Evaluation of Specific Volatile Organic Compounds in Occupied Buildings at the former Sunoco Philadelphia Refinery

Sunoco, Inc. (R&M) Philadelphia Refinery Remediation Program

Philadelphia, Pennsylvania

Prepared for:

Sunoco, Inc. (R&M)
10 Industrial Highway MS4
Lester, Pennsylvania 19029

March 22, 2013

Project Number: 213402094

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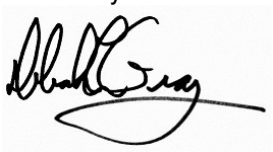

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Executive Summary

On Wednesday, October 24 and Thursday, October 25, 2012, Stantec Consulting Services Inc. (Stantec) conducted a comprehensive study of airborne volatile organic compounds (VOCs) in occupied buildings at the former Sunoco, Inc. (R&M) Philadelphia Refinery, now Philadelphia Energy Solutions (PES) Refining and Marketing (R&M) LLC, located at 3144 Passyunk Avenue, Philadelphia, Pennsylvania (the refinery). The study was conducted as part of Sunoco's participation in a real estate and refinery operation transaction. The study was performed to document the concentration of a number of specific chemicals which may be present inside occupied buildings from refinery activities or related refinery conditions.

Methodology

An initial site visit was conducted on September 18 and 19, 2012 by Stantec and Sunoco to select the occupied buildings to be evaluated and to determine the tentative number and locations of samples to be collected during the study. Based on the initial site visit, a sampling plan was subsequently developed which specified collection of air samples inside occupied buildings on the refinery property for analysis of petroleum-related VOCs in air utilizing United States Environmental Protection Agency (US EPA) Method TO-15 for analysis. This method calls for the collection of air samples into specially prepared vacuum SUMMA canisters (or cans). The sampling plan also specified collection of these air samples over a four (4) hour period to accommodate the possible variability in ambient VOC concentrations.

Samples were collected inside occupied areas of the selected buildings and outdoor air samples were collected for comparison. Thirty-four (34) samples were collected inside buildings and seven (7) samples outdoors. Three (3) trip blanks were also submitted for analysis. Compounds of interest for this study were consistent with the Pennsylvania Department of Environmental Protection's (PADEP) Short List of Petroleum Products, specifically: methyl tert-butyl ether (MTBE), 1,2-dichloroethane, benzene, toluene, 1,2-dibromoethane (ethylene dibromide), ethylbenzene, xylenes, isopropylbenzene (cumene), 1,2,4-trimethylbenzene (1,2,4-TMB), and 1,3,5-trimethylbenzene (1,3,5-TMB). The concentrations of VOCs detected in each sample of indoor and outdoor air were compared to occupational exposure limits (OELs) and risk-based screening levels published by US EPA and PADEP. Summary statistics were calculated to compare the ranges of concentrations of VOCs found in indoor air to concentrations in outdoor air.

Results

The concentrations of all compounds detected in indoor and outdoor air were many orders of magnitude less than the Occupational Safety and Health Administration (OSHA) Permissible

Exposure Limit (PEL) time-weighted averages (TWAs) and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs®) TWA.

The maximum concentrations of all compounds detected in all samples were equal to (benzene only) or less than the corresponding risk-based US EPA Regional Screening Levels (RSLs) and the PADEP Indoor Air Quality (IAQ) criteria for exposure in industrial environments. Note that the US EPA RSL concentrations for chemicals with cancer health effects (MTBE, benzene, and ethylbenzene) were multiplied by a factor of ten (10) to reflect a target cancer risk of 1 in 100,000 or 1E-05 which is consistent with the Pennsylvania risk-based standards.

There were notable differences in the concentrations of most of the compounds detected inside the individual buildings that are not evident from the arithmetic means of the analytical results for all indoor air samples. Specifically, the highest concentrations of benzene were found in the Point Breeze Lab samples (11 and 8.4 µg/m^3) and the 440 Building samples (9 and 7.2 µg/m^3). The highest concentrations of toluene (88 and 330 µg/m^3), ethylbenzene (11 and 6 µg/m^3), total xylenes (51.1 and 31.6 µg/m^3) were found in the PB Lab samples (west lab and 2nd floor office, respectively). The highest concentrations of 1,3,5-TMB (3.9 µg/m^3) and 1,2,4-TMB (11 µg/m^3) were found in the PB Lab, 2nd floor office sample although the PB Lab, west lab sample was not significantly different than other indoor air sample locations.

The concentrations of benzene, toluene, ethylbenzene, xylenes, and trimethylbenzenes in buildings other than the 440 Building and the PB Lab were comparable to the concentrations in outdoor air.

Conclusions

The findings of this evaluation indicate that the indoor and outdoor concentrations of VOCs associated with refinery operations were orders of magnitude lower than occupational exposure limits, and lower than or equal to (benzene only) conservative risk-based screening levels published by US EPA and PADEP for long-term exposures in industrial settings. Note that the US EPA RSL concentrations for chemicals with cancer health effects were adjusted to be consistent with the Pennsylvania risk-based standards. Assuming that the concentrations of petroleum-related VOCs found inside the occupied buildings in late October 2012 are representative of long-term conditions, there do not appear to be health concerns for people who work inside the buildings from exposure to these chemicals.

