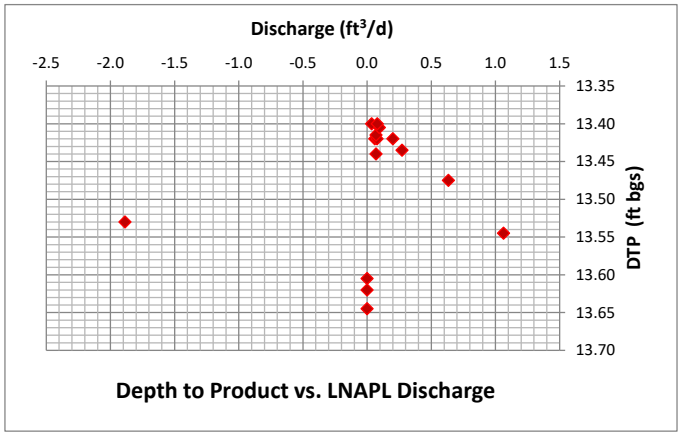
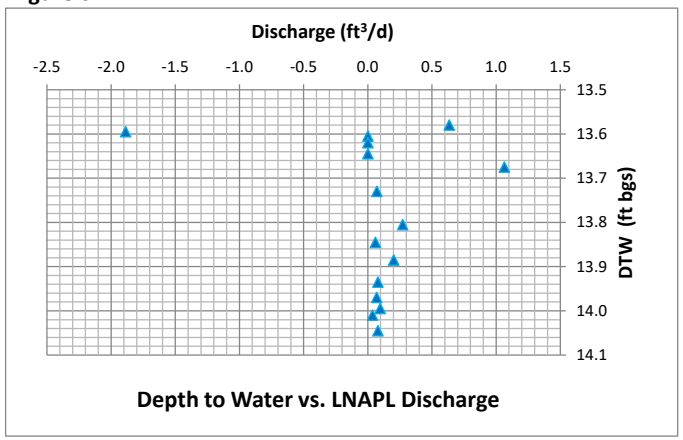


Figure 6



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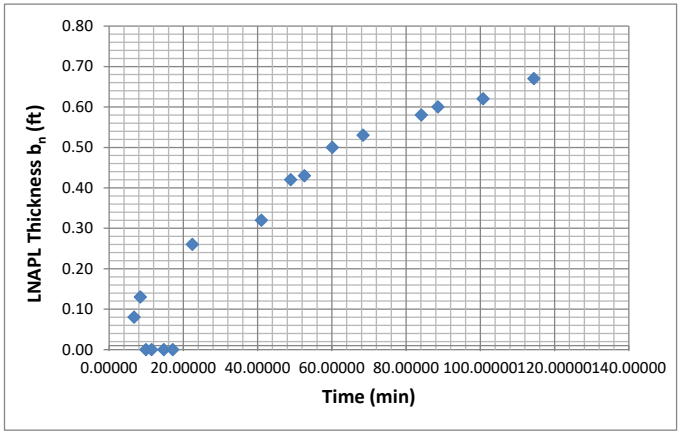


Figure 8

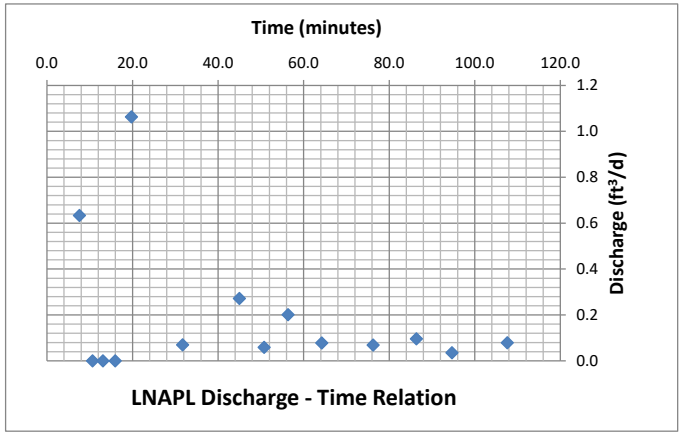


Figure 9

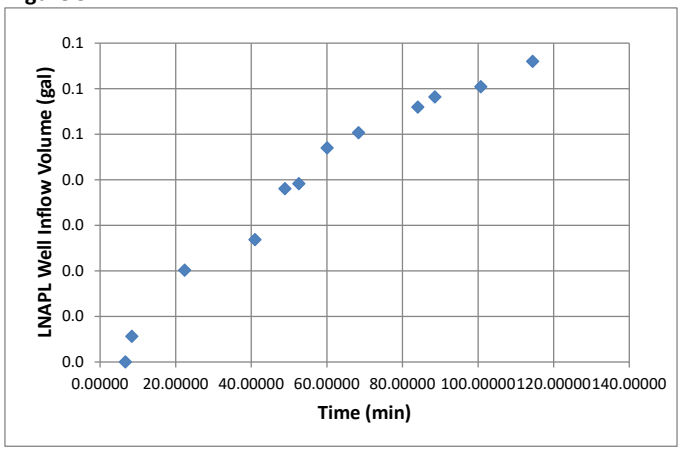
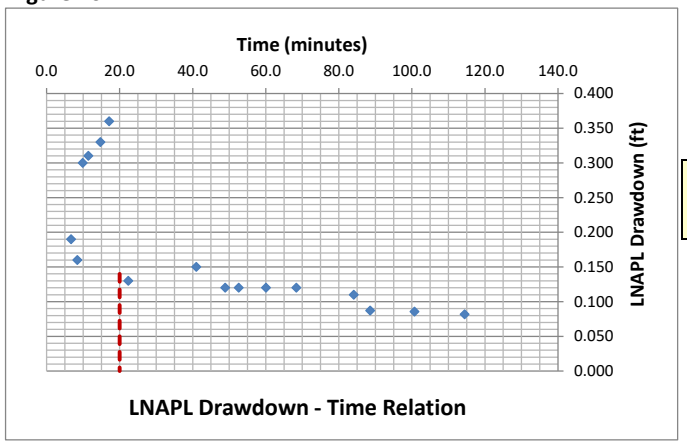


Figure 10



t (min)	s_n (ft)
20	0.14
20	0

Generalized Bouwer and Rice (1976)

Well Designation:	NFSB-02
Date:	11-Mar-20

$$T_n = \frac{r_e^{\,2}\ln(R/r_e)\ln(s_n(t_1)/s_n(t))}{2(-J)(t-t_1)}$$

Enter early time cut-off for least-squares model fit

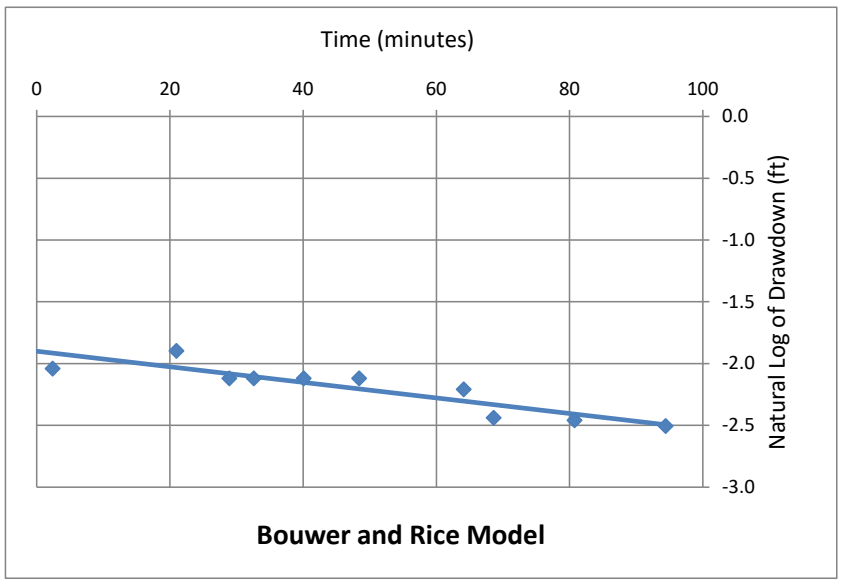
$Time_{cut}$	20	<- Enter or change value here

Model Results: T_n (ft^2/d) = 0.319 +/- 0.05 ft^2/d

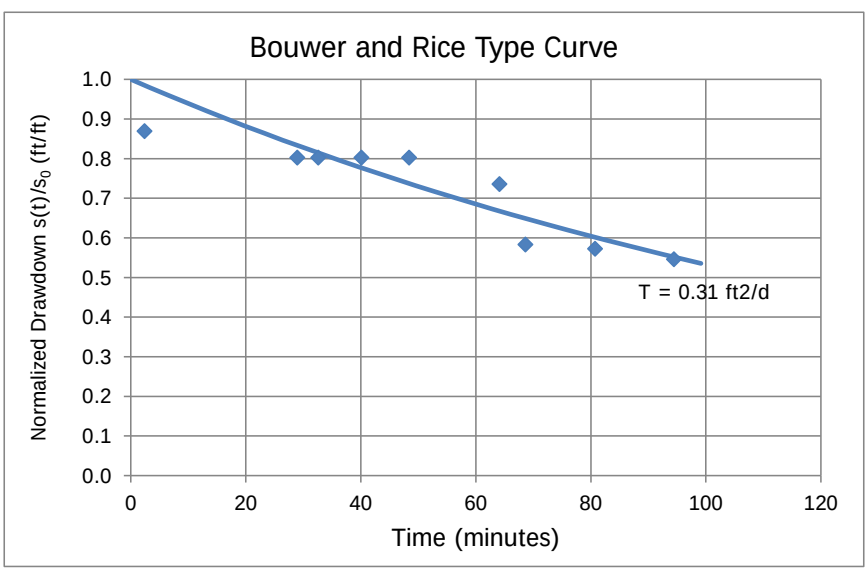
L_e/r_e
24.5
C
1.77
R/r_e
11.05

J-Ratio
-0.163

Coef. Of Variation
0.17



C coefficient calculated from Eq. 6.5(c) of Butler, The Design, Performance, and Analysis of Slug Tests, CRC Press, 2000.



Cooper and Jacob (1946)

Well Designation:	NFSB-02
Date:	11-Mar-20

$$V_n(t_i) = \sum_j^i \frac{4\pi T_n s_j}{\ln\left(\frac{2.25 T_n t_j}{r_e^2 S_n}\right)} \Delta t_j$$

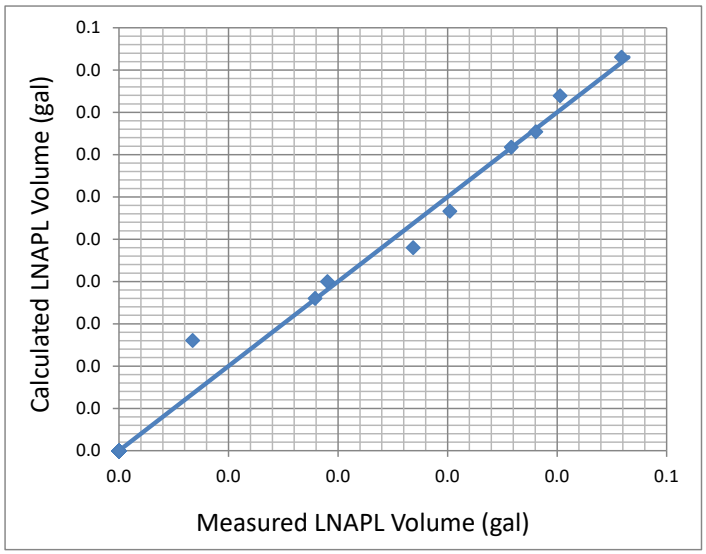
Enter early time cut-off for least-squares model fit

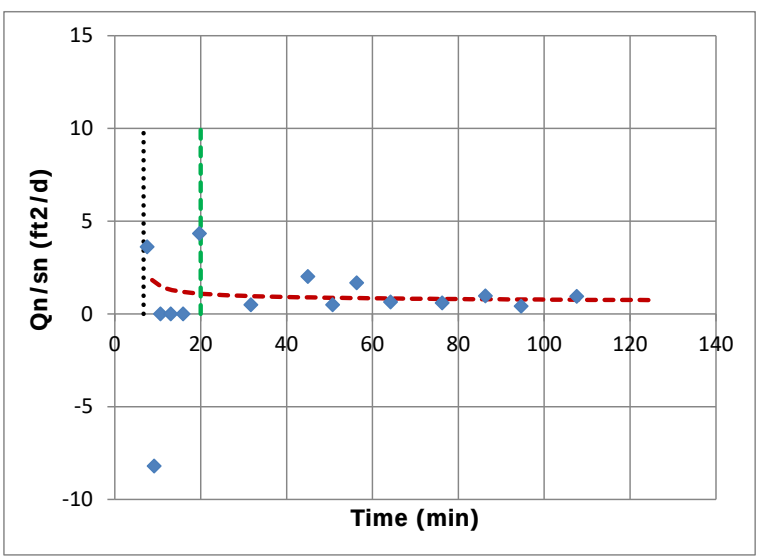
$Time_{cut}$ (min):	20	<- Enter or change values here
Time Adjustment (min):	6.7	

Trial S_n:	d	<-- Enter d for default or enter S_n value
Root-Mean-Square Error:	0.007	<-- Minimize this using "Solver"
	0.016	<-- Working S_n
Trial T_n (ft^2/d):	0.410	<-- By changing T_n through "Solver"

Add constraint T_n > 0.00001

Model Result: T_n (ft^2/d) = **0.410**





Height
10

Cooper, Bredehoeft and Papadopulos (1967)

Well Designation:	NFSB-02
Date:	11-Mar-20

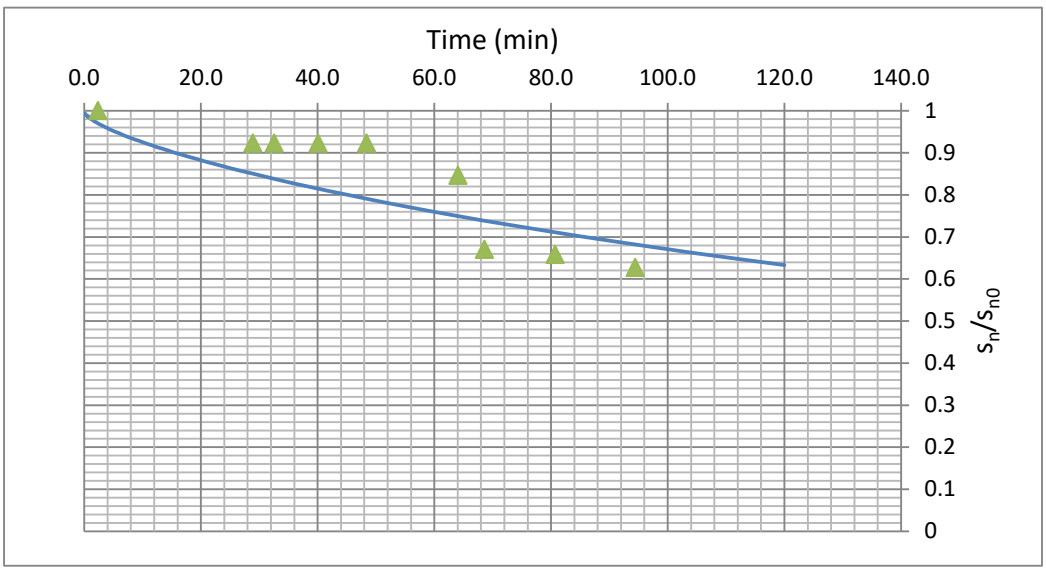
Enter early time cut-off for least-squares model fit

$Time_{cut}$ (min):	20	<- Enter or change values here
Initial Drawdown s_n (ft):	0.13	
Trial S_n:	d	<-- Enter d for default
Root-Mean-Square Error:	0.372	<-- Minimize this using "Solver"
Trial T_n (ft^2/d):	0.170	<-- By changing T_n through "Solver"
	0.010	<-- Working S_n

Add constraint Tn > 0.00001

T_{min}	0.1
T_{max}	120

Model Result: T_n (ft^2/d) = **0.170**



J-Ratio
-0.163

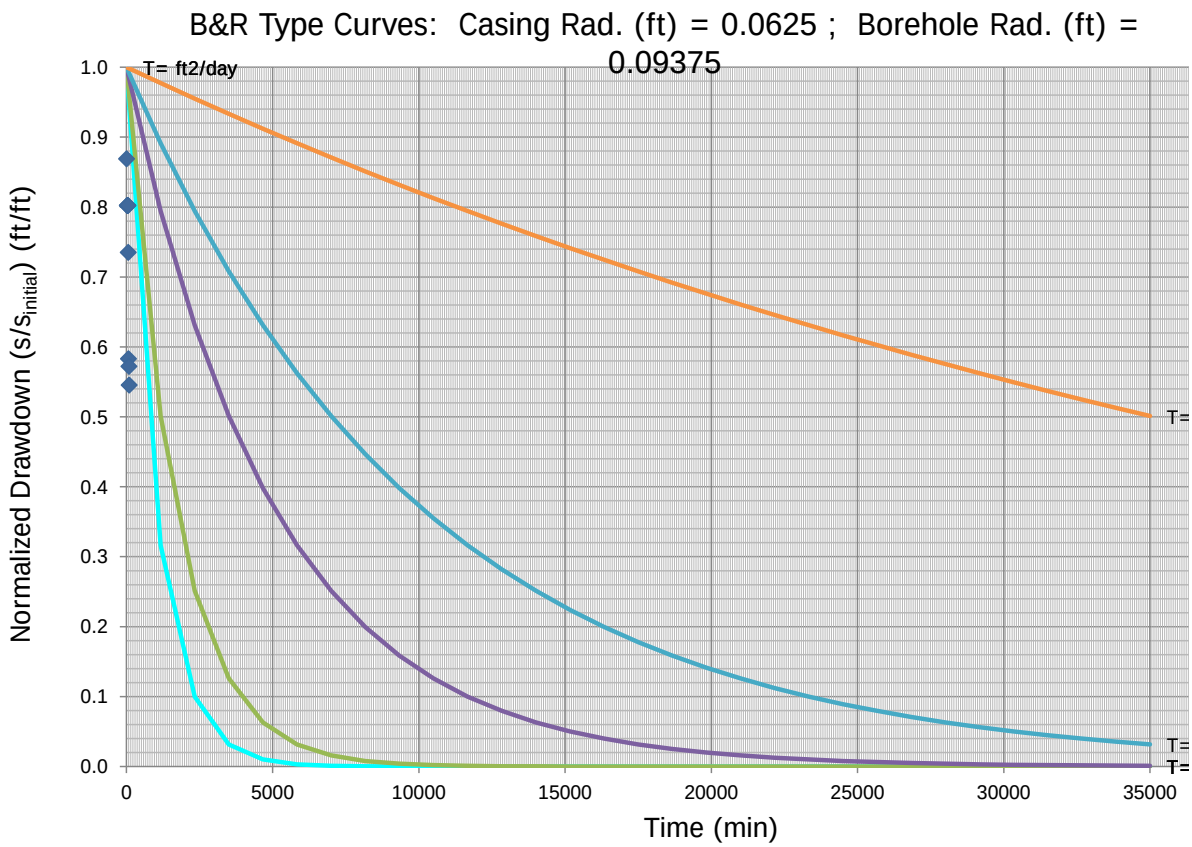
Bouwer and Rice Short Term LNAPL Mobility Test Type Curves

B&R Type Curves: Casing Rad. (ft) = 0.0625 ; Borehole Rad. (ft) = 0.09375

Enter these values

Type Curve ID	Type Curve Name	Notes	Max Time (min)	Transmissivity (ft^2/day)
1	T=0.05 ft2/day		35000	0.05
2	T=0.03 ft2/day		35000	0.03
3	T=0.01 ft2/day		35000	0.01
4	T=0.005 ft2/day		35000	0.005
5	T=0.001 ft2/day		35000	0.001
6	T= ft2/day			
7	T= ft2/day			

J-Ratio
-0.163



<-- If uncertain us

-0.08

=0.001 ft2/day

=0.005 ft2/day

=0.01 ft2/day

40000

B107 NAPL Transmissivity Calculation

$$T_n = K_w * (\mu_w / \mu_n) * (\rho_n / \rho_w) * b * f$$

Paramter	Description	Available Value	Units	Temp.	Calculation Units	Conversion	Calculation Value	Source
K_w	Hydraulic Conductivity (field test)	3.90E-04	cm/sec	NA	ft/day	1 cm/sec = 2834.65 ft/day	1.11	Maximum K calculated at Site
μ_w	dyanamic viscosity of water (literature)	0.9532	mPa*s	71.6 °F	mPa*s	NA	0.9532	http://www.engineeringtoolbox.com/water-density-specific-weight-d_595.html
μ_n	dynamic viscocisty of NAPL (lab test)	4136.04	mPa*s	71.6 °F	mPa*s	NA	4136.04	Lab Report
ρ_n	density of NAPL (lab test)	1.15182	g/cc	71.6 °F	g/cc	NA	1.15182	Lab Report
ρ_w	density of water (literature)	0.99776	g/cc	71.6 °F	g/cc	NA	0.998	http://www.engineeringtoolbox.com/water-density-specific-weight-d_595.html
b_n	NAPL thickness (field)	3.91	ft	NA	ft/day	NA	3.91	Site data - Maximum DNAPL thickness measured.
f	residual NAPL f factor	1	NA	NA	NA	NA	1	Conservative Assumption

Tn (ft^2/day)	1.15E-03

Notes

1. As a conservative approach, F (the fractional competition for soil pores between water, air, and NAPL) is assumed to equal 1. Tn calculated values should be considered estimates of the upper bound of the NAPL transmissivity. http://www.api.org/~/media/Files/EHS/Clean_Water/Ground_Water_Quality/LNAPL/4760-v1.pdf
2. Conservatively assumes that the fomation is fully saturated by NAPL.

Appendix M – Little River Sediment and Surface Water Data (2020)

ANALYTICAL REPORT

Lab Number:	L2024182
Client:	GZA GeoEnvironmental, Inc. 249 Vanderbilt Ave. Norwood, MA 02062
ATTN:	Kyle Maxfield
Phone:	(781) 278-5845
Project Name:	284 WINTER ST
Project Number:	01.0172397.10
Report Date:	06/30/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2024182-01	1C 0-6"	SOIL	HAVERHILL, MA	06/08/20 09:45	06/10/20
L2024182-02	1B 0-6"	SOIL	HAVERHILL, MA	06/08/20 10:15	06/10/20
L2024182-03	1A 0-6"	SOIL	HAVERHILL, MA	06/08/20 11:30	06/10/20
L2024182-04	1A 1-5.5'	SOIL	HAVERHILL, MA	06/08/20 14:30	06/10/20
L2024182-05	2C 0-6"	SOIL	HAVERHILL, MA	06/09/20 08:30	06/10/20
L2024182-06	2A 0-6"	SOIL	HAVERHILL, MA	06/09/20 09:35	06/10/20
L2024182-07	2A 1-4'	SOIL	HAVERHILL, MA	06/09/20 10:15	06/10/20
L2024182-08	3C 0-6"	SOIL	HAVERHILL, MA	06/09/20 10:35	06/10/20
L2024182-09	3B 0-6"	SOIL	HAVERHILL, MA	06/09/20 10:55	06/10/20
L2024182-10	4B 0-6"	SOIL	HAVERHILL, MA	06/09/20 12:45	06/10/20
L2024182-11	4A 1-2.5'	SOIL	HAVERHILL, MA	06/09/20 13:10	06/10/20
L2024182-12	5A 0-6"	SOIL	HAVERHILL, MA	06/09/20 14:05	06/10/20
L2024182-13	5C 0-6"	SOIL	HAVERHILL, MA	06/09/20 14:35	06/10/20
L2024182-14	5B 0-6"	SOIL	HAVERHILL, MA	06/09/20 14:55	06/10/20

Project Name: 284 WINTER ST **Lab Number:** L2024182

Project Number: 01.0172397.10 **Report Date:** 06/30/20

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	YES
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	284 WINTER ST	**Lab Number:**	L2024182
Project Number:	01.0172397.10	**Report Date:**	06/30/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	284 WINTER ST	**Lab Number:**	L2024182
Project Number:	01.0172397.10	**Report Date:**	06/30/20

Case Narrative (continued)

MCP Related Narratives

VPH

In reference to question H:

L2024182-04, -09, -11, and -12: The surrogate recoveries are below the acceptance criteria for 2,5-dibromotoluene-pid (0%) and 2,5-dibromotoluene-fid (0%) due to the dilution required to quantitate the sample. Re-analysis was not required; therefore, the results of the original analysis are reported.

L2024182-06: The surrogate recovery is outside the acceptance criteria for 2,5-dibromotoluene-pid (0%) and 2,5-dibromotoluene-fid (0%); however, the sample was not re-analyzed due to coelution with an obvious interference. A copy of the chromatogram is included as an attachment to this report.

L2024182-07: The surrogate recoveries are outside the acceptance criteria for 2,5-dibromotoluene-pid (48%) and 2,5-dibromotoluene-fid (35%); however, the sample was not re-analyzed due to coelution with an obvious interference. A copy of the chromatogram is included as an attachment to this report.

L2024182-10: The surrogate recovery is outside the acceptance criteria for 2,5-dibromotoluene-fid (66%); however, the sample was not re-analyzed due to coelution with an obvious interference. A copy of the chromatogram is included as an attachment to this report.

EPH

In reference to question H:

L2024182-04, -06, -07, -09, -11, and -12: The surrogate recoveries are below the acceptance criteria for chloro-octadecane (0%) and o-terphenyl (0%) due to the dilution required to quantitate the sample. Re-extraction was not required; therefore, the results of the original analysis are reported.

Non-MCP Related Narratives

% SOOT

L2024182-05, -13, and -14: The Sample Replicate RPD is outside the acceptance criteria of 30%. A double-burn re-analysis was performed with a confirming result. The results of the original analysis are reported. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

Project Name:	284 WINTER ST	**Lab Number:**	L2024182
Project Number:	01.0172397.10	**Report Date:**	06/30/20

Case Narrative (continued)

Total Organic Carbon

L2024182-08: The Sample Replicate RPD is outside the acceptance criteria of 30%. A double-burn re-analysis was performed with a confirming result. The results of the original analysis are reported. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

WG1381140-1: The required batch QC was prepared; however, the native sample required a different reporting method; therefore, the associated QC results could not be reported.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Susan E O'Neil Susan O' Neil

Title: Technical Director/Representative Date: 06/30/20

QC OUTLIER SUMMARY REPORT

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
Extractable Petroleum Hydrocarbons - Westborough Lab								
EPH-19-2.1	1A 1-5.5'	L2024182-04 D	Chloro-Octadecane	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	1A 1-5.5'	L2024182-04 D	o-Terphenyl	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	2A 0-6"	L2024182-06 D	Chloro-Octadecane	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	2A 0-6"	L2024182-06 D	o-Terphenyl	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	2A 1-4'	L2024182-07 D	Chloro-Octadecane	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	2A 1-4'	L2024182-07 D	o-Terphenyl	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	3B 0-6"	L2024182-09 D	Chloro-Octadecane	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	3B 0-6"	L2024182-09 D	o-Terphenyl	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	4A 1-2.5'	L2024182-11 D	Chloro-Octadecane	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	4A 1-2.5'	L2024182-11 D	o-Terphenyl	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	5A 0-6"	L2024182-12 D	Chloro-Octadecane	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	5A 0-6"	L2024182-12 D	o-Terphenyl	Surrogate	0	40-140	-	- - not applicable - -
Volatile Petroleum Hydrocarbons - Westborough Lab								
VPH-18-2.1	1A 1-5.5'	L2024182-04 D	2,5-Dibromotoluene-PID	Surrogate	0	70-130	-	- - not applicable - -
VPH-18-2.1	1A 1-5.5'	L2024182-04 D	2,5-Dibromotoluene-FID	Surrogate	0	70-130	-	- - not applicable - -
VPH-18-2.1	2A 0-6"	L2024182-06 D	2,5-Dibromotoluene-PID	Surrogate	0	70-130	-	- - not applicable - -
VPH-18-2.1	2A 0-6"	L2024182-06 D	2,5-Dibromotoluene-FID	Surrogate	0	70-130	-	- - not applicable - -
VPH-18-2.1	2A 1-4'	L2024182-07 D	2,5-Dibromotoluene-PID	Surrogate	48	70-130	-	potential low bias
VPH-18-2.1	2A 1-4'	L2024182-07 D	2,5-Dibromotoluene-FID	Surrogate	35	70-130	-	potential low bias
VPH-18-2.1	3B 0-6"	L2024182-09 D	2,5-Dibromotoluene-PID	Surrogate	0	70-130	-	- - not applicable - -
VPH-18-2.1	3B 0-6"	L2024182-09 D	2,5-Dibromotoluene-FID	Surrogate	0	70-130	-	- - not applicable - -
VPH-18-2.1	4B 0-6"	L2024182-10 D	2,5-Dibromotoluene-FID	Surrogate	66	70-130	-	potential low bias
VPH-18-2.1	4A 1-2.5'	L2024182-11 D	2,5-Dibromotoluene-PID	Surrogate	0	70-130	-	- - not applicable - -
VPH-18-2.1	4A 1-2.5'	L2024182-11 D	2,5-Dibromotoluene-FID	Surrogate	0	70-130	-	- - not applicable - -
VPH-18-2.1	5A 0-6"	L2024182-12 D	2,5-Dibromotoluene-PID	Surrogate	0	70-130	-	- - not applicable - -
VPH-18-2.1	5A 0-6"	L2024182-12 D	2,5-Dibromotoluene-FID	Surrogate	0	70-130	-	- - not applicable - -

ORGANICS

SEMIVOLATILES

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-01
Client ID: 1C 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/08/20 09:45
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8270D-SIM(M)
Analytical Date: 06/23/20 20:40
Analyst: MJS
Percent Solids: 85%

Extraction Method: ALPHA OP-013
Extraction Date: 06/12/20 21:33
Cleanup Method: EPA 3611B
Cleanup Date: 06/23/20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Naphthalene	926.		ug/kg	3.27	--	1
C1-Naphthalenes	806.		ug/kg	3.27	--	1
C2-Naphthalenes	1150		ug/kg	3.27	--	1
C3-Naphthalenes	579.		ug/kg	3.27	--	1
C4-Naphthalenes	169.		ug/kg	3.27	--	1
Acenaphthylene	762.		ug/kg	3.27	--	1
Acenaphthene	975.		ug/kg	3.27	--	1
Fluorene	717.		ug/kg	3.27	--	1
C1-Fluorenes	630.		ug/kg	3.27	--	1
C2-Fluorenes	418.		ug/kg	3.27	--	1
C3-Fluorenes	187.	G	ug/kg	3.27	--	1
Phenanthrene	3180		ug/kg	3.27	--	1
C1-Phenanthrenes/Anthracenes	2430		ug/kg	3.27	--	1
C2-Phenanthrenes/Anthracenes	1160		ug/kg	3.27	--	1
C3-Phenanthrenes/Anthracenes	363.		ug/kg	3.27	--	1
C4-Phenanthrenes/Anthracenes	85.6		ug/kg	3.27	--	1
Anthracene	1110		ug/kg	3.27	--	1
Fluoranthene	2160		ug/kg	3.27	--	1
Pyrene	2500		ug/kg	3.27	--	1
C1-Fluoranthenes/Pyrenes	2030		ug/kg	3.27	--	1
Benz(a)anthracene	1190		ug/kg	3.27	--	1
Chrysene	1120		ug/kg	3.27	--	1
C1-Chrysenes	955.		ug/kg	3.27	--	1
C2-Chrysenes	508.		ug/kg	3.27	--	1
C3-Chrysenes	289.		ug/kg	3.27	--	1
C4-Chrysenes	124.		ug/kg	3.27	--	1
Benzo(b)fluoranthene	634.		ug/kg	3.27	--	1
Benzo(j)+(k)fluoranthene	694.		ug/kg	3.27	--	1

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-01
Client ID: 1C 0-6"
Sample Location: HAVERHILL, MA
Date Collected: 06/08/20 09:45
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Benzo(e)pyrene	578.		ug/kg	3.27	--	1
Benzo(a)pyrene	1010		ug/kg	3.27	--	1
Perylene	215.		ug/kg	3.27	--	1
Indeno(1,2,3-cd)pyrene	592.		ug/kg	3.27	--	1
Dibenz(a,h)+(a,c)anthracene	158.		ug/kg	3.27	--	1
Benzo(g,h,i)perylene	561.		ug/kg	3.27	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Naphthalene-d8	83		50-130
Phenanthrene-d10	101		50-130
Benzo(a)pyrene-d12	94		50-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-02
Client ID: 1B 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/08/20 10:15
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8270D-SIM(M)
Analytical Date: 06/23/20 22:05
Analyst: MJS
Percent Solids: 88%

Extraction Method: ALPHA OP-013
Extraction Date: 06/12/20 21:33
Cleanup Method: EPA 3611B
Cleanup Date: 06/23/20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Naphthalene	2920		ug/kg	6.44	--	1
C1-Naphthalenes	2340		ug/kg	6.44	--	1
C2-Naphthalenes	5040		ug/kg	6.44	--	1
C3-Naphthalenes	3230		ug/kg	6.44	--	1
C4-Naphthalenes	1120		ug/kg	6.44	--	1
Acenaphthylene	4220		ug/kg	6.44	--	1
Acenaphthene	3700		ug/kg	6.44	--	1
Fluorene	3340		ug/kg	6.44	--	1
C1-Fluorenes	3030		ug/kg	6.44	--	1
C2-Fluorenes	2100		ug/kg	6.44	--	1
C3-Fluorenes	965.	G	ug/kg	6.44	--	1
Phenanthrene	19100	E	ug/kg	6.44	--	1
C1-Phenanthrenes/Anthracenes	13600		ug/kg	6.44	--	1
C2-Phenanthrenes/Anthracenes	5820		ug/kg	6.44	--	1
C3-Phenanthrenes/Anthracenes	1710		ug/kg	6.44	--	1
C4-Phenanthrenes/Anthracenes	409.		ug/kg	6.44	--	1
Anthracene	6920		ug/kg	6.44	--	1
Fluoranthene	11600	E	ug/kg	6.44	--	1
Pyrene	19100	E	ug/kg	6.44	--	1
C1-Fluoranthenes/Pyrenes	12500		ug/kg	6.44	--	1
Benz(a)anthracene	7190		ug/kg	6.44	--	1
Chrysene	6020		ug/kg	6.44	--	1
C1-Chrysenes	4710		ug/kg	6.44	--	1
C2-Chrysenes	2260		ug/kg	6.44	--	1
C3-Chrysenes	1170		ug/kg	6.44	--	1
C4-Chrysenes	454.		ug/kg	6.44	--	1
Benzo(b)fluoranthene	3440		ug/kg	6.44	--	1
Benzo(j)+(k)fluoranthene	3660		ug/kg	6.44	--	1

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-02
Client ID: 1B 0-6"
Sample Location: HAVERHILL, MA
Date Collected: 06/08/20 10:15
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Benzo(e)pyrene	3500		ug/kg	6.44	--	1
Benzo(a)pyrene	7010		ug/kg	6.44	--	1
Perylene	1090		ug/kg	6.44	--	1
Indeno(1,2,3-cd)pyrene	3340		ug/kg	6.44	--	1
Dibenz(a,h)+(a,c)anthracene	918.		ug/kg	6.44	--	1
Benzo(g,h,i)perylene	3330		ug/kg	6.44	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Naphthalene-d8	85		50-130
Phenanthrene-d10	106		50-130
Benzo(a)pyrene-d12	100		50-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-02 D
Client ID: 1B 0-6"
Sample Location: HAVERHILL, MA

Sample Depth:
Matrix: Soil
Analytical Method: 1,8270D-SIM(M)
Analytical Date: 06/24/20 10:48
Analyst: MJS
Percent Solids: 88%

Date Collected: 06/08/20 10:15
Date Received: 06/10/20
Field Prep: Not Specified

Extraction Method: ALPHA OP-013
Extraction Date: 06/12/20 21:33
Cleanup Method: EPA 3611B
Cleanup Date: 06/23/20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Phenanthrene	16500		ug/kg	64.4	--	10
Fluoranthene	10300		ug/kg	64.4	--	10
Pyrene	16500		ug/kg	64.4	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Naphthalene-d8	72		50-130
Phenanthrene-d10	92		50-130
Benzo(a)pyrene-d12	82		50-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-03
Client ID: 1A 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/08/20 11:30
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8270D-SIM(M)
Analytical Date: 06/23/20 23:30
Analyst: MJS
Percent Solids: 87%

Extraction Method: ALPHA OP-013
Extraction Date: 06/12/20 21:33
Cleanup Method: EPA 3611B
Cleanup Date: 06/23/20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Naphthalene	154.		ug/kg	3.17	--	1
C1-Naphthalenes	256.		ug/kg	3.17	--	1
C2-Naphthalenes	578.		ug/kg	3.17	--	1
C3-Naphthalenes	469.		ug/kg	3.17	--	1
C4-Naphthalenes	202.		ug/kg	3.17	--	1
Acenaphthylene	1010		ug/kg	3.17	--	1
Acenaphthene	232.		ug/kg	3.17	--	1
Fluorene	296.		ug/kg	3.17	--	1
C1-Fluorenes	474.		ug/kg	3.17	--	1
C2-Fluorenes	489.		ug/kg	3.17	--	1
C3-Fluorenes	375.	G	ug/kg	3.17	--	1
Phenanthrene	1780		ug/kg	3.17	--	1
C1-Phenanthrenes/Anthracenes	2540		ug/kg	3.17	--	1
C2-Phenanthrenes/Anthracenes	1690		ug/kg	3.17	--	1
C3-Phenanthrenes/Anthracenes	624.		ug/kg	3.17	--	1
C4-Phenanthrenes/Anthracenes	166.		ug/kg	3.17	--	1
Anthracene	810.		ug/kg	3.17	--	1
Fluoranthene	2030		ug/kg	3.17	--	1
Pyrene	3110		ug/kg	3.17	--	1
C1-Fluoranthenes/Pyrenes	2820		ug/kg	3.17	--	1
Benz(a)anthracene	1540		ug/kg	3.17	--	1
Chrysene	1570		ug/kg	3.17	--	1
C1-Chrysenes	1800		ug/kg	3.17	--	1
C2-Chrysenes	1080		ug/kg	3.17	--	1
C3-Chrysenes	508.		ug/kg	3.17	--	1
C4-Chrysenes	226.		ug/kg	3.17	--	1
Benzo(b)fluoranthene	869.		ug/kg	3.17	--	1
Benzo(j)+(k)fluoranthene	886.		ug/kg	3.17	--	1

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-03
Client ID: 1A 0-6"
Sample Location: HAVERHILL, MA
Date Collected: 06/08/20 11:30
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Benzo(e)pyrene	854.		ug/kg	3.17	--	1
Benzo(a)pyrene	1290		ug/kg	3.17	--	1
Perylene	288.		ug/kg	3.17	--	1
Indeno(1,2,3-cd)pyrene	880.		ug/kg	3.17	--	1
Dibenz(a,h)+(a,c)anthracene	258.		ug/kg	3.17	--	1
Benzo(g,h,i)perylene	906.		ug/kg	3.17	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Naphthalene-d8	55		50-130
Phenanthrene-d10	73		50-130
Benzo(a)pyrene-d12	73		50-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-05
Client ID: 2C 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 08:30
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8270D-SIM(M)
Analytical Date: 06/24/20 00:54
Analyst: MJS
Percent Solids: 74%