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1.0 Introduction

Stantec Consulting Services Inc. (Stantec) conducted a comprehensive study of airborne volatile organic compounds (VOCs) in occupied buildings at the former Sunoco, Inc. (R&M) Philadelphia Refinery, now Philadelphia Energy Solutions (PES) Refining and Marketing (R&M) LLC, located at 3144 Passyunk Avenue, Philadelphia, Pennsylvania (the refinery). The study was conducted as part of Sunoco's participation in a real estate and refinery operation transaction. The study was performed to document the concentration of a number of specific chemicals that may be present inside occupied buildings from refinery activities or related refinery conditions.

During a real estate and operational transition involving a facility such as this refinery, the potential for residual chemical exposure in occupied buildings exists and it is reasonable to assess the potential adverse health risk.

This facility refines, processes, and blends transportation fuels. The chemicals of interest for this study were consistent with the Pennsylvania Department of Environmental Protection (PADEP) Table IV-9 Short List of Petroleum Products (PADEP 2004), specifically: methyl tertiary-butyl ether (MTBE), 1,2-dichloroethane, benzene, toluene, 1,2-dibromoethane (ethylene dibromide), ethylbenzene, xylenes, isopropylbenzene (cumene), 1,2,4-trimethylbenzene (1,2,4-TMB), and 1,3,5-trimethylbenzene (1,3,5-TMB). Although the PADEP Table IV-9 Short List is for analysis of soil and water samples, all of the compounds listed for water except naphthalene, are volatile compounds of interest in air.

An initial site visit was conducted on Tuesday, September 18, and Wednesday, September 19, 2012 by Jim Oppenheim (Sunoco), Jennifer Menges (Stantec), and John Reiter (Stantec) to select the occupied buildings where sampling would be conducted and to determine the tentative number and locations of samples to be collected during the study. The sampling plan developed based on this initial site visit, and subsequently implemented by Stantec field staff in cooperation with refinery personnel in October 2012, specified collection of air samples inside occupied buildings on the refinery property for analysis of concentrations of VOCs in air by United States Environmental Protection Agency (US EPA) Method TO-15 (US EPA 1999).

US EPA Method TO-15 calls for the collection of air samples into specially prepared vacuum SUMMA canisters (or cans). The sampling plan specified collection of these air samples over a four (4) hour period of time to accommodate the possible variability in ambient VOC concentrations. Samples were collected inside occupied areas of the buildings and outside samples were collected for comparison. Thirty-four (34) samples were collected inside of buildings and seven (7) samples were collected outdoors. Three (3) trip blanks were also submitted for laboratory analysis.

Analytical results were compared to occupational exposure limits (OELs), specifically the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs) and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values

(TLVs®). Results were also compared to current (November 2012) US EPA risk-based Regional Screening Levels (RSL) for industrial occupancies and PADEP Indoor Air Quality (IAQ) criteria for industrial occupancies. Additionally, PADEP-referenced odor thresholds were cited.

2.0 Chemical Constituents and Applicable Exposure Limits

The facility is a refinery that processes and blends large quantities of petroleum-based transportation fuels. The refining and blending processes generate the volatile petroleum-based organic compounds of interest for this investigation. In addition to being flammable, these volatile compounds may cause adverse health effects ranging from upper respiratory tract irritation at lower concentrations of exposure to more severe effects such as central nervous system depression or intoxication at high concentrations of exposure. Benzene is also considered to be a human carcinogen based on epidemiologic studies demonstrating an increased risk for acute myelogenous leukemia in occupational cohorts exposed to high concentrations (e.g. exceeding approximately 10 parts per million (ppm)) over many years (ATSDR 2007). The potential for adverse health effects correlates with increasing concentrations and duration of exposure.

All of the compounds monitored in this study have relevant occupational standards and risk-based screening levels. The OELs were developed based on the precept that nearly all persons may be exposed to a concentration of the chemical at or below the exposure limit, day after day, week after week, for a working lifetime, without experiencing any adverse health effects due to the chemical exposure.

Risk-based screening levels are concentrations of chemicals in environmental media (soil, ambient air, and drinking water) that correspond to pre-determined levels of cancer risk and/or non-cancer hazard, under the assumption that an individual will be exposed daily over thirty (30) years (residential) or twenty-five (25) years working life-time. Two sources of risk-based screening concentrations are presented in this report: US EPA RSLs and PADEP IAQ criteria. All screening concentrations used to evaluate sampling results were developed for exposures in industrial settings.

The US EPA RSLs have been harmonized across US EPA Regions and are generally accepted as a quick and conservative method for initial evaluation of constituents found in environmental media. RSLs are presented by the US EPA as being protective for members of the general population (including sensitive groups) over a lifetime. Thus concentrations of chemicals in environmental media that are less than the RSLs are believed to be of no concern for public health. Concentrations of chemicals above conservative RSLs do not necessarily mean that health effects will occur as a result of exposure, but that further evaluation of the situation should be considered. There are carcinogenic target risk (TR) screening concentrations and non-carcinogenic hazard index (HI) screening concentrations. All chemicals produce non-cancer health effects at some level of exposure and some may also be carcinogenic. Screening concentrations generally (although not always) reflect the more sensitive outcome and lowest associated concentration.

Although the non-residential PADEP IAQ criteria were developed under the Pennsylvania Land Recycling Program to assist in the evaluation of vapor intrusion into non-residential buildings, these risk-based concentrations are analogous to US EPA RSLs and provide additional references for evaluating the results of the samples collected during this study.

3.0 Sampling Methodology

3.1 COLLECTION OF AMBIENT AIR SAMPLES

Ambient air samples were prepared by first checking the laboratory-provided SUMMA canister vacuum using a digital gauge and documenting the pre-sample pressure. Flow regulators with integral pressure gauges were attached to the canisters and tightened by hand. Sampling was initiated by opening the SUMMA canister valve to its fully open position.

Samples were collected at breathing zone height by placing the SUMMA canisters on elevated surfaces so that the sample collection intake ports were approximately three (3) to six (6) feet above the ground or floor surface. Samples were collected for approximately four (4) hours. While grab samples may have been sufficient, sample durations were intentionally longer to provide some assurance that if the concentration of the compound(s) were variable, the sample would be representative.

Samples were collected at indoor and outdoor locations previously selected and discussed during the initial site visit and sampling plan development. However, since sample conditions are dynamic and may have been different at the time of sample collection, the field technicians used their best judgment in sample location selection and, as a result, some locations may be different than originally planned. Three (3) trip blanks were provided to the lab for analysis.

3.2 QUALITY ASSURANCE PROCEDURES FOR SAMPLE COLLECTION

Sample quality assurance encompasses procedures used for pre-sample preparation; handling of samples before, during, and after collection; elimination of potential cross contamination; and elimination of collection of interfering compounds or materials. The need for some of these is unnecessary when using SUMMA canisters due the inherent relatively failsafe technology.

Flow rate and volume are not critical since the sample methodology is for whole air (i.e., a prescribed total volume) regardless of the rate of sampling or total volume of air collected. The flow regulators provide an approximate canister fill time. Following sample completion the final pressure is recorded for assurance that air was indeed collected into the canister.

Contemporary sampling media provides little opportunity for cross-contamination or external contamination. SUMMA canisters were cleaned and prepared by the analytical laboratory in a manner consistent and appropriate for re-use and the methodology and compounds selected for analysis.

Onsite recordkeeping included SUMMA can serial number, flow controller serial number, start time, stop time, total sample time, location of sample, pre-sample pressure, post-sample pressure, and notes pertaining to the location of the sample. This information is provided in Table 1.

The laboratory received the samples according to their strict receipt requirements and documentation. A *Sample Acceptance Check Form* is provided with the laboratory analytical reports provided in Appendix A.

4.0 Sampling Locations

Figure 1 illustrates the locations of buildings in which samples were collected and outside sample locations. The indoor sample locations were selected during the initial site visit by Jim Oppenheim (Sunoco), Jennifer Menges (Stantec), and John Reiter (Stantec). The indoor sample locations were selected based on the current and anticipated occupancy and use of the buildings, populations in the buildings, and locations of occupants within the buildings. The number and locations of indoor air samples per building were selected to be representative of conditions and potential exposure to the building occupants. Outdoor sample locations were selected based on the proximity to buildings in which samples were collected, and in some instances, proximity to pumping and product handling equipment. The number and locations of outdoor air samples were selected to be representative of petroleum-related compounds in ambient air that may contribute to the presence of the same compounds in indoor air.

Samples were collected in building locations identified in Table 1 and shown on Figure 1. Indoor air samples were collected in the following locations:

- Blending & Shipping (B&S) Office
- 24 Gate Building
- Girard Point (GP) Training Building
- GP Main Office Building
- 440 Building
- 15 Pump House
- North Yard Scale House
- Schuylkill River Tank Farm (SRTF) Propane Loading
- SRTF Main Pump House
- Point Breeze (PB) Main Office Building
- PB Lab
- PB Refinery Hall
- PB Maintenance Shop

Duplicate samples were collected in the 24 Gate Building (1st floor), the GP Main Office Building (2nd floor east), and the PB Refinery Hall (2nd floor east wing).

Outdoor samples were collected in the following locations:

- near the B&S Office
- outside the GP Main Office Building
- outside 15 Pump House, under the equipment roof at grade
- outside 15 Pump House, under the equipment roof approximately eight (8) to ten (10) feet below grade
- outside the North Yard Scale House
- outside the SRTF Main Pump House
- outside in the PB gate area, near the PB buildings

5.0 Analytical Results

Table 1 lists the sample location, date of sampling, start time, stop time, total sample duration, canister ID, regulator ID, pre-sample pressure, and post-sample pressure. Table 2 presents the analytical results for each indoor and outdoor sample location. Summary statistics for indoor and outdoor air samples are presented in Table 3 along with occupational exposure standards and risk-based screening concentrations. Laboratory analytical reports are provided in Appendix A.

The table below presents the arithmetic mean for all compounds detected in two (2) or more samples, or the only concentration detected. The maximum detected concentrations are shown below the means in bold, italic font. Two (2) of the compounds of interest, 1,2-dichloroethane and 1,2-dibromoethane were not detected in any of the samples and are not included on this summary table. The three (3) duplicate samples corresponding to sample numbers 3, 15, and 40 on Table 2 yielded analytical results that were virtually identical to the results of the corresponding "sample" and are not factored into the summary statistics.