Extraction Method: ALPHA OP-013
Extraction Date: 06/12/20 21:33
Cleanup Method: EPA 3611B
Cleanup Date: 06/23/20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Naphthalene	8600		ug/kg	17.8	--	1
C1-Naphthalenes	21800		ug/kg	17.8	--	1
C2-Naphthalenes	35700		ug/kg	17.8	--	1
C3-Naphthalenes	17400		ug/kg	17.8	--	1
C4-Naphthalenes	4340		ug/kg	17.8	--	1
Acenaphthylene	18600		ug/kg	17.8	--	1
Acenaphthene	21000		ug/kg	17.8	--	1
Fluorene	22500		ug/kg	17.8	--	1
C1-Fluorenes	18100		ug/kg	17.8	--	1
C2-Fluorenes	10400		ug/kg	17.8	--	1
C3-Fluorenes	3550		ug/kg	17.8	--	1
Phenanthrene	95100	E	ug/kg	17.8	--	1
C1-Phenanthrenes/Anthracenes	66000		ug/kg	17.8	--	1
C2-Phenanthrenes/Anthracenes	27500		ug/kg	17.8	--	1
C3-Phenanthrenes/Anthracenes	7490		ug/kg	17.8	--	1
C4-Phenanthrenes/Anthracenes	1600		ug/kg	17.8	--	1
Anthracene	30800	E	ug/kg	17.8	--	1
Fluoranthene	49100	E	ug/kg	17.8	--	1
Pyrene	56000	E	ug/kg	17.8	--	1
C1-Fluoranthenes/Pyrenes	49000		ug/kg	17.8	--	1
Benz(a)anthracene	27400	E	ug/kg	17.8	--	1
Chrysene	22200		ug/kg	17.8	--	1
C1-Chrysenes	19000		ug/kg	17.8	--	1
C2-Chrysenes	9110		ug/kg	17.8	--	1
C3-Chrysenes	4670		ug/kg	17.8	--	1
C4-Chrysenes	1400		ug/kg	17.8	--	1
Benzo(b)fluoranthene	12200		ug/kg	17.8	--	1
Benzo(j)+(k)fluoranthene	11500		ug/kg	17.8	--	1

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-05
Client ID: 2C 0-6"
Sample Location: HAVERHILL, MA
Date Collected: 06/09/20 08:30
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Benzo(e)pyrene	9700		ug/kg	17.8	--	1
Benzo(a)pyrene	20600		ug/kg	17.8	--	1
Perylene	3930		ug/kg	17.8	--	1
Indeno(1,2,3-cd)pyrene	9950		ug/kg	17.8	--	1
Dibenz(a,h)+(a,c)anthracene	3030		ug/kg	17.8	--	1
Benzo(g,h,i)perylene	8620		ug/kg	17.8	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Naphthalene-d8	90		50-130
Phenanthrene-d10	108		50-130
Benzo(a)pyrene-d12	103		50-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-05 D
Client ID: 2C 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 08:30
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8270D-SIM(M)
Analytical Date: 06/24/20 12:13
Analyst: MJS
Percent Solids: 74%

Extraction Method: ALPHA OP-013
Extraction Date: 06/12/20 21:33
Cleanup Method: EPA 3611B
Cleanup Date: 06/23/20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Phenanthrene	77100		ug/kg	178	--	10
Anthracene	25700		ug/kg	178	--	10
Fluoranthene	41200		ug/kg	178	--	10
Pyrene	46500		ug/kg	178	--	10
Benz(a)anthracene	22600		ug/kg	178	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Naphthalene-d8	73		50-130
Phenanthrene-d10	90		50-130
Benzo(a)pyrene-d12	85		50-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-08
Client ID: 3C 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 10:35
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8270D-SIM(M)
Analytical Date: 06/24/20 02:19
Analyst: MJS
Percent Solids: 93%

Extraction Method: ALPHA OP-013
Extraction Date: 06/12/20 21:33
Cleanup Method: EPA 3611B
Cleanup Date: 06/23/20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Naphthalene	85100	E	ug/kg	7.62	--	1
C1-Naphthalenes	58700	E	ug/kg	7.62	--	1
C2-Naphthalenes	14200		ug/kg	7.62	--	1
C3-Naphthalenes	2310		ug/kg	7.62	--	1
C4-Naphthalenes	478.		ug/kg	7.62	--	1
Acenaphthylene	1980		ug/kg	7.62	--	1
Acenaphthene	13300	E	ug/kg	7.62	--	1
Fluorene	6730		ug/kg	7.62	--	1
C1-Fluorenes	2180		ug/kg	7.62	--	1
C2-Fluorenes	1060		ug/kg	7.62	--	1
C3-Fluorenes	361.		ug/kg	7.62	--	1
Phenanthrene	11700	E	ug/kg	7.62	--	1
C1-Phenanthrenes/Anthracenes	7150		ug/kg	7.62	--	1
C2-Phenanthrenes/Anthracenes	2720		ug/kg	7.62	--	1
C3-Phenanthrenes/Anthracenes	690.		ug/kg	7.62	--	1
C4-Phenanthrenes/Anthracenes	153.		ug/kg	7.62	--	1
Anthracene	3200		ug/kg	7.62	--	1
Fluoranthene	3900		ug/kg	7.62	--	1
Pyrene	4820		ug/kg	7.62	--	1
C1-Fluoranthenes/Pyrenes	4630		ug/kg	7.62	--	1
Benz(a)anthracene	2040		ug/kg	7.62	--	1
Chrysene	1780		ug/kg	7.62	--	1
C1-Chrysenes	1650		ug/kg	7.62	--	1
C2-Chrysenes	794.		ug/kg	7.62	--	1
C3-Chrysenes	452.		ug/kg	7.62	--	1
C4-Chrysenes	218.		ug/kg	7.62	--	1
Benzo(b)fluoranthene	793.		ug/kg	7.62	--	1
Benzo(j)+(k)fluoranthene	850.		ug/kg	7.62	--	1

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-08
Client ID: 3C 0-6"
Sample Location: HAVERHILL, MA
Date Collected: 06/09/20 10:35
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Benzo(e)pyrene	705.		ug/kg	7.62	--	1
Benzo(a)pyrene	1440		ug/kg	7.62	--	1
Perylene	268.		ug/kg	7.62	--	1
Indeno(1,2,3-cd)pyrene	652.		ug/kg	7.62	--	1
Dibenz(a,h)+(a,c)anthracene	213.		ug/kg	7.62	--	1
Benzo(g,h,i)perylene	583.		ug/kg	7.62	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Naphthalene-d8	83		50-130
Phenanthrene-d10	115		50-130
Benzo(a)pyrene-d12	102		50-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-08 D
Client ID: 3C 0-6"
Sample Location: HAVERHILL, MA

Sample Depth:
Matrix: Soil
Analytical Method: 1,8270D-SIM(M)
Analytical Date: 06/24/20 13:38
Analyst: MJS
Percent Solids: 93%

Date Collected: 06/09/20 10:35
Date Received: 06/10/20
Field Prep: Not Specified

Extraction Method: ALPHA OP-013
Extraction Date: 06/12/20 21:33
Cleanup Method: EPA 3611B
Cleanup Date: 06/23/20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Naphthalene	76400		ug/kg	76.2	--	10
C1-Naphthalenes	49900		ug/kg	76.2	--	10
Acenaphthene	11800		ug/kg	76.2	--	10
Phenanthrene	10200		ug/kg	76.2	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Naphthalene-d8	73		50-130
Phenanthrene-d10	95		50-130
Benzo(a)pyrene-d12	85		50-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-10
Client ID: 4B 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 12:45
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8270D-SIM(M)
Analytical Date: 06/24/20 03:44
Analyst: MJS
Percent Solids: 85%

Extraction Method: ALPHA OP-013
Extraction Date: 06/12/20 21:33
Cleanup Method: EPA 3611B
Cleanup Date: 06/23/20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Naphthalene	41700	E	ug/kg	4.49	--	1
C1-Naphthalenes	19900	E	ug/kg	4.49	--	1
C2-Naphthalenes	7170		ug/kg	4.49	--	1
C3-Naphthalenes	1710		ug/kg	4.49	--	1
C4-Naphthalenes	259.		ug/kg	4.49	--	1
Acenaphthylene	308.		ug/kg	4.49	--	1
Acenaphthene	7070	E	ug/kg	4.49	--	1
Fluorene	3240		ug/kg	4.49	--	1
C1-Fluorenes	1350		ug/kg	4.49	--	1
C2-Fluorenes	360.		ug/kg	4.49	--	1
C3-Fluorenes	125.	G	ug/kg	4.49	--	1
Phenanthrene	11100	E	ug/kg	4.49	--	1
C1-Phenanthrenes/Anthracenes	2880		ug/kg	4.49	--	1
C2-Phenanthrenes/Anthracenes	632.		ug/kg	4.49	--	1
C3-Phenanthrenes/Anthracenes	169.		ug/kg	4.49	--	1
C4-Phenanthrenes/Anthracenes	61.2		ug/kg	4.49	--	1
Anthracene	2710		ug/kg	4.49	--	1
Fluoranthene	6860	E	ug/kg	4.49	--	1
Pyrene	5920		ug/kg	4.49	--	1
C1-Fluoranthenes/Pyrenes	2040		ug/kg	4.49	--	1
Benz(a)anthracene	2470		ug/kg	4.49	--	1
Chrysene	2020		ug/kg	4.49	--	1
C1-Chrysenes	720.		ug/kg	4.49	--	1
C2-Chrysenes	311.		ug/kg	4.49	--	1
C3-Chrysenes	287.		ug/kg	4.49	--	1
C4-Chrysenes	145.		ug/kg	4.49	--	1
Benzo(b)fluoranthene	1820		ug/kg	4.49	--	1
Benzo(j)+(k)fluoranthene	1670		ug/kg	4.49	--	1

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-10
Client ID: 4B 0-6"
Sample Location: HAVERHILL, MA
Date Collected: 06/09/20 12:45
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Benzo(e)pyrene	1210		ug/kg	4.49	--	1
Benzo(a)pyrene	2160		ug/kg	4.49	--	1
Perylene	612.		ug/kg	4.49	--	1
Indeno(1,2,3-cd)pyrene	1570		ug/kg	4.49	--	1
Dibenz(a,h)+(a,c)anthracene	376.		ug/kg	4.49	--	1
Benzo(g,h,i)perylene	1320		ug/kg	4.49	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Naphthalene-d8	81		50-130
Phenanthrene-d10	118		50-130
Benzo(a)pyrene-d12	98		50-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-10 D
Client ID: 4B 0-6"
Sample Location: HAVERHILL, MA

Sample Depth:
Matrix: Soil
Analytical Method: 1,8270D-SIM(M)
Analytical Date: 06/24/20 15:03
Analyst: MJS
Percent Solids: 85%

Date Collected: 06/09/20 12:45
Date Received: 06/10/20
Field Prep: Not Specified

Extraction Method: ALPHA OP-013
Extraction Date: 06/12/20 21:33
Cleanup Method: EPA 3611B
Cleanup Date: 06/23/20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Naphthalene	37000		ug/kg	44.9	--	10
C1-Naphthalenes	17300		ug/kg	44.9	--	10
Acenaphthene	6190		ug/kg	44.9	--	10
Phenanthrene	9360		ug/kg	44.9	--	10
Fluoranthene	5820		ug/kg	44.9	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Naphthalene-d8	70		50-130
Phenanthrene-d10	98		50-130
Benzo(a)pyrene-d12	83		50-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-13
Client ID: 5C 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 14:35
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8270D-SIM(M)
Analytical Date: 06/24/20 05:08
Analyst: MJS
Percent Solids: 78%

Extraction Method: ALPHA OP-013
Extraction Date: 06/12/20 21:33
Cleanup Method: EPA 3611B
Cleanup Date: 06/23/20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Naphthalene	175.		ug/kg	9.70	--	1
C1-Naphthalenes	180.		ug/kg	9.70	--	1
C2-Naphthalenes	458.		ug/kg	9.70	--	1
C3-Naphthalenes	567.		ug/kg	9.70	--	1
C4-Naphthalenes	283.		ug/kg	9.70	--	1
Acenaphthylene	612.		ug/kg	9.70	--	1
Acenaphthene	562.		ug/kg	9.70	--	1
Fluorene	436.		ug/kg	9.70	--	1
C1-Fluorenes	644.		ug/kg	9.70	--	1
C2-Fluorenes	723.		ug/kg	9.70	--	1
C3-Fluorenes	385.	G	ug/kg	9.70	--	1
Phenanthrene	2800		ug/kg	9.70	--	1
C1-Phenanthrenes/Anthracenes	3020		ug/kg	9.70	--	1
C2-Phenanthrenes/Anthracenes	1710		ug/kg	9.70	--	1
C3-Phenanthrenes/Anthracenes	557.		ug/kg	9.70	--	1
C4-Phenanthrenes/Anthracenes	152.		ug/kg	9.70	--	1
Anthracene	803.		ug/kg	9.70	--	1
Fluoranthene	4570		ug/kg	9.70	--	1
Pyrene	4900		ug/kg	9.70	--	1
C1-Fluoranthenes/Pyrenes	2470		ug/kg	9.70	--	1
Benz(a)anthracene	1480		ug/kg	9.70	--	1
Chrysene	1590		ug/kg	9.70	--	1
C1-Chrysenes	1020		ug/kg	9.70	--	1
C2-Chrysenes	661.		ug/kg	9.70	--	1
C3-Chrysenes	500.		ug/kg	9.70	--	1
C4-Chrysenes	249.		ug/kg	9.70	--	1
Benzo(b)fluoranthene	1030		ug/kg	9.70	--	1
Benzo(j)+(k)fluoranthene	964.		ug/kg	9.70	--	1

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-13
Client ID: 5C 0-6"
Sample Location: HAVERHILL, MA
Date Collected: 06/09/20 14:35
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Benzo(e)pyrene	810.		ug/kg	9.70	--	1
Benzo(a)pyrene	1290		ug/kg	9.70	--	1
Perylene	336.		ug/kg	9.70	--	1
Indeno(1,2,3-cd)pyrene	919.		ug/kg	9.70	--	1
Dibenz(a,h)+(a,c)anthracene	227.		ug/kg	9.70	--	1
Benzo(g,h,i)perylene	892.		ug/kg	9.70	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Naphthalene-d8	79		50-130
Phenanthrene-d10	110		50-130
Benzo(a)pyrene-d12	103		50-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-14 D
Client ID: 5B 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 14:55
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8270D-SIM(M)
Analytical Date: 06/24/20 09:23
Analyst: MJS
Percent Solids: 78%

Extraction Method: ALPHA OP-013
Extraction Date: 06/12/20 21:33
Cleanup Method: EPA 3611B
Cleanup Date: 06/23/20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Naphthalene	342.		ug/kg	20.1	--	2
C1-Naphthalenes	1680		ug/kg	20.1	--	2
C2-Naphthalenes	4810		ug/kg	20.1	--	2
C3-Naphthalenes	2840		ug/kg	20.1	--	2
C4-Naphthalenes	330.		ug/kg	20.1	--	2
Acenaphthylene	634.		ug/kg	20.1	--	2
Acenaphthene	6520		ug/kg	20.1	--	2
Fluorene	3940		ug/kg	20.1	--	2
C1-Fluorenes	2270		ug/kg	20.1	--	2
C2-Fluorenes	438.		ug/kg	20.1	--	2
C3-Fluorenes	196.	G	ug/kg	20.1	--	2
Phenanthrene	14100		ug/kg	20.1	--	2
C1-Phenanthrenes/Anthracenes	2570		ug/kg	20.1	--	2
C2-Phenanthrenes/Anthracenes	709.		ug/kg	20.1	--	2
C3-Phenanthrenes/Anthracenes	216.		ug/kg	20.1	--	2
C4-Phenanthrenes/Anthracenes	88.4		ug/kg	20.1	--	2
Anthracene	2450		ug/kg	20.1	--	2
Fluoranthene	4880		ug/kg	20.1	--	2
Pyrene	4220		ug/kg	20.1	--	2
C1-Fluoranthenes/Pyrenes	1460		ug/kg	20.1	--	2
Benz(a)anthracene	1610		ug/kg	20.1	--	2
Chrysene	1500		ug/kg	20.1	--	2
C1-Chrysenes	694.		ug/kg	20.1	--	2
C2-Chrysenes	357.		ug/kg	20.1	--	2
C3-Chrysenes	400.		ug/kg	20.1	--	2
C4-Chrysenes	280.		ug/kg	20.1	--	2
Benzo(b)fluoranthene	1180		ug/kg	20.1	--	2
Benzo(j)+(k)fluoranthene	1090		ug/kg	20.1	--	2

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-14 D
Client ID: 5B 0-6"
Sample Location: HAVERHILL, MA
Date Collected: 06/09/20 14:55
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
PAHs - Mansfield Lab						
Benzo(e)pyrene	894.		ug/kg	20.1	--	2
Benzo(a)pyrene	1420		ug/kg	20.1	--	2
Perylene	372.		ug/kg	20.1	--	2
Indeno(1,2,3-cd)pyrene	971.		ug/kg	20.1	--	2
Dibenz(a,h)+(a,c)anthracene	245.		ug/kg	20.1	--	2
Benzo(g,h,i)perylene	882.		ug/kg	20.1	--	2

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Naphthalene-d8	78		50-130
Phenanthrene-d10	104		50-130
Benzo(a)pyrene-d12	98		50-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D-SIM(M)
Analytical Date: 06/23/20 14:59
Analyst: MJS

Extraction Method: ALPHA OP-013
Extraction Date: 06/12/20 21:33
Cleanup Method: EPA 3611B
Cleanup Date: 06/23/20

Parameter	Result	Qualifier	Units	RL	MDL
PAHs - Mansfield Lab for sample(s): 01-03,05,08,10,13-14 Batch: WG1381156-1					
Naphthalene	ND		ug/kg	1.00	--
C1-Naphthalenes	ND		ug/kg	1.00	--
C2-Naphthalenes	ND		ug/kg	1.00	--
C3-Naphthalenes	ND		ug/kg	1.00	--
C4-Naphthalenes	ND		ug/kg	1.00	--
Acenaphthylene	ND		ug/kg	1.00	--
Acenaphthene	ND		ug/kg	1.00	--
Fluorene	ND		ug/kg	1.00	--
C1-Fluorenes	ND		ug/kg	1.00	--
C2-Fluorenes	ND		ug/kg	1.00	--
C3-Fluorenes	ND		ug/kg	1.00	--
Phenanthrene	ND		ug/kg	1.00	--
C1-Phenanthrenes/Anthracenes	ND		ug/kg	1.00	--
C2-Phenanthrenes/Anthracenes	ND		ug/kg	1.00	--
C3-Phenanthrenes/Anthracenes	ND		ug/kg	1.00	--
C4-Phenanthrenes/Anthracenes	ND		ug/kg	1.00	--
Anthracene	ND		ug/kg	1.00	--
Fluoranthene	ND		ug/kg	1.00	--
Pyrene	ND		ug/kg	1.00	--
C1-Fluoranthenes/Pyrenes	ND		ug/kg	1.00	--
Benz(a)anthracene	ND		ug/kg	1.00	--
Chrysene	ND		ug/kg	1.00	--
C1-Chrysenes	ND		ug/kg	1.00	--
C2-Chrysenes	ND		ug/kg	1.00	--
C3-Chrysenes	ND		ug/kg	1.00	--
C4-Chrysenes	ND		ug/kg	1.00	--
Benzo(b)fluoranthene	ND		ug/kg	1.00	--
Benzo(j)+(k)fluoranthene	ND		ug/kg	1.00	--
Benzo(e)pyrene	ND		ug/kg	1.00	--

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D-SIM(M)
Analytical Date: 06/23/20 14:59
Analyst: MJS

Extraction Method: ALPHA OP-013
Extraction Date: 06/12/20 21:33
Cleanup Method: EPA 3611B
Cleanup Date: 06/23/20

Parameter	Result	Qualifier	Units	RL	MDL
PAHs - Mansfield Lab for sample(s): 01-03,05,08,10,13-14 Batch: WG1381156-1					
Benzo(a)pyrene	ND		ug/kg	1.00	--
Perylene	ND		ug/kg	1.00	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	1.00	--
Dibenz(a,h)+(a,c)anthracene	ND		ug/kg	1.00	--
Benzo(g,h,i)perylene	ND		ug/kg	1.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Naphthalene-d8	80		50-130
Phenanthrene-d10	98		50-130
Benzo(a)pyrene-d12	81		50-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
PAHs - Mansfield Lab Associated sample(s): 01-03,05,08,10,13-14 Batch: WG1381156-2 WG1381156-3								
Naphthalene	85		89		50-130	5		30
Acenaphthylene	85		89		50-130	5		30
Acenaphthene	87		90		50-130	3		30
Fluorene	93		95		50-130	2		30
Phenanthrene	96		100		50-130	4		30
Anthracene	104		106		50-130	2		30
Fluoranthene	100		103		50-130	3		30
Pyrene	95		98		50-130	3		30
Benz(a)anthracene	98		98		50-130	0		30
Chrysene	92		93		50-130	1		30
Benzo(b)fluoranthene	90		90		50-130	0		30
Benzo(j)+(k)fluoranthene	86		86		50-130	0		30
Benzo(a)pyrene	82		83		50-130	1		30
Indeno(1,2,3-cd)pyrene	93		92		50-130	1		30
Dibenz(a,h)+(a,c)anthracene	91		91		50-130	0		30
Benzo(g,h,i)perylene	87		86		50-130	1		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Naphthalene-d8	81		83		50-130
Phenanthrene-d10	97		98		50-130
Benzo(a)pyrene-d12	85		85		50-130

PETROLEUM HYDROCARBONS

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-01	Date Collected:	06/08/20 09:45
Client ID:	1C 0-6"	Date Received:	06/10/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Soil
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/17/20 21:55
Analyst:	BAD
Percent Solids:	85%

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:1.3

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	5.33	--	1
C9-C12 Aliphatics	ND		mg/kg	5.33	--	1
C9-C10 Aromatics	ND		mg/kg	5.33	--	1
C5-C8 Aliphatics, Adjusted	ND		mg/kg	5.33	--	1
C9-C12 Aliphatics, Adjusted	ND		mg/kg	5.33	--	1
Benzene	ND		mg/kg	0.106	--	1
Toluene	ND		mg/kg	0.106	--	1
Ethylbenzene	ND		mg/kg	0.106	--	1
p/m-Xylene	ND		mg/kg	0.106	--	1
o-Xylene	ND		mg/kg	0.106	--	1
Methyl tert butyl ether	ND		mg/kg	0.053	--	1
Naphthalene	1.53		mg/kg	0.213	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	109		70-130
2,5-Dibromotoluene-FID	114		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-01	Date Collected:	06/08/20 09:45
Client ID:	1C 0-6"	Date Received:	06/10/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1	Extraction Date:	06/20/20 11:19
Analytical Date:	06/22/20 09:53	Cleanup Method1:	EPH-04-1
Analyst:	MEO	Cleanup Date1:	06/21/20
Percent Solids:	85%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	7.74		mg/kg	7.65	--	1
C19-C36 Aliphatics	22.5		mg/kg	7.65	--	1
C11-C22 Aromatics	90.9		mg/kg	7.65	--	1
C11-C22 Aromatics, Adjusted	72.4		mg/kg	7.65	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	68		40-140
o-Terphenyl	60		40-140
2-Fluorobiphenyl	72		40-140
2-Bromonaphthalene	76		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-02	Date Collected:	06/08/20 10:15
Client ID:	1B 0-6"	Date Received:	06/10/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Soil
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/17/20 22:26
Analyst:	BAD
Percent Solids:	88%

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:1 +/- 25%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	5.38	--	1
C9-C12 Aliphatics	7.86		mg/kg	5.38	--	1
C9-C10 Aromatics	5.87		mg/kg	5.38	--	1
C5-C8 Aliphatics, Adjusted	ND		mg/kg	5.38	--	1
C9-C12 Aliphatics, Adjusted	ND		mg/kg	5.38	--	1
Benzene	ND		mg/kg	0.108	--	1
Toluene	ND		mg/kg	0.108	--	1
Ethylbenzene	ND		mg/kg	0.108	--	1
p/m-Xylene	ND		mg/kg	0.108	--	1
o-Xylene	ND		mg/kg	0.108	--	1
Methyl tert butyl ether	ND		mg/kg	0.054	--	1
Naphthalene	3.71		mg/kg	0.215	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	103		70-130
2,5-Dibromotoluene-FID	107		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-02	Date Collected:	06/08/20 10:15
Client ID:	1B 0-6"	Date Received:	06/10/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1	Extraction Date:	06/20/20 11:19
Analytical Date:	06/22/20 10:18	Cleanup Method1:	EPH-04-1
Analyst:	MEO	Cleanup Date1:	06/21/20
Percent Solids:	88%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	46.7		mg/kg	14.5	--	2
C19-C36 Aliphatics	55.4		mg/kg	14.5	--	2
C11-C22 Aromatics	394		mg/kg	14.5	--	2
C11-C22 Aromatics, Adjusted	308		mg/kg	14.5	--	2

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	62		40-140
o-Terphenyl	87		40-140
2-Fluorobiphenyl	82		40-140
2-Bromonaphthalene	87		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-03	Date Collected:	06/08/20 11:30
Client ID:	1A 0-6"	Date Received:	06/10/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Soil
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/17/20 22:57
Analyst:	BAD
Percent Solids:	87%

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:1.3

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	5.22	--	1
C9-C12 Aliphatics	ND		mg/kg	5.22	--	1
C9-C10 Aromatics	ND		mg/kg	5.22	--	1
C5-C8 Aliphatics, Adjusted	ND		mg/kg	5.22	--	1
C9-C12 Aliphatics, Adjusted	ND		mg/kg	5.22	--	1
Benzene	ND		mg/kg	0.104	--	1
Toluene	ND		mg/kg	0.104	--	1
Ethylbenzene	ND		mg/kg	0.104	--	1
p/m-Xylene	ND		mg/kg	0.104	--	1
o-Xylene	ND		mg/kg	0.104	--	1
Methyl tert butyl ether	ND		mg/kg	0.052	--	1
Naphthalene	ND		mg/kg	0.209	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	110		70-130
2,5-Dibromotoluene-FID	116		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-03	Date Collected:	06/08/20 11:30
Client ID:	1A 0-6"	Date Received:	06/10/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1	Extraction Date:	06/20/20 11:19
Analytical Date:	06/22/20 10:43	Cleanup Method1:	EPH-04-1
Analyst:	MEO	Cleanup Date1:	06/21/20
Percent Solids:	87%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	15.2		mg/kg	15.0	--	2
C19-C36 Aliphatics	34.9		mg/kg	15.0	--	2
C11-C22 Aromatics	331		mg/kg	15.0	--	2
C11-C22 Aromatics, Adjusted	280		mg/kg	15.0	--	2

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	43		40-140
o-Terphenyl	63		40-140
2-Fluorobiphenyl	81		40-140
2-Bromonaphthalene	96		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-04 D	Date Collected:	06/08/20 14:30
Client ID:	1A 1-5.5'	Date Received:	06/10/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Soil
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/23/20 15:39
Analyst:	BAD
Percent Solids:	84%

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:1 +/- 25%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	351	--	50
C9-C12 Aliphatics	786		mg/kg	351	--	50
C9-C10 Aromatics	571		mg/kg	351	--	50
C5-C8 Aliphatics, Adjusted	ND		mg/kg	351	--	50
C9-C12 Aliphatics, Adjusted	ND		mg/kg	351	--	50
Benzene	ND		mg/kg	7.01	--	50
Toluene	ND		mg/kg	7.01	--	50
Ethylbenzene	33.8		mg/kg	7.01	--	50
p/m-Xylene	16.6		mg/kg	7.01	--	50
o-Xylene	12.9		mg/kg	7.01	--	50
Methyl tert butyl ether	ND		mg/kg	3.51	--	50
Naphthalene	672		mg/kg	14.0	--	50

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	0	Q	70-130
2,5-Dibromotoluene-FID	0	Q	70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-04	D	Date Collected:	06/08/20 14:30
Client ID:	1A 1-5.5'		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Soil		Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1		Extraction Date:	06/20/20 11:19
Analytical Date:	06/26/20 11:35		Cleanup Method1:	EPH-04-1
Analyst:	SC		Cleanup Date1:	06/21/20
Percent Solids:	84%			

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	678	--	90
C19-C36 Aliphatics	ND		mg/kg	678	--	90
C11-C22 Aromatics	7790		mg/kg	678	--	90
C11-C22 Aromatics, Adjusted	5840		mg/kg	678	--	90
Naphthalene	464		mg/kg	33.9	--	90
2-Methylnaphthalene	341		mg/kg	33.9	--	90
Acenaphthylene	ND		mg/kg	33.9	--	90
Acenaphthene	170		mg/kg	33.9	--	90
Fluorene	103		mg/kg	33.9	--	90
Phenanthrene	295		mg/kg	33.9	--	90
Anthracene	74.7		mg/kg	33.9	--	90
Fluoranthene	121		mg/kg	33.9	--	90
Pyrene	163		mg/kg	33.9	--	90
Benzo(a)anthracene	65.0		mg/kg	33.9	--	90
Chrysene	72.6		mg/kg	33.9	--	90
Benzo(b)fluoranthene	38.3		mg/kg	33.9	--	90
Benzo(k)fluoranthene	ND		mg/kg	33.9	--	90
Benzo(a)pyrene	41.6		mg/kg	33.9	--	90
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	33.9	--	90
Dibenzo(a,h)anthracene	ND		mg/kg	33.9	--	90
Benzo(ghi)perylene	ND		mg/kg	33.9	--	90

Project Name: 284 WINTER ST **Lab Number:** L2024182

Project Number: 01.0172397.10 **Report Date:** 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-04	D	Date Collected:	06/08/20 14:30
Client ID:	1A 1-5.5'		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**0**	Q	40-140
o-Terphenyl	**0**	Q	40-140
2-Fluorobiphenyl	67		40-140
2-Bromonaphthalene	71		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-05	Date Collected:	06/09/20 08:30
Client ID:	2C 0-6"	Date Received:	06/10/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Soil
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/18/20 00:29
Analyst:	BAD
Percent Solids:	74%

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:1 +/- 25%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	7.77	--	1
C9-C12 Aliphatics	24.5		mg/kg	7.77	--	1
C9-C10 Aromatics	16.9		mg/kg	7.77	--	1
C5-C8 Aliphatics, Adjusted	ND		mg/kg	7.77	--	1
C9-C12 Aliphatics, Adjusted	ND		mg/kg	7.77	--	1
Benzene	ND		mg/kg	0.155	--	1
Toluene	ND		mg/kg	0.155	--	1
Ethylbenzene	ND		mg/kg	0.155	--	1
p/m-Xylene	ND		mg/kg	0.155	--	1
o-Xylene	ND		mg/kg	0.155	--	1
Methyl tert butyl ether	ND		mg/kg	0.078	--	1
Naphthalene	7.54		mg/kg	0.311	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	110		70-130
2,5-Dibromotoluene-FID	96		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-05	D	Date Collected:	06/09/20 08:30
Client ID:	2C 0-6"		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Soil		Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1		Extraction Date:	06/20/20 11:19
Analytical Date:	06/26/20 12:00		Cleanup Method1:	EPH-04-1
Analyst:	SC		Cleanup Date1:	06/21/20
Percent Solids:	74%			

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	93.7		mg/kg	53.4	--	6
C19-C36 Aliphatics	130		mg/kg	53.4	--	6
C11-C22 Aromatics	978		mg/kg	53.4	--	6
C11-C22 Aromatics, Adjusted	773		mg/kg	53.4	--	6

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	90		40-140
o-Terphenyl	135		40-140
2-Fluorobiphenyl	71		40-140
2-Bromonaphthalene	74		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-06 D	Date Collected:	06/09/20 09:35
Client ID:	2A 0-6"	Date Received:	06/10/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil		
Analytical Method:	131,VPH-18-2.1		
Analytical Date:	06/23/20 16:40		
Analyst:	BAD		
Percent Solids:	76%		

Trap: EST, Carbopack B/Carboxen 1000&1001

Analytical Column: Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:1 +/- 25%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	27.3	--	4
C9-C12 Aliphatics	307		mg/kg	27.3	--	4
C9-C10 Aromatics	225		mg/kg	27.3	--	4
C5-C8 Aliphatics, Adjusted	ND		mg/kg	27.3	--	4
C9-C12 Aliphatics, Adjusted	67.8		mg/kg	27.3	--	4
Benzene	0.562		mg/kg	0.547	--	4
Toluene	ND		mg/kg	0.547	--	4
Ethylbenzene	10.3		mg/kg	0.547	--	4
p/m-Xylene	0.887		mg/kg	0.547	--	4
o-Xylene	2.73		mg/kg	0.547	--	4
Methyl tert butyl ether	ND		mg/kg	0.273	--	4
Naphthalene	37.5		mg/kg	1.09	--	4

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	0	Q	70-130
2,5-Dibromotoluene-FID	0	Q	70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-06	D	Date Collected:	06/09/20 09:35
Client ID:	2A 0-6"		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Soil		Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1		Extraction Date:	06/20/20 11:19
Analytical Date:	06/26/20 12:24		Cleanup Method1:	EPH-04-1
Analyst:	SC		Cleanup Date1:	06/21/20
Percent Solids:	76%			

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	1670		mg/kg	1010	--	120
C19-C36 Aliphatics	1250		mg/kg	1010	--	120
C11-C22 Aromatics	20000		mg/kg	1010	--	120
C11-C22 Aromatics, Adjusted	16300		mg/kg	1010	--	120
Naphthalene	122		mg/kg	50.7	--	120
2-Methylnaphthalene	ND		mg/kg	50.7	--	120
Acenaphthylene	ND		mg/kg	50.7	--	120
Acenaphthene	454		mg/kg	50.7	--	120
Fluorene	434		mg/kg	50.7	--	120
Phenanthrene	1020		mg/kg	50.7	--	120
Anthracene	266		mg/kg	50.7	--	120
Fluoranthene	320		mg/kg	50.7	--	120
Pyrene	475		mg/kg	50.7	--	120
Benzo(a)anthracene	201		mg/kg	50.7	--	120
Chrysene	192		mg/kg	50.7	--	120
Benzo(b)fluoranthene	96.7		mg/kg	50.7	--	120
Benzo(k)fluoranthene	ND		mg/kg	50.7	--	120
Benzo(a)pyrene	109		mg/kg	50.7	--	120
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	50.7	--	120
Dibenzo(a,h)anthracene	ND		mg/kg	50.7	--	120
Benzo(ghi)perylene	ND		mg/kg	50.7	--	120

Project Name: 284 WINTER ST **Lab Number:** L2024182

Project Number: 01.0172397.10 **Report Date:** 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-06	D	Date Collected:	06/09/20 09:35
Client ID:	2A 0-6"		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**0**	Q	40-140
o-Terphenyl	**0**	Q	40-140
2-Fluorobiphenyl	68		40-140
2-Bromonaphthalene	69		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-07 D	Date Collected:	06/09/20 10:15
Client ID:	2A 1-4'	Date Received:	06/10/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Soil
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/18/20 02:01
Analyst:	BAD
Percent Solids:	78%

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:1 +/- 25%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	27.2	--	4
C9-C12 Aliphatics	268		mg/kg	27.2	--	4
C9-C10 Aromatics	200		mg/kg	27.2	--	4
C5-C8 Aliphatics, Adjusted	ND		mg/kg	27.2	--	4
C9-C12 Aliphatics, Adjusted	60.4		mg/kg	27.2	--	4
Benzene	ND		mg/kg	0.543	--	4
Toluene	ND		mg/kg	0.543	--	4
Ethylbenzene	5.59		mg/kg	0.543	--	4
p/m-Xylene	ND		mg/kg	0.543	--	4
o-Xylene	1.76		mg/kg	0.543	--	4
Methyl tert butyl ether	ND		mg/kg	0.272	--	4
Naphthalene	32.5		mg/kg	1.09	--	4

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	**48**	Q	70-130
2,5-Dibromotoluene-FID	**35**	Q	70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-07	D	Date Collected:	06/09/20 10:15
Client ID:	2A 1-4'		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Soil		Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1		Extraction Date:	06/20/20 11:19
Analytical Date:	06/26/20 12:49		Cleanup Method1:	EPH-04-1
Analyst:	SC		Cleanup Date1:	06/21/20
Percent Solids:	78%			

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	663		mg/kg	660	--	80
C19-C36 Aliphatics	ND		mg/kg	660	--	80
C11-C22 Aromatics	8500		mg/kg	660	--	80
C11-C22 Aromatics, Adjusted	6010		mg/kg	660	--	80
Naphthalene	46.7		mg/kg	33.0	--	80
2-Methylnaphthalene	ND		mg/kg	33.0	--	80
Acenaphthylene	88.8		mg/kg	33.0	--	80
Acenaphthene	126		mg/kg	33.0	--	80
Fluorene	187		mg/kg	33.0	--	80
Phenanthrene	610		mg/kg	33.0	--	80
Anthracene	176		mg/kg	33.0	--	80
Fluoranthene	327		mg/kg	33.0	--	80
Pyrene	350		mg/kg	33.0	--	80
Benzo(a)anthracene	146		mg/kg	33.0	--	80
Chrysene	117		mg/kg	33.0	--	80
Benzo(b)fluoranthene	99.4		mg/kg	33.0	--	80
Benzo(k)fluoranthene	37.3		mg/kg	33.0	--	80
Benzo(a)pyrene	98.0		mg/kg	33.0	--	80
Indeno(1,2,3-cd)Pyrene	44.3		mg/kg	33.0	--	80
Dibenzo(a,h)anthracene	ND		mg/kg	33.0	--	80
Benzo(ghi)perylene	39.2		mg/kg	33.0	--	80

Project Name: 284 WINTER ST **Lab Number:** L2024182

Project Number: 01.0172397.10 **Report Date:** 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-07	D	Date Collected:	06/09/20 10:15
Client ID:	2A 1-4'		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**0**	Q	40-140
o-Terphenyl	**0**	Q	40-140
2-Fluorobiphenyl	59		40-140
2-Bromonaphthalene	62		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-08	D	Date Collected:	06/09/20 10:35
Client ID:	3C 0-6"		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Soil
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/23/20 17:42
Analyst:	BAD
Percent Solids:	93%

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:1 +/- 25%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	102	--	20
C9-C12 Aliphatics	267		mg/kg	102	--	20
C9-C10 Aromatics	158		mg/kg	102	--	20
C5-C8 Aliphatics, Adjusted	ND		mg/kg	102	--	20
C9-C12 Aliphatics, Adjusted	ND		mg/kg	102	--	20
Benzene	2.72		mg/kg	2.05	--	20
Toluene	ND		mg/kg	2.05	--	20
Ethylbenzene	23.4		mg/kg	2.05	--	20
p/m-Xylene	16.6		mg/kg	2.05	--	20
o-Xylene	7.68		mg/kg	2.05	--	20
Methyl tert butyl ether	ND		mg/kg	1.02	--	20
Naphthalene	181		mg/kg	4.10	--	20

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	96		70-130
2,5-Dibromotoluene-FID	83		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-08	D	Date Collected:	06/09/20 10:35
Client ID:	3C 0-6"		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Soil		Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1		Extraction Date:	06/20/20 11:19
Analytical Date:	06/26/20 13:14		Cleanup Method1:	EPH-04-1
Analyst:	SC		Cleanup Date1:	06/21/20
Percent Solids:	93%			

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	69.2	--	10
C19-C36 Aliphatics	87.8		mg/kg	69.2	--	10
C11-C22 Aromatics	373		mg/kg	69.2	--	10
C11-C22 Aromatics, Adjusted	217		mg/kg	69.2	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	65		40-140
o-Terphenyl	80		40-140
2-Fluorobiphenyl	76		40-140
2-Bromonaphthalene	80		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-09	D	Date Collected:	06/09/20 10:55
Client ID:	3B 0-6"		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Soil
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/18/20 04:04
Analyst:	BAD
Percent Solids:	82%

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:2.2

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	762	--	200
C9-C12 Aliphatics	1200		mg/kg	762	--	200
C9-C10 Aromatics	ND		mg/kg	762	--	200
C5-C8 Aliphatics, Adjusted	ND		mg/kg	762	--	200
C9-C12 Aliphatics, Adjusted	950		mg/kg	762	--	200
Benzene	37.1		mg/kg	15.2	--	200
Toluene	ND		mg/kg	15.2	--	200
Ethylbenzene	106		mg/kg	15.2	--	200
p/m-Xylene	92.8		mg/kg	15.2	--	200
o-Xylene	47.4		mg/kg	15.2	--	200
Methyl tert butyl ether	ND		mg/kg	7.62	--	200
Naphthalene	746		mg/kg	30.5	--	200

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	0	Q	70-130
2,5-Dibromotoluene-FID	0	Q	70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-09	D	Date Collected:	06/09/20 10:55
Client ID:	3B 0-6"		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Soil		Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1		Extraction Date:	06/20/20 11:19
Analytical Date:	06/26/20 13:39		Cleanup Method1:	EPH-04-1
Analyst:	SC		Cleanup Date1:	06/21/20
Percent Solids:	82%			

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	953	--	120
C19-C36 Aliphatics	ND		mg/kg	953	--	120
C11-C22 Aromatics	5710		mg/kg	953	--	120
C11-C22 Aromatics, Adjusted	3860		mg/kg	953	--	120
Naphthalene	739		mg/kg	47.6	--	120
2-Methylnaphthalene	414		mg/kg	47.6	--	120
Acenaphthylene	ND		mg/kg	47.6	--	120
Acenaphthene	115		mg/kg	47.6	--	120
Fluorene	102		mg/kg	47.6	--	120
Phenanthrene	248		mg/kg	47.6	--	120
Anthracene	53.7		mg/kg	47.6	--	120
Fluoranthene	74.2		mg/kg	47.6	--	120
Pyrene	105		mg/kg	47.6	--	120
Benzo(a)anthracene	ND		mg/kg	47.6	--	120
Chrysene	ND		mg/kg	47.6	--	120
Benzo(b)fluoranthene	ND		mg/kg	47.6	--	120
Benzo(k)fluoranthene	ND		mg/kg	47.6	--	120
Benzo(a)pyrene	ND		mg/kg	47.6	--	120
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	47.6	--	120
Dibenzo(a,h)anthracene	ND		mg/kg	47.6	--	120
Benzo(ghi)perylene	ND		mg/kg	47.6	--	120

Project Name: 284 WINTER ST **Lab Number:** L2024182

Project Number: 01.0172397.10 **Report Date:** 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-09	D	Date Collected:	06/09/20 10:55
Client ID:	3B 0-6"		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**0**	Q	40-140
o-Terphenyl	**0**	Q	40-140
2-Fluorobiphenyl	59		40-140
2-Bromonaphthalene	63		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-10	D	Date Collected:	06/09/20 12:45
Client ID:	4B 0-6"		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Soil
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/18/20 05:05
Analyst:	BAD
Percent Solids:	85%

Trap: EST, Carbopack B/Carboxen 1000&1001

Analytical Column: Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:1.3

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	108	--	20
C9-C12 Aliphatics	137		mg/kg	108	--	20
C9-C10 Aromatics	ND		mg/kg	108	--	20
C5-C8 Aliphatics, Adjusted	ND		mg/kg	108	--	20
C9-C12 Aliphatics, Adjusted	110		mg/kg	108	--	20
Benzene	ND		mg/kg	2.15	--	20
Toluene	ND		mg/kg	2.15	--	20
Ethylbenzene	12.9		mg/kg	2.15	--	20
p/m-Xylene	8.60		mg/kg	2.15	--	20
o-Xylene	5.47		mg/kg	2.15	--	20
Methyl tert butyl ether	ND		mg/kg	1.08	--	20
Naphthalene	88.6		mg/kg	4.30	--	20

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	110		70-130
2,5-Dibromotoluene-FID	**66**	Q	70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-10	D	Date Collected:	06/09/20 12:45
Client ID:	4B 0-6"		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Soil		Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1		Extraction Date:	06/20/20 11:19
Analytical Date:	06/26/20 14:04		Cleanup Method1:	EPH-04-1
Analyst:	SC		Cleanup Date1:	06/21/20
Percent Solids:	85%			

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	37.1	--	5
C19-C36 Aliphatics	ND		mg/kg	37.1	--	5
C11-C22 Aromatics	111		mg/kg	37.1	--	5
C11-C22 Aromatics, Adjusted	71.2		mg/kg	37.1	--	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	64		40-140
o-Terphenyl	52		40-140
2-Fluorobiphenyl	57		40-140
2-Bromonaphthalene	59		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-11	D	Date Collected:	06/09/20 13:10
Client ID:	4A 1-2.5'		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Soil
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/18/20 06:06
Analyst:	BAD
Percent Solids:	84%

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:1.6

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	939	--	200
C9-C12 Aliphatics	1600		mg/kg	939	--	200
C9-C10 Aromatics	971		mg/kg	939	--	200
C5-C8 Aliphatics, Adjusted	ND		mg/kg	939	--	200
C9-C12 Aliphatics, Adjusted	ND		mg/kg	939	--	200
Benzene	ND		mg/kg	18.8	--	200
Toluene	ND		mg/kg	18.8	--	200
Ethylbenzene	128		mg/kg	18.8	--	200
p/m-Xylene	118		mg/kg	18.8	--	200
o-Xylene	62.4		mg/kg	18.8	--	200
Methyl tert butyl ether	ND		mg/kg	9.39	--	200
Naphthalene	945		mg/kg	37.5	--	200

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	0	Q	70-130
2,5-Dibromotoluene-FID	0	Q	70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-11	D	Date Collected:	06/09/20 13:10
Client ID:	4A 1-2.5'		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Soil		Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1		Extraction Date:	06/20/20 11:19
Analytical Date:	06/26/20 14:29		Cleanup Method1:	EPH-04-1
Analyst:	SC		Cleanup Date1:	06/21/20
Percent Solids:	84%			

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	1560		mg/kg	465	--	60
C19-C36 Aliphatics	851		mg/kg	465	--	60
C11-C22 Aromatics	5060		mg/kg	465	--	60
C11-C22 Aromatics, Adjusted	3320		mg/kg	465	--	60
Naphthalene	765		mg/kg	23.2	--	60
2-Methylnaphthalene	373		mg/kg	23.2	--	60
Acenaphthylene	ND		mg/kg	23.2	--	60
Acenaphthene	93.8		mg/kg	23.2	--	60
Fluorene	74.7		mg/kg	23.2	--	60
Phenanthrene	184		mg/kg	23.2	--	60
Anthracene	45.8		mg/kg	23.2	--	60
Fluoranthene	61.4		mg/kg	23.2	--	60
Pyrene	81.9		mg/kg	23.2	--	60
Benzo(a)anthracene	30.4		mg/kg	23.2	--	60
Chrysene	28.2		mg/kg	23.2	--	60
Benzo(b)fluoranthene	ND		mg/kg	23.2	--	60
Benzo(k)fluoranthene	ND		mg/kg	23.2	--	60
Benzo(a)pyrene	ND		mg/kg	23.2	--	60
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	23.2	--	60
Dibenzo(a,h)anthracene	ND		mg/kg	23.2	--	60
Benzo(ghi)perylene	ND		mg/kg	23.2	--	60

Project Name: 284 WINTER ST **Lab Number:** L2024182

Project Number: 01.0172397.10 **Report Date:** 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-11	D	Date Collected:	06/09/20 13:10
Client ID:	4A 1-2.5'		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**0**	Q	40-140
o-Terphenyl	**0**	Q	40-140
2-Fluorobiphenyl	62		40-140
2-Bromonaphthalene	63		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-12 D	Date Collected:	06/09/20 14:05
Client ID:	5A 0-6"	Date Received:	06/10/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Soil
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/18/20 07:08
Analyst:	BAD
Percent Solids:	70%

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:1.7

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	322	--	50
C9-C12 Aliphatics	1520		mg/kg	322	--	50
C9-C10 Aromatics	740		mg/kg	322	--	50
C5-C8 Aliphatics, Adjusted	ND		mg/kg	322	--	50
C9-C12 Aliphatics, Adjusted	326		mg/kg	322	--	50
Benzene	ND		mg/kg	6.44	--	50
Toluene	ND		mg/kg	6.44	--	50
Ethylbenzene	203		mg/kg	6.44	--	50
p/m-Xylene	173		mg/kg	6.44	--	50
o-Xylene	83.6		mg/kg	6.44	--	50
Methyl tert butyl ether	ND		mg/kg	3.22	--	50
Naphthalene	372		mg/kg	12.9	--	50

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	0	Q	70-130
2,5-Dibromotoluene-FID	0	Q	70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-12	D	Date Collected:	06/09/20 14:05
Client ID:	5A 0-6"		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Soil		Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1		Extraction Date:	06/20/20 11:19
Analytical Date:	06/26/20 14:53		Cleanup Method1:	EPH-04-1
Analyst:	SC		Cleanup Date1:	06/21/20
Percent Solids:	70%			

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	463		mg/kg	280	--	30
C19-C36 Aliphatics	284		mg/kg	280	--	30
C11-C22 Aromatics	1990		mg/kg	280	--	30
C11-C22 Aromatics, Adjusted	1400		mg/kg	280	--	30
Naphthalene	297		mg/kg	14.0	--	30
2-Methylnaphthalene	132		mg/kg	14.0	--	30
Acenaphthylene	ND		mg/kg	14.0	--	30
Acenaphthene	27.3		mg/kg	14.0	--	30
Fluorene	15.6		mg/kg	14.0	--	30
Phenanthrene	39.0		mg/kg	14.0	--	30
Anthracene	ND		mg/kg	14.0	--	30
Fluoranthene	24.1		mg/kg	14.0	--	30
Pyrene	30.8		mg/kg	14.0	--	30
Benzo(a)anthracene	14.5		mg/kg	14.0	--	30
Chrysene	14.7		mg/kg	14.0	--	30
Benzo(b)fluoranthene	ND		mg/kg	14.0	--	30
Benzo(k)fluoranthene	ND		mg/kg	14.0	--	30
Benzo(a)pyrene	ND		mg/kg	14.0	--	30
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	14.0	--	30
Dibenzo(a,h)anthracene	ND		mg/kg	14.0	--	30
Benzo(ghi)perylene	ND		mg/kg	14.0	--	30

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-12 D
Client ID: 5A 0-6"
Sample Location: HAVERHILL, MA
Date Collected: 06/09/20 14:05
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**0**	Q	40-140
o-Terphenyl	**0**	Q	40-140
2-Fluorobiphenyl	61		40-140
2-Bromonaphthalene	60		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-13	Date Collected:	06/09/20 14:35
Client ID:	5C 0-6"	Date Received:	06/10/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1	Extraction Date:	06/20/20 11:19
Analytical Date:	06/22/20 15:19	Cleanup Method1:	EPH-04-1
Analyst:	MEO	Cleanup Date1:	06/21/20
Percent Solids:	78%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	33.6		mg/kg	8.14	--	1
C19-C36 Aliphatics	86.9		mg/kg	8.14	--	1
C11-C22 Aromatics	131		mg/kg	8.14	--	1
C11-C22 Aromatics, Adjusted	114		mg/kg	8.14	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	67		40-140
o-Terphenyl	72		40-140
2-Fluorobiphenyl	78		40-140
2-Bromonaphthalene	78		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-13	D	Date Collected:	06/09/20 14:35
Client ID:	5C 0-6"		Date Received:	06/10/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Soil
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/23/20 18:44
Analyst:	BAD
Percent Solids:	78%

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:1.3

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	12.7	--	2
C9-C12 Aliphatics	49.3		mg/kg	12.7	--	2
C9-C10 Aromatics	24.8		mg/kg	12.7	--	2
C5-C8 Aliphatics, Adjusted	ND		mg/kg	12.7	--	2
C9-C12 Aliphatics, Adjusted	24.5		mg/kg	12.7	--	2
Benzene	ND		mg/kg	0.254	--	2
Toluene	ND		mg/kg	0.254	--	2
Ethylbenzene	ND		mg/kg	0.254	--	2
p/m-Xylene	ND		mg/kg	0.254	--	2
o-Xylene	ND		mg/kg	0.254	--	2
Methyl tert butyl ether	ND		mg/kg	0.127	--	2
Naphthalene	0.706		mg/kg	0.507	--	2

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	98		70-130
2,5-Dibromotoluene-FID	110		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-14	Date Collected:	06/09/20 14:55
Client ID:	5B 0-6"	Date Received:	06/10/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Soil
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/18/20 09:11
Analyst:	BAD
Percent Solids:	78%

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:1.4

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	6.05	--	1
C9-C12 Aliphatics	7.49		mg/kg	6.05	--	1
C9-C10 Aromatics	ND		mg/kg	6.05	--	1
C5-C8 Aliphatics, Adjusted	ND		mg/kg	6.05	--	1
C9-C12 Aliphatics, Adjusted	7.49		mg/kg	6.05	--	1
Benzene	ND		mg/kg	0.121	--	1
Toluene	ND		mg/kg	0.121	--	1
Ethylbenzene	ND		mg/kg	0.121	--	1
p/m-Xylene	ND		mg/kg	0.121	--	1
o-Xylene	ND		mg/kg	0.121	--	1
Methyl tert butyl ether	ND		mg/kg	0.061	--	1
Naphthalene	0.288		mg/kg	0.242	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	108		70-130
2,5-Dibromotoluene-FID	113		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024182-14	Date Collected:	06/09/20 14:55
Client ID:	5B 0-6"	Date Received:	06/10/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1	Extraction Date:	06/20/20 11:19
Analytical Date:	06/22/20 16:10	Cleanup Method1:	EPH-04-1
Analyst:	MEO	Cleanup Date1:	06/21/20
Percent Solids:	78%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	8.23	--	1
C19-C36 Aliphatics	57.9		mg/kg	8.23	--	1
C11-C22 Aromatics	140		mg/kg	8.23	--	1
C11-C22 Aromatics, Adjusted	98.1		mg/kg	8.23	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	54		40-140
o-Terphenyl	62		40-140
2-Fluorobiphenyl	74		40-140
2-Bromonaphthalene	75		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 131,VPH-18-2.1
Analytical Date: 06/17/20 15:47
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-03,05,07,09-12,14 Batch: WG1383297-4					
C5-C8 Aliphatics	ND		mg/kg	5.00	--
C9-C12 Aliphatics	ND		mg/kg	5.00	--
C9-C10 Aromatics	ND		mg/kg	5.00	--
C5-C8 Aliphatics, Adjusted	ND		mg/kg	5.00	--
C9-C12 Aliphatics, Adjusted	ND		mg/kg	5.00	--
Benzene	ND		mg/kg	0.100	--
Toluene	ND		mg/kg	0.100	--
Ethylbenzene	ND		mg/kg	0.100	--
p/m-Xylene	ND		mg/kg	0.100	--
o-Xylene	ND		mg/kg	0.100	--
Methyl tert butyl ether	ND		mg/kg	0.050	--
Naphthalene	ND		mg/kg	0.200	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	106		70-130
2,5-Dibromotoluene-FID	111		70-130

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 135,EPH-19-2.1
Analytical Date: 06/22/20 09:04
Analyst: MEO

Extraction Method: EPA 3546
Extraction Date: 06/20/20 11:19
Cleanup Method: EPH-04-1
Cleanup Date: 06/21/20

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-14 Batch: WG1384047-1					
C9-C18 Aliphatics	ND		mg/kg	6.59	--
C19-C36 Aliphatics	ND		mg/kg	6.59	--
C11-C22 Aromatics	ND		mg/kg	6.59	--
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.59	--
Naphthalene	ND		mg/kg	0.330	--
2-Methylnaphthalene	ND		mg/kg	0.330	--
Acenaphthylene	ND		mg/kg	0.330	--
Acenaphthene	ND		mg/kg	0.330	--
Fluorene	ND		mg/kg	0.330	--
Phenanthrene	ND		mg/kg	0.330	--
Anthracene	ND		mg/kg	0.330	--
Fluoranthene	ND		mg/kg	0.330	--
Pyrene	ND		mg/kg	0.330	--
Benzo(a)anthracene	ND		mg/kg	0.330	--
Chrysene	ND		mg/kg	0.330	--
Benzo(b)fluoranthene	ND		mg/kg	0.330	--
Benzo(k)fluoranthene	ND		mg/kg	0.330	--
Benzo(a)pyrene	ND		mg/kg	0.330	--
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.330	--
Dibenzo(a,h)anthracene	ND		mg/kg	0.330	--
Benzo(ghi)perylene	ND		mg/kg	0.330	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	52		40-140
o-Terphenyl	61		40-140
2-Fluorobiphenyl	82		40-140
2-Bromonaphthalene	83		40-140

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 131,VPH-18-2.1
Analytical Date: 06/23/20 11:00
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Petroleum Hydrocarbons - Westborough Lab for sample(s): 04,06,08,13 Batch: WG1384999-4					
C5-C8 Aliphatics	ND		mg/kg	5.00	--
C9-C12 Aliphatics	ND		mg/kg	5.00	--
C9-C10 Aromatics	ND		mg/kg	5.00	--
C5-C8 Aliphatics, Adjusted	ND		mg/kg	5.00	--
C9-C12 Aliphatics, Adjusted	ND		mg/kg	5.00	--
Benzene	ND		mg/kg	0.100	--
Toluene	ND		mg/kg	0.100	--
Ethylbenzene	ND		mg/kg	0.100	--
p/m-Xylene	ND		mg/kg	0.100	--
o-Xylene	ND		mg/kg	0.100	--
Methyl tert butyl ether	ND		mg/kg	0.050	--
Naphthalene	ND		mg/kg	0.200	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	104		70-130
2,5-Dibromotoluene-FID	118		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-03,05,07,09-12,14 Batch: WG1383297-2 WG1383297-3								
C5-C8 Aliphatics	103		112		70-130	8		25
C9-C12 Aliphatics	106		114		70-130	7		25
C9-C10 Aromatics	94		102		70-130	8		25
Benzene	95		102		70-130	7		25
Toluene	95		103		70-130	8		25
Ethylbenzene	97		105		70-130	8		25
p/m-Xylene	96		103		70-130	7		25
o-Xylene	95		102		70-130	7		25
Methyl tert butyl ether	99		108		70-130	8		25
Naphthalene	92		100		70-130	8		25
1,2,4-Trimethylbenzene	94		102		70-130	8		25
Pentane	103		111		70-130	7		25
2-Methylpentane	108		116		70-130	7		25
2,2,4-Trimethylpentane	99		107		70-130	8		25
n-Nonane	107		115		30-130	7		25
n-Decane	108		116		70-130	7		25
n-Butylcyclohexane	103		111		70-130	7		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,5-Dibromotoluene-PID	96		103		70-130
2,5-Dibromotoluene-FID	101		107		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-14 Batch: WG1384047-2 WG1384047-3								
C9-C18 Aliphatics	49		63		40-140	25		25
C19-C36 Aliphatics	71		77		40-140	8		25
C11-C22 Aromatics	60		70		40-140	15		25
Naphthalene	53		65		40-140	20		25
2-Methylnaphthalene	55		66		40-140	18		25
Acenaphthylene	53		64		40-140	19		25
Acenaphthene	56		68		40-140	19		25
Fluorene	56		68		40-140	19		25
Phenanthrene	56		68		40-140	19		25
Anthracene	56		68		40-140	19		25
Fluoranthene	57		69		40-140	19		25
Pyrene	57		69		40-140	19		25
Benzo(a)anthracene	56		68		40-140	19		25
Chrysene	56		69		40-140	21		25
Benzo(b)fluoranthene	62		76		40-140	20		25
Benzo(k)fluoranthene	47		58		40-140	21		25
Benzo(a)pyrene	54		66		40-140	20		25
Indeno(1,2,3-cd)Pyrene	52		64		40-140	21		25
Dibenzo(a,h)anthracene	55		68		40-140	21		25
Benzo(ghi)perylene	51		63		40-140	21		25

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-14 Batch: WG1384047-2 WG1384047-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	61		64		40-140
o-Terphenyl	57		70		40-140
2-Fluorobiphenyl	83		80		40-140
2-Bromonaphthalene	84		81		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 04,06,08,13 Batch: WG1384999-2 WG1384999-3								
C5-C8 Aliphatics	103		113		70-130	9		25
C9-C12 Aliphatics	107		119		70-130	11		25
C9-C10 Aromatics	88		97		70-130	9		25
Benzene	88		96		70-130	9		25
Toluene	88		97		70-130	9		25
Ethylbenzene	90		99		70-130	9		25
p/m-Xylene	89		98		70-130	9		25
o-Xylene	89		97		70-130	9		25
Methyl tert butyl ether	95		104		70-130	9		25
Naphthalene	86		94		70-130	9		25
1,2,4-Trimethylbenzene	88		97		70-130	9		25
Pentane	101		111		70-130	9		25
2-Methylpentane	107		118		70-130	10		25
2,2,4-Trimethylpentane	99		108		70-130	9		25
n-Nonane	107		119		30-130	11		25
n-Decane	111		123		70-130	10		25
n-Butylcyclohexane	104		115		70-130	10		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,5-Dibromotoluene-PID	91		100		70-130
2,5-Dibromotoluene-FID	101		115		70-130

INORGANICS
&
MISCELLANEOUS

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-01
Client ID: 1C 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/08/20 09:45
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.505		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	0.420		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	0.462		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Westborough Lab										
Cyanide, Physiologically Available	ND		mg/kg	1.1	--	1	06/17/20 14:05	06/17/20 16:21	64,9014(M)	LH
General Chemistry - Mansfield Lab										
Solids, Total	85.1		%	0.100	--	1	-	06/12/20 20:07	121,2540G	LB
% Soot (Rep 1)	0.013		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Rep 2)	0.029		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Average)	0.021		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-02
Client ID: 1B 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/08/20 10:15
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.741		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	0.854		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	0.798		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Westborough Lab										
Cyanide, Physiologically Available	ND		mg/kg	1.0	--	1	06/17/20 14:05	06/17/20 17:15	64,9014(M)	LH
General Chemistry - Mansfield Lab										
Solids, Total	87.9		%	0.100	--	1	-	06/12/20 20:07	121,2540G	LB
% Soot (Rep 1)	0.032		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Rep 2)	0.027		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Average)	0.030		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-03
Client ID: 1A 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/08/20 11:30
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.13		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	0.852		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	0.993		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Westborough Lab										
Cyanide, Physiologically Available	ND		mg/kg	1.1	--	1	06/17/20 14:05	06/17/20 16:25	64,9014(M)	LH
General Chemistry - Mansfield Lab										
Solids, Total	87.2		%	0.100	--	1	-	06/12/20 20:07	121,2540G	LB
% Soot (Rep 1)	0.207		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Rep 2)	0.167		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Average)	0.187		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-04
Client ID: 1A 1-5.5'
Sample Location: HAVERHILL, MA

Date Collected: 06/08/20 14:30
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	5.28		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	6.26		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	5.77		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	84.2		%	0.100	--	1	-	06/12/20 20:07	121,2540G	LB

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-05
Client ID: 2C 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 08:30
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.86		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	1.87		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	1.86		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Westborough Lab										
Cyanide, Physiologically Available	ND		mg/kg	1.2	--	1	06/17/20 14:05	06/17/20 17:16	64,9014(M)	LH
General Chemistry - Mansfield Lab										
Solids, Total	73.5		%	0.100	--	1	-	06/12/20 20:07	121,2540G	LB
% Soot (Rep 1)	0.123		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Rep 2)	0.085		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Average)	0.104		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-06
Client ID: 2A 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 09:35
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	15.9		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	15.8		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	15.8		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	76.2		%	0.100	--	1	-	06/12/20 20:07	121,2540G	LB

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-07
Client ID: 2A 1-4'
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 10:15
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	3.48		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	4.52		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	4.00		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	77.6		%	0.100	--	1	-	06/12/20 20:07	121,2540G	LB

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-08
Client ID: 3C 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 10:35
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.382		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	0.860		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	0.621		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Westborough Lab										
Cyanide, Physiologically Available	ND		mg/kg	1.0	--	1	06/17/20 14:05	06/17/20 16:27	64,9014(M)	LH
General Chemistry - Mansfield Lab										
Solids, Total	92.8		%	0.100	--	1	-	06/12/20 20:07	121,2540G	LB
% Soot (Rep 1)	0.025		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Rep 2)	ND		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Average)	0.017		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-09
Client ID: 3B 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 10:55
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	3.06		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	3.36		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	3.21		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	82.3		%	0.100	--	1	-	06/12/20 20:07	121,2540G	LB

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-10
Client ID: 4B 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 12:45
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.208		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	0.233		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	0.220		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Westborough Lab										
Cyanide, Physiologically Available	ND		mg/kg	1.2	--	1	06/17/20 14:05	06/17/20 16:28	64,9014(M)	LH
General Chemistry - Mansfield Lab										
Solids, Total	85.3		%	0.100	--	1	-	06/12/20 20:07	121,2540G	LB
% Soot (Rep 1)	0.018		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Rep 2)	ND		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Average)	0.011		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-11
Client ID: 4A 1-2.5'
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 13:10
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.70		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	1.54		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	1.62		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	84.2		%	0.100	--	1	-	06/12/20 20:07	121,2540G	LB

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-12
Client ID: 5A 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 14:05
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	5.08		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	5.19		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	5.14		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	69.7		%	0.100	--	1	-	06/12/20 20:07	121,2540G	LB

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-13
Client ID: 5C 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 14:35
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.911		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	1.22		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	1.06		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Westborough Lab										
Cyanide, Physiologically Available	ND		mg/kg	1.2	--	1	06/17/20 14:05	06/17/20 16:29	64,9014(M)	LH
General Chemistry - Mansfield Lab										
Solids, Total	77.5		%	0.100	--	1	-	06/12/20 20:07	121,2540G	LB
% Soot (Rep 1)	0.027		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Rep 2)	0.658		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Average)	0.342		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024182-14
Client ID: 5B 0-6"
Sample Location: HAVERHILL, MA

Date Collected: 06/09/20 14:55
Date Received: 06/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.489		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	0.413		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	0.451		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Westborough Lab										
Cyanide, Physiologically Available	ND		mg/kg	1.2	--	1	06/17/20 14:05	06/17/20 16:30	64,9014(M)	LH
General Chemistry - Mansfield Lab										
Solids, Total	78.4		%	0.100	--	1	-	06/12/20 20:07	121,2540G	LB
% Soot (Rep 1)	0.106		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Rep 2)	0.180		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Average)	0.143		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP

Project Name: 284 WINTER ST **Lab Number:** L2024182

Project Number: 01.0172397.10 **Report Date:** 06/30/20

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab for sample(s): 01-14 Batch: WG1381140-1										
Total Organic Carbon (Rep1)	ND		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	ND		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	ND		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Westborough Lab for sample(s): 01-03,05,08,10,13-14 Batch: WG1382685-1										
Cyanide, Physiologically Available	ND		mg/kg	0.89	--	1	06/17/20 14:05	06/17/20 16:09	64,9014(M)	LH
General Chemistry - Mansfield Lab for sample(s): 01-03,05,08,10,13-14 Batch: WG1385069-1										
% Soot (Rep 1)	ND		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Rep 2)	ND		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP
% Soot (Average)	ND		%	0.010	NA	1	-	06/29/20 14:17	91,-	SP

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Organic Carbon - Mansfield Lab Associated sample(s): 01-14 Batch: WG1381140-2								
Total Organic Carbon (Rep1)	103		-		75-125	-		25
Total Organic Carbon (Rep2)	105		-		75-125	-		25
Total Organic Carbon (Average)	104		-		75-125	-		25
General Chemistry - Westborough Lab Associated sample(s): 01-03,05,08,10,13-14 Batch: WG1382685-2								
Cyanide, Physiologically Available	95		-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03,05,08,10,13-14 Batch: WG1382685-3								
Cyanide, Physiologically Available	**1**		-		0-10	-		20
General Chemistry - Mansfield Lab Associated sample(s): 01-03,05,08,10,13-14 Batch: WG1385069-2								
% Soot (Rep 1)	105		-		75-125	-		25
% Soot (Rep 2)	89		-		75-125	-		25

Matrix Spike Analysis
Batch Quality Control

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03,05,08,10,13-14 QC Batch ID: WG1382685-5 QC Sample: L2024182-01 Client ID: 1C 0-6"												
Cyanide, Physiologically Available	ND	11	8.5	77		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: 284 WINTER ST

Project Number: 01.0172397.10

Lab Number: L2024182

Report Date: 06/30/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1381141-1 QC Sample: L2024182-04 Client ID: 1A 1-5.5'						
Solids, Total	84.2	84.8	%	1		10
General Chemistry - Westborough Lab Associated sample(s): 01-03,05,08,10,13-14 QC Batch ID: WG1382685-4 QC Sample: L2024182-01 Client ID: 1C 0-6"						
Cyanide, Physiologically Available	ND	ND	mg/kg	NC		20

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2024182-01A	Vial MeOH preserved	A	NA		5.2	Y	Absent		VPH-DELUX-18(28)
L2024182-01B	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-ALKPAH(14),A2-TS(7)
L2024182-01C	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-SOOT(28)
L2024182-01D	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-TOC-9060-2REPS(28)
L2024182-01E	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-01F	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-02A	Vial MeOH preserved	A	NA		5.2	Y	Absent		VPH-DELUX-18(28)
L2024182-02B	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-ALKPAH(14),A2-TS(7)
L2024182-02C	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-SOOT(28)
L2024182-02D	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-TOC-9060-2REPS(28)
L2024182-02E	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-02F	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-02X	Glass 60ml unpreserved split	A	NA		5.2	Y	Absent		A2-TOC-9060-2REPS(28)
L2024182-03A	Vial MeOH preserved	A	NA		5.2	Y	Absent		VPH-DELUX-18(28)
L2024182-03B	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-ALKPAH(14),A2-TS(7)
L2024182-03C	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-SOOT(28)
L2024182-03D	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-TOC-9060-2REPS(28)
L2024182-03E	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-03F	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-04A	Vial MeOH preserved	A	NA		5.2	Y	Absent		VPH-DELUX-18(28)
L2024182-04B	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-TS(7),A2-TOC-9060-2REPS(28)
L2024182-04C	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		EPH-DELUX-20(14)
L2024182-05A	Vial MeOH preserved	A	NA		5.2	Y	Absent		VPH-DELUX-18(28)

*Values in parentheses indicate holding time in days

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2024182-05B	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-ALKPAH(14),A2-TS(7)
L2024182-05C	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-SOOT(28)
L2024182-05D	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-TOC-9060-2REPS(28)
L2024182-05E	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-05F	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-06A	Vial MeOH preserved	A	NA		5.2	Y	Absent		VPH-DELUX-18(28)
L2024182-06B	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-TS(7),A2-TOC-9060-2REPS(28)
L2024182-06C	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		EPH-DELUX-20(14)
L2024182-07A	Vial MeOH preserved	A	NA		5.2	Y	Absent		VPH-DELUX-18(28)
L2024182-07B	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-TS(7),A2-TOC-9060-2REPS(28)
L2024182-07C	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		EPH-DELUX-20(14)
L2024182-08A	Vial MeOH preserved	A	NA		5.2	Y	Absent		VPH-DELUX-18(28)
L2024182-08B	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-ALKPAH(14),A2-TS(7)
L2024182-08C	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-SOOT(28)
L2024182-08D	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-TOC-9060-2REPS(28)
L2024182-08E	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-08F	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-09A	Vial MeOH preserved	A	NA		5.2	Y	Absent		VPH-DELUX-18(28)
L2024182-09B	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-TS(7),A2-TOC-9060-2REPS(28)
L2024182-09C	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		EPH-DELUX-20(14)
L2024182-10A	Vial MeOH preserved	A	NA		5.2	Y	Absent		VPH-DELUX-18(28)
L2024182-10B	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-ALKPAH(14),A2-TS(7)
L2024182-10C	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-SOOT(28)
L2024182-10D	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-TOC-9060-2REPS(28)
L2024182-10E	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-10F	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-11A	Vial MeOH preserved	A	NA		5.2	Y	Absent		VPH-DELUX-18(28)
L2024182-11B	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-TS(7),A2-TOC-9060-2REPS(28)

*Values in parentheses indicate holding time in days

Project Name: 284 WINTER ST
Project Number: 01.0172397.10

Lab Number: L2024182
Report Date: 06/30/20

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2024182-11C	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		EPH-DELUX-20(14)
L2024182-12A	Vial MeOH preserved	A	NA		5.2	Y	Absent		VPH-DELUX-18(28)
L2024182-12B	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-TS(7),A2-TOC-9060-2REPS(28)
L2024182-12C	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		EPH-DELUX-20(14)
L2024182-13A	Vial MeOH preserved	A	NA		5.2	Y	Absent		VPH-DELUX-18(28)
L2024182-13B	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-ALKPAH(14),A2-TS(7)
L2024182-13C	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-SOOT(28)
L2024182-13D	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-TOC-9060-2REPS(28)
L2024182-13E	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-13F	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-14A	Vial MeOH preserved	A	NA		5.2	Y	Absent		VPH-DELUX-18(28)
L2024182-14B	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-ALKPAH(14),A2-TS(7)
L2024182-14C	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-SOOT(28)
L2024182-14D	Glass 120ml/4oz unpreserved	A	NA		5.2	Y	Absent		A2-TOC-9060-2REPS(28)
L2024182-14E	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)
L2024182-14F	Glass 250ml/8oz unpreserved	A	NA		5.2	Y	Absent		EPH-20(14),PACN(14)

*Values in parentheses indicate holding time in days

Project Name:	284 WINTER ST	**Lab Number:**	L2024182
Project Number:	01.0172397.10	**Report Date:**	06/30/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

Report Format: Data Usability Report

Project Name:	284 WINTER ST	**Lab Number:**	L2024182
Project Number:	01.0172397.10	**Report Date:**	06/30/20

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less

Project Name: 284 WINTER ST
Project Number: 01.0172397.10
Lab Number: L2024182
Report Date: 06/30/20

Data Qualifiers

than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

Project Name: 284 WINTER ST **Lab Number:** L2024182
Project Number: 01.0172397.10 **Report Date:** 06/30/20

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

64 Quality Assurance and Quality Control Requirements and Performance Standards for SW-846 Methods. MADEP BWSC. WSC-CAM-IIA (Revision 4), WSC-CAM-V C (Revision 2), WSC-CAM-IIIA (Revision 5). August 2004.

91 Analysis of Soot following ES&T publications by Accardi-Dey and Gschwend, 2003; and Gustafsson (et. al.), 1997.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

131 Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), MassDEP, February 2018, Revision 2.1 with QC Requirements & Performance Standards for the Analysis of VPH under the Massachusetts Contingency Plan, WSC-CAM-IVA, June 1, 2018.

135 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, December 2019, Revision 2.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, March 1, 2020.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
EPA TO-12 Non-methane organics
EPA 3C Fixed gases
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 2

Date Rec'd in Lab: 6/10/20

ALPHA Job #: L2429782

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: GZA GeoEnvironmental
Address: 249 Vanderbilt Ave Norwood, MA 02062
Phone: 781-278-3700
Fax:
Email: kyle.Maxfield@gza.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: 248 Winter Street, Haverhill, MA
Project Location: Haverhill, MA
Project #: 01.0172397.10
Project Manager: Kyle Maxfield
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program	Criteria
	MA MCP

Other Project Specific Requirements/Comments/Detection Limits:
Please refer to the analyses listed on this COC.