Summary of Air Sampling Results [1)]

Compound	OSHA PEL [2)]	ACGIH TLV [3)]	RSL Ind. [4)]	PADEP Ind. [5)]	Indoor		Outdoor	
					Freq. Detect	Concentration (mean / ***max***)	Freq. Detect	Concentration (mean / ***max***)
MTBE [6)]	—	1.8E+05	4.7E+02	3.1E+02	2/34	1.28E+00 ***1.6E+00***	0/7	—
Benzene	3.19E+03	1.6E+03	1.6E+01	1.1E+01	34/34	2.9E+00 ***1.1E+01***	6/7	2.62E+00 ***4.9E+00***
Ethylbenzene	4.34E+05	8.68E+04	4.90E+01	7.30E+01	30/34	1.77E+00 ***1.1E+01***	2/7	1.97E+00 ***3.1E+00***
Toluene	7.54E+05	7.54E+05	2.20E+04	1.20E+03	34/34	1.88E+01 ***3.3E+02***	7/7	7.61E+00 ***1.9E+01***
Xylenes	4.34E+05	4.34E+05	4.40E+02	3.00E+02	34/34	7.50E+00 ***5.11E+01***	5/7	6.55E+00 ***1.71E+01***
Cumene	2.46E+05	2.46E+05	1.80E+03	1.10E+03	17/34	1.42E+00 ***2.6E+00***	1/7	2.0E+00 ***2.0E+00***
1,3,5-TMB [7)]	—	1.23E+05	3.10E+01	1.70E+01	7/34	1.53E+00 ***3.9E+00***	1/7	1.6E+00 ***1.6E+00***
1,2,4-TMB [8)]	—	1.23E+05	3.10E+01	1.70E+01	31/34	1.96E+00 ***1.1E+01***	4/7	1.69E+00 ***3.6E+00***

Footnotes:

1) All concentrations, including those for occupational standards are given in µg/m^3
2) OSHA Permissible Exposure Limit (PEL)
3) ACGIH Threshold Limit Value (TLV)
4) EPA Regional Screening Level (RSL) for industrial exposure
5) Pennsylvania Department of Environmental Protection IAQ criteria for industrial exposure
6) methyl tert-butyl ether
7) 1,3,5-trimethylbenzene (RSL for 1,2,4-trimethylbenzene)
8) 1,2,4-trimethylbenzene

The analytical results are discussed in the following sections with concentrations provided in micrograms per cubic meter (µg/m^3).

5.1 COMPARISON OF INDOOR AIR SAMPLES

5.1.1 Indoor Air Samples

Of the ten (10) compounds analyzed (m,p-xylenes and o-xylene were combined into total xylenes), 1,2-dichloroethane and 1,2-dibromoethane were not detected in any sample and MTBE was detected only in two (2) samples, both on the second floor of the PB Refinery Hall. Benzene, toluene, and xylene were detected in the majority of the indoor and outdoor samples. No compounds were detected in the trip blanks.

There were notable differences in the concentrations of most of the compounds detected inside the individual buildings that are not evident from the arithmetic means of the analytical results for all indoor air samples. Specifically, the highest concentrations of benzene were found in the PB Lab samples (11 and 8.4 µg/m^3) and the 440 Building samples (9 and 7.2 µg/m^3). The highest concentrations of toluene (88 and 330 µg/m^3), ethylbenzene (11 and 6 µg/m^3), total xylenes (51.1 and 31.6 µg/m^3) were found in the PB Lab samples (west lab and 2nd floor office, respectively). The highest concentrations of 1,3,5-TMB (3.9 µg/m^3) and 1,2,4-TMB (11 µg/m^3) were found in the PB Lab, 2nd floor office sample although the PB Lab, west lab sample was not significantly different than other indoor air sample locations.

MTBE was detected only in samples collected in the PB Refinery Hall building (2nd floor, both conference room and east wing) and was undetected in any other inside or outside sample.

The concentrations of benzene, toluene, ethylbenzene, xylenes, and trimethylbenzenes in buildings other than the 440 Building and the PB Lab were similar to the concentrations in outdoor air. As shown in the table below, the range of concentrations detected in air samples from the 440 Building and the PB Lab are compared to the range of concentrations found in all of the other buildings (as a group; not including non-detects) from which samples were collected.

Range of Concentrations Detected in Indoor Air by Building [1)]

Compound	440 Building		PB Lab		All Other Buildings		Outdoor	
	low	high	low	high	low	high	low	high
MTBE [2)]	—	—	—	—	0.96	1.6	—	—
Benzene	7.2	9.0	8.4	11	0.94	4.3	1.2	4.9
Ethylbenzene	0.97	1.8	6.0	11	0.74	2.9	0.83	3.1
Toluene	8.2	8.3	88	330	3.6	14	2.0	19
Xylenes	4.4	5.8	31.6	51.1	2.5	14.7	2.0	17.1
Cumene	1.9	2.5	1.3	2.6	0.77	2.1	2.0	2.0
1,3,5-TMB [3)]	—	—	1.4	3.9	0.87	1.3	1.6	1.6
1,2,4-TMB [4)]	1.2	1.3	3.9	11	0.78	4.0	0.92	3.6

Footnotes:

1) All concentrations are given in µg/m^3
2) methyl tert-butyl ether
3) 1,3,5-trimethylbenzene
4) 1,2,4-trimethylbenzene

It is apparent that the concentrations of VOCs found indoors on the second floor of the PB Lab were higher than in the other buildings and higher than outdoor air. In particular, the lowest concentrations of ethylbenzene, toluene, and total xylenes detected in the PB Lab were higher than the highest concentrations of those same compounds found in all other buildings combined. These results indicate that sources in the PB Lab were likely contributing to the concentrations of VOCs in this space.