Samples are expected to have high concentrations of MGP and petroleum related analytes

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Alkylated PAHs - 8270 SIM	Total organic carbon	Black Carbon	EPH - carbon ranges only	VPH w/ target VOCs	Physiologically Available Cyanide	Total Solids	EPH w/ target PAHs					Sample Specific Comments	Total # Bottles
29182-01	1C 0-6"	6/8/20	0945	Soil	BCD	X	X	X	X	X	X	X							6
-02	1B 0-6"	↓	1015	↓	↓	X	X	X	X	X	X	X							6
-03	1A 0-6"	↓	1130	↓	↓	X	X	X	X	X	X	X							6
-04	1A 1-5.5'	6/8/20	1430	↓	↓		X			X		X	X					contains visible, separate phase product	3
-05	2C 0-6"	6/9/20	0830	↓	↓	X	X	X	X	X	X	X							6
	~~2B 0-6"~~	↓	~~0905~~	↓	↓	BCD													
-06	2A 0-6"	↓	0935	↓	↓		X			X		X	X					contains visible, separate phase product	3
-07	2A 1-4'	↓	1015	↓	↓		X			X		X	X						3
-08	3C 0-6"	↓	1035	↓	↓	X	X	X	X	X	X	X							6
-09	3B 0-6"	6/9/20	1055	Soil	BCD		X			X		X	X					contains visible, separate phase product	3
						Container Type													
						Preservative													

SAMPLE HANDLING
Filtration
☐ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Relinquished By:	Date/Time	Received By:	Date/Time
Bailey Dupont	6/10/20 1500	[illegible]	6/10/20 1500
[illegible]	6/10/20 1630	[illegible]	6/10/20 1630

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

CHAIN OF CUSTODY

PAGE 2 OF 2

Date Rec'd in Lab: 6/10/20

ALPHA Job #: L2027KL

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: GZA GeoEnvironmental
Address: 249 Vanderbilt Ave. Norwood, MA 02062
Phone: 781-278-3700
Fax:
Email: kyle.maxfield@gza.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: 248 Winter Street, Haverhill, MA
Project Location: Haverhill, MA
Project #: 01.0172397.10
Project Manager: Kyle Maxfield
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program	Criteria
	MA MCP

Other Project Specific Requirements/Comments/Detection Limits:
Please refer to the analyses listed on this COC
All samples are expected to have high concentrations of MGP and petroleum related analytes

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Alkylated PAHs-8270 SIM	Total organic carbon	Black carbon	EPH-carbon ranges only	VPH w/ target VOCs	Physiologically Available Cyanide	Total solids	EPH w/ target PAHs					Sample Specific Comments	Total # Bottles
	~~3A 0-6"~~	~~6/9/20~~	~~1215~~	~~Soil~~	~~BCD~~ BCD														
21/22-10	4B 0-6"	6/9/20	1245	Soil	BCD	X	X	X	X	X	X	X							6
-11	4A 1-2.5'		1310				X			X		X	X					contains visible, separate phase product	3
	~~4A 0-6"~~		~~1330~~		BCD														
-12	5A 0-6"		1405				X			X		X	X					contains visible, separate phase product	3
-13	5C 0-6"		1435			X	X	X	X	X	X	X							6
-14	5B 0-6"	6/9/20	1455	Soil	BCD	X	X	X	X	X	X	X							6

Container Type												
Preservative												

SAMPLE HANDLING
Filtration
☐ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Relinquished By:	Date/Time	Received By:	Date/Time
Bailey Dupont	6/10/20 1500		6/10/20 1546
	6/10/20 1630		6/10/20 1650

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 14-OCT-07)

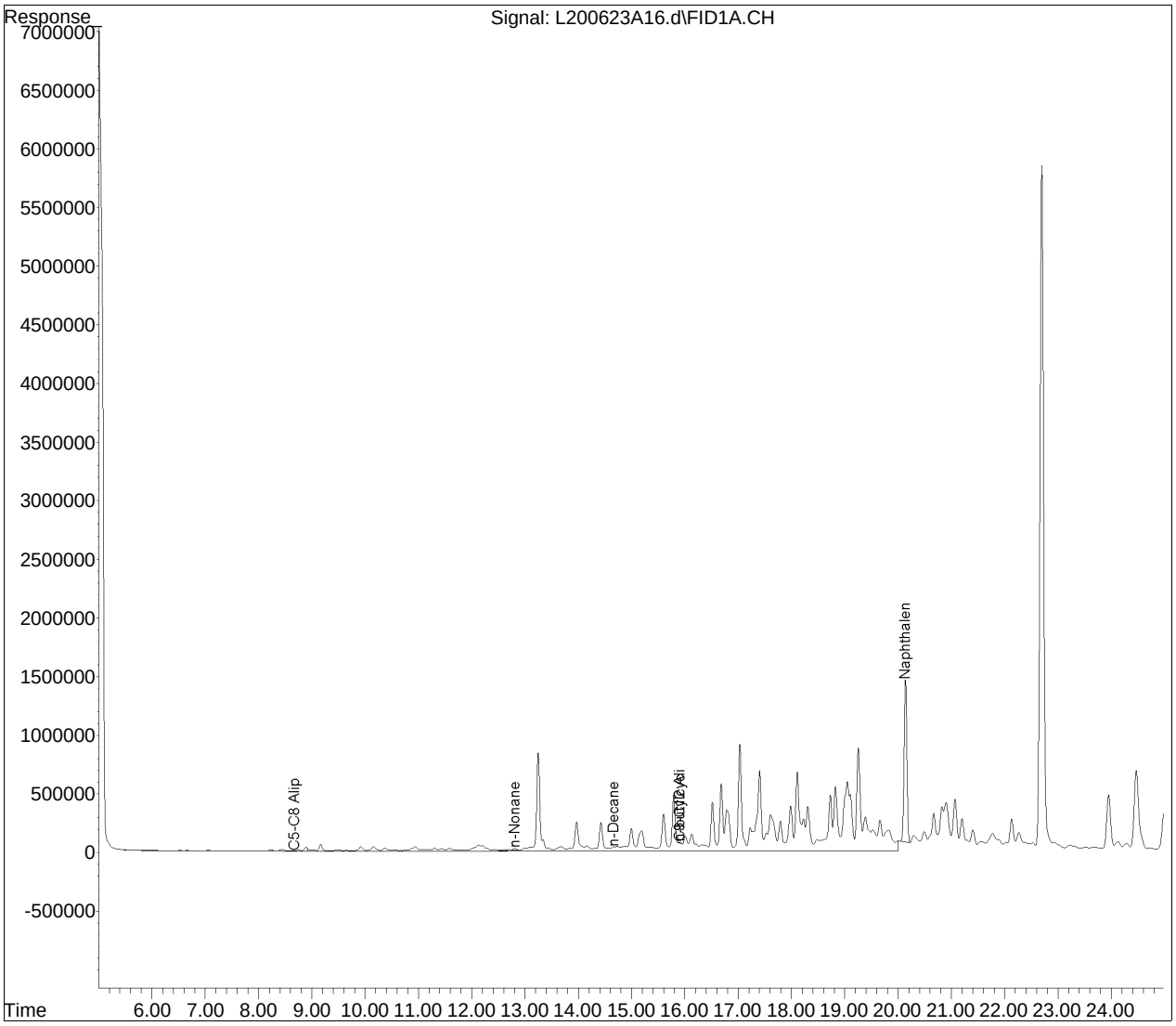
Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES_GC\LVPH\2020\200623Aali\
Data File : L200623A16.d
Signal(s) : FID1A.CH
Acq On : 23 Jun 2020 4:40 pm
Operator : LVPH:BAD
Sample : l2024182-06D,41,15,18.66,0.025,,a
Misc : WG1384999,ICAL16831,VPH-75
ALS Vial : 16 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jun 24 12:14:04 2020
Quant Method : I:\VOLATILES_GC\LVPH\2020\200623Aali\svph-ali200528A.m
Quant Title : VPH ALIPHATIC
QLast Update : Fri May 29 09:09:20 2020
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Sub List : Default - All compounds listed



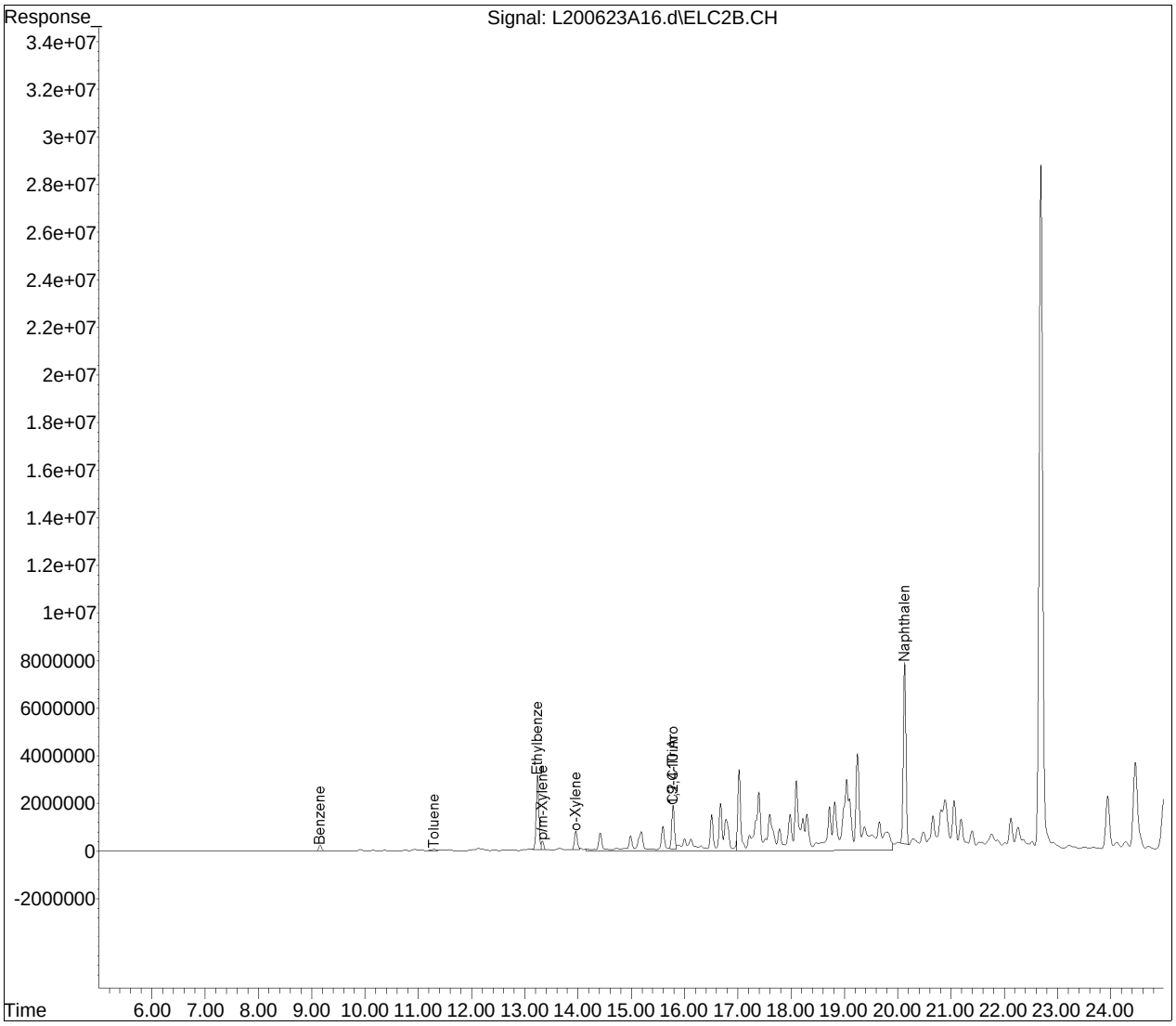
Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES_GC\LVPH\2020\200623Aaro\
Data File : L200623A16.d
Signal(s) : ELC2B.CH
Acq On : 23 Jun 2020 4:40 pm
Operator : LVPH:BAD
Sample : l2024182-06D,41,15,18.66,0.025,,a
Misc : WG1384999,ICAL16832,VPH-75
ALS Vial : 0 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jun 24 12:04:31 2020
Quant Method : I:\VOLATILES_GC\LVPH\2020\200623Aaro\svph-aro200528A.m
Quant Title : VPH AROMATIC
QLast Update : Fri May 29 09:20:31 2020
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Sub List : Default - All compounds listed



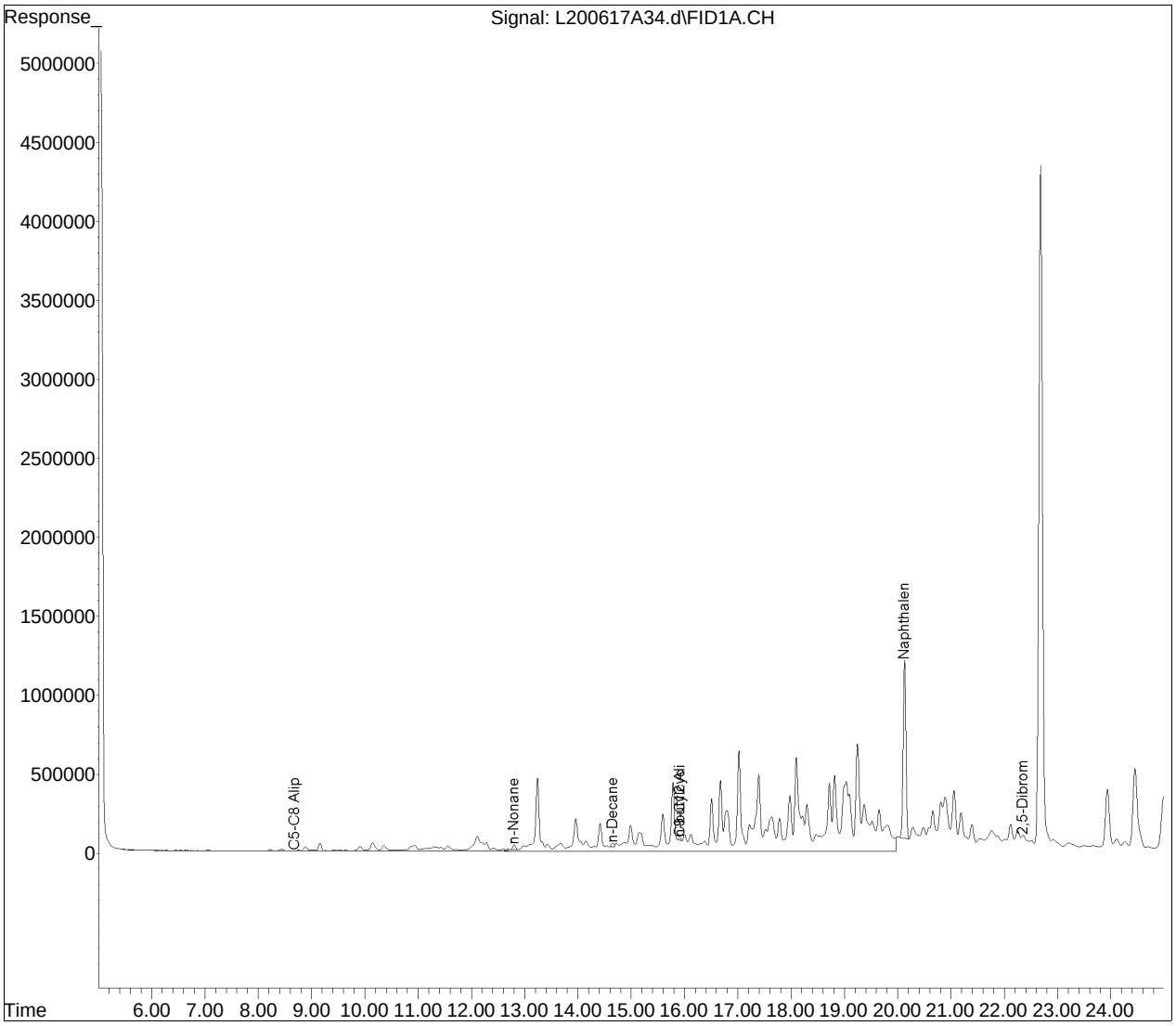
Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES_GC\LVPH\2020\200617Aali\
Data File : L200617A34.d
Signal(s) : FID1A.CH
Acq On : 18 Jun 2020 2:01 am
Operator : LVPH:BAD
Sample : l2024182-07D,41,15,18.08,0.025,,a
Misc : WG1383297,ICAL16831,VPH-75
ALS Vial : 34 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jun 18 14:11:37 2020
Quant Method : I:\VOLATILES_GC\LVPH\2020\200617Aali\svph-ali200528A.m
Quant Title : VPH ALIPHATIC
QLast Update : Fri May 29 09:09:20 2020
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Sub List : Default - All compounds listed



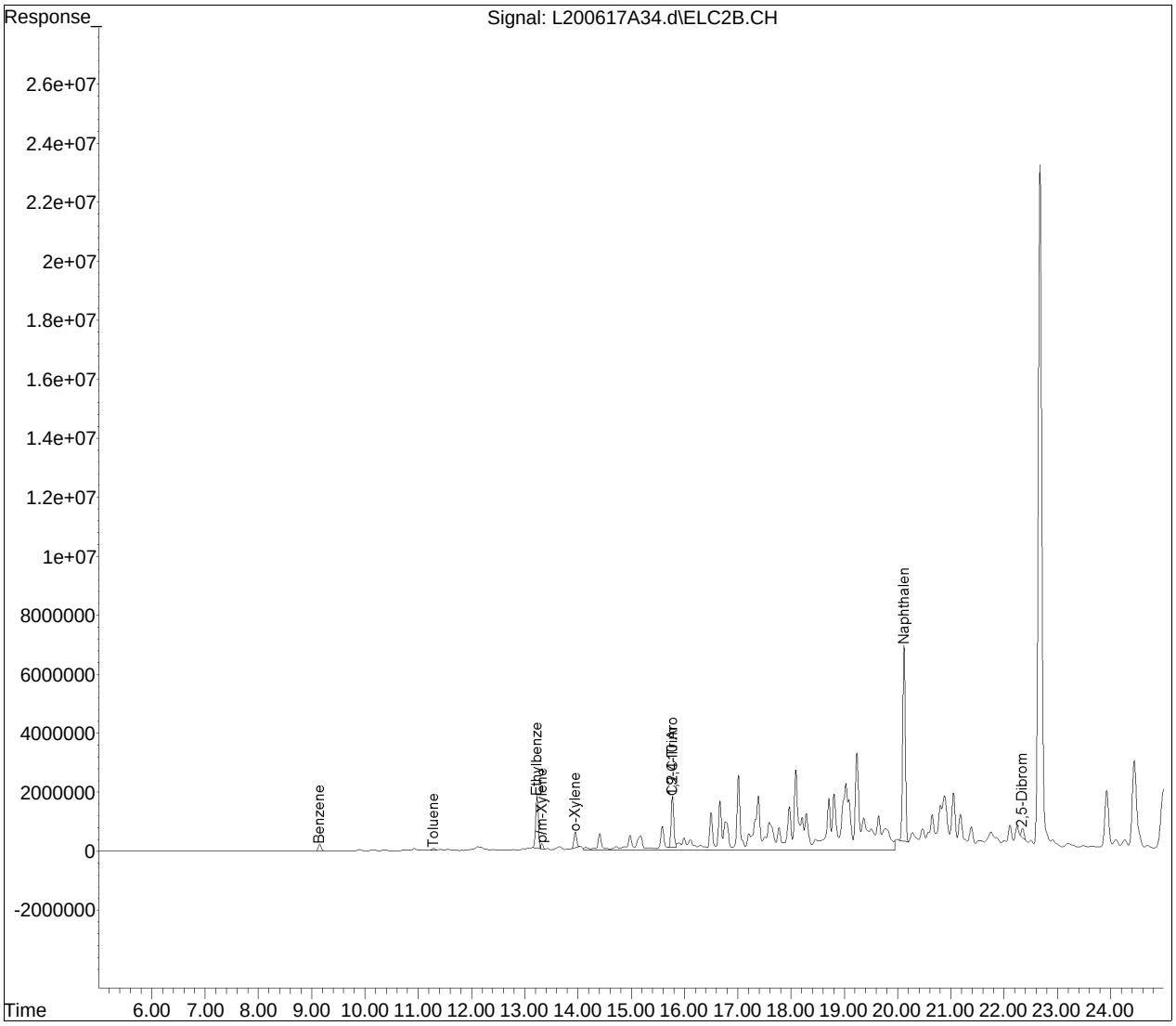
Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES_GC\LVPH\2020\200617Aaro\
Data File : L200617A34.d
Signal(s) : ELC2B.CH
Acq On : 18 Jun 2020 2:01 am
Operator : LVPH:BAD
Sample : l2024182-07D,41,15,18.08,0.025,,a
Misc : WG1383297,ICAL16832,VPH-75
ALS Vial : 0 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jun 18 15:00:48 2020
Quant Method : I:\VOLATILES_GC\LVPH\2020\200617Aaro\svph-aro200528A.m
Quant Title : VPH AROMATIC
QLast Update : Fri May 29 09:20:31 2020
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Sub List : Default - All compounds listed



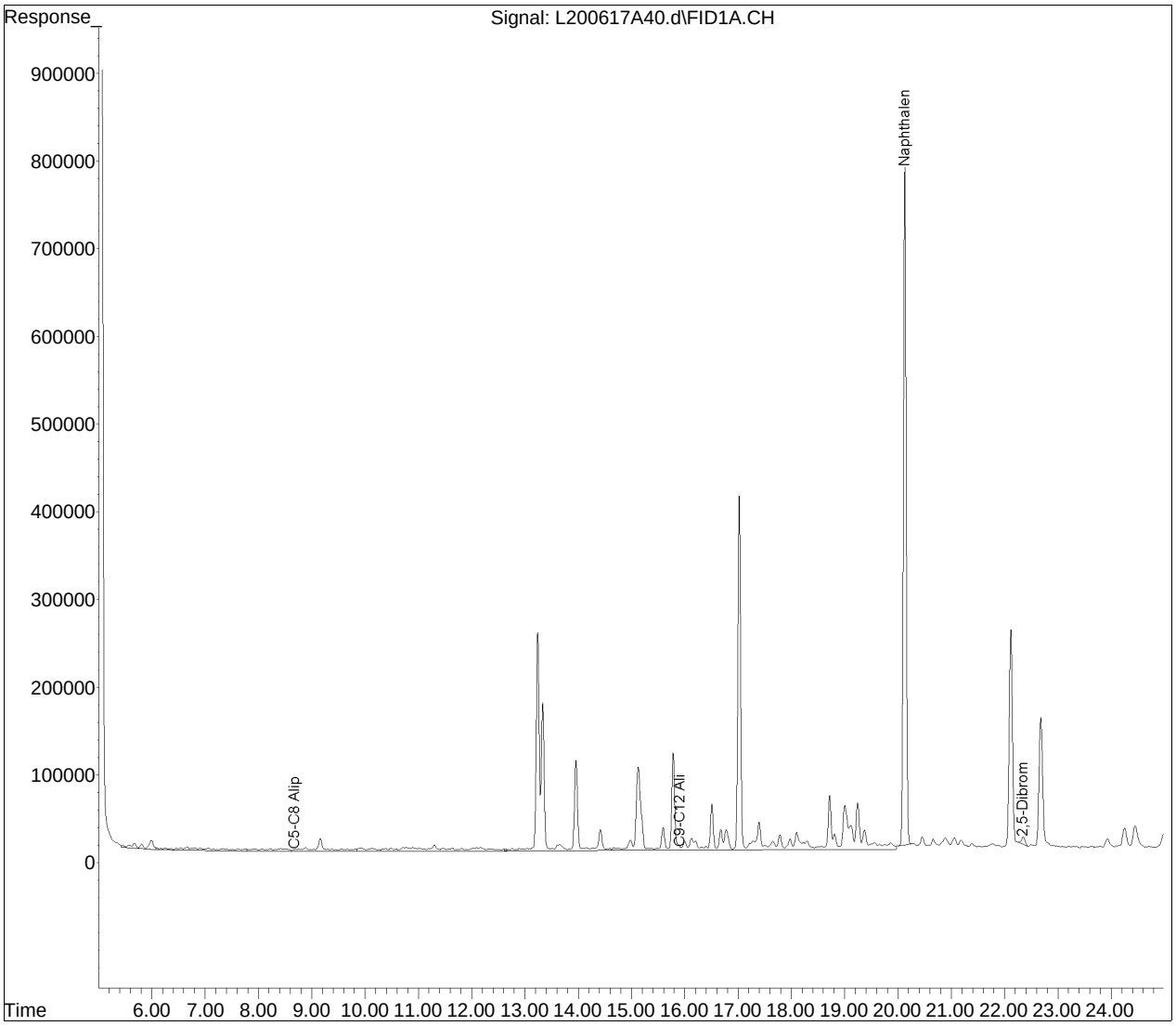
Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES_GC\LVPH\2020\200617Aali\
Data File : L200617A40.d
Signal(s) : FID1A.CH
Acq On : 18 Jun 2020 5:05 am
Operator : LVPH:BAD
Sample : l2024182-10D,41,15,19.45,0.005,,a
Misc : WG1383297,ICAL16831,VPH-75
ALS Vial : 40 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jun 18 14:15:05 2020
Quant Method : I:\VOLATILES_GC\LVPH\2020\200617Aali\svph-ali200528A.m
Quant Title : VPH ALIPHATIC
QLast Update : Fri May 29 09:09:20 2020
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Sub List : Default - All compounds listed



ANALYTICAL REPORT

Lab Number:	L2024416
Client:	GZA GeoEnvironmental, Inc. 249 Vanderbilt Ave. Norwood, MA 02062
ATTN:	Kyle Maxfield
Phone:	(781) 278-5845
Project Name:	284 WINTER ST, HAVERHILL, MA
Project Number:	01.0172397.10
Report Date:	06/30/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: 284 WINTER ST, HAVERHILL, MA
Project Number: 01.0172397.10

Lab Number: L2024416
Report Date: 06/30/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2024416-01	DOWNSTREAM	WATER	HAVERHILL, MA	06/11/20 08:30	06/11/20
L2024416-02	UPSTREAM	WATER	HAVERHILL, MA	06/11/20 09:00	06/11/20
L2024416-03	5A 2-3'	SOIL	HAVERHILL, MA	06/11/20 09:10	06/11/20

Project Name: 284 WINTER ST, HAVERHILL, MA **Lab Number:** L2024416

Project Number: 01.0172397.10 **Report Date:** 06/30/20

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	YES
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	NO
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	284 WINTER ST, HAVERHILL, MA	**Lab Number:**	L2024416
Project Number:	01.0172397.10	**Report Date:**	06/30/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	284 WINTER ST, HAVERHILL, MA	**Lab Number:**	L2024416
Project Number:	01.0172397.10	**Report Date:**	06/30/20

Case Narrative (continued)

Report Revision

June 30, 2020: The EPH and VPH reporting lists have been amended on L2024416-01 and -02.

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Physiologically Available Cyanide.

VPH

In reference to question G:

L2024416-03: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

L2024416-03: The surrogate recoveries are below the acceptance criteria for 2,5-dibromotoluene-pid (0%) and 2,5-dibromotoluene-fid (0%) due to the dilution required to quantitate the sample. Re-analysis was not required; therefore, the results of the original analysis are reported.

EPH

In reference to question G:

L2024416-03: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

L2024416-03: The surrogate recoveries are below the acceptance criteria for chloro-octadecane (0%) and o-terphenyl (0%) due to the dilution required to quantitate the sample. Re-extraction was not required; therefore, the results of the original analysis are reported.

Non-MCP Related Narratives

Total Organic Carbon

WG1381140: The required batch QC was prepared; however, the native sample required a different reporting

Project Name:	284 WINTER ST, HAVERHILL, MA	**Lab Number:**	L2024416
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Case Narrative (continued)

method; therefore, the associated QC results could not be reported.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Cristin Walker

Title: Technical Director/Representative

Date: 06/30/20

QC OUTLIER SUMMARY REPORT

Project Name: 284 WINTER ST, HAVERHILL, MA

Project Number: 01.0172397.10

Lab Number: L2024416

Report Date: 06/30/20

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
Extractable Petroleum Hydrocarbons - Westborough Lab								
EPH-19-2.1	5A 2-3'	L2024416-03 D	Chloro-Octadecane	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	5A 2-3'	L2024416-03 D	o-Terphenyl	Surrogate	0	40-140	-	- - not applicable - -
EPH-19-2.1	Batch QC	WG1384242-3	Naphthalene	LCSD	26	25	03	non-directional bias
Volatile Petroleum Hydrocarbons - Westborough Lab								
VPH-18-2.1	5A 2-3'	L2024416-03 D	2,5-Dibromotoluene-PID	Surrogate	0	70-130	-	- - not applicable - -
VPH-18-2.1	5A 2-3'	L2024416-03 D	2,5-Dibromotoluene-FID	Surrogate	0	70-130	-	- - not applicable - -

ORGANICS

PETROLEUM HYDROCARBONS

Project Name: 284 WINTER ST, HAVERHILL, MA
Lab Number: L2024416
Project Number: 01.0172397.10
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024416-01	Date Collected:	06/11/20 08:30
Client ID:	DOWNSTREAM	Date Received:	06/11/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/17/20 16:01
Analyst:	BAD

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	100	--	1
C9-C12 Aliphatics	ND		ug/l	100	--	1
C9-C10 Aromatics	ND		ug/l	100	--	1
C5-C8 Aliphatics, Adjusted	ND		ug/l	100	--	1
C9-C12 Aliphatics, Adjusted	ND		ug/l	100	--	1
Benzene	ND		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	ND		ug/l	2.00	--	1
o-Xylene	ND		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	ND		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	111		70-130
2,5-Dibromotoluene-FID	104		70-130

Project Name: 284 WINTER ST, HAVERHILL, MA
Project Number: 01.0172397.10
Lab Number: L2024416
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024416-01	Date Collected:	06/11/20 08:30
Client ID:	DOWNSTREAM	Date Received:	06/11/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1	Extraction Date:	06/23/20 19:51
Analytical Date:	06/24/20 05:43	Cleanup Method1:	EPH-04-1
Analyst:	LL	Cleanup Date1:	06/24/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1
Naphthalene	ND		ug/l	10.0	--	1
2-Methylnaphthalene	ND		ug/l	10.0	--	1
Acenaphthylene	ND		ug/l	10.0	--	1
Acenaphthene	ND		ug/l	10.0	--	1
Fluorene	ND		ug/l	10.0	--	1
Phenanthrene	ND		ug/l	10.0	--	1
Anthracene	ND		ug/l	10.0	--	1
Fluoranthene	ND		ug/l	10.0	--	1
Pyrene	ND		ug/l	10.0	--	1
Benzo(a)anthracene	ND		ug/l	10.0	--	1
Chrysene	ND		ug/l	10.0	--	1
Benzo(b)fluoranthene	ND		ug/l	10.0	--	1
Benzo(k)fluoranthene	ND		ug/l	10.0	--	1
Benzo(a)pyrene	ND		ug/l	10.0	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	10.0	--	1
Dibenzo(a,h)anthracene	ND		ug/l	10.0	--	1
Benzo(g,h,i)perylene	ND		ug/l	10.0	--	1

Project Name: 284 WINTER ST, HAVERHILL, MA **Lab Number:** L2024416

Project Number: 01.0172397.10 **Report Date:** 06/30/20

SAMPLE RESULTS

Lab ID:	L2024416-01	Date Collected:	06/11/20 08:30
Client ID:	DOWNSTREAM	Date Received:	06/11/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	57		40-140
o-Terphenyl	47		40-140
2-Fluorobiphenyl	55		40-140
2-Bromonaphthalene	56		40-140

Project Name: 284 WINTER ST, HAVERHILL, MA
Lab Number: L2024416
Project Number: 01.0172397.10
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024416-02	Date Collected:	06/11/20 09:00
Client ID:	UPSTREAM	Date Received:	06/11/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:	
Matrix:	Water
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/17/20 16:31
Analyst:	BAD

Trap:	EST, Carbopack B/Carboxen 1000&1001	Analytical Column:	Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		ug/l	100	--	1
C9-C12 Aliphatics	ND		ug/l	100	--	1
C9-C10 Aromatics	ND		ug/l	100	--	1
C5-C8 Aliphatics, Adjusted	ND		ug/l	100	--	1
C9-C12 Aliphatics, Adjusted	ND		ug/l	100	--	1
Benzene	ND		ug/l	2.00	--	1
Toluene	ND		ug/l	2.00	--	1
Ethylbenzene	ND		ug/l	2.00	--	1
p/m-Xylene	ND		ug/l	2.00	--	1
o-Xylene	ND		ug/l	2.00	--	1
Methyl tert butyl ether	ND		ug/l	3.00	--	1
Naphthalene	ND		ug/l	4.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	108		70-130
2,5-Dibromotoluene-FID	101		70-130

Project Name: 284 WINTER ST, HAVERHILL, MA
Project Number: 01.0172397.10
Lab Number: L2024416
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024416-02	Date Collected:	06/11/20 09:00
Client ID:	UPSTREAM	Date Received:	06/11/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified
Sample Depth:			
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	135,EPH-19-2.1	Extraction Date:	06/23/20 19:51
Analytical Date:	06/24/20 06:08	Cleanup Method1:	EPH-04-1
Analyst:	LL	Cleanup Date1:	06/24/20

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1
Naphthalene	ND		ug/l	10.0	--	1
2-Methylnaphthalene	ND		ug/l	10.0	--	1
Acenaphthylene	ND		ug/l	10.0	--	1
Acenaphthene	ND		ug/l	10.0	--	1
Fluorene	ND		ug/l	10.0	--	1
Phenanthrene	ND		ug/l	10.0	--	1
Anthracene	ND		ug/l	10.0	--	1
Fluoranthene	ND		ug/l	10.0	--	1
Pyrene	ND		ug/l	10.0	--	1
Benzo(a)anthracene	ND		ug/l	10.0	--	1
Chrysene	ND		ug/l	10.0	--	1
Benzo(b)fluoranthene	ND		ug/l	10.0	--	1
Benzo(k)fluoranthene	ND		ug/l	10.0	--	1
Benzo(a)pyrene	ND		ug/l	10.0	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	10.0	--	1
Dibenzo(a,h)anthracene	ND		ug/l	10.0	--	1
Benzo(g,h,i)perylene	ND		ug/l	10.0	--	1

Project Name: 284 WINTER ST, HAVERHILL, MA **Lab Number:** L2024416

Project Number: 01.0172397.10 **Report Date:** 06/30/20

SAMPLE RESULTS

Lab ID:	L2024416-02	Date Collected:	06/11/20 09:00
Client ID:	UPSTREAM	Date Received:	06/11/20
Sample Location:	HAVERHILL, MA	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	56		40-140
o-Terphenyl	49		40-140
2-Fluorobiphenyl	57		40-140
2-Bromonaphthalene	59		40-140

Project Name: 284 WINTER ST, HAVERHILL, MA **Lab Number:** L2024416

Project Number: 01.0172397.10 **Report Date:** 06/30/20

SAMPLE RESULTS

Lab ID:	L2024416-03	D	Date Collected:	06/11/20 09:10
Client ID:	5A 2-3'		Date Received:	06/11/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:	
Matrix:	Soil
Analytical Method:	131,VPH-18-2.1
Analytical Date:	06/17/20 20:54
Analyst:	BAD
Percent Solids:	77%

Trap: EST, Carbopack B/Carboxen 1000&1001

Analytical Column: Restek, RTX-502.2, 105m, 0.53ID, 3um

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Were samples received in methanol?	Covering the Soil
Methanol ratio:	1:1.3

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	1340	--	200
C9-C12 Aliphatics	1620		mg/kg	1340	--	200
C9-C10 Aromatics	ND		mg/kg	1340	--	200
C5-C8 Aliphatics, Adjusted	ND		mg/kg	1340	--	200
C9-C12 Aliphatics, Adjusted	1380		mg/kg	1340	--	200
Benzene	ND		mg/kg	26.8	--	200
Toluene	ND		mg/kg	26.8	--	200
Ethylbenzene	130		mg/kg	26.8	--	200
p/m-Xylene	63.8		mg/kg	26.8	--	200
o-Xylene	40.5		mg/kg	26.8	--	200
Methyl tert butyl ether	ND		mg/kg	13.4	--	200
Naphthalene	1300		mg/kg	53.6	--	200

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	0	Q	70-130
2,5-Dibromotoluene-FID	0	Q	70-130

Project Name: 284 WINTER ST, HAVERHILL, MA
Project Number: 01.0172397.10
Lab Number: L2024416
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID:	L2024416-03	D	Date Collected:	06/11/20 09:10
Client ID:	5A 2-3'		Date Received:	06/11/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified
Sample Depth:				
Matrix:	Soil		Extraction Method:	EPA 3546
Analytical Method:	135,EPH-19-2.1		Extraction Date:	06/22/20 11:21
Analytical Date:	06/25/20 11:11		Cleanup Method1:	EPH-04-1
Analyst:	MEO		Cleanup Date1:	06/23/20
Percent Solids:	77%			

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	834	--	100
C19-C36 Aliphatics	907		mg/kg	834	--	100
C11-C22 Aromatics	7760		mg/kg	834	--	100
C11-C22 Aromatics, Adjusted	4240		mg/kg	834	--	100
Naphthalene	1320		mg/kg	41.7	--	100
2-Methylnaphthalene	548		mg/kg	41.7	--	100
Acenaphthylene	42.6		mg/kg	41.7	--	100
Acenaphthene	215		mg/kg	41.7	--	100
Fluorene	150		mg/kg	41.7	--	100
Phenanthrene	412		mg/kg	41.7	--	100
Anthracene	112		mg/kg	41.7	--	100
Fluoranthene	218		mg/kg	41.7	--	100
Pyrene	215		mg/kg	41.7	--	100
Benzo(a)anthracene	88.5		mg/kg	41.7	--	100
Chrysene	78.5		mg/kg	41.7	--	100
Benzo(b)fluoranthene	62.9		mg/kg	41.7	--	100
Benzo(k)fluoranthene	ND		mg/kg	41.7	--	100
Benzo(a)pyrene	56.2		mg/kg	41.7	--	100
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	41.7	--	100
Dibenzo(a,h)anthracene	ND		mg/kg	41.7	--	100
Benzo(ghi)perylene	ND		mg/kg	41.7	--	100

Project Name: 284 WINTER ST, HAVERHILL, MA **Lab Number:** L2024416

Project Number: 01.0172397.10 **Report Date:** 06/30/20

SAMPLE RESULTS

Lab ID:	L2024416-03	D	Date Collected:	06/11/20 09:10
Client ID:	5A 2-3'		Date Received:	06/11/20
Sample Location:	HAVERHILL, MA		Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	**0**	Q	40-140
o-Terphenyl	**0**	Q	40-140
2-Fluorobiphenyl	74		40-140
2-Bromonaphthalene	81		40-140

Project Name: 284 WINTER ST, HAVERHILL, MA **Lab Number:** L2024416

Project Number: 01.0172397.10 **Report Date:** 06/30/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 131,VPH-18-2.1
Analytical Date: 06/17/20 10:45
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-02 Batch: WG1383098-4					
C5-C8 Aliphatics	ND		ug/l	100	--
C9-C12 Aliphatics	ND		ug/l	100	--
C9-C10 Aromatics	ND		ug/l	100	--
C5-C8 Aliphatics, Adjusted	ND		ug/l	100	--
C9-C12 Aliphatics, Adjusted	ND		ug/l	100	--
Benzene	ND		ug/l	2.00	--
Toluene	ND		ug/l	2.00	--
Ethylbenzene	ND		ug/l	2.00	--
p/m-Xylene	ND		ug/l	2.00	--
o-Xylene	ND		ug/l	2.00	--
Methyl tert butyl ether	ND		ug/l	3.00	--
Naphthalene	ND		ug/l	4.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	94		70-130
2,5-Dibromotoluene-FID	88		70-130

Project Name: 284 WINTER ST, HAVERHILL, MA **Lab Number:** L2024416

Project Number: 01.0172397.10 **Report Date:** 06/30/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 131,VPH-18-2.1
Analytical Date: 06/17/20 15:47
Analyst: BAD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Petroleum Hydrocarbons - Westborough Lab for sample(s): 03 Batch: WG1383297-4					
C5-C8 Aliphatics	ND		mg/kg	5.00	--
C9-C12 Aliphatics	ND		mg/kg	5.00	--
C9-C10 Aromatics	ND		mg/kg	5.00	--
C5-C8 Aliphatics, Adjusted	ND		mg/kg	5.00	--
C9-C12 Aliphatics, Adjusted	ND		mg/kg	5.00	--
Benzene	ND		mg/kg	0.100	--
Toluene	ND		mg/kg	0.100	--
Ethylbenzene	ND		mg/kg	0.100	--
p/m-Xylene	ND		mg/kg	0.100	--
o-Xylene	ND		mg/kg	0.100	--
Methyl tert butyl ether	ND		mg/kg	0.050	--
Naphthalene	ND		mg/kg	0.200	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	106		70-130
2,5-Dibromotoluene-FID	111		70-130

Project Name: 284 WINTER ST, HAVERHILL, MA
Project Number: 01.0172397.10

Lab Number: L2024416
Report Date: 06/30/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 135,EPH-19-2.1
Analytical Date: 06/22/20 17:29
Analyst: LL

Extraction Method: EPA 3546
Extraction Date: 06/21/20 20:37
Cleanup Method: EPH-04-1
Cleanup Date: 06/22/20

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 03 Batch: WG1384242-1					
C9-C18 Aliphatics	ND		mg/kg	6.52	--
C19-C36 Aliphatics	ND		mg/kg	6.52	--
C11-C22 Aromatics	ND		mg/kg	6.52	--
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.52	--
Naphthalene	ND		mg/kg	0.326	--
2-Methylnaphthalene	ND		mg/kg	0.326	--
Acenaphthylene	ND		mg/kg	0.326	--
Acenaphthene	ND		mg/kg	0.326	--
Fluorene	ND		mg/kg	0.326	--
Phenanthrene	ND		mg/kg	0.326	--
Anthracene	ND		mg/kg	0.326	--
Fluoranthene	ND		mg/kg	0.326	--
Pyrene	ND		mg/kg	0.326	--
Benzo(a)anthracene	ND		mg/kg	0.326	--
Chrysene	ND		mg/kg	0.326	--
Benzo(b)fluoranthene	ND		mg/kg	0.326	--
Benzo(k)fluoranthene	ND		mg/kg	0.326	--
Benzo(a)pyrene	ND		mg/kg	0.326	--
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.326	--
Dibenzo(a,h)anthracene	ND		mg/kg	0.326	--
Benzo(ghi)perylene	ND		mg/kg	0.326	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	71		40-140
o-Terphenyl	52		40-140
2-Fluorobiphenyl	60		40-140
2-Bromonaphthalene	61		40-140

Project Name: 284 WINTER ST, HAVERHILL, MA
Project Number: 01.0172397.10

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Method Blank Analysis
Batch Quality Control

Analytical Method: 135,EPH-19-2.1
Analytical Date: 06/24/20 05:18
Analyst: LL

Extraction Method: EPA 3510C
Extraction Date: 06/23/20 19:51
Cleanup Method: EPH-04-1
Cleanup Date: 06/24/20

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-02 Batch: WG1385078-1					
C9-C18 Aliphatics	ND		ug/l	100	--
C19-C36 Aliphatics	ND		ug/l	100	--
C11-C22 Aromatics	ND		ug/l	100	--
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--
Naphthalene	ND		ug/l	10.0	--
2-Methylnaphthalene	ND		ug/l	10.0	--
Acenaphthylene	ND		ug/l	10.0	--
Acenaphthene	ND		ug/l	10.0	--
Fluorene	ND		ug/l	10.0	--
Phenanthrene	ND		ug/l	10.0	--
Anthracene	ND		ug/l	10.0	--
Fluoranthene	ND		ug/l	10.0	--
Pyrene	ND		ug/l	10.0	--
Benzo(a)anthracene	ND		ug/l	10.0	--
Chrysene	ND		ug/l	10.0	--
Benzo(b)fluoranthene	ND		ug/l	10.0	--
Benzo(k)fluoranthene	ND		ug/l	10.0	--
Benzo(a)pyrene	ND		ug/l	10.0	--
Indeno(1,2,3-cd)Pyrene	ND		ug/l	10.0	--
Dibenzo(a,h)anthracene	ND		ug/l	10.0	--
Benzo(g,h,i)perylene	ND		ug/l	10.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	58		40-140
o-Terphenyl	52		40-140
2-Fluorobiphenyl	65		40-140
2-Bromonaphthalene	67		40-140

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST, HAVERHILL, MA
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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG1383098-2 WG1383098-3								
C5-C8 Aliphatics	107		107		70-130	0		25
C9-C12 Aliphatics	109		108		70-130	1		25
C9-C10 Aromatics	114		113		70-130	1		25
Benzene	115		115		70-130	0		25
Toluene	114		113		70-130	1		25
Ethylbenzene	114		114		70-130	0		25
p/m-Xylene	114		113		70-130	1		25
o-Xylene	113		112		70-130	1		25
Methyl tert butyl ether	119		118		70-130	1		25
Naphthalene	118		117		70-130	1		25
1,2,4-Trimethylbenzene	114		113		70-130	1		25
Pentane	108		109		70-130	1		25
2-Methylpentane	108		107		70-130	1		25
2,2,4-Trimethylpentane	107		106		70-130	1		25
n-Nonane	110		109		30-130	1		25
n-Decane	107		106		70-130	1		25
n-Butylcyclohexane	111		110		70-130	1		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,5-Dibromotoluene-PID	114		112		70-130
2,5-Dibromotoluene-FID	107		103		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST, HAVERHILL, MA
Project Number: 01.0172397.10
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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 03 Batch: WG1383297-2 WG1383297-3								
C5-C8 Aliphatics	103		112		70-130	8		25
C9-C12 Aliphatics	106		114		70-130	7		25
C9-C10 Aromatics	94		102		70-130	8		25
Benzene	95		102		70-130	7		25
Toluene	95		103		70-130	8		25
Ethylbenzene	97		105		70-130	8		25
p/m-Xylene	96		103		70-130	7		25
o-Xylene	95		102		70-130	7		25
Methyl tert butyl ether	99		108		70-130	8		25
Naphthalene	92		100		70-130	8		25
1,2,4-Trimethylbenzene	94		102		70-130	8		25
Pentane	103		111		70-130	7		25
2-Methylpentane	108		116		70-130	7		25
2,2,4-Trimethylpentane	99		107		70-130	8		25
n-Nonane	107		115		30-130	7		25
n-Decane	108		116		70-130	7		25
n-Butylcyclohexane	103		111		70-130	7		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,5-Dibromotoluene-PID	96		103		70-130
2,5-Dibromotoluene-FID	101		107		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: 284 WINTER ST, HAVERHILL, MA
Project Number: 01.0172397.10

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Report Date: 06/30/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 03 Batch: WG1384242-2 WG1384242-3								
C9-C18 Aliphatics	57		54		40-140	5		25
C19-C36 Aliphatics	75		70		40-140	7		25
C11-C22 Aromatics	68		54		40-140	23		25
Naphthalene	66		51		40-140	**26**	Q	25
2-Methylnaphthalene	68		53		40-140	25		25
Acenaphthylene	64		50		40-140	25		25
Acenaphthene	69		54		40-140	24		25
Fluorene	68		54		40-140	23		25
Phenanthrene	67		53		40-140	23		25
Anthracene	68		54		40-140	23		25
Fluoranthene	69		55		40-140	23		25
Pyrene	67		53		40-140	23		25
Benzo(a)anthracene	66		52		40-140	24		25
Chrysene	67		53		40-140	23		25
Benzo(b)fluoranthene	74		59		40-140	23		25
Benzo(k)fluoranthene	55		44		40-140	22		25
Benzo(a)pyrene	63		50		40-140	23		25
Indeno(1,2,3-cd)Pyrene	62		50		40-140	21		25
Dibenzo(a,h)anthracene	65		52		40-140	22		25
Benzo(ghi)perylene	59		47		40-140	23		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: 284 WINTER ST, HAVERHILL, MA

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Lab Number: L2024416

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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 03 Batch: WG1384242-2 WG1384242-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	70		66		40-140
o-Terphenyl	68		54		40-140
2-Fluorobiphenyl	76		59		40-140
2-Bromonaphthalene	77		60		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

Lab Control Sample Analysis
Batch Quality Control

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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG1385078-2 WG1385078-3								
C9-C18 Aliphatics	57		58		40-140	2		25
C19-C36 Aliphatics	79		76		40-140	4		25
C11-C22 Aromatics	55		58		40-140	5		25
Naphthalene	48		52		40-140	8		25
2-Methylnaphthalene	51		55		40-140	8		25
Acenaphthylene	49		52		40-140	6		25
Acenaphthene	53		57		40-140	7		25
Fluorene	55		59		40-140	7		25
Phenanthrene	56		58		40-140	4		25
Anthracene	54		56		40-140	4		25
Fluoranthene	59		61		40-140	3		25
Pyrene	55		56		40-140	2		25
Benzo(a)anthracene	54		55		40-140	2		25
Chrysene	54		56		40-140	4		25
Benzo(b)fluoranthene	62		64		40-140	3		25
Benzo(k)fluoranthene	46		48		40-140	4		25
Benzo(a)pyrene	51		53		40-140	4		25
Indeno(1,2,3-cd)Pyrene	51		52		40-140	2		25
Dibenzo(a,h)anthracene	52		54		40-140	4		25
Benzo(g,h,i)perylene	47		50		40-140	6		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: 284 WINTER ST, HAVERHILL, MA

Project Number: 01.0172397.10

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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG1385078-2 WG1385078-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	62		58		40-140
o-Terphenyl	57		62		40-140
2-Fluorobiphenyl	57		60		40-140
2-Bromonaphthalene	59		62		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

INORGANICS
&
MISCELLANEOUS

Project Name: 284 WINTER ST, HAVERHILL, MA
Project Number: 01.0172397.10

Lab Number: L2024416
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024416-01
Client ID: DOWNSTREAM
Sample Location: HAVERHILL, MA

Date Collected: 06/11/20 08:30
Date Received: 06/11/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP General Chemistry - Westborough Lab										
Cyanide, Physiologically Available	ND		mg/l	0.005	--	1	06/23/20 11:10	06/23/20 13:01	97,9014	LH

Project Name: 284 WINTER ST, HAVERHILL, MA
Project Number: 01.0172397.10

Lab Number: L2024416
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SAMPLE RESULTS

Lab ID: L2024416-02
Client ID: UPSTREAM
Sample Location: HAVERHILL, MA

Date Collected: 06/11/20 09:00
Date Received: 06/11/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP General Chemistry - Westborough Lab										
Cyanide, Physiologically Available	ND		mg/l	0.005	--	1	06/23/20 11:10	06/23/20 13:02	97,9014	LH

Project Name: 284 WINTER ST, HAVERHILL, MA
Project Number: 01.0172397.10

Lab Number: L2024416
Report Date: 06/30/20

SAMPLE RESULTS

Lab ID: L2024416-03
Client ID: 5A 2-3'
Sample Location: HAVERHILL, MA

Date Collected: 06/11/20 09:10
Date Received: 06/11/20
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	5.95		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	6.48		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	6.21		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
General Chemistry - Mansfield Lab										
Solids, Total	76.6		%	0.100	--	1	-	06/16/20 17:53	121,2540G	LB

Project Name: 284 WINTER ST, HAVERHILL, MA **Lab Number:** L2024416

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Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab for sample(s): 03 Batch: WG1381140-1										
Total Organic Carbon (Rep1)	ND		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Rep2)	ND		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
Total Organic Carbon (Average)	ND		%	0.010	--	1	-	06/24/20 09:15	1,9060A	SP
MCP General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1384842-1										
Cyanide, Physiologically Available	ND		mg/l	0.005	--	1	06/23/20 11:10	06/23/20 12:56	97,9014	LH

Lab Control Sample Analysis

Batch Quality Control

Project Name: 284 WINTER ST, HAVERHILL, MA

Project Number: 01.0172397.10

Lab Number: L2024416

Report Date: 06/30/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Organic Carbon - Mansfield Lab Associated sample(s): 03 Batch: WG1381140-2								
Total Organic Carbon (Rep1)	103		-		75-125	-		25
Total Organic Carbon (Rep2)	105		-		75-125	-		25
Total Organic Carbon (Average)	104		-		75-125	-		25
MCP General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1384842-2 WG1384842-3								
Cyanide, Physiologically Available	104		100		80-120	4		20
MCP General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1384842-4								
Cyanide, Physiologically Available	**3**		-		0-10	-		20

Project Name: 284 WINTER ST, HAVERHILL, MA
Project Number: 01.0172397.10

Lab Number: L2024416
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Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2024416-01A	Vial HCl preserved	A	NA		2.6	Y	Absent		VPH-18(14)
L2024416-01B	Vial HCl preserved	A	NA		2.6	Y	Absent		VPH-18(14)
L2024416-01C	Vial HCl preserved	A	NA		2.6	Y	Absent		VPH-18(14)
L2024416-01D	Plastic 250ml NaOH preserved	A	>12	>12	2.6	Y	Absent		MCP-PACN9014-10(14)
L2024416-01E	Amber 1000ml HCl preserved	A	<2	<2	2.6	Y	Absent		EPH-20(14)
L2024416-01F	Amber 1000ml HCl preserved	A	<2	<2	2.6	Y	Absent		EPH-20(14)
L2024416-02A	Vial HCl preserved	A	NA		2.6	Y	Absent		VPH-18(14)
L2024416-02B	Vial HCl preserved	A	NA		2.6	Y	Absent		VPH-18(14)
L2024416-02C	Vial HCl preserved	A	NA		2.6	Y	Absent		VPH-18(14)
L2024416-02D	Plastic 250ml NaOH preserved	A	>12	>12	2.6	Y	Absent		MCP-PACN9014-10(14)
L2024416-02E	Amber 1000ml HCl preserved	A	<2	<2	2.6	Y	Absent		EPH-20(14)
L2024416-02F	Amber 1000ml HCl preserved	A	<2	<2	2.6	Y	Absent		EPH-20(14)
L2024416-03A	Vial MeOH preserved	A	NA		2.6	Y	Absent		VPH-DELUX-18(28)
L2024416-03B	Glass 120ml/4oz unpreserved	A	NA		2.6	Y	Absent		A2-TS(7),A2-TOC-9060-2REPS(28)
L2024416-03C	Glass 120ml/4oz unpreserved	A	NA		2.6	Y	Absent		EPH-DELUX-20(14)

*Values in parentheses indicate holding time in days

Project Name:	284 WINTER ST, HAVERHILL, MA	**Lab Number:**	L2024416
Project Number:	01.0172397.10	**Report Date:**	06/30/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

Report Format: Data Usability Report

Project Name:	284 WINTER ST, HAVERHILL, MA	**Lab Number:**	L2024416
Project Number:	01.0172397.10	**Report Date:**	06/30/20

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less

Project Name: 284 WINTER ST, HAVERHILL, MA
Project Number: 01.0172397.10
Lab Number: L2024416
Report Date: 06/30/20

Data Qualifiers

than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

Project Name:	284 WINTER ST, HAVERHILL, MA	**Lab Number:**	L2024416
Project Number:	01.0172397.10	**Report Date:**	06/30/20

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

131 Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), MassDEP, February 2018, Revision 2.1 with QC Requirements & Performance Standards for the Analysis of VPH under the Massachusetts Contingency Plan, WSC-CAM-IVA, June 1, 2018.

135 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, December 2019, Revision 2.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, March 1, 2020.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
EPA TO-12 Non-methane organics
EPA 3C Fixed gases
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 6/11/20

ALPHA Job #: L2429 16

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: GZA GeoEnvironmental
Address: 249 Vanderbilt Ave. Norwood, MA 02062
Phone: 781-278-3700
Fax:
Email: kyle.maxfield@gza.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: 248 Winter Street, Haverhill, MA
Project Location: Haverhill, MA
Project #: 01.0172397.10
Project Manager: Kyle Maxfield
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program	Criteria
	MA MCP

Other Project Specific Requirements/Comments/Detection Limits:
Soil sample is expected to have high concentrations of MGP and petroleum related analytes.

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	EPH-carbon ranges only	VPH-carbon ranges only	Physiologically Available Cyanide	Total organic carbon	VPH w/ target VOCs	Total Solids	EPH w/ target PAHs	Sample Specific Comments	Total # Bottles
24416-01	Downstream	6/11/20	0830	Water	MLM	X	X	X						6
-02	Upstream	6/11/20	0900	Water	MLM	X	X	X						6
-03	SA 2-3'	6/10/20	0910	Soil	BCD				X	X	X	X	contains visible separate phase product	3

SAMPLE HANDLING
Filtration
☐ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Container Type														
Preservative														

Relinquished By:	Date/Time	Received By:	Date/Time
Matt McGowan	6/11/20, 1403	[illegible]	6/11/20 14:03
[illegible]	6/11/20 1515	[illegible]	6/11/20 1515

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

Appendix N – Retaining Wall Piping Inventory Photolog

Photographic Log

Client Name: National Grid	**Site Location:** 284 Winter Street – Haverhill, MA	**Project No.** 01.0172397.10

Photo No.	**Date:**
1	6/11/2020

Direction Photo Taken:
North

Description:
Pipe Penetration #1 (P1)[1]. 6-inch diameter steel located within a small tunnel adjacent to the Winter Street bridge.

Photo No.	**Date:**
2	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #2 (P2). 8-inch diameter PVC pipe within retaining wall. City of Haverhill Combined Sewer Overflow (CSO).

[1] "P" Designation (P1, P2, P3, etc.), reference locations shown on Figure 2: Exploration Location Plan.

Photographic Log

Photo No.	Date:
3	6/11/2020

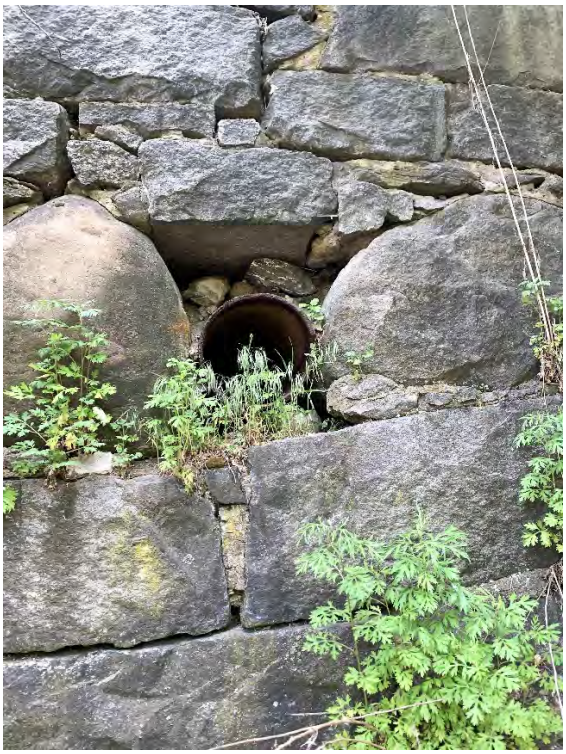
Direction Photo Taken:
Northeast

Description:
Pipe Penetration #3 (P3). 13-inch diameter clay pipe; Open to distance of approximately 15 feet from face of wall.

Photo No.	Date:
4	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #4 (P4). 10-inch diameter cast iron pipe. Too high on wall to determine open length of pipe/obstructions.



Photographic Log

Photo No.	Date:
5	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #5 (P5). 6-inch cast iron. Comes out of wall and turns downward toward riverbed.

Photo No.	Date:
6	6/11/2020

Direction Photo Taken:
Northeast

Description:
Penetration #6. Approximately 1-inch diameter hole in wall. Unable to penetrate with fish tape. Visible product seeping from wall, with a strong coal tar-like odor.

Photographic Log

Photo No.	Date:
7	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #7 (Two pipes, P6-P7). 4-inch diameter cast iron pipe. Unable to measure distance into pipes/obstructions due to height on wall.

Photo No.	Date:
8	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #8 (P8). 4-inch cast iron pipe. Filled with sand and leave debris.

Photographic Log

Photo No.	Date:
9	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #9 (P9). 2-inch diameter cast iron pipe. Unable to measure distance into pipes/obstructions due to height on wall.

Photo No.	Date:
10	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #10 (P10). 5 pipes protruding from wall in this area: 1 2-inch diameter with a 1-inch diameter pipe telescoped inside; 1 4-inch diameter, 1 2-inch diameter, 1 1-inch diameter steel/cast iron. Unable to probe open distances due to height on wall.

Photographic Log

Photo No.	Date:
11	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #11 (P11-13). 3 pipes protruding from wall in this area; 1 4-inch diameter steel/cast iron pipe, 1 6-inch diameter clay pipe, and 1 6-inch diameter steel/cast iron pipe. Hardened asphalt/tar like material on stone wall around/below all the pipes. Unable to determine depths/distances due to height on wall.

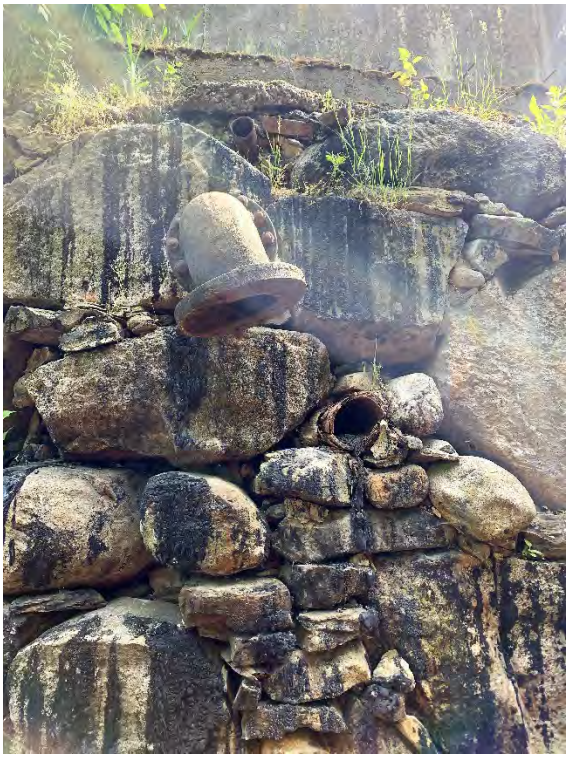


Photo No.	Date:
12	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #12 (P14). 4-inch metal or cast-iron pipe. Unable to probe open distance due to height on wall.

Photo No.	Date:
13	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #13 (P15). 6-inch diameter metal/cast-iron pipe, open to approximately 7 feet from face of wall.

Photo No.	Date:
14	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #14 (P16). 4-inch diameter metal/cast-iron pipe, open to approximately 17 feet from face of wall. Hardened tar all along face of rock wall.

Photographic Log

Photo No.	Date:
15	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #15 (P17). 8-inch diameter clay pipe, open to approximately 3 feet from face of wall. Hardened tar all along face of rock wall.

Photo No.	Date:
16	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #16 (P18-19). Two pipes, top is 16-inch diameter concrete pipe through brick portion of wall (could not probe distance); bottom is a 6-inch diameter metal/cast-iron pipe, open to approximately 5 feet from face of wall.

Photographic Log

Photo No.	Date:
17	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #17 (P20-21). Two 4-inch steel/cast iron pipes. Top pipe open to approximately 3 feet and bottom pipe open to approximately 2 feet from face of wall.

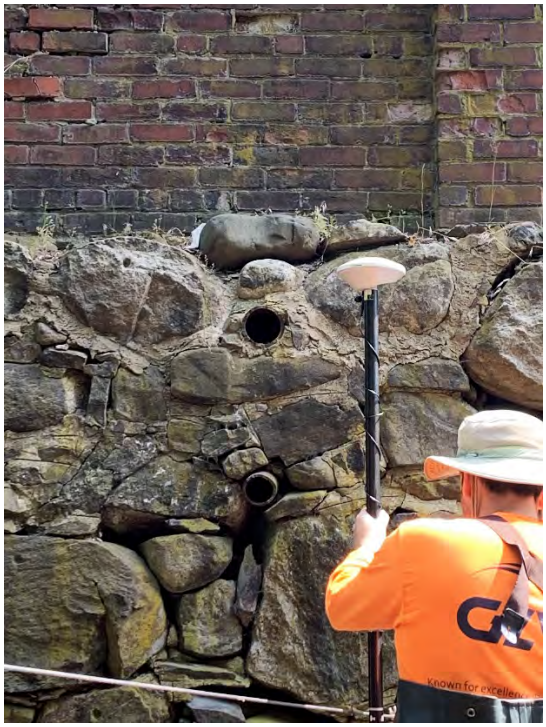


Photo No.	Date:
18	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #18 (P22). 12-inch diameter clay pipe (difficult to see as it does not extend out of the rock wall). Open to approximately 14.5 feet from face of wall.

Photographic Log

Photo No.	Date:
19	6/11/2020

Direction Photo Taken:
Northeast

Description:
Penetration #19 (P23). Apparent product seeping through wall. Product appears to be "fresh." No odor observed during documentation.

Photo No.	Date:
20	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #20 (P24). 8-inch cast iron pipe. Two locations below pipe where product appears to be seeping through wall. Open to approximately 8 feet from face of wall

Photographic Log

Photo No.	Date:
21	6/11/2020

Direction Photo Taken:
Northeast

Description:
Pipe Penetration #21 (P25). 8-inch diameter cast iron pipe. Sealed with concrete. Observed hardened tar-like material below pipe on exposed dry bed of Little River.

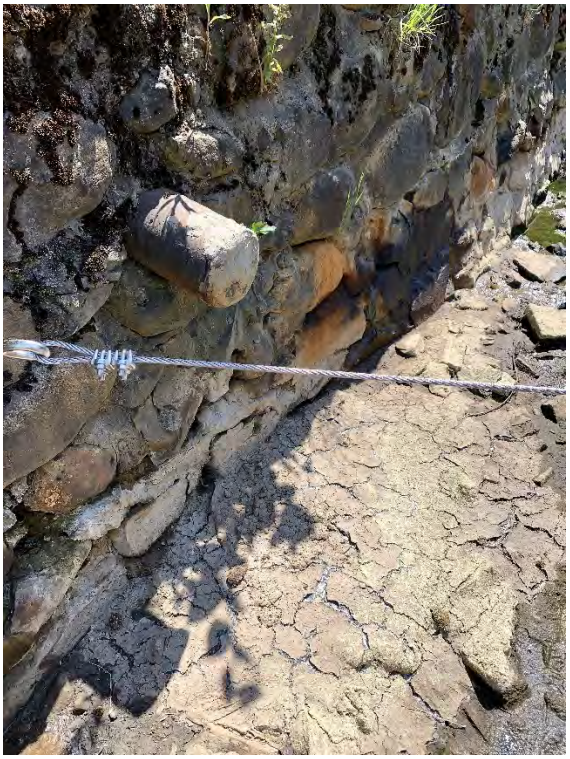


Photo No.	Date:
22	6/11/2020

Direction Photo Taken:
Northeast

Description:
Penetration #22 (P26). 8-inch diameter cast iron pipe. Contains muck and sediment along bottom/interior of pipe. Open to approximately 8 feet from face of wall.

Appendix O –Public Involvement Notifications and Owner Notices/Data Transmittals

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F: 781.278.5702
www.gza.com

April 5, 2022
GZA File No. 01.0172397.10

The Honorable James J. Fiorentini
Mayor of Haverhill
Haverhill City Hall
4 Summer Street, Room 100
Haverhill, MA 01830

Peter Carbone, Chairperson
Haverhill Board of Health
4 Summer Street, Room 210
Haverhill, MA 01830

Re: Phase II Comprehensive Site Assessment Report
284 Winter Street, Haverhill, Massachusetts
Release Tracking Number (RTN) 3-32792

To Whom It May Concern:

On behalf of Boston Gas Company d/b/a National Grid, GZA GeoEnvironmental, Inc. (GZA) is providing notification in accordance with 310 CMR 40.1403(3)(e) of the Massachusetts Contingency Plan (MCP) that a Phase II Comprehensive Site Assessment Report for the above-referenced Site is being submitted to the Massachusetts Department of Environmental Protection (MassDEP). The Phase II included the collection and analysis of soil, groundwater and sediment samples from the Site, and the evaluation of the risk posed by the Site to human health, public welfare, safety, and the environment. As required by the MCP, a copy of the Phase II conclusions is attached.

A copy of the Supplemental Phase II CSA submittal can be viewed under RTN 3-32792 at the MassDEP website: http://eeaonline.eea.state.ma.us/DEP/wsc_viewer/main.aspx after April 6, 2022. Copies of the report can also be obtained by contacting Jesse Edmands of National Grid at (781) 907-3682 / jesse.edmands@nationalgrid.com or the undersigned at 781-278-3700.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg

Charles Lindberg, LSP
Senior Principal

cc: Jesse Edmands, National Grid
MassDEP, NERO (via eDEP)

Attachments: Phase II CSA Conclusions

J:\170,000-179,999\172397\172397-10.KM\Reports\Phase II Report\Appendix O - Public Notification\Winter St Phase II City Notice.docx

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CONCLUSIONS

GZA GeoEnvironmental, Inc. and Anchor QEA LLC have completed a Phase II Comprehensive Site Assessment of the 284 Winter Street Site, in Haverhill, Massachusetts in accordance with the relevant requirements of the MCP (310 CMR 40.0830 et seq.). Based on this assessment, we developed the following conclusions:

1. The Site consists of the property located at 284 Main Street in Haverhill, Massachusetts and is currently occupied by a gasoline service station and car wash. An adjacent, vacant property to the southeast of the 284 Winter Street parcel also lies within the Disposal Site, along with a portion of the Little River which flows along the Property's western boundary. The Site occupies approximately 1.6 acres of land with a relatively level upland area separated from the Little River (at an elevation approximately 15 feet below that of the upland area) by a masonry retaining wall.

2. The Site lies within a commercial/industrial area in the downtown portion of Haverhill. No water supplies are located in the vicinity of the Site and environmentally sensitive areas other than the Little River have not been identified in the Site area. The Little River has been channelized in the Site area and it enters a concrete flood conduit at the downstream edge of the Disposal Site; this conduit flows beneath downtown Haverhill and discharges to the Merrimack River.

3. An MGP operated at the 284 Winter Street property between approximately 1853 and 1970, with various gas production processes utilized over this period. The Property has been used as a gasoline service station, fuel oil distribution facility and a car wash since 1977.

4. During a site assessment for a planned real estate transaction in November 2014, certain constituents were reported in soil and groundwater samples at concentrations exceeding the MCP Reportable Concentrations (RCs). The owner of the property (HRT) notified the MassDEP regarding this finding in March 2015 and Release Tracking Number (RTN) 3-32792 was assigned. During assessment of this RTN in May 2015, HRT's consultant (Ramboll) noted a sheen on the Little River that appeared to be emanating from the Property. An additional notification to MassDEP was made and an additional RTN (3-32875) was assigned. Immediate Response Action (IRA) activities were initiated in May 2015 in response to this finding and included gauging and recovery of Non-Aqueous Phase Liquid (NAPL) in Site monitoring wells and installation of absorbent booms in the Little River. A semi-permanent boom system was installed within the River in November 2016 and has been maintained through the present under the IRA.

5. Ramboll completed a Phase I Initial Site Investigation (ISI) on behalf of HRT in April 2016 for RTNs 3-32792 and 3-32875 and continued IRA activities through October 2019. The Phase II work required under the MCP was not completed by the specified deadline and MassDEP issued a Notice of Noncompliance (NON). National Grid assumed responsibility for the MCP response actions for the two RTNs in November 2019 with the filing of a Tier Classification transfer. National Grid and MassDEP signed an Administrative Consent Order (ACO) in October 2020 which established a deadline of April 6, 2022 for submittal of the Phase II report.

6. The Site is underlain by an historic fill layer of varying thickness and composition which overlies a fine-grained deposit consisting of silt or silty sand. The fill underlying the 284 Winter Street property is typical of an historic urban fill, composed of reworked natural soils with significant quantities of debris, including concrete, asphalt, brick, wood, coal and glass. Remnants of former structures were encountered at number of locations during subsurface explorations at the Site.

7. Groundwater flow at the Site is generally toward the west/southwest, with the Little River as the main discharge point. A "perched" groundwater condition exists within the footprint of the historical relief holder in the central portion of

the Site, with groundwater elevations typically 7-8 feet higher than elsewhere within the property and within 4 feet of ground surface. Total groundwater flow through the Site is estimated to be approximately 1 gpm, with flow rates restricted by the relatively low permeability of Site soils. The estimated transport velocity for groundwater at the Site is approximately 0.1 ft/day (37 ft/yr).

8. Petroleum and MGP-related constituents including naphthalene, other PAHs, EPH and VPH fractions and aromatic VOCs are present in soils throughout the 284 Winter Street Property, with the most significant impacts found at the 5 to 20 foot depth range. While constituent of concern (COC) concentrations in soil exceeded the MCP Method 1 cleanup standards at a number of locations, they were generally below the Upper Concentration Limits (UCLs).

9. The primary COCs detected in groundwater samples at levels above the Method 1 standards included naphthalene, C_9-C_{10} aromatics and benzene, with the highest concentrations reported in the central, western and southern portions of the 284 Winter Street property. Significant impacts to groundwater extend from the eastern portion of the property to the Little River; wells installed on the western side of the river to the southwest of the 284 Winter Street property did not indicate detectable levels of the primary Site COCs.

10. Concentrations of constituents detected in soil gas at the Site appear to be primarily related to incidental emissions and spills associated with the active gasoline and diesel storage and dispensing operations. GZA's evaluation concluded that the reported concentrations do not indicate significant potential for vapor intrusion into occupied structures at the Site.

11. Significant impacts were observed to the sediments beneath the Little River adjacent to the Site, including elevated concentrations of Site COCs and the presence of visible oil or tar (VOT) over a substantial area.

12. NAPL has been observed at several locations across the western, central and southern portions of the Site, but significant accumulations of separate-phase materials have only been observed at two locations in the upland area, one of which is within the historical relief gas holder. Evaluations of NAPL mobility and recoverability completed under MassDEP guidance concluded that these materials are not feasible to recover. NAPL has historically migrated to the Little River and has been observed seeping from the retaining wall at the edge of the Site under certain conditions.

13. A Method 3 Risk Characterization has indicated that quantitative human health risk estimates were below the relevant MCP criteria with the exception of one receptor group/exposure scenario (construction/utility workers excavating below the water table within the former holder area). The risk estimate for the one scenario which exceeded the limits were driven by benzene and naphthalene concentrations in the perched groundwater within the historical holder, where an active electrical line is apparently present.

14. Sediment conditions within the Little River adjacent to the Site represent a condition of Readily Apparent Harm (RAH) to environmental receptors due to the widespread VOT.

15. Achievement of a Permanent Solution cannot be demonstrated at this time for the 284 Winter Street Site, due to the exceedance of the human health risk criteria for that one exposure scenario and the RAH condition. A Phase III Remedial Action Plan will be submitted to MassDEP to evaluate the feasibility of performing remedial actions to address the identified risks and achieve a Temporary or Permanent Solution for the Site.

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F: 781.278.5702
www.gza.com

Notification to Property Owners Pursuant to 310 CMR 40.1406 of the Massachusetts Contingency Plan

April 5, 2022
GZA File No. 01.0172397.10

Mr. David A. Vasta
5 Heron Cove Road
Windham, NH 03087

Re: Notification of Phase II Comprehensive Site Assessment
284 Winter Street, Haverhill, Massachusetts
Release Tracking Number (RTN) 3-32792

Dear Mr. Vasta:

Massachusetts regulations require that notification regarding the delineation of a Disposal Site Boundary be provided to any owner of property within such boundaries upon completion of a Phase II – Comprehensive Site Assessment report. These notice requirements are contained in the Massachusetts Contingency Plan – MCP, 310 CMR 40.1406. On behalf of Boston Gas Company d/b/a National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) is providing this letter, with the attached BWSC 122 Form, a copy of the disposal site map, and copy of the Supplemental Phase II report conclusions to address the MCP notice requirements for your property at 35 Lafayette Square, Haverhill, Massachusetts.

A copy of the Supplemental Phase II CSA submittal can be viewed under RTN 3-32792 at the MassDEP website: http://eeaonline.eea.state.ma.us/DEP/wsc_viewer/main.aspx after April 6, 2022. Copies of the report can also be obtained by contacting Jesse Edmands of National Grid at (781) 907-3682/jesse.edmands@nationalgrid.com or the undersigned at 781-278-3700.

Please note that additional public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address:https://www.mass.gov/lists/public-involvement-during-cleanup-of-contaminated-properties.

Very truly yours,
GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC122 Form, Site Plan, Phase II CSA Conclusions

cc: Jesse Edmands, National Grid (via Email)
MassDEP (via eDEP)

J:\170,000-179,999\172397\172397-10.KM\Reports\Phase II Report\Appendix O - Public Notification\35 Lafayette Sq P2 DSB Notice.docx

An Equal Opportunity Employer M/F/V/H

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 32792

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 284 Winter Street
2. City/Town: Haverhill
3. ZIP Code: 01832-0000
4. Assessor's Parcel ID: Map 307, Lot 2-1

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Victor Von Vasta Revocable Trust (David Vasta, Trustee)
2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)
   a. Street Address: 35 Lafayette Square
   b. City/Town: Haverhill
   c. ZIP Code: 01832-0000
3. Assessor's Parcel ID: Map 515, Lot 296-13

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	Polycyclic aromatic hydrocarbons (PAHs)
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: _____ (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 32792

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas d/b/a National Grid
2. Contact First Name: Jesse
3. Last Name: Edmands
4. Street: 40 Sylvan Road
5. Title: Program Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-1120
9. Telephone: (781) 907-3652
10. Email: jesse.edmands@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

LEGEND

- AQSS-04 — APPROXIMATE SEDIMENT CORE LOCATION (ANCHOR QEA -
- VE-1 — VACUUM EXCAVATION PROBE PERFORMED BY GEOSEARCH AUGUST 11, 2021
- GZ-1 — MONITORING WELL INSTALLED BY GEOSEARCH AUGUST 31 - SEPTEMBER 1, 2020
- 1A — SEDIMENT SAMPLE COLLECTED BY GZA ON JUNE 8-10,
- P1 — PIPE OR SEEP LOCATION
- SG-1 — SOIL GAS POINT PERFORMED BY GZA ON FEBRUARY 5,
- B102 — MONITORING WELL INSTALLED BY GEOSEARCH JANUARY 21-23, 2020 AND OBSERVED BY GZA
- B101 — SOIL BORING PERFORMED BY GEOSEARCH (2020) AND OBSERVED BY
- NFNP-01 — NAPL SAMPLE COLLECTED BY GZA PERSONNEL NOVEMBER 1,
- NFSB-01 (MW) — MONITORING WELL INSTALLED BY TECHNICAL DRILLING SERVICES OCTOBER 20-25, 2016 AND OBSERVED BY GZA
- NFSB-05 — SOIL BORING PERFORMED BY TECHNICAL DRILLING SERVICES OCTOBER 20-25, 2016 AND OBSERVED BY GZA
- NFAA-01 — AMBIENT AIR SAMPLE COLLECTED BY GZA PERSONNEL OCTOBER 19,
- NFSV-01 — SOIL VAPOR SAMPLE COLLECTED BY GZA PERSONNEL OCTOBER 18-19,
- NFCB-01 — CATCH BASIN SEDIMENT SAMPLE COLLECTED BY GZA PERSONNEL OCTOBER 18-19, 2016
- ENV-1MW — MONITORING WELL INSTALLED BY RAMBOLL ENVIRON APRIL 27-28,
- ENV-2B(A) — SOIL BORING COMPLETED BY RAMBOLL ENVIRON APRIL 27-28,
- MW-1 — MONITORING WELL INSTALLED BY LESSARD
- DISPOSAL SITE BOUNDARY
- 284 WINTER STREET PROPERTY BOUNDARY AS RECORDED ON ALTA/ACSM LAND TITLE SURVEY PLAN PERFORMED BY MHF DESIGN CONSULTANTS (STAMPED FEBRUARY 12, 2015) NOTE: THIS BOUNDARY DIFFERS FROM THE MASSGIS ASSESSORS PARCEL DATA.
- ASSESSORS PARCEL DATA PROVIDED BY MASSGIS ON SEPTEMBER 1, 2020

SOURCE

1) THIS MAP CONTAINS THE ESRI ArcGIS ONLINE BING MAPS AERIAL LAYER PACKAGE, PUBLISHED APRIL 13, 2020 BY ESRI ARCIMS SERVICES AND UPDATED MONTHLY. THIS SERVICE USES UNIFORM NATIONALLY RECOGNIZED DATUM AND CARTOGRAPHY STANDARDS AND A VARIETY OF AVAILABLE SOURCES FROM SEVERAL DATA PROVIDERS.
2) THE LOCATIONS OF THE MONITORING WELLS INSTALLED BY GEOSEARCH AUGUST 31 - SEPTEMBER 1, 2020 WERE LOCATED FROM A SURVEY PERFORMED BY THE MORIN-CAMERON GROUP, INC. ON SEPTEMBER 29, 2020. THE LOCATIONS OF THE SEDIMENT SAMPLES COLLECTED BY GZA IN JUNE 2020 AND THE PIPE LOCATIONS WERE APPROXIMATELY DETERMINED USING A TRIMBLE GEO-7X HAND-HELD GPS ON 06-10-2020. THE LOCATIONS OF THE MONITORING WELLS AND SOIL BORINGS PERFORMED BY GEOSEARCH IN JANUARY 2020 WERE APPROXIMATELY DETERMINED USING A TRIMBLE GEO-7X HAND-HELD GPS ON 05-07-2020. THE LOCATIONS OF THE NF SERIES OF EXPLORATIONS AND SAMPLING LOCATIONS WERE APPROXIMATELY DETERMINED USING A TRIMBLE GEO-XH HAND-HELD GPS ON 10-18-2016. THE LOCATIONS OF THE SOIL GAS POINTS INSTALLED BY GZA IN FEBRUARY 2020, SOIL BORING INSTALLED BY GEOSEARCH AUGUST 31, 2021 (GZA-2A), AND THE VACUUM EXCAVATION PROBES PERFORMED BY GEOSEARCH AUGUST 11, 2021 WERE APPROXIMATELY DETERMINED BY LINE OF SIGHT FROM EXISTING TOPOGRAPHIC AND MAN-MADE FEATURES. THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
3) THE LOCATIONS OF THE SOIL BORINGS AND MONITORING WELLS PERFORMED BY RAMBOLL AND THE MONITORING WELLS PERFORMED BY LESSARD WERE APPROXIMATELY DETERMINED FROM A PLAN PREPARED BY RAMBOLL ENTITLED: "SITE LAYOUT", FIGURE 2, DATED: 02-10-2017, PROJECT.: 1690005598.
4) THE LOCATIONS OF THE APPROXIMATE SEDIMENT CORE LOCATIONS PERFORMED BY ANCHOR QEA IN 2021 WERE DETERMINED FROM A GEODATABASE FILE PROVIDED BY ANCHOR QEA ON MARCH 29, 2022, FILE: AQ SAMPLE LOCATIONS 20220329.GDB.
5) THE HISTORIC RELIEF GAS HOLDER WAS APPROXIMATELY LOCATED FROM AN "UNDATED HISTORICAL PLAN" IN THE RAMBOLL ENVIRON PHASE I INITIAL SITE INVESTIGATION REPORT, DATED APRIL 2016.