5.1.2 Outdoor Ambient Air Samples

From the discussion above, it can be seen that the range of VOC concentrations detected in samples of outdoor air overlap the range of the same compounds detected in air from all of the buildings except for the PB Lab. While benzene, toluene, xylenes, and 1,2,4-TMB were found in more than 50% of the outdoor air samples as shown in Table 3, MTBE, cumene, and 1,3,5-TMB were less prevalent in outdoor air than in indoor air.

With the exceptions of the 440 Building and the PB Lab noted previously, the range of concentrations of VOCs were similar in indoor and outdoor air.

6.0 Comparison of Inside Samples to Applicable Exposure Limits

6.1 OCCUPATIONAL EXPOSURE LIMITS

OELs published as OSHA PELs and ACGIH TLVs® are presented in Table 3 for all constituents for which these were available. ACGIH TLVs are health-based values and refer to concentrations of chemicals to which it is believed nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without adverse health effects. The majority of OSHA PELs are based on 1969 TLVs with the exception that some have been updated as chemical-specific standards to reflect more current toxicological data and research (e.g., benzene).

As shown by Table 3, the concentrations of all detected compounds inside the buildings and in outdoor air samples are more than 100 times lower than the lowest OEL (benzene).

6.2 RISK-BASED SCREENING LEVELS

US EPA RSLs and PADEP IAQ criteria concentrations for exposure to constituents in air in industrial settings are presented on Table 3 and discussed briefly below.

6.2.1 US EPA RSLs

US EPA RSLs for carcinogenic chemicals are derived to correspond to an excess lifetime cancer risk of 1 in 1,000,000 (1 in 1 million or 1E-06) for a person (receptor) who is assumed to be exposed to that concentration over an extended period of time (twenty-five (25) years for industrial). The RSL concentrations for cancer health effects (MTBE, benzene, and ethylbenzene) were multiplied by a factor of 10 to correspond to the Pennsylvania target risk of 1 in 100,000 (1 in one hundred thousand or 1E-05). To put the conservatism of the risk-based screening levels for cancer health effects into perspective, between 1 in 4 and 1 in 3 people in the United States develop some type of cancer during their lifetime.

RSLs for chemicals that produce adverse non-cancer effects are concentrations that are very unlikely to produce health effects in people who are exposed over many years. Concentrations of constituents below applicable RSL concentrations are generally not considered to be of concern for public health. Concentrations above RSLs do not necessarily mean that adverse health effects will occur, but do indicate that additional evaluation may be appropriate. All RSL concentrations for non-cancer health effects (toluene, all xylene isomers, cumene and both trimethylbenzene isomers) correspond to a Hazard Quotient (HQ) of 1.0. The HQ is the ratio of the potential exposure to the chemical on a daily basis to the level of exposure at which no non-cancer adverse health effects would be expected to occur. Like the risk-based screening levels for cancer as a health outcome, screening levels for non-cancer health effects are also extremely conservative (protective). No adjustments to non-cancer screening level concentrations were required because both the EPA RSLs and PADEP IAQ criteria were derived to correspond to HQ of 1.0.

6.2.2 PADEP Indoor Air Quality Criteria

Similar to the US EPA RSLs, the PADEP IAQ criteria for evaluating vapor intrusion into non-residential buildings are derived using risk-based algorithms. The concentrations correspond to a target cancer risk of 1E-05 and HQ of 1.0. These values were developed as guidelines for remediation and were published in the Land Recycling Program Technical Guidance Manual (January 24, 2004). For the majority of the compounds found in this investigation, the US EPA RSLs and PADEP IAQ criteria values are similar. The most notable exception is toluene, where the EPA RSL is approximately ten (10) times higher than the PADEP IAQ criteria. It should also be noted that the PADEP criteria were published in 2004 and the EPA RSLs are current as of November 2012.

The PADEP odor thresholds are also shown on Table 3. None of the petroleum-related compounds selected for analysis in indoor or outdoor samples were detected in concentrations approaching or exceeding these published odor thresholds.

6.2.3 Comparison of Results to Risk-Based Screening Levels

As can be seen from Table 3, none of the concentrations of VOCs detected in either samples of indoor air or outdoor air were higher than the corresponding risk-based screening levels for long-term exposure in an industrial setting. The highest concentration of benzene found in the second floor of the PB Lab (11 µg/m^3) was equal to the PADEP industrial (non-residential) IAQ criteria, but slightly less than the current (November 2012) EPA RSL (16 µg/m^3) adjusted to a cancer risk of 1E-05.

7.0 Summary and Conclusions

With the exception of the concentrations of all chemicals found in the air of the PB Lab, and for benzene in the 440 Building, the average indoor concentrations of VOCs were similar to the average outdoor concentrations.

The concentrations of all chemicals detected in indoor and outdoor air were several orders of magnitude less than the OSHA PEL TWAs and the ACGIH TLV® TWAs. No concentration of any chemical remotely approached the corresponding odor threshold listed by PADEP.

The maximum concentrations of all chemicals detected in all samples were equal to (benzene in the PB Lab) or less than the corresponding conservative risk-based US EPA RSL and the PADEP IAQ criteria for exposure in industrial environments. Note that the US EPA RSL concentrations for chemicals with cancer health effects (MTBE, benzene, and ethylbenzene) were multiplied by a factor of ten (10) to reflect a target cancer risk of 1 in 100,000 or 1E-05 which is consistent with the Pennsylvania risk-based standards. US EPA RSLs are derived to correspond to a target cancer risk of 1 in 1,000,000 or 1E-06. Non-cancer screening criteria (toluene, xylenes, 1,3,5-TMB and 1,2,4-TMB) correspond to a HQ of 1.0.

In general, the concentrations of petroleum-related VOCs found in the air inside and outside of the buildings were low, considering that the facility is a petroleum refinery. The concentrations of individual VOCs found during this investigation can be put into perspective by comparing the results to regional ambient air concentrations reported by PADEP.

Regional ambient air quality in the Philadelphia area where the refinery is located is best represented by data from the Marcus Hook monitoring station (latitude 39.8178, longitude -75.4142). The table below shows the arithmetic mean indoor and outdoor concentrations of benzene, toluene, ethylbenzene, xylenes (m-, p- isomers), 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene documented at the facility alongside regional outdoor air concentrations from the Marcus Hook monitoring station (PADEP 2003).

Comparison of Concentrations Detected to Regional Air [1)]

Compound	***Facility Results [2)]***		***Marcus Hook [3)]***
	Indoors	***Outdoors***	
Benzene	2.9 (±2.45)	2.62 (±1.48)	2.84
Ethylbenzene	1.77 (±1.99)	1.97 (±1.61)	0.91
Toluene	18.77 (±56.76)	7.61 (±5.65)	5.46
Xylenes (m,p)	5.67 (±7.44)	4.86 (±4.59)	2.91
1,3,5-TMB [4)]	1.53 (±1.06)	1.6	0.34
1,2,4-TMB [5)]	1.96 (±1.91)	1.69 (±1.29)	0.88

Footnotes:

1) All concentrations are given in µg/m^3
2) *Mean (Standard Deviation)* values from Table 3
3) From PADEP 2003
4) 1,3,5-trimethylbenzene
5) 1,2,4-trimethylbenzene

As would be expected, the concentrations of petroleum-related compounds in the outdoor air at the facility were somewhat higher than regional background. However, the average concentrations of benzene in both indoor and outdoor air at the facility were similar to the annual average concentration reported for the Marcus Hook monitoring station in 2000 (PADEP 2003). As discussed previously, the arithmetic mean of the toluene concentrations from all of the indoor air samples is highly influenced by the concentrations detected in the PB Lab.

In conclusion, the findings of this study show that the concentrations of volatile organic compounds associated with refinery operations found in indoor and outdoor air were orders of magnitude lower than occupational exposure standards, and lower than or equal to (benzene only) conservative risk-based screening levels published by US EPA and PADEP for long-term exposures in industrial (non-residential) settings. The concentrations of petroleum-related compounds detected in the air inside occupied buildings on the former Sunoco Philadelphia Refinery are not anticipated to pose an adverse health risk for persons working in those buildings.

8.0 References

Agency for Toxic Substances and Disease Registry (ATSDR), Toxicological Profile for Benzene, August, 2007.

American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances, ACGIH Publication No. 0113, 2013.

Pennsylvania Department of Environmental Protection (PADEP), Bureau of Land Recycling and Land Management, Technical Guidance Manual-Section IV.A.4 Vapor Intrusion into Buildings from Groundwater and Soil under the Act 2 Statewide Health Standard. Table 3-Indoor Air Criteria, January 24, 2004.

Pennsylvania Department of Environmental Protection, Southern Delaware County Air Monitoring Project, Third Interim Report. Table 2.3, July 31, 2003. (http://www.dep.state.pa.us/dep/deputate/airwaste/aq/toxics/projects/sdel/sdelrpt3.pdf)

Code of Federal Regulations Chapter 29 Part 1910, Occupational Safety and Health Standards, Subpart Z – Toxic and Hazardous Substances, Table Z-1 Limits for Air Contaminants. (http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9992)

US EPA Regional Screening Levels Table, November 2012.

US EPA, Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition. Compendium Method TO-15. Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/ Mass Spectrometry (GC/MS). January 1999.