0 25 50 100
SCALE IN FEET

N

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

PHASE II COMPREHENSIVE SITE ASSESSMENT
284 WINTER STREET
HAVERHILL, MASSACHUSETTS

EXPLORATION LOCATION PLAN

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com

PREPARED FOR: nationalgrid

PROJ MGR: KFM	REVIEWED BY: CAL	CHECKED BY: KFM	FIGURE 2
DESIGNED BY: KFM	DRAWN BY: SMW/EMD	SCALE: 1 " = 50 FEET	
DATE: 04/01/2022	PROJECT NO. 01.0172397.10	REVISION NO.	

© 2022 - GZA GeoEnvironmental, Inc. J:\170,000-179,999\172397\172397-10.KMF\Figures\GIS\172397-10_PH2_FIG2_explorationLocation_v8.mxd, 4/1/2022, 11:10:05 AM, elaine.donohue

CONCLUSIONS

GZA GeoEnvironmental, Inc. and Anchor QEA LLC have completed a Phase II Comprehensive Site Assessment of the 284 Winter Street Site, in Haverhill, Massachusetts in accordance with the relevant requirements of the MCP (310 CMR 40.0830 et seq.). Based on this assessment, we developed the following conclusions:

1. The Site consists of the property located at 284 Main Street in Haverhill, Massachusetts and is currently occupied by a gasoline service station and car wash. An adjacent, vacant property to the southeast of the 284 Winter Street parcel also lies within the Disposal Site, along with a portion of the Little River which flows along the Property's western boundary. The Site occupies approximately 1.6 acres of land with a relatively level upland area separated from the Little River (at an elevation approximately 15 feet below that of the upland area) by a masonry retaining wall.

2. The Site lies within a commercial/industrial area in the downtown portion of Haverhill. No water supplies are located in the vicinity of the Site and environmentally sensitive areas other than the Little River have not been identified in the Site area. The Little River has been channelized in the Site area and it enters a concrete flood conduit at the downstream edge of the Disposal Site; this conduit flows beneath downtown Haverhill and discharges to the Merrimack River.

3. An MGP operated at the 284 Winter Street property between approximately 1853 and 1970, with various gas production processes utilized over this period. The Property has been used as a gasoline service station, fuel oil distribution facility and a car wash since 1977.

4. During a site assessment for a planned real estate transaction in November 2014, certain constituents were reported in soil and groundwater samples at concentrations exceeding the MCP Reportable Concentrations (RCs). The owner of the property (HRT) notified the MassDEP regarding this finding in March 2015 and Release Tracking Number (RTN) 3-32792 was assigned. During assessment of this RTN in May 2015, HRT's consultant (Ramboll) noted a sheen on the Little River that appeared to be emanating from the Property. An additional notification to MassDEP was made and an additional RTN (3-32875) was assigned. Immediate Response Action (IRA) activities were initiated in May 2015 in response to this finding and included gauging and recovery of Non-Aqueous Phase Liquid (NAPL) in Site monitoring wells and installation of absorbent booms in the Little River. A semi-permanent boom system was installed within the River in November 2016 and has been maintained through the present under the IRA.

5. Ramboll completed a Phase I Initial Site Investigation (ISI) on behalf of HRT in April 2016 for RTNs 3-32792 and 3-32875 and continued IRA activities through October 2019. The Phase II work required under the MCP was not completed by the specified deadline and MassDEP issued a Notice of Noncompliance (NON). National Grid assumed responsibility for the MCP response actions for the two RTNs in November 2019 with the filing of a Tier Classification transfer. National Grid and MassDEP signed an Administrative Consent Order (ACO) in October 2020 which established a deadline of April 6, 2022 for submittal of the Phase II report.

6. The Site is underlain by an historic fill layer of varying thickness and composition which overlies a fine-grained deposit consisting of silt or silty sand. The fill underlying the 284 Winter Street property is typical of an historic urban fill, composed of reworked natural soils with significant quantities of debris, including concrete, asphalt, brick, wood, coal and glass. Remnants of former structures were encountered at number of locations during subsurface explorations at the Site.

7. Groundwater flow at the Site is generally toward the west/southwest, with the Little River as the main discharge point. A "perched" groundwater condition exists within the footprint of the historical relief holder in the central portion of

the Site, with groundwater elevations typically 7-8 feet higher than elsewhere within the property and within 4 feet of ground surface. Total groundwater flow through the Site is estimated to be approximately 1 gpm, with flow rates restricted by the relatively low permeability of Site soils. The estimated transport velocity for groundwater at the Site is approximately 0.1 ft/day (37 ft/yr).

8. Petroleum and MGP-related constituents including naphthalene, other PAHs, EPH and VPH fractions and aromatic VOCs are present in soils throughout the 284 Winter Street Property, with the most significant impacts found at the 5 to 20 foot depth range. While constituent of concern (COC) concentrations in soil exceeded the MCP Method 1 cleanup standards at a number of locations, they were generally below the Upper Concentration Limits (UCLs).

9. The primary COCs detected in groundwater samples at levels above the Method 1 standards included naphthalene, C_9-C_{10} aromatics and benzene, with the highest concentrations reported in the central, western and southern portions of the 284 Winter Street property. Significant impacts to groundwater extend from the eastern portion of the property to the Little River; wells installed on the western side of the river to the southwest of the 284 Winter Street property did not indicate detectable levels of the primary Site COCs.

10. Concentrations of constituents detected in soil gas at the Site appear to be primarily related to incidental emissions and spills associated with the active gasoline and diesel storage and dispensing operations. GZA's evaluation concluded that the reported concentrations do not indicate significant potential for vapor intrusion into occupied structures at the Site.

11. Significant impacts were observed to the sediments beneath the Little River adjacent to the Site, including elevated concentrations of Site COCs and the presence of visible oil or tar (VOT) over a substantial area.

12. NAPL has been observed at several locations across the western, central and southern portions of the Site, but significant accumulations of separate-phase materials have only been observed at two locations in the upland area, one of which is within the historical relief gas holder. Evaluations of NAPL mobility and recoverability completed under MassDEP guidance concluded that these materials are not feasible to recover. NAPL has historically migrated to the Little River and has been observed seeping from the retaining wall at the edge of the Site under certain conditions.

13. A Method 3 Risk Characterization has indicated that quantitative human health risk estimates were below the relevant MCP criteria with the exception of one receptor group/exposure scenario (construction/utility workers excavating below the water table within the former holder area). The risk estimate for the one scenario which exceeded the limits were driven by benzene and naphthalene concentrations in the perched groundwater within the historical holder, where an active electrical line is apparently present.

14. Sediment conditions within the Little River adjacent to the Site represent a condition of Readily Apparent Harm (RAH) to environmental receptors due to the widespread VOT.

15. Achievement of a Permanent Solution cannot be demonstrated at this time for the 284 Winter Street Site, due to the exceedance of the human health risk criteria for that one exposure scenario and the RAH condition. A Phase III Remedial Action Plan will be submitted to MassDEP to evaluate the feasibility of performing remedial actions to address the identified risks and achieve a Temporary or Permanent Solution for the Site.

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ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

249 Vanderbilt Avenue
Norwood, MA 02062
T: 781.278.3700
F: 781.278.5701
F: 781.278.5702
www.gza.com

Notification to Property Owners Pursuant to 310 CMR 40.1406 of the Massachusetts Contingency Plan

April 5, 2022
GZA File No. 01.0172397.10

Mr. Joseph Alosky
Trustee, Alosky Realty Trust
203 Essex Street
Haverhill, MA 01832

Re: Notification of Phase II Comprehensive Site Assessment
284 Winter Street, Haverhill, Massachusetts
Release Tracking Number (RTN) 3-32792

Dear Mr. Alosky:

Massachusetts regulations require that notification regarding the delineation of a Disposal Site Boundary be provided to any owner of property within such boundaries upon completion of a Phase II – Comprehensive Site Assessment report. These notice requirements are contained in the Massachusetts Contingency Plan – MCP, 310 CMR 40.1406. On behalf of Boston Gas Company d/b/a National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) is providing this letter, with the attached BWSC 122 Form, a copy of the disposal site map, and copy of the Supplemental Phase II report conclusions to address the MCP notice requirements for your property at 191 Essex Street, Haverhill, Massachusetts.

A copy of the Supplemental Phase II CSA submittal can be viewed under RTN 3-32792 at the MassDEP website: http://eeaonline.eea.state.ma.us/DEP/wsc_viewer/main.aspx after April 6, 2022. Copies of the report can also be obtained by contacting Jesse Edmands of National Grid at (781) 907-3682/jesse.edmands@nationalgrid.com or the undersigned at 781-278-3700.

Please note that additional public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address:https://www.mass.gov/lists/public-involvement-during-cleanup-of-contaminated-properties.

Very truly yours,
GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC122 Form, Site Plan, Phase II CSA Conclusions

cc: Jesse Edmands, National Grid (via Email)
MassDEP (via eDEP)

J:\170,000-179,999\172397\172397-10.KM\Reports\Phase II Report\Appendix O - Public Notification\191 Essex St P2 DSB Notice.docx

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 32792

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 284 Winter Street
2. City/Town: Haverhill
3. ZIP Code: 01832-0000
4. Assessor's Parcel ID: Map 307, Lot 2-1

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Joseph Alosky, Trustee, Alosky Realty Trust
2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)
   a. Street Address: 191 Essex Street
   b. City/Town: Haverhill
   c. ZIP Code: 01832-0000
3. Assessor's Parcel ID: Map 515, Lot 296-18

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	Polycyclic aromatic hydrocarbons (PAHs), EPH
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: _____ (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 32792

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas d/b/a National Grid
2. Contact First Name: Jesse
3. Last Name: Edmands
4. Street: 40 Sylvan Road
5. Title: Program Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-1120
9. Telephone: (781) 907-3652
10. Email: jesse.edmands@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

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GEOTECHNICAL
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CONSTRUCTION MANAGEMENT

249 Vanderbilt Avenue
Norwood, MA 02062
T: 781.278.3700
F: 781.278.5701
F: 781.278.5702
www.gza.com

Notification to Property Owners Pursuant to 310 CMR 40.1406 of the Massachusetts Contingency Plan

April 5, 2022
GZA File No. 01.0172397.10

Mr. Stephen Leblanc
221 Essex Street
Haverhill, MA 01832

Re: Notification of Phase II Comprehensive Site Assessment
284 Winter Street, Haverhill, Massachusetts
Release Tracking Number (RTN) 3-32792

Dear Mr. Leblanc:

Massachusetts regulations require that notification regarding the delineation of a Disposal Site Boundary be provided to any owner of property within such boundaries upon completion of a Phase II – Comprehensive Site Assessment report. These notice requirements are contained in the Massachusetts Contingency Plan – MCP, 310 CMR 40.1406. On behalf of Boston Gas Company d/b/a National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) is providing this letter, with the attached BWSC 122 Form, a copy of the disposal site map, and copy of the Supplemental Phase II report conclusions to address the MCP notice requirements for your property at 221 Essex Street, Haverhill, Massachusetts.

A copy of the Supplemental Phase II CSA submittal can be viewed under RTN 3-32792 at the MassDEP website: http://eeaonline.eea.state.ma.us/DEP/wsc_viewer/main.aspx after April 6, 2022. Copies of the report can also be obtained by contacting Jesse Edmands of National Grid at (781) 907-3682/jesse.edmands@nationalgrid.com or the undersigned at 781-278-3700.

Please note that additional public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address:https://www.mass.gov/lists/public-involvement-during-cleanup-of-contaminated-properties.

Very truly yours,
GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC122 Form, Site Plan, Phase II CSA Conclusions

cc: Jesse Edmands, National Grid (via Email)
MassDEP (via eDEP)

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An Equal Opportunity Employer M/F/V/H

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 32792

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 284 Winter Street
2. City/Town: Haverhill 3. ZIP Code: 01832-0000
4. Assessor's Parcel ID: Map 307, Lot 2-1

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Mr. Stephen Leblanc
2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)
   a. Street Address: 221 Essex Street
   b. City/Town: Haverhill c. ZIP Code: 01832-0000
3. Assessor's Parcel ID: Map 515, Lot 296-3

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	Polycyclic aromatic hydrocarbons (PAHs), EPH
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: _____ (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 32792

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas d/b/a National Grid
2. Contact First Name: Jesse
3. Last Name: Edmands
4. Street: 40 Sylvan Road
5. Title: Program Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-1120
9. Telephone: (781) 907-3652
10. Email: jesse.edmands@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

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F: 781.278.5701
F: 781.278.5702
www.gza.com

Notification to Property Owners Pursuant to 310 CMR 40.1406 of the Massachusetts Contingency Plan

April 5, 2022
GZA File No. 01.0172397.10

FTG Realty LLC c/o Steven Pascoe
82 Wendell Avenue, Suite 100
Pittsfield, MA 01201

Re: Notification of Phase II Comprehensive Site Assessment
284 Winter Street, Haverhill, Massachusetts
Release Tracking Number (RTN) 3-32792

Dear Mr. Pascoe:

Massachusetts regulations require that notification regarding the delineation of a Disposal Site Boundary be provided to any owner of property within such boundaries upon completion of a Phase II – Comprehensive Site Assessment report. These notice requirements are contained in the Massachusetts Contingency Plan – MCP, 310 CMR 40.1406. On behalf of Boston Gas Company d/b/a National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) is providing this letter, with the attached BWSC 122 Form, a copy of the disposal site map, and copy of the Supplemental Phase II report conclusions to address the MCP notice requirements for your property at 235 Essex Street, Haverhill, Massachusetts.

A copy of the Supplemental Phase II CSA submittal can be viewed under RTN 3-32792 at the MassDEP website: http://eeaonline.eea.state.ma.us/DEP/wsc_viewer/main.aspx after April 6, 2022. Copies of the report can also be obtained by contacting Jesse Edmands of National Grid at (781) 907-3682/jesse.edmands@nationalgrid.com or the undersigned at 781-278-3700.

Please note that additional public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address:https://www.mass.gov/lists/public-involvement-during-cleanup-of-contaminated-properties.

Very truly yours,
GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC122 Form, Site Plan, Phase II CSA Conclusions

cc: Jesse Edmands, National Grid (via Email)
MassDEP (via eDEP)

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 32792

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 284 Winter Street
2. City/Town: Haverhill
3. ZIP Code: 01832-0000
4. Assessor's Parcel ID: Map 307, Lot 2-1

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: FTG Realty LLC c/o Steven Pascoe
2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)
   a. Street Address: 235 Essex Street
   b. City/Town: Haverhill
   c. ZIP Code: 01832-0000
3. Assessor's Parcel ID: Map 515, Lot 296-8

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	Polycyclic aromatic hydrocarbons (PAHs)
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: _____ (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 32792

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas d/b/a National Grid
2. Contact First Name: Jesse
3. Last Name: Edmands
4. Street: 40 Sylvan Road
5. Title: Program Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-1120
9. Telephone: (781) 907-3652
10. Email: jesse.edmands@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

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F: 781.278.5701
F: 781.278.5702
www.gza.com

Notification to Property Owners Pursuant to 310 CMR 40.1406 of the Massachusetts Contingency Plan

April 5, 2022
GZA File No. 01.0172397.10

Haffner Realty Trust
c/o Ms. Sarah T. Connolly, Esquire
Nixon Peabody LLP
53 State Street
Boston, MA 02109

Re: Notification of Phase II Comprehensive Site Assessment
284 Winter Street, Haverhill, Massachusetts
Release Tracking Number (RTN) 3-32792

Dear Ms. Connolly:

Massachusetts regulations require that notification regarding the delineation of a Disposal Site Boundary be provided to any owner of property within such boundaries upon completion of a Phase II – Comprehensive Site Assessment report. These notice requirements are contained in the Massachusetts Contingency Plan – MCP, 310 CMR 40.1406. On behalf of Boston Gas Company d/b/a National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) is providing this letter, with the attached BWSC 122 Form, a copy of the disposal site map, and copy of the Supplemental Phase II report conclusions to address the MCP notice requirements for your property at 284 Winter Street, Haverhill, Massachusetts.

A copy of the Supplemental Phase II CSA submittal can be viewed under RTN 3-32792 at the MassDEP website: http://eeaonline.eea.state.ma.us/DEP/wsc_viewer/main.aspx after April 6, 2022. Copies of the report can also be obtained by contacting Jesse Edmands of National Grid at (781) 907-3682/jesse.edmands@nationalgrid.com or the undersigned at 781-278-3700.

Please note that additional public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address:https://www.mass.gov/lists/public-involvement-during-cleanup-of-contaminated-properties.

Very truly yours,
GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC122 Form, Site Plan, Phase II CSA Conclusions

cc: Jesse Edmands, National Grid (via Email)
MassDEP (via eDEP)

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 32792

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 284 Winter Street
2. City/Town: Haverhill
3. ZIP Code: 01832-0000
4. Assessor's Parcel ID: Map 307, Lot 2-1

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Haffner Realty Trust, c/o Ms. Sarah T. Connolly, Esquire
2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)
   a. Street Address: 284 Winter Street
   b. City/Town: Haverhill
   c. ZIP Code: 01832-0000
3. Assessor's Parcel ID: Map 307, Lot 2-1

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[x] 1. Soil	Extractable/volatile petroleum hydrocarbons, PAHs
[x] 2. Groundwater	Extractable/volatile petroleum hydrocarbons, benzene
[ ] 3. Surface Water	
[x] 4. Sediment	Polycyclic aromatic hydrocarbons (PAHs) EPH
[ ] 5. Indoor Air	
[x] 6. Soil Gas	C9-C12 aliphatics, volatile organic compounds
[ ] 7. Other: _____ (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 32792

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas d/b/a National Grid
2. Contact First Name: Jesse
3. Last Name: Edmands
4. Street: 40 Sylvan Road
5. Title: Program Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-1120
9. Telephone: (781) 907-3652
10. Email: jesse.edmands@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

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F: 781.278.5701
F: 781.278.5702
www.gza.com

Notification to Property Owners Pursuant to 310 CMR 40.1406 of the Massachusetts Contingency Plan

April 5, 2022
GZA File No. 01.0172397.10

Peter Carbone, Chairperson
Haverhill Board of Health
4 Summer Street, Room 210
Haverhill, MA 01830

Re: Notification of Phase II Comprehensive Site Assessment
284 Winter Street, Haverhill, Massachusetts
Release Tracking Number (RTN) 3-32792

Dear Mr. Carbone:

Massachusetts regulations require that notification regarding the delineation of a Disposal Site Boundary be provided to any owner of property within such boundaries upon completion of a Phase II – Comprehensive Site Assessment report. These notice requirements are contained in the Massachusetts Contingency Plan – MCP, 310 CMR 40.1406. On behalf of Boston Gas Company d/b/a National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) is providing this letter, with the attached BWSC 122 Form, a copy of the disposal site map, and copy of the Supplemental Phase II report conclusions to address the MCP notice requirements for City property adjacent to 284 Winter Street, Haverhill, Massachusetts.

A copy of the Supplemental Phase II CSA submittal can be viewed under RTN 3-32792 at the MassDEP website: http://eeaonline.eea.state.ma.us/DEP/wsc_viewer/main.aspx after April 6, 2022. Copies of the report can also be obtained by contacting Jesse Edmands of National Grid at (781) 907-3682/jesse.edmands@nationalgrid.com or the undersigned at 781-278-3700.

Please note that additional public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address:https://www.mass.gov/lists/public-involvement-during-cleanup-of-contaminated-properties.

Very truly yours,
GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC122 Form, Site Plan, Phase II CSA Conclusions

cc: Jesse Edmands, National Grid (via Email)
MassDEP (via eDEP)

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 32792

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 284 Winter Street
2. City/Town: Haverhill 3. ZIP Code: 01832-0000
4. Assessor's Parcel ID: Map 307, Lot 2-1

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: City of Haverhill
2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)
   a. Street Address: Winter Street
   b. City/Town: Haverhill c. ZIP Code: 01832-0000
3. Assessor's Parcel ID: N/A

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[x] 1. Soil	Extractable/volatile petroleum hydrocarbons, PAHs
[x] 2. Groundwater	Extractable/volatile petroleum hydrocarbons, benzene
[ ] 3. Surface Water	
[x] 4. Sediment	Polycyclic aromatic hydrocarbons (PAHs)
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: _____ (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 32792

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas d/b/a National Grid
2. Contact First Name: Jesse
3. Last Name: Edmands
4. Street: 40 Sylvan Road
5. Title: Program Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-1120
9. Telephone: (781) 907-3652
10. Email: jesse.edmands@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

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F: 781.278.5702
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Notification to Property Owners Pursuant to 310 CMR 40.1406 of the Massachusetts Contingency Plan

April 5, 2022
GZA File No. 01.0172397.10

Debra Darby
Massachusetts Bay Transportation Authority
10 Park Plaza, Room 6720
Boston, MA 02116

Re: Notification of Phase II Comprehensive Site Assessment
284 Winter Street, Haverhill, Massachusetts
Release Tracking Number (RTN) 3-32792

Dear Ms. Darby:

Massachusetts regulations require that notification regarding the delineation of a Disposal Site Boundary be provided to any owner of property within such boundaries upon completion of a Phase II – Comprehensive Site Assessment report. These notice requirements are contained in the Massachusetts Contingency Plan – MCP, 310 CMR 40.1406. On behalf of Boston Gas Company d/b/a National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) is providing this letter, with the attached BWSC 122 Form, a copy of the disposal site map, and copy of the Supplemental Phase II report conclusions to address the MCP notice requirements for Massachusetts Bay Transportation Authority (MBTA) property adjacent to 284 Winter Street, Haverhill, Massachusetts.

A copy of the Supplemental Phase II CSA submittal can be viewed under RTN 3-32792 at the MassDEP website: http://eeaonline.eea.state.ma.us/DEP/wsc_viewer/main.aspx after April 6, 2022. Copies of the report can also be obtained by contacting Jesse Edmands of National Grid at (781) 907-3682/jesse.edmands@nationalgrid.com or the undersigned at 781-278-3700.

Please note that additional public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address:https://www.mass.gov/lists/public-involvement-during-cleanup-of-contaminated-properties.

Very truly yours,
GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC122 Form, Site Plan, Phase II CSA Conclusions

cc: Jesse Edmands, National Grid (via Email)
MassDEP (via eDEP)

J:\170,000-179,999\172397\172397-10.KM\Reports\Phase II Report\Appendix O - Public Notification\MBTA P2 DSB Notice.docx

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 32792

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 284 Winter Street
2. City/Town: Haverhill 3. ZIP Code: 01832-0000
4. Assessor's Parcel ID: Map 307, Lot 2-1

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Massachusetts Bay Transportation Authority
2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)
   a. Street Address: Winter Street
   b. City/Town: Haverhill c. ZIP Code: 01832-0000
3. Assessor's Parcel ID: Map 307, Lot 2-3

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[x] 1. Soil	Extractable/volatile petroleum hydrocarbons, PAHs
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[ ] 4. Sediment	
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: _____ (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 32792

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas d/b/a National Grid
2. Contact First Name: Jesse
3. Last Name: Edmands
4. Street: 40 Sylvan Road
5. Title: Program Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-1120
9. Telephone: (781) 907-3652
10. Email: jesse.edmands@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

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July 29, 2020
File No. 01.0172397.10

Mr. Joseph Alosky
Trustee, Alosky Realty Trust
203 Essex Street
Haverhill, MA 01832

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
191 Essex Street
Haverhill, Massachusetts
Little River Sediment and Surface Water Sampling

Dear Mr. Alosky:

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling was described in our June 2, 2020 letter and is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the referenced property that is being completed by Boston Gas Company d/b/a National Grid (National Grid).

GZA collected a sediment sample from within the Little River adjacent to the 191 Essex Street property on June 8, 2020 and submitted it to Alpha Analytical of Mansfield, Massachusetts for analysis by the relevant Massachusetts Department of Environmental protection (MassDEP) methods. Extracted data from the analytical laboratory reports applicable to the above reference property are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be submitted to MassDEP. We have also enclosed a copy of the MassDEP transmittal form (BWSC123).

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC123 Form
Site Plan
Laboratory Reports (Work Order No. L2024182)

cc: Amy Willoughby (National Grid)
Jason Alosky (Jason@spool.com)

\\GZANOR\Jobs\170,000-179,999\172397\172397-10.KM\Data Transmittals\No. 3 - Sediment and Surface Water Sampling\191 Essex Street\Haverhill Winter St_Alosky_Phase II Data Transmittal 7-20.docx

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Mr. Joseph Alosky
2. Street Address: 203 Essex Street

City/Town: Haverhill Zip Code: 01832

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 191 Essex Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of sediment and surface water samples within the Little River at the 284 Winter Street Property.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby
Street Address: 280 Melrose Street
City/Town: Providence, RI Zip Code: 02907
Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

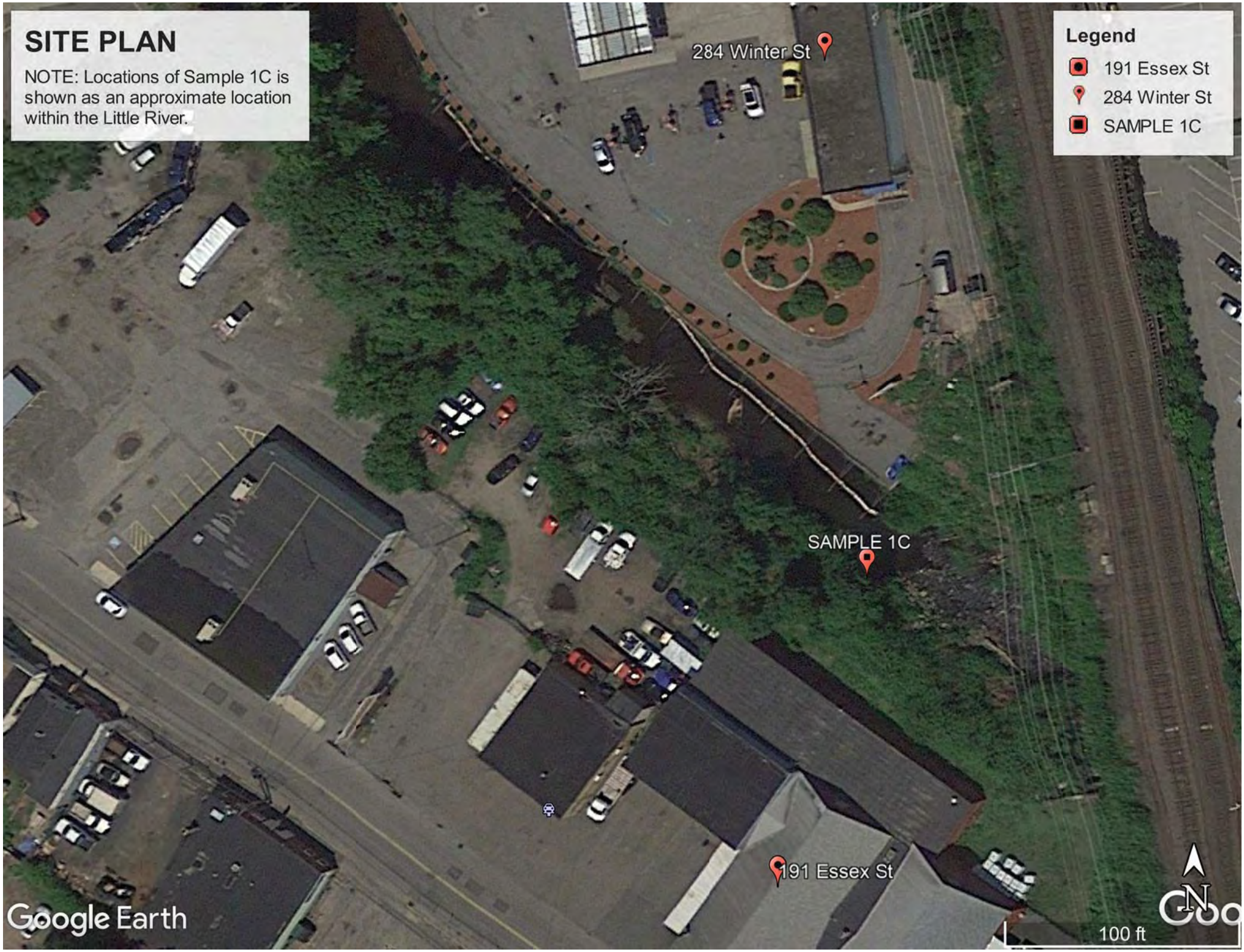
When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.


SITE PLAN
NOTE: Locations of Sample 1C is shown as an approximate location within the Little River.
Legend
191 Essex St
284 Winter St
SAMPLE 1C
284 Winter St
SAMPLE 1C
191 Essex St
N
100 ft
Google Earth

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October 16, 2020
File No. 01.0172397.10

Mr. Joseph Alosky
Trustee, Alosky Realty Trust
203 Essex Street
Haverhill, MA 01832

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
284 Winter Street
Haverhill, Massachusetts
191/221 Essex Street Groundwater Sampling

Dear Mr. Alosky:

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling was described in our September 8, 2020 letter and is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the 284 Winter Street site that is being completed by Boston Gas Company d/b/a National Grid (National Grid).

GZA collected groundwater samples from monitoring wells installed on the 191 Essex Street property and adjacent to the property line between the 191 and 221 Essex Street properties on September 15, 2020 and submitted them to Alpha Analytical of Mansfield, Massachusetts for analysis by the relevant Massachusetts Department of Environmental protection (MassDEP) methods. Extracted data from the analytical laboratory reports applicable to the above referenced wells (designated GZ-1 and GZ-1A) are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be submitted to MassDEP. We have also enclosed a copy of the MassDEP transmittal form (BWSC123). As part of this work a second round of groundwater sampling in anticipated to be performed in November 2020.

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC123 Form
Site Plan
Laboratory Reports (Work Order No. L2038556)

cc: Amy Willoughby (National Grid)
Jason Alosky (Jason@spool.com)

J:\170,000-179,999\172397\172397-10.KM\Data Transmittals\No. 4 - Groundwater Sampling\Haverhill Winter St_Alosky_Phase II Data Transmittal 8-20.docx

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Mr. Joseph Alosky
2. Street Address: 203 Essex Street

City/Town: Haverhill Zip Code: 01832

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 191 and 221 Essex Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of groundwater samples from monitoring wells installed on the 191 and 221 Essex Street Properties.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby
Street Address: 280 Melrose Street
City/Town: Providence, RI Zip Code: 02907
Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Exploration Location Plan

Approximate locations of explorations performed at the 191 and 221 Essex Street Properties. GZA-1 and GZA-1A were completed as groundwater monitoring wells.

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F: 781.278.5702
www.gza.com

December 17, 2020
File No. 01.0172397.10

Mr. Joseph Alosky
Trustee, Alosky Realty Trust
203 Essex Street
Haverhill, MA 01832

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
284 Winter Street
Haverhill, Massachusetts
191/221 Essex Street Groundwater Sampling

Dear Mr. Alosky:

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling was described in our September 8, 2020 letter and is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the 284 Winter Street site that is being completed by Boston Gas Company d/b/a National Grid (National Grid).

GZA collected groundwater samples from monitoring wells installed on the 191 Essex Street property and adjacent to the property line between the 191 and 221 Essex Street properties on November 23, 2020 and submitted them to Alpha Analytical of Westborough, Massachusetts for analysis by the relevant Massachusetts Department of Environmental protection (MassDEP) methods. Extracted data from the analytical laboratory reports applicable to the above referenced wells (designated GZ-1 and GZ-1A) are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be submitted to MassDEP. We have also enclosed a copy of the MassDEP transmittal form (BWSC123). Detectable concentrations of the constituents of concern for the 284 Winter Street site were not reported in the groundwater samples collected from your property on November 23, 2020. At this time, we do not anticipate any further groundwater sampling at your property.

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC123 Form
Site Plan
Laboratory Report Excerpts (Work Order No. L2052184)

cc: Amy Willoughby (National Grid)
Jason Alosky (Jason@spool.com)

J:\170,000-179,999\172397\172397-10.KM\Data Transmittals\No. 5 - Groundwater Sampling\191 Essex Street\Haverhill Winter St_Alosky_Phase II Data Transmittal 12-20.docx

An Equal Opportunity Employer M/F/V/H

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Mr. Joseph Alosky
2. Street Address: 203 Essex Street

City/Town: Haverhill Zip Code: 01832

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 191 and 221 Essex Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of groundwater samples from monitoring wells installed on the 191 and 221 Essex Street Properties.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby
Street Address: 280 Melrose Street
City/Town: Providence, RI Zip Code: 02907
Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Exploration Location Plan

Approximate locations of explorations performed at the 191 and 221 Essex Street Properties. GZA-1 and GZA-1A were completed as groundwater monitoring wells.

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Norwood, MA 02062
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F: 781.278.5701
F: 781.278.5702
www.gza.com

July 29, 2020
File No. 01.0172397.10

Haffner Realty Trust
c/o Ms. Sarah T. Connolly, Esq.
Nixon Peabody LLP
53 State Street
Boston, Massachusetts 02109

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
284 Winter Street
Haverhill, Massachusetts

Dear Attorney Connolly:

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling was described in our June 2, 2020 letter and is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the referenced property that is being completed under a October 2019 agreement between Haffner Realty Trust (HRT) and Boston Gas Company d/b/a National Grid (National Grid).

GZA collected sediment and surface water samples from within the Little River adjacent to 284 Winter Street on June 8 through June 11, 2020 and submitted them to Alpha Analytical of Mansfield, Massachusetts for analysis by the relevant Massachusetts Department of Environmental protection (MassDEP) methods. The analytical laboratory reports are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be provided to HRT. We have also enclosed a copy of the MassDEP transmittal form (BWSC123).

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC123 Form
Site Plan
Laboratory Reports (Work Order No. L2024182 and No. 2024416)

cc: Amy Willoughby (National Grid)
Robin Main and Christine Dieter (Hinckley Allen)
Ruth H. Silman and Donald D. Cooper (Nixon Peabody)

\\GZANOR\Jobs\170,000-179,999\172397\172397-10.KM\Data Transmittals\No. 3 - Sediment and Surface Water Sampling\Haffners\Haverhill Winter St_HRT_Phase II Data Transmittal 7-20.docx

An Equal Opportunity Employer M/F/V/H

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Haffner Realty Trust c/o Ms. Sarah T. Connolly, Esq.
2. Street Address: 53 State Street

City/Town: Boston Zip Code: 02109

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of sediment and surface water samples within the Little River at the 284 Winter Street Property.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby

Street Address: 280 Melrose Street

City/Town: Providence, RI Zip Code: 02907

Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

LEGEND

- 1A — SEDIMENT SAMPLE COLLECTED BY GZA ON JUNE 8-10, 2020
- P1 — PIPE LOCATION
- B101 — SOIL BORING PERFORMED BY GEOSEARCH ON JANUARY 21-23, 2020 AND OBSERVED BY GZA
- NFAA-01 — AMBIENT AIR SAMPLE COLLECTED BY GZA PERSONNEL OCTOBER 19, 2016
- NFSB-05 — SOIL BORING PERFORMED BY TECHNICAL DRILLING SERVICES OCTOBER 20-25, 2016 AND OBSERVED BY GZA
- NFCB01 — CATCH BASIN SEDIMENT SAMPLE COLLECTED BY GZA PERSONNEL OCTOBER 18-19, 2016
- NFSB-01 (MW) — MONITORING WELL INSTALLED BY TECHNICAL DRILLING SERVICES OCTOBER 20-25, 2016 AND OBSERVED BY GZA
- NFNP01 — NAPL SAMPLE
- NFSV01 — SOIL VAPOR SAMPLE COLLECTED BY GZA PERSONNEL OCTOBER 18-19, 2016
- ENV-1MW — MONITORING WELL INSTALLED BY RAMBOLL ENVIRON APRIL 27-28, 2015
- MW-1 — MONITORING WELL INSTALLED BY LESSARD ENVIRONMENTAL, INC.
- ASSESSORS PARCEL DATA

SOURCE

1) THIS MAP CONTAINS THE ESRI ArcGIS ONLINE BING MAPS AERIAL LAYER PACKAGE, PUBLISHED APRIL 13, 2020 BY ESRI ARCIMS SERVICES AND UPDATED MONTHLY. THIS SERVICE USES UNIFORM NATIONALLY RECOGNIZED DATUM AND CARTOGRAPHY STANDARDS AND A VARIETY OF AVAILABLE SOURCES FROM SEVERAL DATA PROVIDERS.
2) THE LOCATIONS OF THE SEDIMENT SAMPLES COLLECTED BY GZA IN JUNE 2020 AND THE PIPE LOCATIONS WERE APPROXIMATELY DETERMINED USING A TRIMBLE GEO-7X HAND-HELD GPS ON 06-10-2020. THE LOCATIONS OF THE SOIL BORINGS INSTALLED BY GEOSEARCH IN JANUARY 2020 WERE APPROXIMATELY DETERMINED USING A TRIMBLE GEO-7X HAND-HELD GPS ON 05-07-2020. THE LOCATIONS OF THE NF SERIES OF EXPLORATIONS AND SAMPLING LOCATIONS WERE APPROXIMATELY DETERMINED USING A TRIMBLE GEO-XH HAND-HELD GPS ON 10-18-2016. THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
3) THE LOCATIONS OF THE MONITORING WELLS INSTALLED BY RAMBOLL AND THE MONITORING WELLS INSTALLED BY LESSARD WERE APPROXIMATELY DETERMINED FROM A PLAN PREPARED BY RAMBOLL ENTITLED: "SITE LAYOUT", FIGURE 2, DATED: 02-10-2017, PROJECT.: 1690005598.