FIGURE

SOURCE: BASEMAP PROVIDED BY LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES

N

LEGEND

- OUTDOOR AIR SAMPLING LOCATION
- AREA OF INTEREST
- BUILDING LOCATION FOR INDOOR AIR SAMPLING

FIGURE 1

SITE PLAN

FOR SUNOCO

Sunoco, Inc. (R&M)
Philadelphia Refinery
3144 Passyunk Avenue
Philadelphia, PA. 19145

0 250 500 FEET

SCALE: AS SHOWN
DATE: 8/29/2013
DRN: TFB
CHD: JLM

TABLES

Table 1: Sample Locations and Parameters - Sunoco Philadelphia Refinery									
Sample No.	**Location/Description**	**Date**	**Start Time**	**Stop Time**	**Sample Duration (hr:min)**	**Canister ID**	**Regulator ID**	**Pre-Sample Pressure, (PSI) [1]**	**Post-Sample Pressure, (PSI) [1]**
1	B&S Office	10/24/2012	10:35	14:35	4:00	AC01003	FCA00317	29.5	8.0
2	B&S Office (outside)	10/24/2012	10:37	14:39	4:02	AC00760	FCA00595	29.5	13.0
3	24 Gate Building (1st floor)	10/24/2012	10:50	14:50	4:00	AC01853	FCA00134	29.5	7.0
4	24 Gate Building (2nd floor)	10/24/2012	10:52	14:52	4:00	AC01010	FCA00188	29.6	7.3
5	GP Training Building (1st floor vending area)	10/24/2012	11:07	15:07	4:00	AC01928	FCA00161	29.5	9.0
6	GP Training Building (1st floor west)	10/24/2012	11:10	15:10	4:00	AC01669	FCA00564	29.5	9.0
7	GP Training Building (3rd floor gym)	10/24/2012	11:12	15:13	4:01	AC00641	FCA00023	29.5	6.5
8	GP Training Building (basement)	10/24/2012	11:10	15:16	4:06	AC00747	FCA00604	29.5	7.5
9	GP Main Office Building (basement west)	10/24/2012	12:26	16:26	4:00	AC01113	FCA00575	29.5	7.0
10	GP Main Office Building (basement center)	10/24/2012	12:31	16:31	4:00	AC01436	FCA00521	29.4	10.0
11	GP Main Office Building (basement east)	10/24/2012	12:33	16:33	4:00	AC01376	FCA00349	29.4	8.0
12	GP Main Office Building (1st floor entrance)	10/24/2012	12:36	16:37	4:01	AC00672	FCA00198	29.4	4.8
13	GP Main Office Building (1st floor west)	10/24/2012	12:48	16:48	4:00	AC00475	FCA00402	29.5	3.5
14	GP Main Office Building (2nd floor west)	10/24/2012	12:54	16:54	4:00	AC01263	FCA00516	29.4	9.5
15	GP Main Office Building (2nd floor east)	10/24/2012	12:40	16:40	4:00	AC01145	FCA00374	29.4	6.5
16	GP Main Office Building (outside west)	10/24/2012	12:44	16:44	4:00	AC00782	FCA00298	29.6	0.0
17	440 Building (2nd floor Room 221, inspection)	10/24/2012	13:10	17:10	4:00	AC01215	FCA00365	29.5	8.0
18	440 Building (2nd floor meeting room)	10/24/2012	13:13	17:13	4:00	AC01670	FCA00319	29.6	5.5
19	15 Pump House (inside)	10/24/2012	13:27	17:27	4:00	AC01930	FCA00016	29.5	7.0
20	15 Pump House (under roof w/ pump equipment, approximately 8-10' below grade)	10/24/2012	13:30	17:30	4:00	AC01420	FCA00397	29.5	6.3
21	15 Pump House (outside, at grade)	10/24/2012	13:35	17:35	4:00	AC01464	FCA00034	29.5	3.0
22	North Yard Scale House (inside)	10/24/2012	13:51	17:51	4:00	AC00590	FCA00168	29.5	7.8
23	North Yard Scale House (outside)	10/25/2012	8:17	12:18	4:01	AC01664	FCA00422	29.0	11.0
24	“Trip blank,” regulator attached, unopened	10/25/2012	---	---	---	AC01830	FCA00480	29.4	29.4