0 25 50 100
SCALE IN FEET

DRAFT

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

IMMEDIATE RESPONSE ACTION
284 WINTER STREET
HAVERHILL, MASSACHUSETTS

EXPLORATION LOCATION PLAN

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: nationalgrid	
PROJ MGR: KFM	REVIEWED BY: CAL	CHECKED BY: KFM	FIGURE
DESIGNED BY: KFM	DRAWN BY: SMW/EMD	SCALE: 1 " = 50 FEET	2
DATE: 07/06/2020	PROJECT NO. 01.0172397.10	REVISION NO.	

© 2020 - GZA GeoEnvironmental, Inc. J:\170,000-179,999\172397\172397-10.KM\Figures\GIS\172397-10_FIG2_explorationLocation_v2.mxd, 7/6/2020, 3:33:37 PM, elaine.donohue

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F: 781.278.5701
F: 781.278.5702
www.gza.com

October 16, 2020
File No. 01.0172397.10

Haffner Realty Trust
c/o Ms. Sarah T. Connolly, Esq.
Nixon Peabody LLP
53 State Street
Boston, Massachusetts 02109

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
284 Winter Street
Haverhill, Massachusetts

Dear Attorney Connolly:

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the referenced property that is being completed under a October 2019 agreement between Haffner Realty Trust (HRT) and Boston Gas Company d/b/a National Grid (National Grid).

GZA collected groundwater samples from monitoring wells installed on the 191 and 221 Essex Street properties and from MW-1 on the 284 Winter Street property on September 15, 2020 and submitted them to Alpha Analytical of Mansfield, Massachusetts for analysis by the relevant Massachusetts Department of Environmental protection (MassDEP) methods. Extracted data from the analytical laboratory report are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be provided to HRT. We have also enclosed a copy of the MassDEP transmittal form (BWSC123).

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC123 Form
Site Plan
Laboratory Reports (Work Order No. 2038556)

cc: Amy Willoughby (National Grid)
Robin Main and Christine Dieter (Hinckley Allen)
Ruth H. Silman and Donald D. Cooper (Nixon Peabody)

J:\170,000-179,999\172397\172397-10.KM\Data Transmittals\No. 4 - Groundwater Sampling\Haffners\Haverhill Winter St_HRT_Phase II Data Transmittal 10-20.docx

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Haffner Realty Trust c/o Ms. Sarah T. Connolly, Esq.
2. Street Address: 53 State Street

City/Town: Boston Zip Code: 02109

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of groundwater samples from monitoring wells installed on the 191 and 221 Essex Street Properties.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby

Street Address: 280 Melrose Street

City/Town: Providence, RI Zip Code: 02907

Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

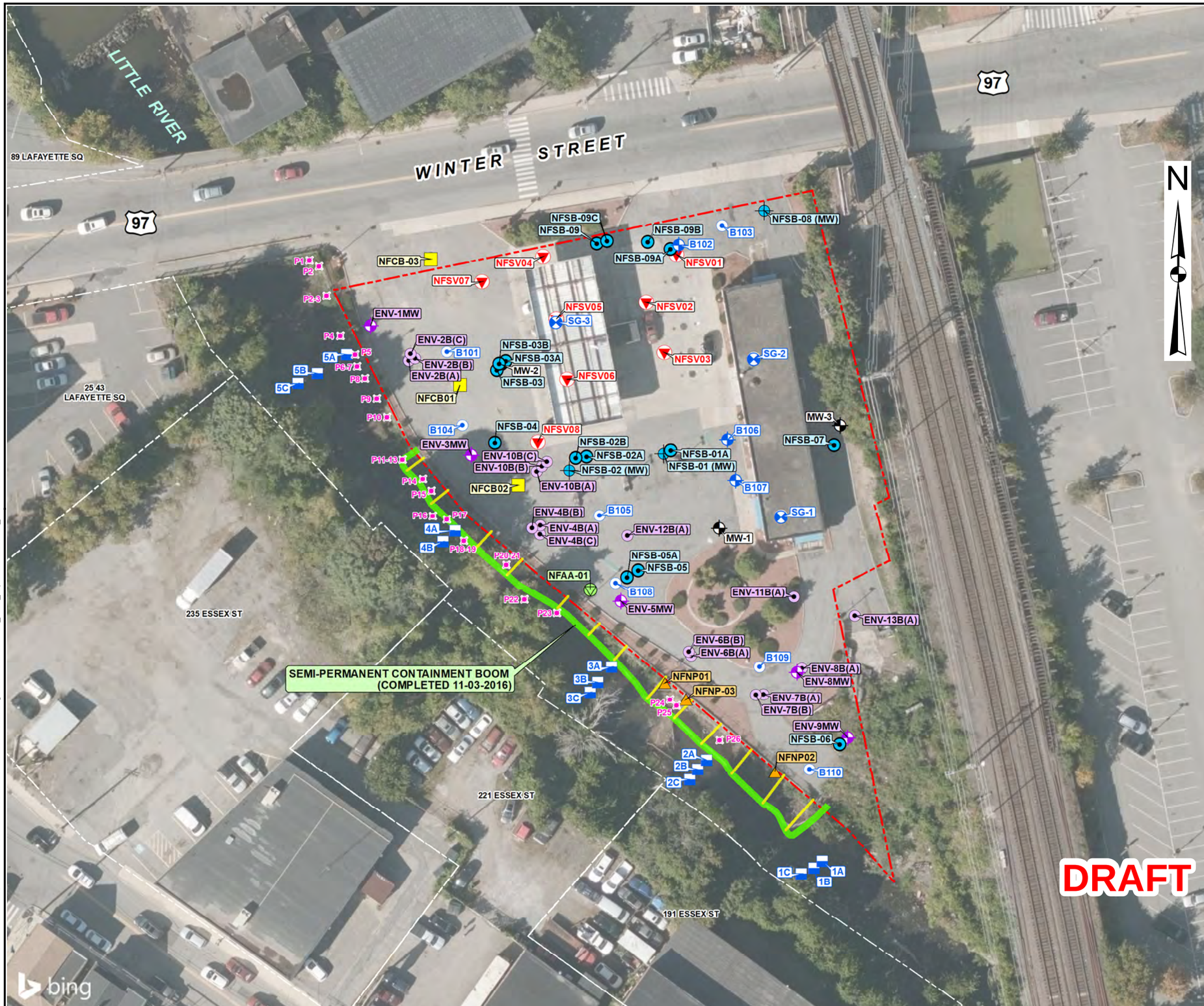
When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.



LEGEND

- 1A — SEDIMENT SAMPLE COLLECTED BY GZA ON JUNE 8-10, 2020
- P1 — PIPE LOCATION
- SG-1 — SOIL GAS POINTS PERFORMED BY GZA ON FEBRUARY 5, 2020
- B102 — MONITORING WELL PERFORMED BY GEOSEARCH ON JANUARY 21-23, 2020 AND OBSERVED BY GZA
- B101 — SOIL BORING PERFORMED BY GEOSEARCH ON JANUARY 21-23, 2020 AND OBSERVED BY GZA
- NFAA-01 — AMBIENT AIR SAMPLE COLLECTED BY GZA PERSONNEL OCTOBER 19, 2016
- NFSB-05 — SOIL BORING PERFORMED BY TECHNICAL DRILLING SERVICES OCTOBER 20-25, 2016 AND OBSERVED BY GZA
- NFCB01 — CATCH BASIN SEDIMENT SAMPLE COLLECTED BY GZA PERSONNEL OCTOBER 18-19, 2016
- NFSB-01 (MW) — MONITORING WELL INSTALLED BY TECHNICAL DRILLING SERVICES OCTOBER 20-25, 2016 AND OBSERVED BY GZA
- NFNP01 — NAPL SAMPLE
- NFSV01 — SOIL VAPOR SAMPLE COLLECTED BY GZA PERSONNEL OCTOBER 18-19, 2016
- ENV-1MW — MONITORING WELL INSTALLED BY RAMBOLL ENVIRON APRIL 27-28, 2015
- MW-1 — MONITORING WELL INSTALLED BY LESSARD ENVIRONMENTAL, INC.
- ENV-2B(A) — SOIL BORING COMPLETED BY RAMBOLL ENVIRON APRIL 27-28, 2015
- PROPERTY BOUNDARY AS RECORDED ON ALTA/ACSM LAND TITLE SURVEY PLAN PERFORMED BY MHF DESIGN CONSULTANTS (STAMPED FEBRUARY 12, 2015)
- ASSESSORS PARCEL DATA PROVIDED BY MASSGIS ON SEPTEMBER 1, 2020

SOURCE

1) THIS MAP CONTAINS THE ESRI ArcGIS ONLINE BING MAPS AERIAL LAYER PACKAGE, PUBLISHED APRIL 13, 2020 BY ESRI ARCIMS SERVICES AND UPDATED MONTHLY. THIS SERVICE USES UNIFORM NATIONALLY RECOGNIZED DATUM AND CARTOGRAPHY STANDARDS AND A VARIETY OF AVAILABLE SOURCES FROM SEVERAL DATA PROVIDERS.
2) THE LOCATIONS OF THE SEDIMENT SAMPLES COLLECTED BY GZA IN JUNE 2020 AND THE PIPE LOCATIONS WERE APPROXIMATELY DETERMINED USING A TRIMBLE GEO-7X HAND-HELD GPS ON 06-10-2020. THE LOCATIONS OF THE MONITORING WELLS AND SOIL BORINGS PERFORMED BY GEOSEARCH IN JANUARY 2020 WERE APPROXIMATELY DETERMINED USING A TRIMBLE GEO-7X HAND-HELD GPS ON 05-07-2020. THE LOCATIONS OF THE NF SERIES OF EXPLORATIONS AND SAMPLING LOCATIONS WERE APPROXIMATELY DETERMINED USING A TRIMBLE GEO-XH HAND-HELD GPS ON 10-18-2016. THE LOCATIONS OF THE SOIL GAS POINTS INSTALLED BY GZA IN FEBRUARY 2020 WERE APPROXIMATELY DETERMINED BY LINE OF SIGHT FROM EXISTING TOPOGRAPHIC AND MAN-MADE FEATURES. THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
3) THE LOCATIONS OF THE SOIL BORINGS AND MONITORING WELLS PERFORMED BY RAMBOLL AND THE MONITORING WELLS PERFORMED BY LESSARD WERE APPROXIMATELY DETERMINED FROM A PLAN PREPARED BY RAMBOLL ENTITLED: "SITE LAYOUT", FIGURE 2, DATED: 02-10-2017, PROJECT.: 1690005598.

0 25 50 100
SCALE IN FEET

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA, ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

IMMEDIATE RESPONSE ACTION
284 WINTER STREET
HAVERHILL, MASSACHUSETTS

EXPLORATION LOCATION PLAN

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com

PREPARED FOR: nationalgrid

PROJ MGR: KFM	REVIEWED BY: CAL	CHECKED BY: KFM	FIGURE 2
DESIGNED BY: KFM	DRAWN BY: SMW/EMD	SCALE: 1 " = 50 FEET	
DATE: 09/11/2020	PROJECT NO. 01.0172397.10	REVISION NO.	

© 2020 - GZA GeoEnvironmental, Inc. J:\170,000-179,999\172397\172397-10.KMF\figures\GIS\172397-10_FIG2_explorationLocation_v2.mxd, 9/11/2020, 1:07:15 PM, elaine.donohue

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F: 781.278.5701
F: 781.278.5702
www.gza.com

September 15, 2021
File No. 01.0172397.10

Haffner Realty Trust
c/o Ms. Sarah T. Connolly, Esquire
Nixon Peabody LLP
53 State Street
Boston, Massachusetts 02109

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
284 Winter Street
Haverhill, Massachusetts

Dear Attorney Connolly:

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the referenced property that is being completed under a October 2019 agreement between Haffner Realty Trust (HRT) and Boston Gas Company d/b/a National Grid (National Grid).

GZA collected groundwater samples from monitoring wells installed on HRT property on August 11, 2021, and submitted them to Alpha Analytical of Westborough, Massachusetts for analysis by the relevant Massachusetts Department of Environmental protection (MassDEP) methods. A copy of the analytical laboratory report is attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be provided to HRT. We have also enclosed a copy of the MassDEP transmittal form (BWSC123).

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC123 Form
Site Plan
Laboratory Reports (Work Order No. 2143342)

cc: Amy Willoughby (National Grid)
Robin Main and Christine Dieter (Hinckley Allen)
Donald D. Cooper (Nixon Peabody)

J:\170,000-179,999\172397\172397-10.KM\Data Transmittals\No. 6 - Groundwater Sampling\Haverhill Winter St_HRT_Phase II Data Transmittal 09-21.docx

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Haffner Realty Trust c/o Ms. Sarah T. Connolly, Esq.
2. Street Address: 53 State Street

City/Town: Boston Zip Code: 02109

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of groundwater samples from monitoring wells installed on the HRT property.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby

Street Address: 280 Melrose Street

City/Town: Providence, RI Zip Code: 02907

Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

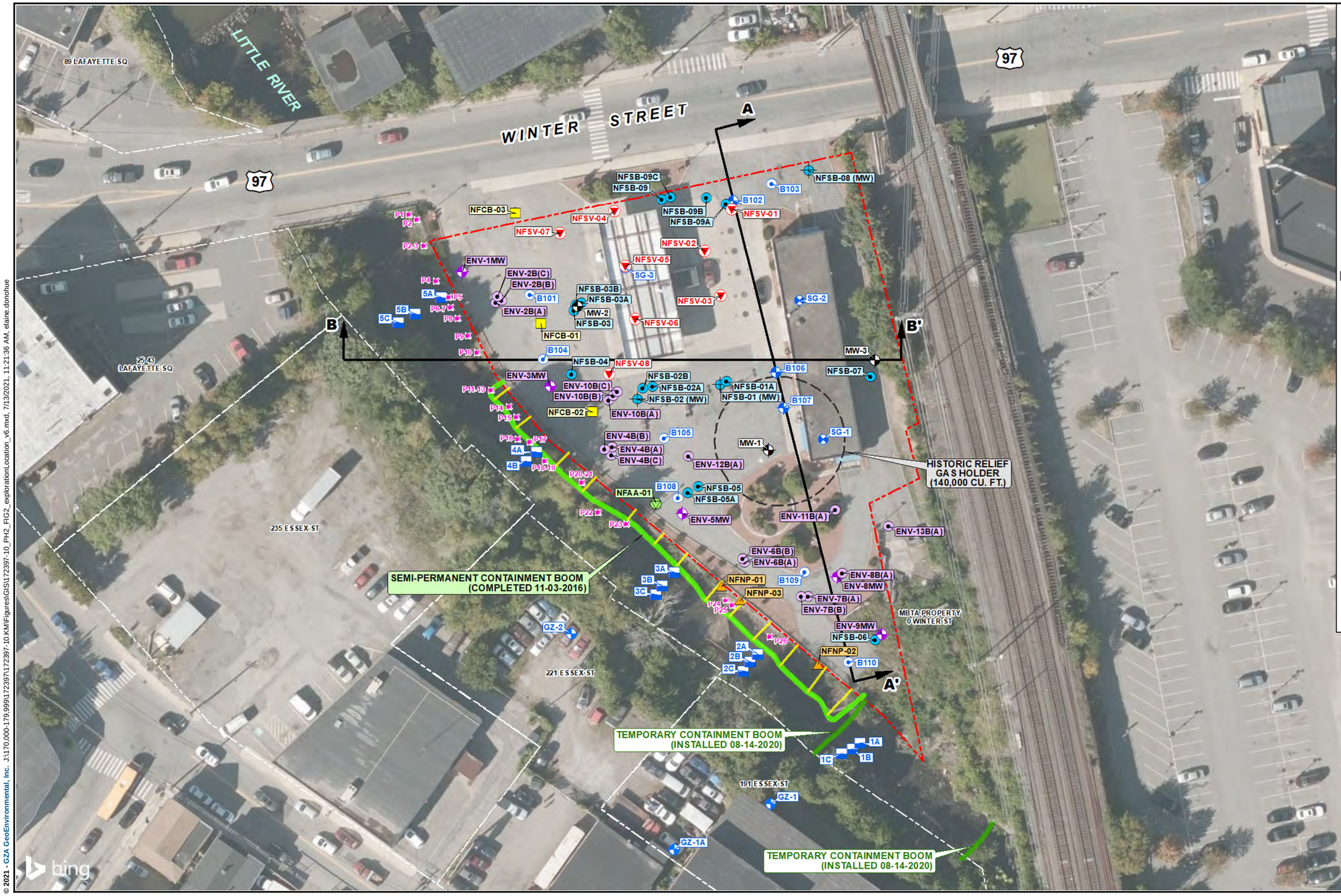
When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.



LEGEND

- GZ-1 — MONITORING WELL INSTALLED BY GEOSEARCH AUGUST 31 - SEPTEMBER 1, 2020
- 1A — SEDIMENT SAMPLE COLLECTED BY GZA ON JUNE 8-10, 2020
- P1 — PIPE LOCATION
- SG-1 — SOIL GAS POINT PERFORMED BY GZA ON FEBRUARY 5, 2020
- B102 — MONITORING WELL INSTALLED BY GEOSEARCH JANUARY 21-23, 2020 AND OBSERVED BY GZA
- B101 — SOIL BORING PERFORMED BY GEOSEARCH JANUARY 21-23, 2020 AND OBSERVED BY GZA
- NFNP-01 — NAPL SAMPLE COLLECTED BY GZA PERSONNEL NOVEMBER 1, 2016
- NFSB-01 (MW) — MONITORING WELL INSTALLED BY TECHNICAL DRILLING SERVICES OCTOBER 20-25, 2016 AND OBSERVED BY GZA
- NFSB-05 — SOIL BORING PERFORMED BY TECHNICAL DRILLING SERVICES OCTOBER 20-25, 2016 AND OBSERVED BY GZA
- NFAA-01 — AMBIENT AIR SAMPLE COLLECTED BY GZA PERSONNEL OCTOBER 19,
- NFSV-01 — SOIL VAPOR SAMPLE COLLECTED BY GZA PERSONNEL OCTOBER 18-19, 2016
- NFCB-01 — CATCH BASIN SEDIMENT SAMPLE COLLECTED BY GZA PERSONNEL OCTOBER 18-19, 2016
- ENV-1MW — MONITORING WELL INSTALLED BY RAMBOLL ENVIRON APRIL 27-28,
- ENV-2B(A) — SOIL BORING COMPLETED BY RAMBOLL ENVIRON APRIL 27-28,
- MW-1 — MONITORING WELL INSTALLED BY LESSARD ENVIRONMENTAL
- PROPERTY BOUNDARY AS RECORDED ON ALTA/ACSM LAND TITLE SURVEY PLAN PERFORMED BY MHF DESIGN CONSULTANTS (STAMPED FEBRUARY 12, 2015)
- ASSESSORS PARCEL DATA PROVIDED BY MASSGIS ON SEPTEMBER 1, 2020

SOURCE

1) THIS MAP CONTAINS THE ESRI ArcGIS ONLINE BING MAPS AERIAL LAYER PACKAGE, PUBLISHED APRIL 13, 2020 BY ESRI ARCIMS SERVICES AND UPDATED MONTHLY. THIS SERVICE USES UNIFORM NATIONALLY RECOGNIZED DATUM AND CARTOGRAPHY STANDARDS AND A VARIETY OF AVAILABLE SOURCES FROM SEVERAL DATA PROVIDERS.

2) THE LOCATIONS OF THE MONITORING WELLS INSTALLED BY GEOSEARCH AUGUST 31 - SEPTEMBER 1, 2020 WERE LOCATED FROM A SURVEY PERFORMED BY THE MORIN-CAMERON GROUP, INC. ON SEPTEMBER 29, 2020. THE LOCATIONS OF THE SEDIMENT SAMPLES COLLECTED BY GZA IN JUNE 2020 AND THE PIPE LOCATIONS WERE APPROXIMATELY DETERMINED USING A TRIMBLE GEO-7X HAND-HELD GPS ON 06-10-2020. THE LOCATIONS OF THE MONITORING WELLS AND SOIL BORINGS PERFORMED BY GEOSEARCH IN JANUARY 2020 WERE APPROXIMATELY DETERMINED USING A TRIMBLE GEO-7X HAND-HELD GPS ON 05-07-2020. THE LOCATIONS OF THE NF SERIES OF EXPLORATIONS AND SAMPLING LOCATIONS WERE APPROXIMATELY DETERMINED USING A TRIMBLE GEO-XH HAND-HELD GPS ON 10-18-2016. THE LOCATIONS OF THE SOIL GAS POINTS INSTALLED BY GZA IN FEBRUARY 2020 WERE APPROXIMATELY DETERMINED BY LINE OF SIGHT FROM EXISTING TOPOGRAPHIC AND MAN-MADE FEATURES. THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

3) THE LOCATIONS OF THE SOIL BORINGS AND MONITORING WELLS PERFORMED BY RAMBOLL AND THE MONITORING WELLS PERFORMED BY LESSARD WERE APPROXIMATELY DETERMINED FROM A PLAN PREPARED BY RAMBOLL ENTITLED: "SITE LAYOUT", FIGURE 2, DATED: 02-10-2017, PROJECT.: 1690005598.

4) THE HISTORIC RELIEF GAS HOLDER WAS APPROXIMATLEY LOCATED FROM AN "UNDATED HISTORICAL PLAN" IN THE RAMBOLL ENVIRON PHASE I INITIAL SITE INVESTIGATION REPORT, DATED APRIL 2016.

0 25 50 100
SCALE IN FEET

N

DRAFT

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

PHASE II COMPREHENSIVE SITE ASSESSMENT
284 WINTER STREET
HAVERHILL, MASSACHUSETTS

EXPLORATION LOCATION PLAN

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com

PREPARED FOR: nationalgrid

PROJ MGR: KFM	REVIEWED BY: CAL	CHECKED BY: KFM	FIGURE
DESIGNED BY: KFM	DRAWN BY: SMW/EMD	SCALE: 1 " = 50 FEET	2
DATE: 07/13/2021	PROJECT NO. 01.0172397.10	REVISION NO.	

© 2021 - GZA GeoEnvironmental, Inc. J:\170,000-179,999\172397\172397-10.KM\Figures\GIS\172397-10_PH2_FIG2_explorationLocation_v6.mxd, 7/13/2021, 11:21:36 AM, elaine.donohue

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F: 781.278.5701
F: 781.278.5702
www.gza.com

July 29, 2020
File No. 01.0172397.10

Mr. Stephen Leblanc
221 Essex Street
Haverhill, MA 01832

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
221 Essex Street
Haverhill, Massachusetts
Little River Sediment and Surface Water Sampling

Dear Mr. Leblanc:

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling was described in our June 2, 2020 letter and is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the referenced property that is being completed by Boston Gas Company d/b/a National Grid (National Grid).

GZA collected sediment samples from within the Little River adjacent to the 221 Essex Street property on June 9, 2020 and submitted them to Alpha Analytical of Mansfield, Massachusetts for analysis by the relevant Massachusetts Department of Environmental protection (MassDEP) methods. Extracted data from the analytical laboratory reports applicable to the above referenced property are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be submitted to MassDEP. We have also enclosed a copy of the MassDEP transmittal form (BWSC123).

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC123 Form
Site Plan
Laboratory Reports (Work Order No. L2024182)

cc: Amy Willoughby (National Grid)

\\GZANOR\Jobs\170,000-179,999\172397\172397-10.KM\Data Transmittals\No. 3 - Sediment and Surface Water Sampling\221 Essex Street\Haverhill Winter St_Leblanc_Phase II Data Transmittal 7-20.docx

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Mr. Stephen Leblanc
2. Street Address: 221 Essex Street

City/Town: Haverhill Zip Code: 01832

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 221 Essex Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of sediment and surface water samples within the Little River at the 284 Winter Street Property.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby
Street Address: 280 Melrose Street
City/Town: Providence, RI Zip Code: 02907
Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

SITE PLAN

NOTE: Locations of Sample 2C and SAMPLE 3C are shown as an approximate location within the Little River.

CHAIN OF CUSTODY

PAGE 1 OF 2

Date Rec'd in Lab: 6/10/20

ALPHA Job #: L2429782

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: GZA GeoEnvironmental
Address: 249 Vanderbilt Ave Norwood, MA 02062
Phone: 781-278-3700
Fax:
Email: kyle.Maxfield@gza.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: 248 Winter Street, Haverhill, MA
Project Location: Haverhill, MA
Project #: 01.0172397.10
Project Manager: Kyle Maxfield
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program	Criteria
	MA MCP

Other Project Specific Requirements/Comments/Detection Limits:
Please refer to the analyses listed on this COC.

Samples are expected to have high concentrations of MGP and petroleum related analytes

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Alkylated PAHs - 8270 SIM	Total organic carbon	Black Carbon	EPH - carbon ranges only	VPH w/ target VOCs	Physiologically Available Cyanide	Total Solids	EPH w/ target PAHs					Sample Specific Comments	Total # Bottles
24182-01	1C 0-6"	6/8/20	0945	Soil	BCD	X	X	X	X	X	X	X							6
-02	1B 0-6"	↓	1015	↓	↓	X	X	X	X	X	X	X							6
-03	1A 0-6"	↓	1130	↓	↓	X	X	X	X	X	X	X							6
-04	1A 1-5.5'	6/8/20	1430	↓	↓		X			X		X	X					contains visible, separate phase product	3
-05	2C 0-6"	6/9/20	0830	↓	↓	X	X	X	X	X	X	X							6
	~~2B 0-6"~~	↓	~~0955~~	↓	↓	BCD													
-06	2A 0-6"	↓	0935	↓	↓		X			X		X	X					contains visible, separate phase product	3
-07	2A 1-4'	↓	1015	↓	↓		X			X		X	X						3
-08	3C 0-6"	↓	1035	↓	↓	X	X	X	X	X	X	X							6
-09	3B 0-6"	6/9/20	1055	Soil	BCD		X			X		X	X					contains visible, separate phase product	3
					Container Type														
					Preservative														

SAMPLE HANDLING
Filtration
☐ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Relinquished By:	Date/Time	Received By:	Date/Time
Bailey DuPont	6/10/20 1500	[illegible]	6/10/20 1536
[illegible]	6/10/20 1630	[illegible]	6/10/20 1630

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

CHAIN OF CUSTODY

PAGE 2 OF 2

Date Rec'd in Lab: 6/10/20

ALPHA Job #: L2027KL

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: GZA GeoEnvironmental
Address: 249 Vanderbilt Ave
Norwood, MA 02062
Phone: 781-278-3700
Fax:
Email: kyle.maxfield@gza.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: 248 Winter Street, Haverhill, MA
Project Location: Haverhill, MA
Project #: 01.0172397.10
Project Manager: Kyle Maxfield
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program	Criteria
	MA MCP

Other Project Specific Requirements/Comments/Detection Limits:
Please refer to the analyses listed on this COC
All samples are expected to have high concentrations of MGP and petroleum related analytes

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Alkylated PAHs-8270 SIM	Total organic carbon	Black carbon	EPH-carbon ranges oil	VPH w/ target VOCs	Physiologically Available Cyanide	Total solids	EPH w/ target PAHs					Sample Specific Comments	Total # Bottles
	~~3A 0-6"~~	~~6/9/20~~	~~1215~~	~~Soil~~	~~BCD~~ BCD														
27/R2-10	4B 0-6"	6/9/20	1245	Soil	BCD	X	X	X	X	X	X	X							6
-11	4A 1-2.5'		1310				X			X		X	X					contains visible, separate phase product	3
	~~4A 0-6"~~		~~1330~~		BCD														
-12	5A 0-6"		1405				X			X		X	X					contains visible, separate phase product	3
-13	5C 0-6"		1435			X	X	X	X	X	X	X							6
-14	5B 0-6"	6/9/20	1455	Soil	BCD	X	X	X	X	X	X	X							6

SAMPLE HANDLING
Filtration
☐ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Container Type													
Preservative													

Relinquished By:	Date/Time	Received By:	Date/Time
Bailey Dupont	6/10/20 1500	[illegible]	6/10/20 1546
[illegible]	6/10/20 1630	[illegible]	6/10/20 1650

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 14-OCT-07)

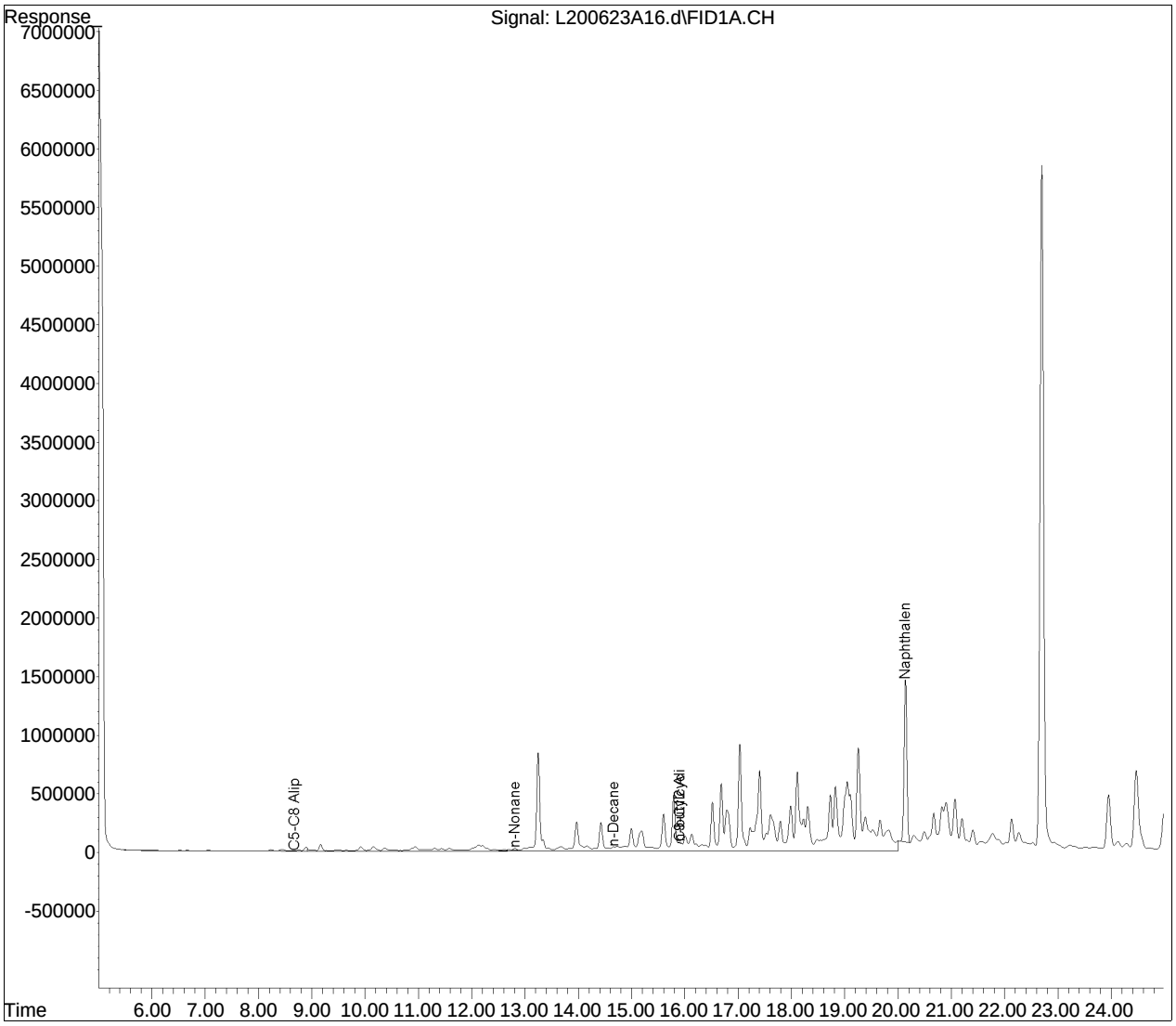
Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES_GC\LVPH\2020\200623Aali\
Data File : L200623A16.d
Signal(s) : FID1A.CH
Acq On : 23 Jun 2020 4:40 pm
Operator : LVPH:BAD
Sample : l2024182-06D,41,15,18.66,0.025,,a
Misc : WG1384999,ICAL16831,VPH-75
ALS Vial : 16 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jun 24 12:14:04 2020
Quant Method : I:\VOLATILES_GC\LVPH\2020\200623Aali\svph-ali200528A.m
Quant Title : VPH ALIPHATIC
QLast Update : Fri May 29 09:09:20 2020
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Sub List : Default - All compounds listed



svph-ali200528A.m Wed Jun 24 14:23:42 2020 Page: 2

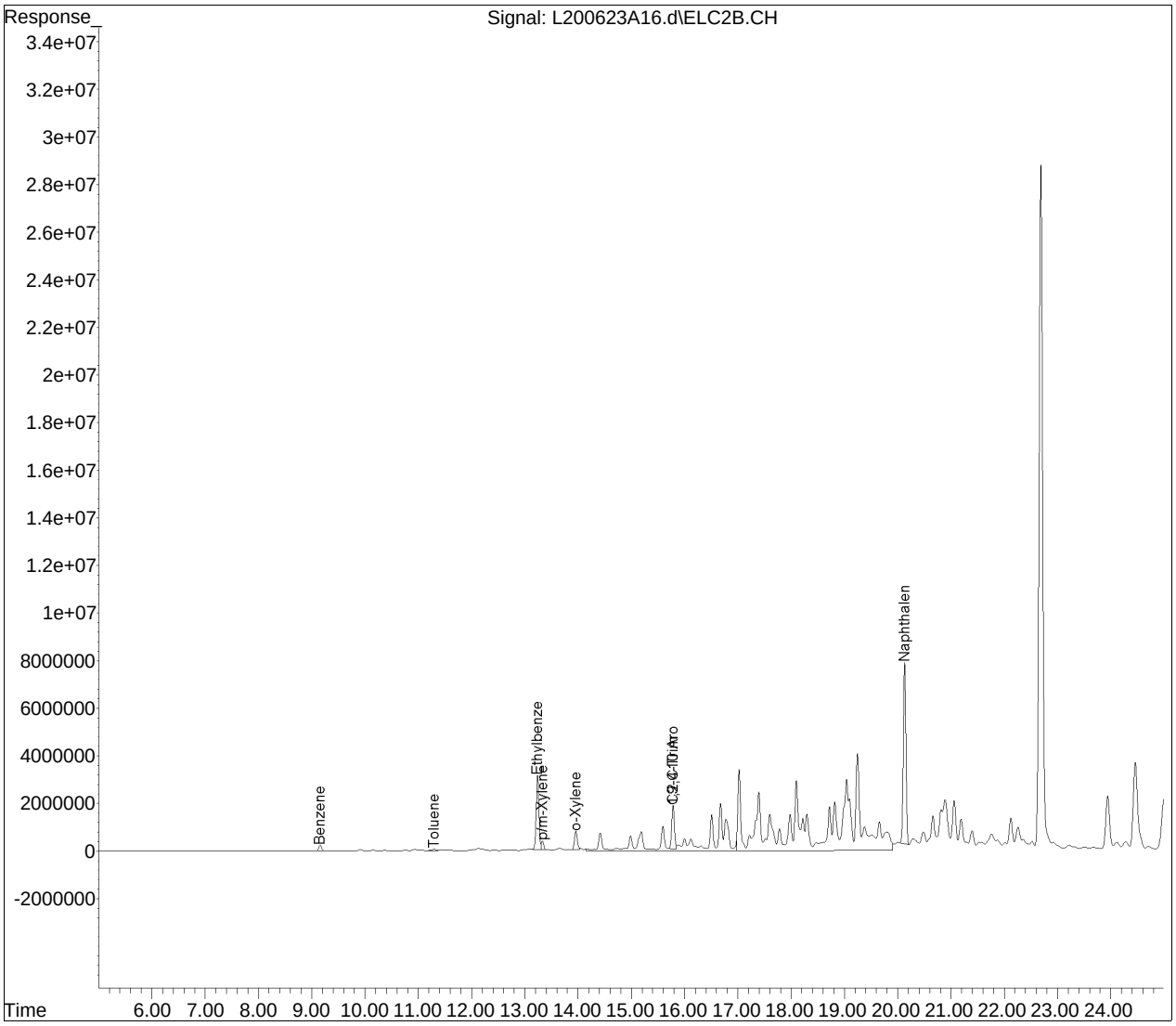
Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES_GC\LVPH\2020\200623Aaro\
Data File : L200623A16.d
Signal(s) : ELC2B.CH
Acq On : 23 Jun 2020 4:40 pm
Operator : LVPH:BAD
Sample : l2024182-06D,41,15,18.66,0.025,,a
Misc : WG1384999,ICAL16832,VPH-75
ALS Vial : 0 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jun 24 12:04:31 2020
Quant Method : I:\VOLATILES_GC\LVPH\2020\200623Aaro\svph-aro200528A.m
Quant Title : VPH AROMATIC
QLast Update : Fri May 29 09:20:31 2020
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Sub List : Default - All compounds listed



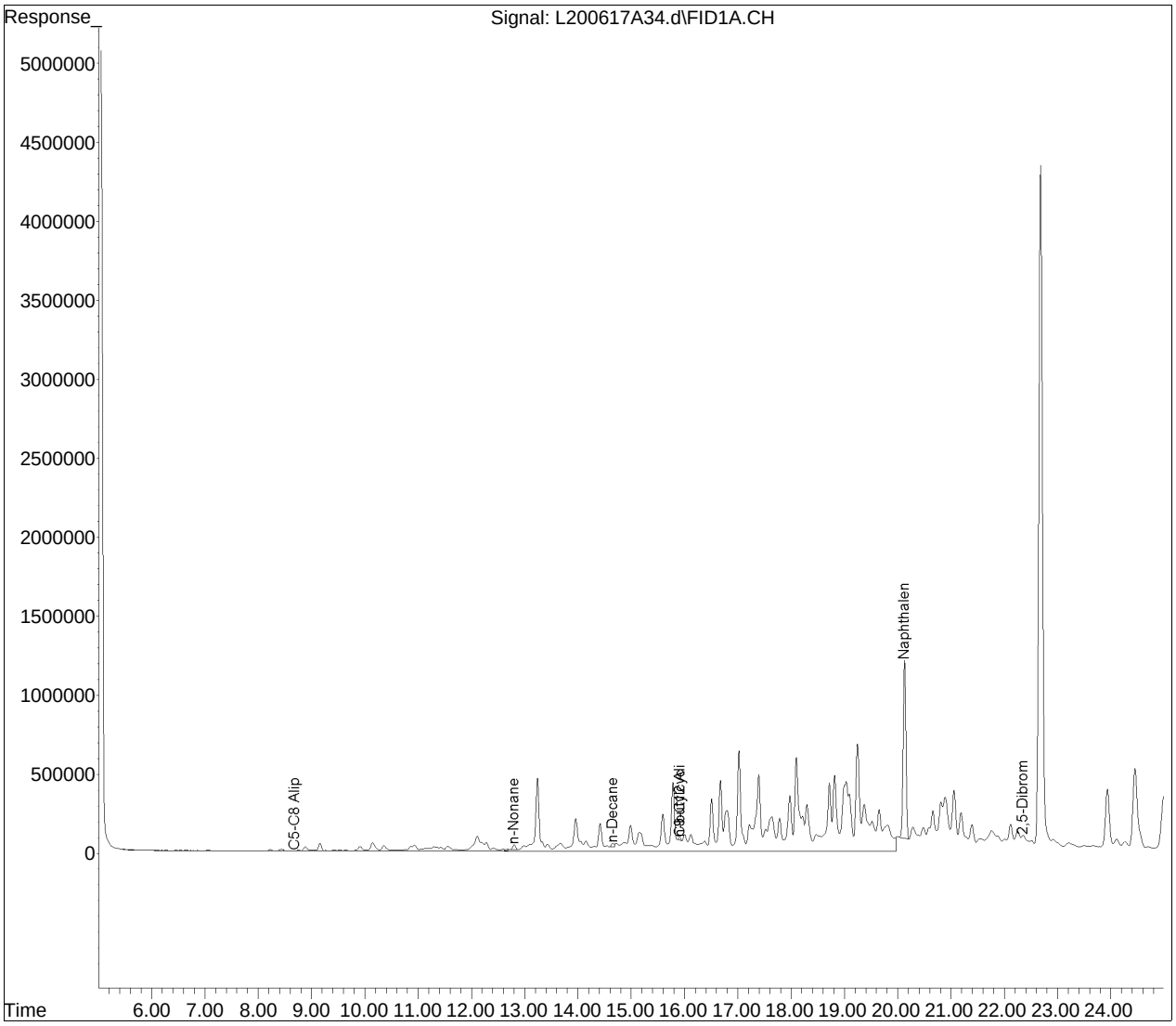
Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES_GC\LVPH\2020\200617Aali\
Data File : L200617A34.d
Signal(s) : FID1A.CH
Acq On : 18 Jun 2020 2:01 am
Operator : LVPH:BAD
Sample : l2024182-07D,41,15,18.08,0.025,,a
Misc : WG1383297,ICAL16831,VPH-75
ALS Vial : 34 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jun 18 14:11:37 2020
Quant Method : I:\VOLATILES_GC\LVPH\2020\200617Aali\svph-ali200528A.m
Quant Title : VPH ALIPHATIC
QLast Update : Fri May 29 09:09:20 2020
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Sub List : Default - All compounds listed



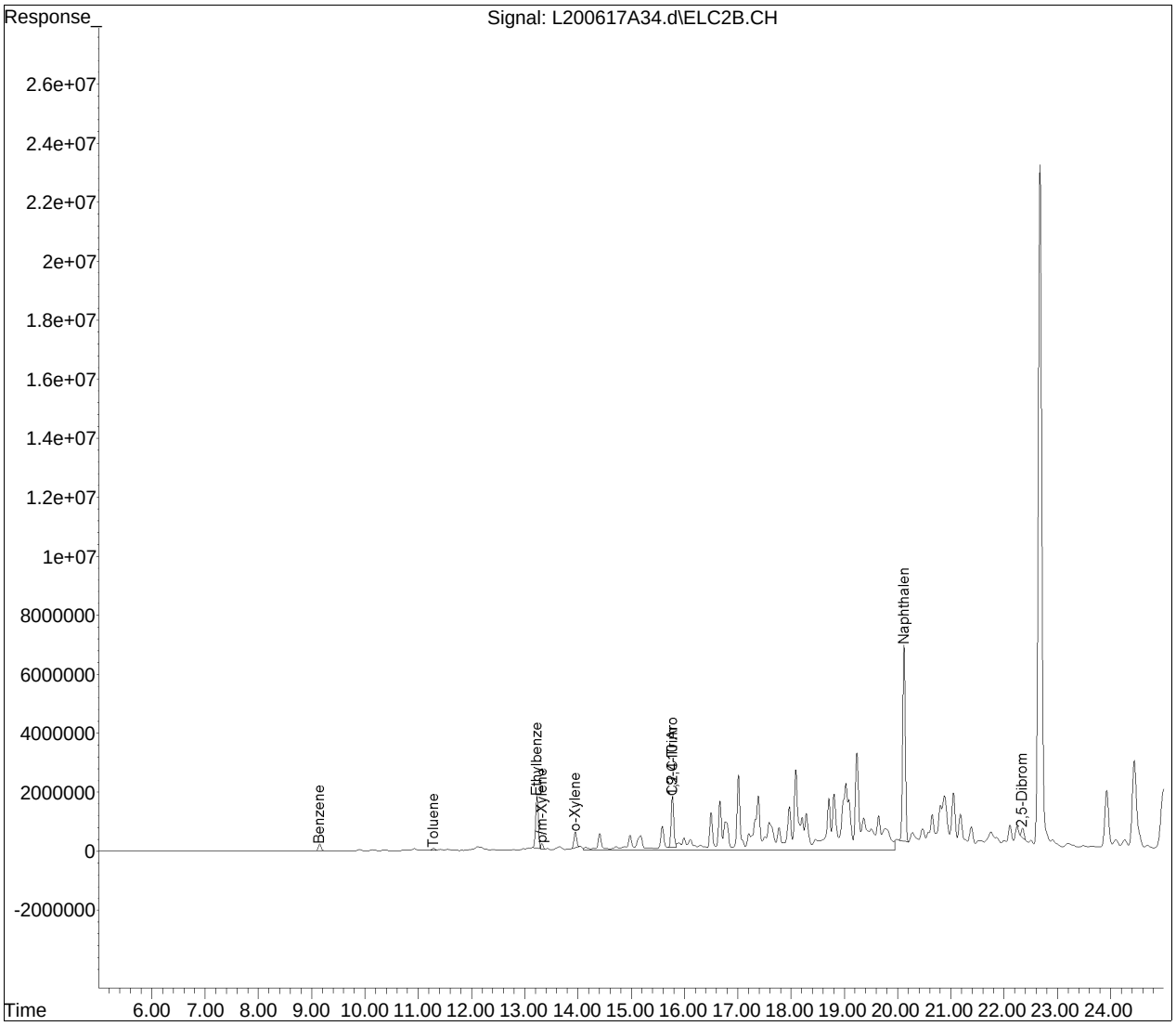
Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES_GC\LVPH\2020\200617Aaro\
Data File : L200617A34.d
Signal(s) : ELC2B.CH
Acq On : 18 Jun 2020 2:01 am
Operator : LVPH:BAD
Sample : l2024182-07D,41,15,18.08,0.025,,a
Misc : WG1383297,ICAL16832,VPH-75
ALS Vial : 0 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jun 18 15:00:48 2020
Quant Method : I:\VOLATILES_GC\LVPH\2020\200617Aaro\svph-aro200528A.m
Quant Title : VPH AROMATIC
QLast Update : Fri May 29 09:20:31 2020
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Sub List : Default - All compounds listed



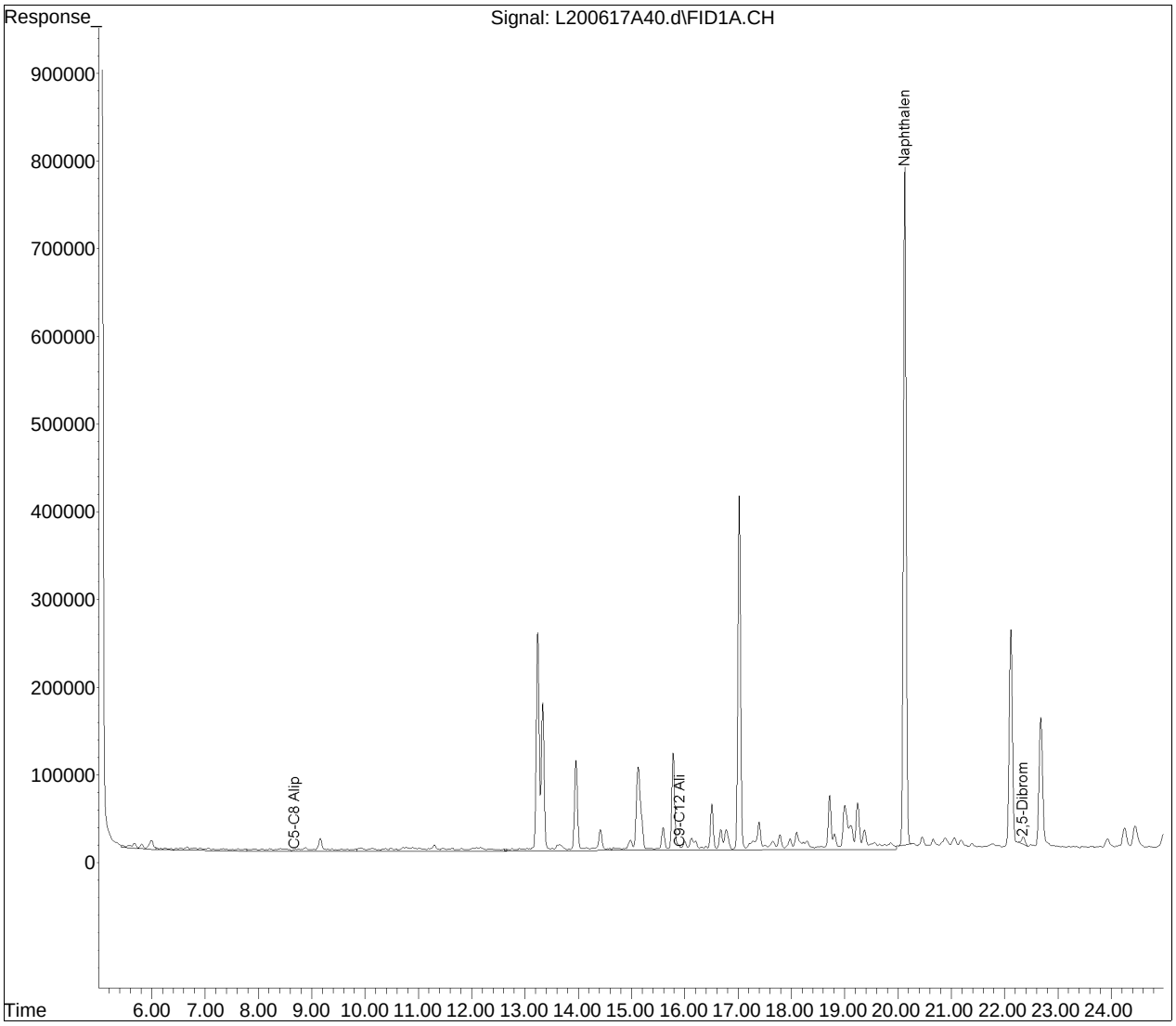
Quantitation Report (QT Reviewed)

Data Path : I:\VOLATILES_GC\LVPH\2020\200617Aali\
Data File : L200617A40.d
Signal(s) : FID1A.CH
Acq On : 18 Jun 2020 5:05 am
Operator : LVPH:BAD
Sample : l2024182-10D,41,15,19.45,0.005,,a
Misc : WG1383297,ICAL16831,VPH-75
ALS Vial : 40 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jun 18 14:15:05 2020
Quant Method : I:\VOLATILES_GC\LVPH\2020\200617Aali\svph-ali200528A.m
Quant Title : VPH ALIPHATIC
QLast Update : Fri May 29 09:09:20 2020
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

Sub List : Default - All compounds listed



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October 16, 2020
File No. 01.0172397.10

Mr. Stephen Leblanc
221 Essex Street
Haverhill, MA 01832

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
284 Winter Street
Haverhill, Massachusetts
191/221 Essex Street Groundwater Sampling

Dear Mr. Leblanc:

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling was described in our September 8, 2020 letter and is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the 284 Winter Street site that is being completed by Boston Gas Company d/b/a National Grid (National Grid).

GZA collected groundwater samples from monitoring wells installed on the 221 Essex Street property and adjacent to the property line between the 191 and 221 Essex Street properties on September 15, 2020 and submitted them to Alpha Analytical of Mansfield, Massachusetts for analysis by the relevant Massachusetts Department of Environmental protection (MassDEP) methods. Extracted data from the analytical laboratory report applicable to the above referenced wells (GZ-2 and GZ-1A) are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be submitted to MassDEP. We have also enclosed a copy of the MassDEP transmittal form (BWSC123). As part of this work a second round of groundwater sampling is anticipated to be performed in November 2020.

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC123 Form
Site Plan
Laboratory Reports (Work Order No. L2038556)

cc: Amy Willoughby (National Grid)

J:\170,000-179,999\172397\172397-10.KM\Data Transmittals\No. 4 - Groundwater Sampling\221 Essex Street\Haverhill Winter St_Leblanc_Phase II Data Transmittal 10-20.docx

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Mr. Stephen Leblanc
2. Street Address: 221 Essex Street

City/Town: Haverhill Zip Code: 01832

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 191 and 221 Essex Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of groundwater samples from monitoring wells installed on the 191 and 221 Essex Street Properties.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby
Street Address: 280 Melrose Street
City/Town: Providence, RI Zip Code: 02907
Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Exploration Location Plan

Approximate locations of explorations performed at the 191 and 221 Essex Street Properties. GZA-2 and GZA-1A were completed as groundwater monitoring wells.

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F: 781.278.5702
www.gza.com

December 17, 2020
File No. 01.0172397.10

Mr. Stephen Leblanc
221 Essex Street
Haverhill, MA 01832

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
284 Winter Street
Haverhill, Massachusetts
191/221 Essex Street Groundwater Sampling

Dear Mr. Leblanc:

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling was described in our September 8, 2020 letter and is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the 284 Winter Street site that is being completed by Boston Gas Company d/b/a National Grid (National Grid).

GZA collected groundwater samples from monitoring wells installed on the 221 Essex Street property and adjacent to the property line between the 191 and 221 Essex Street properties on November 23, 2020 and submitted them to Alpha Analytical of Westborough, Massachusetts for analysis by the relevant Massachusetts Department of Environmental protection (MassDEP) methods. Extracted data from the analytical laboratory report applicable to the above referenced wells (GZ-2 and GZ-1A) are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be submitted to MassDEP. We have also enclosed a copy of the MassDEP transmittal form (BWSC123). Detectable concentrations of the constituents of concern for the 284 Winter Street site were not reported in the groundwater samples collected from your property on November 23, 2020. At this time, we do not anticipate any further groundwater sampling at your property.

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC123 Form
Site Plan
Laboratory Report Excerpts (Work Order No. L2052184)

cc: Amy Willoughby (National Grid)

J:\170,000-179,999\172397\172397-10.KM\Data Transmittals\No. 4 - Groundwater Sampling\221 Essex Street\Haverhill Winter St_Leblanc_Phase II Data Transmittal 10-20.docx

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Mr. Stephen Leblanc
2. Street Address: 221 Essex Street

City/Town: Haverhill Zip Code: 01832

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 191 and 221 Essex Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of groundwater samples from monitoring wells installed on the 191 and 221 Essex Street Properties.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby
Street Address: 280 Melrose Street
City/Town: Providence, RI Zip Code: 02907
Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Exploration Location Plan

Approximate locations of explorations performed at the 191 and 221 Essex Street Properties. GZA-2 and GZA-1A were completed as groundwater monitoring wells.

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July 28, 2020
File No. 01.0172397.10

Mr. David A. Vasta
5 Heron Cove Road
Windham, NH 03087

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
35 Lafayette Square
Haverhill, Massachusetts
Little River Sediment and Surface Water Sampling

Dear Mr. Vasta:

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling was described in our June 2, 2020 letter and is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the referenced property that is being completed by Boston Gas Company d/b/a National Grid (National Grid).

GZA collected a sediment sample from within the Little River adjacent to the 35 Lafayette Square property on June 9, 2020 and submitted it to Alpha Analytical of Mansfield, Massachusetts for analysis by the relevant Massachusetts Department of Environmental protection (MassDEP) methods. Extracted data from the analytical laboratory reports applicable to the above referenced property are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be submitted to MassDEP. We have also enclosed a copy of the MassDEP transmittal form (BWSC123).

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC123 Form
Site Plan
Laboratory Reports (Work Order No. L2024182)

cc: Amy Willoughby (National Grid)
J:\170,000-179,999\172397\172397-10.KM\Data Transmittals\No. 3 - Sediment and Surface Water Sampling\35 Lafayette Square\Haverhill Winter St_Vasta_Phase II Data Transmittal No. 1_07282020 text.docx

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Mr. David Asta
2. Street Address: 5 Heron Cove Road

City/Town: Windham Zip Code: 030087

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 35 Lafayette Square

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of sediment and surface water samples within the Little River at the 284 Winter Street Property.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby
Street Address: 280 Melrose Street
City/Town: Providence, RI Zip Code: 02907
Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

SITE PLAN

NOTE: Location of SAMPLE 5C is shown as an approximate location within the Little River.

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249 Vanderbilt Avenue
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F: 781.278.5701
F: 781.278.5702
www.gza.com

March 10, 2020
File No. 01.0172397.10

Haffner Realty Trust
c/o Ms. Sarah T. Connolly, Esq.
Nixon Peabody LLP
53 State Street
Boston, Massachusetts 02109

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
284 Winter Street
Haverhill, Massachusetts

Dear Attorney Connolly:

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling was part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the referenced property that is being completed under a November 2019 agreement between Haffner Realty Trust (HRT) and Boston Gas Company d/b/a National Grid (National Grid).

GZA is conveying the results of environmental samples collected from HRT property during the initial portion of the Phase II CSA in January and February 2020. GZA collected soil, soil vapor, and groundwater samples and submitted them to either ESS Laboratory in Cranston, Rhode Island or Alpha Analytical of Mansfield, Massachusetts for analysis by the relevant Massachusetts Department of Environmental protection (MassDEP) methods. Copies of the analytical laboratory reports are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be provided to HRT later in 2020. We have also enclosed a copy of the MassDEP transmittal form (BWSC123).

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC123 Form
Laboratory Reports (Work Order Nos. 20A0729, 20A0786, L2006496, and L2006490)

cc: Amy Willoughby (National Grid)
Robin Main (Hinckley Allen)
Ruth H. Silman and Donald D. Cooper (Nixon Peabody)

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An Equal Opportunity Employer M/F/V/H

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Haffners Realty Trust C/o Ms. Ruth H. Silman, Esq

2. Street Address: 100 Summer Street

City/Town: Boston, MA Zip Code: 02110

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Soil, groundwater, and soil vapor samples within 284 Winter Street property.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby, Boston Gas Company d/b/a National

Street Address: 40 Sylvan Road

City/Town: Waltham, MA Zip Code: 02451

Telephone: (781) 907-3644 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

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F: 781.278.5701
F: 781.278.5702
www.gza.com

June 1, 2020
File No. 01.0172397.10

Haffner Realty Trust
c/o Ms. Sarah T. Connolly, Esq.
Nixon Peabody LLP
53 State Street
Boston, Massachusetts 02109

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
284 Winter Street
Haverhill, Massachusetts

Dear Attorney Connolly:

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the referenced property that is being completed under a November 2019 agreement between Haffner Realty Trust (HRT) and Boston Gas Company d/b/a National Grid (National Grid).

GZA is conveying the results of environmental samples collected from HRT property during a second round of groundwater sampling under the Phase II CSA in May 2020. GZA collected groundwater samples and submitted them to Alpha Analytical of Mansfield, Massachusetts for analysis by the relevant Massachusetts Department of Environmental protection (MassDEP) methods. A copy of the analytical laboratory report is attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be provided to HRT later in 2020. We have also enclosed a copy of the MassDEP transmittal form (BWSC123).

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Charles A. Lindberg

Charles A. Lindberg, LSP
Senior Principal

Attachments: BWSC123 Form
Laboratory Reports (Work Order No. L2019097)

cc: Amy Willoughby (National Grid)
Robin Main (Hinckley Allen)
Ruth H. Silman and Donald D. Cooper (Nixon Peabody)

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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Haffner Realty Trust c/o Ms. Sarah T. Connolly, Esq.
2. Street Address: 53 State Street

City/Town: Boston Zip Code: 02109

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of groundwater samples within 284 Winter Street Property.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby

Street Address: 280 Melrose Street

City/Town: Providence, RI Zip Code: 02907

Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

9 Water Street, First Floor
Amesbury, Massachusetts 01913
978.792.5737

December 21, 2021

Mr. David A. Vasta
5 Heron Cove Road
Windham, NH 03087

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
35 Lafayette Square
Haverhill, Massachusetts
Little River Sediment Sampling

Dear Mr. Vasta,

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the referenced property that is being completed by Boston Gas Company d/b/a National Grid (National Grid).

Anchor QEA collected sediment samples from within the Little River adjacent to the 35 Lafayette Square property on September 30, 2021, and submitted it to Alpha Analytical of Westborough, Massachusetts for chemical analysis and GeoTesting Express of Acton, Massachusetts for physical property testing. Extracted data from the laboratory reports applicable to the above reference property are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be submitted to MassDEP. We have also enclosed a copy of the MassDEP transmittal form (BWSC123).

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Sincerely,

Billie-Jo L Gauley

Billie-Jo L. Gauley
Anchor QEA, LLC

cc: Charles A. Lindberg, LSP (GZA GeoEnvironmental, Inc.)
Jesse Edmands (National Grid)
Amy Willoughby (National Grid)

Attachments

BWSC123 Form – Notice of Environmental Sampling
Sediment Core Location Map
Analytical Data

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Mr. David Asta
2. Street Address: 5 Heron Cove Road

City/Town: Windham Zip Code: 030087

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 35 Lafayette Square

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of sediment samples within the Little River at the 284 Winter Street Property.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby
Street Address: 280 Melrose Street
City/Town: Providence, RI Zip Code: 02907
Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

LEGEND:

- Approximate Sediment Core Location (September 2021)
- Tax Parcel
- Tax Parcel of Focus
- Tax Parcel Sample Area

NOTES:

1. Sediment core locations are based on visual observations and are shown as an approximate location within the Little River.
2. Horizontal datum is Massachusetts State Plane, North American Datum of 1983, U.S. Feet.
3. Aerial image is acquired from MassGIS at https://www.mass.gov/info-details/massgis-data-layers. Image date is 2019.
4. Tax parcels acquired from MassGIS at https://massgis.maps.arcgis.com on August 27, 2019.

0 50
Feet

Publish Date: 2021/12/02, 8:49 AM | User: epipkin
Filepath: Q:\Jobs\National_Grid_0327\284_Winter_Street\Maps\Data Transmittal Letter\AQ_284_WinterSt_Sample_Properties.mxd

ANCHOR QEA

Figure 1
Sediment Core Location Map
Data Transmittal Letter

9 Water Street, First Floor
Amesbury, Massachusetts 01913
978.792.5737

December 21, 2021

Mr. Joseph Alosky
Trustee, Alosky Realty Trust
203 Essex Street
Haverhill, MA 01832

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
191 Essex Street
Haverhill, Massachusetts
Little River Sediment Sampling

Dear Mr. Alosky,

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling was described in the Access Agreement dated March 2, 2020, amended August 19, 2020, and is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the referenced property that is being completed by Boston Gas Company d/b/a National Grid (National Grid).

Anchor QEA collected a sediment sample from within the Little River adjacent to the 191 Essex Street property on September 28, 2021, and submitted it to Alpha Analytical of Westborough, Massachusetts for chemical analysis. Extracted data from the analytical laboratory reports applicable to the above reference property are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be submitted to MassDEP. We have also enclosed a copy of the MassDEP transmittal form (BWSC123).

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Sincerely,

Billie-Jo L Gauley

Billie-Jo L. Gauley
Anchor QEA, LLC

cc: Charles A. Lindberg, LSP (GZA GeoEnvironmental, Inc.)
Amy Willoughby (National Grid)
Jesse Edmands (National Grid)
Jason Alosky (Jason@spool.com)

Attachments

BWSC123 Form – Notice of Environmental Sampling
Sediment Core Location Map
Analytical Data

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Mr. Joseph Alosky
2. Street Address: 203 Essex Street

City/Town: Haverhill Zip Code: 01832

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 191 Essex Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of sediment samples within the Little River at the 284 Winter Street Property.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby
Street Address: 280 Melrose Street
City/Town: Providence, RI Zip Code: 02907
Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

LEGEND:

- Approximate Sediment Core Location (September 2021)
- Tax Parcel
- Tax Parcel of Focus
- Tax Parcel Sample Area

NOTES:

1. Sediment core locations are based on visual observations and are shown as an approximate location within the Little River.
2. Horizontal datum is Massachusetts State Plane, North American Datum of 1983, U.S. Feet.
3. Aerial image is acquired from MassGIS at https://www.mass.gov/info-details/massgis-data-layers. Image date is 2019.
4. Tax parcels acquired from MassGIS at https://massgis.maps.arcgis.com on August 27, 2019.

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Filepath: Q:\Jobs\National_Grid_0327\284_Winter_Street\Maps\Data Transmittal Letter\AQ_284_WinterSt_Sample_Properties.mxd

ANCHOR QEA

Figure 1
Sediment Core Location Map
Data Transmittal Letter

9 Water Street, First Floor
Amesbury, Massachusetts 01913
978.792.5737

December 21, 2021

Mr. Stephen Leblanc
221 Essex Street
Haverhill, MA 01832

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
221 Essex Street
Haverhill, Massachusetts
Little River Sediment Sampling

Dear Mr. Leblanc,

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling was described in the Access Agreement dated February 13, 202, amended August 7, 2020, and is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the referenced property that is being completed by Boston Gas Company d/b/a National Grid (National Grid).

Anchor QEA collected a sediment sample from within the Little River adjacent to the 221 Essex Street property on September 28, 2021, and submitted it to Alpha Analytical of Westborough, Massachusetts for chemical analysis and GeoTesting Express of Acton, Massachusetts for physical property testing. Extracted data from the laboratory reports applicable to the above reference property are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be submitted to MassDEP. We have also enclosed a copy of the MassDEP transmittal form (BWSC123).

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Sincerely,

Billie-Jo L Gauley

Billie-Jo L. Gauley
Anchor QEA, LLC

cc: Charles A. Lindberg, LSP (GZA GeoEnvironmental, Inc.)
Jesse Edmands (National Grid)
Amy Willoughby (National Grid)

Attachments

BWSC123 Form – Notice of Environmental Sampling
Sediment Core Location Map
Analytical Data

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Mr. Stephen Leblanc
2. Street Address: 221 Essex Street

City/Town: Haverhill Zip Code: 01832

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 221 Essex Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of sediment samples within the Little River at the 284 Winter Street Property.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby
Street Address: 280 Melrose Street
City/Town: Providence, RI Zip Code: 02907
Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

LEGEND:

- Approximate Sediment Core Location (September 2021)
- Tax Parcel
- Tax Parcel of Focus
- Tax Parcel Sample Area

NOTES:

1. Sediment core locations are based on visual observations and are shown as an approximate location within the Little River.
2. Horizontal datum is Massachusetts State Plane, North American Datum of 1983, U.S. Feet.
3. Aerial image is acquired from MassGIS at https://www.mass.gov/info-details/massgis-data-layers. Image date is 2019.
4. Tax parcels acquired from MassGIS at https://massgis.maps.arcgis.com on August 27, 2019.

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Filepath: Q:\Jobs\National_Grid_0327\284_Winter_Street\Maps\Data Transmittal Letter\AQ_284_WinterSt_Sample_Properties.mxd

ANCHOR QEA

Figure 1
Sediment Core Location Map
Data Transmittal Letter

9 Water Street, First Floor
Amesbury, Massachusetts 01913
978.792.5737

December 21, 2021

FTG Realty LLC c/o Steven Pascoe
82 Wendell Avenue, Suite 100
Pittsfield, MA 01201
pasinvestments142@gmail.com

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
Assessor's Parcel Numbers 515-296-8 and 515-296-9 Essex Street
Haverhill, Massachusetts
Little River Sediment Sampling

Dear Mr. Pascoe,

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling was described in the Access Agreement transmitted via email on September 24, 2021, with access authorized via email on September 30, 2021, for one day of sampling. The sampling is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the referenced property that is being completed by Boston Gas Company d/b/a National Grid (National Grid).

Anchor QEA collected a sediment sample from within the Little River adjacent to the Assessor's Parcel Numbers 515-296-8 and 515-296-9 Essex Street property on September 30, 2021, and submitted it to Alpha Analytical of Westborough, Massachusetts for chemical analysis. Extracted data from the analytical laboratory reports applicable to the above reference property are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be submitted to MassDEP. We have also enclosed a copy of the MassDEP transmittal form (BWSC123).

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Sincerely,

Billie-Jo L Gauley

Billie-Jo L. Gauley
Anchor QEA, LLC

cc: Charles A. Lindberg, LSP (GZA GeoEnvironmental, Inc.)
Amy Willoughby (National Grid)
Jesse Edmands (National Grid)

Attachments

BWSC123 Form – Notice of Environmental Sampling
Sediment Core Location Map
Analytical Data

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: FTG Realty LLC c/o Steven Pascoe
2. Street Address: 82 Wendell Avenue, Suite 100

City/Town: Pittsfield Zip Code: 01201

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 235 Essex Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of sediment samples within the Little River at 284 Winter Street property.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby
Street Address: 280 Melrose Street
City/Town: Providence, RI Zip Code: 02907
Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

LEGEND:

- Approximate Sediment Core Location (September 2021)
- Tax Parcel
- Tax Parcel of Focus
- Tax Parcel Sample Area

NOTES:

1. Sediment core locations are based on visual observations and are shown as an approximate location within the Little River.
2. Horizontal datum is Massachusetts State Plane, North American Datum of 1983, U.S. Feet.
3. Aerial image is acquired from MassGIS at https://www.mass.gov/info-details/massgis-data-layers. Image date is 2019.
4. Tax parcels acquired from MassGIS at https://massgis.maps.arcgis.com on August 27, 2019.

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Filepath: Q:\Jobs\National_Grid_0327\284_Winter_Street\Maps\Data Transmittal Letter\AQ_284_WinterSt_Sample_Properties.mxd

ANCHOR QEA

Figure 1
Sediment Core Location Map
Data Transmittal Letter

9 Water Street, First Floor
Amesbury, Massachusetts 01913
978.792.5737

ANCHOR QEA

December 21, 2021

Haffner Realty Trust
c/o Ms. Sarah T. Connolly, Esq., Trustee
Nixon Peabody LLP
53 State Street
Boston, Massachusetts 02109

Re: Results of Environmental Analyses
Release Tracking Number (RTN) 3-32792
284 Winter Street
Haverhill, Massachusetts
Little River Sediment Sampling

Dear Attorney Connolly,

Massachusetts regulations require that results of environmental sample analyses be provided to any owner of property where samples are collected as part of a response action under the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000). These notice requirements are contained in the MCP (310 CMR 40.1403[10]). The sampling is part of a Phase II Comprehensive Site Assessment (Phase II CSA) of the referenced property that is being completed by Boston Gas Company d/b/a National Grid (National Grid).

Anchor QEA collected sediment samples from within the Little River adjacent to the 284 Winter Street property on September 28, 29, and 30, 2021, and submitted it to Alpha Analytical of Westborough, Massachusetts for chemical analysis and GeoTesting Express of Acton, Massachusetts for physical property testing. Extracted data from the laboratory reports applicable to the above reference property are attached to this letter; the results will be summarized and discussed in a Phase II CSA report that will be submitted to MassDEP. We have also enclosed a copy of the MassDEP transmittal form (BWSC123).

Please note that public involvement opportunities are available under 310 CMR 40.1403(9) and 40.1404. For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, please refer to the following MassDEP web address https://www.mass.gov/orgs/bureau-of-waste-site-cleanup-massdep.

Sincerely,

Billie-Jo L Gauley

Billie-Jo L. Gauley
Anchor QEA, LLC

cc: Charles A. Lindberg, LSP (GZA GeoEnvironmental, Inc.)
Amy Willoughby (National Grid)
Jesse Edmands (National Grid)
Robin Main and Christine Dieter (Hinckley Allen)
Donald D. Cooper (Nixon Peabody)

Attachments

BWSC123 Form – Notice of Environmental Sampling
Sediment Core Location Map
Analytical Data

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

A. The address of the disposal site related to this Notice and Release Tracking Number (provided above):

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

B. This notice is being provided to the following party:

1. Name: Haffner Realty Trust c/o Ms. Sarah T. Connolly, Esq.
2. Street Address: 53 State Street

City/Town: Boston Zip Code: 02109

C. This notice is being given to inform its recipient (the party listed in Section B):

☑ 1. That environmental sampling will be/has been conducted at property owned by the recipient of this notice.

☑ 2. Of the results of environmental sampling conducted at property owned by the recipient of this notice.

☑ 3. Check to indicate if the analytical results are attached. (If item 2. above is checked, the analytical results from the environmental sampling must be attached to this notice.)

D. Location of the property where the environmental sampling will be/has been conducted:

1. Street Address: 284 Winter Street

City/Town: Haverhill Zip Code: 01832

2. MCP phase of work during which the sampling will be/has been conducted:

☐ Immediate Response Action
☐ Release Abatement Measure
☐ Utility-related Abatement Measure
☐ Phase I Initial Site Investigation
☑ Phase II Comprehensive Site Assessment
☐ Phase III Feasibility Evaluation
☐ Phase IV Remedy Implementation Plan
☐ Phase V/Remedy Operation Status
☐ Post-Temporary Solution Operation, Maintenance and Monitoring
☐ Other _____ (specify)

3. Description of property where sampling will be/has been conducted:

☐ residential ☑ commercial ☐ industrial ☐ school/playground ☐ Other _____ (specify)

4. Description of the sampling locations and types (e.g., soil, groundwater, indoor air, soil gas) to the extent known at the time of this notice.

Collection of sediment samples within the Little River at the 284 Winter Street Property.

E. Contact information related to the party providing this notice:

Contact Name: Amy Willoughby

Street Address: 280 Melrose Street

City/Town: Providence, RI Zip Code: 02907

Telephone: (401) 258-5410 Email: amy.willoughby@nationalgrid.com

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC123

This Notice is Related to:
Release Tracking Number

3 - 32792

NOTICE OF ENVIRONMENTAL SAMPLING

As required by 310 CMR 40.1403(10) of the Massachusetts Contingency Plan

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1403(10). The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party who is addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form. (The regulations refer to the area where the oil or hazardous material is present as the "disposal site".)

PURPOSE OF THIS NOTICE

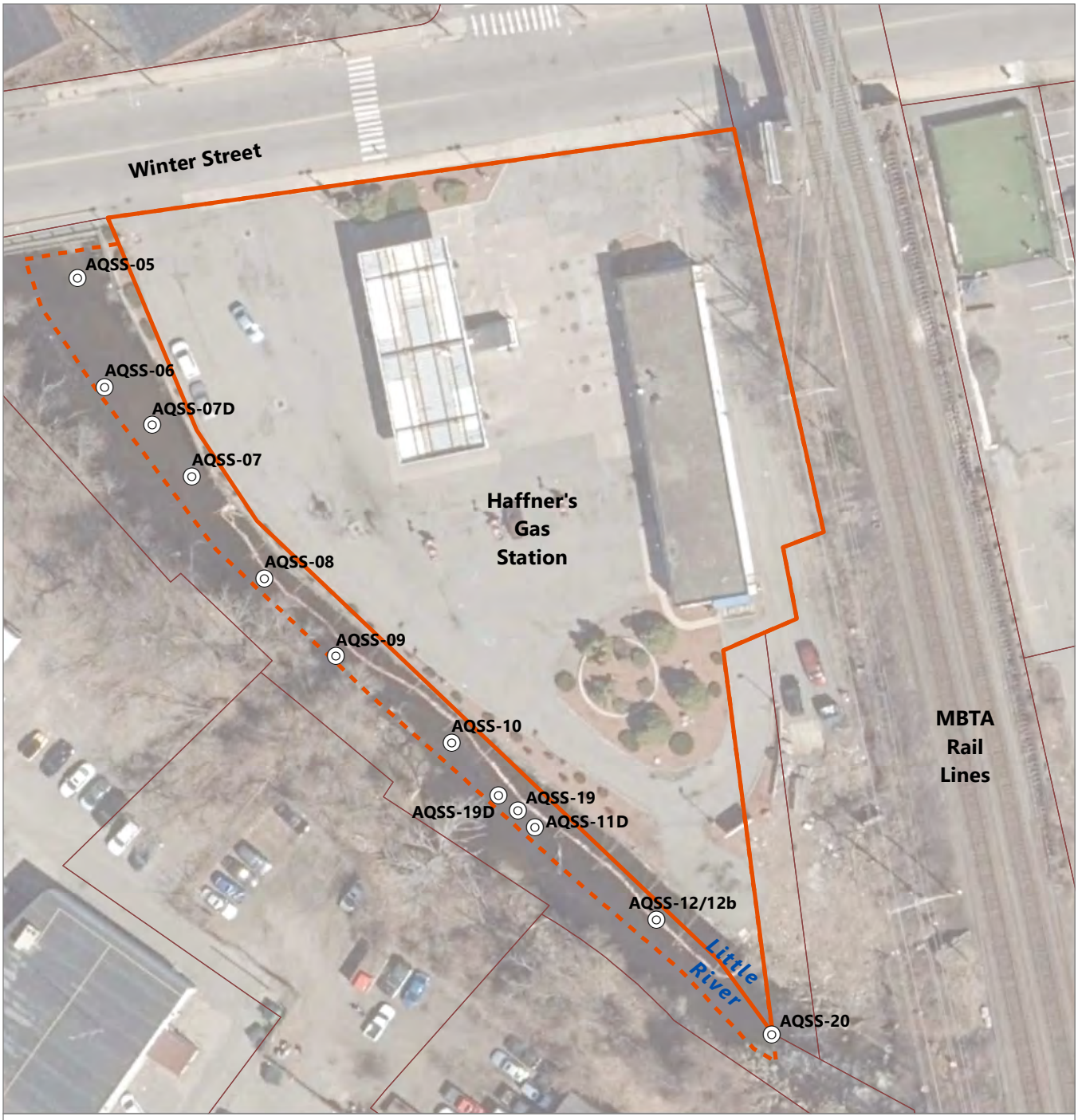
When environmental samples are taken as part of an investigation of a release for which a notification to MassDEP has been made under the Massachusetts Contingency Plan (310 CMR 40.0300) on behalf of someone other than the owner of the property, the regulations require that the property owner (listed in **Section B** on the reverse side of this form) be given notice of the environmental sampling. The regulations also require that the property owner subsequently receive the analytical results following the analysis of the environmental samples.

Section C on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time. If you are receiving this notice to inform you of the analytical results following the analysis of the environmental samples, you should also have received, as an attachment, a copy of analytical results. These results should indicate the number and type(s) of samples (e.g., soil, groundwater) analyzed, any chemicals identified, and the measured concentrations of those chemicals.

Section D on the reverse side of this form identifies the property where the environmental sampling will be/has been conducted, provides a description of the sampling locations within the property, and indicates the phase of work under the Massachusetts Contingency Plan regulatory process during which the samples will be/were collected.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup. For more information regarding this notice, you may contact the party listed in **Section E** on the reverse side of this form. Information about the disposal site identified in Section A is also available in files at the Massachusetts Department of Environmental Protection. See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.



LEGEND:

- Approximate Sediment Core Location (September 2021)
- Tax Parcel
- Tax Parcel of Focus
- Tax Parcel Sample Area

NOTES:

1. Sediment core locations are based on visual observations and are shown as an approximate location within the Little River.
2. Horizontal datum is Massachusetts State Plane, North American Datum of 1983, U.S. Feet.
3. Aerial image is acquired from MassGIS at https://www.mass.gov/info-details/massgis-data-layers. Image date is 2019.
4. Tax parcels acquired from MassGIS at https://massgis.maps.arcgis.com on August 27, 2019.

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Filepath: Q:\Jobs\National_Grid_0327\284_Winter_Street\Maps\Data Transmittal Letter\AQ_284_WinterSt_Sample_Properties.mxd

ANCHOR QEA

Figure 1
Sediment Core Location Map
Data Transmittal Letter

GZA GeoEnvironmental, Inc.