Table 1: Sample Locations and Parameters - Sunoco Philadelphia Refinery

Sample No.	Location/Description	Date	Start Time	Stop Time	Sample Duration (hr:min)	Canister ID	Regulator ID	Pre-Sample Pressure, (PSI) [1]	Post-Sample Pressure, (PSI) [1]
25	"Trip blank," regulator attached, unopened	10/25/2012	---	---	---	AC01093	FCA00058	29.5	29.5
26	SRTF Propane Loading (inside)	10/25/2012	8:59	12:59	4:00	AC00540	FCA00482	29.3	8.5
27	SRTF Main Pump House (inside)	10/25/2012	9:07	13:08	4:01	AC01810	FCA00609	29.4	8.0
28	SRTF Main Pump House (outside)	10/25/2012	9:10	13:10	4:00	AC01350	FCA00454	29.5	5.0
29	PB Main Office Building, (safety office)	10/25/2012	8:23	12:23	4:00	AC00716	FCA00239	29.5	0.0
30	PB Main Office Building, (medical area)	10/25/2012	8:29	12:29	4:00	AC00501	FCA00015	29.5	6.0
31	PB Main Office Building, (1st floor lobby)	10/25/2012	8:34	12:34	4:00	AC00765	FCA00303	29.5	5.8
32	PB Main Office Building,(1st floor east wing)	10/25/2012	8:37	12:37	4:00	AC01403	FCA00432	29.5	10.0
33	PB Main Office Building, (1st floor west wing)	10/25/2012	8:41	12:41	4:00	AC01573	FCA00449	29.5	3.0
34	PB Main Office Building, (2nd floor west wing)	10/25/2012	8:44	12:44	4:00	AC00947	FCA00632	29.5	5.0
35	PB Main Office Building, (2nd floor center file room)	10/25/2012	8:48	12:48	4:00	AC00033	FCA00473	29.5	4.0
36	PB Main Office Building, (2nd floor east conference room)	10/25/2012	8:51	12:51	4:00	AC01790	FCA00538	29.5	3.5
37	PB Lab (west lab)	10/25/2012	9:00	13:00	4:00	AC01886	FCA00274	29.5	5.0
38	PB Lab (2nd floor office)	10/25/2012	9:08	13:08	4:00	AC01487	FCA00418	29.5	4.5
39	PB Refinery Hall (2nd floor conference room)	10/25/2012	9:40	13:40	4:00	AC01115	FCA00563	29.6	6.5
40	PB Refinery Hall (2nd floor east wing)	10/25/2012	9:43	13:43	4:00	AC01243	FCA00603	29.4	2.0
41	PB Maintenance Shop (break room)	10/25/2012	9:51	13:51	4:00	AC01218	FCA00405	29.6	9.0
42	PB Maintenance Shop (office)	10/25/2012	9:55	13:55	4:00	AC01179	FCA00040	29.6	4.8
43	PB buildings (adjacent gate area)	10/25/2012	10:00	14:00	4:00	AC00870	FCA00215	29.5	6.0
44	"Trip blank," regulator attached, unopened	10/25/2012	---	---	---	AC00993	FCA00619	29.5	29.5

1. PSI = pounds per square inch

Table 2: Laboratory Analytical Results – Select Volatile Organic Compounds (VOCs) - Sunoco Philadelphia Refinery [1,2,3]

Sample	Type[4]	Location/Description	Methyl Tertiary Butyl Ether (MTBE)	1,2-dichloroethane	Benzene	Toluene	1,2 Dibromoethane	Ethylbenzene	m,p-Xylene	o-Xylene	total Xylene	Cumene	1,3,5-Trimethyl benzene	1,2,4-Trimethyl benzene
1	I	B&S Office	ND[5]	ND	4.3	7.4	ND	1.3	4.5	1.6	6.1	2.1	ND	1.5
3	I	24 Gate Building (1st floor)	ND	ND	2.1	7.0	ND	1.5	4.0	1.5	5.5	1.0	ND	1.7
4	I	24 Gate Building (2nd floor)	ND	ND	1.8	6.8	ND	1.2	3.8	1.4	5.2	ND	ND	1.5
5	I	GP Training Building (1st floor vending area)	ND	ND	3.5	7.2	ND	1.3	3.7	1.4	5.1	1.0	ND	1.6
6	I	GP Training Building (1st floor west)	ND	ND	4.2	7.5	ND	2.2	4.6	1.7	6.3	1.3	ND	1.8
7	I	GP Training Building (3rd floor gym)	ND	ND	4.2	12	ND	1.8	6.3	2.2	8.5	2.0	1.2	4.0
8	I	GP Training Building (basement)	ND	ND	3.1	7.8	ND	1.5	4.9	1.8	6.7	1.5	0.97	3.2
9	I	GP Main Office Building (basement west)	ND	ND	2.3	6.9	ND	1.3	4.2	1.5	5.7	1.4	ND	1.6
10	I	GP Main Office Building (basement center)	ND	ND	2.2	6.9	ND	1.2	3.6	1.3	4.9	1.0	ND	1.3
11	I	GP Main Office Building (basement east)	ND	ND	1.6	6.1	ND	0.86	2.7	1.0	3.7	ND	ND	0.93
12	I	GP Main Office Building (1st floor entrance)	ND	ND	1.7	6.2	ND	0.99	2.9	1.1	4.0	ND	ND	1.0
13	I	GP Main Office Building (1st floor west)	ND	ND	1.5	5.6	ND	0.86	2.6	0.96	3.56	ND	ND	ND
14	I	GP Main Office Building (2nd floor west)	ND	ND	1.6	6	ND	1.1	3.0	1.1	4.1	0.79	ND	1.0
15	I	GP Main Office Building (2nd floor east)	ND	ND	1.9	6.4	ND	1.2	3.4	1.2	4.6	1.0	ND	1.2
17	I	440 Building (2nd floor Room 221, inspection)	ND	ND	9.0	8.3	ND	1.8	4.3	1.5	5.8	2.5	ND	1.3
18	I	440 Building (2nd floor meeting room)	ND	ND	7.2	8.2	ND	0.97	3.2	1.2	4.4	1.9	ND	1.2
19	I	15 Pump House (inside)	ND	ND	3.6	14	ND	2.9	11	3.7	14.7	0.77	1.3	3.3
22	I	North Yard Scale House (inside)	ND	ND	1.7	9.2	ND	1.7	4.6	1.5	6.1	0.85	ND	1.2
26	I	SRTF Propane Loading (inside)	ND	ND	2.1	4.0	ND	0.99	3.8	1.3	5.1	1.1	ND	1.4
27	I	SRTF Main Pump House (inside)	ND	ND	2.3	3.6	ND	ND	3	1.1	4.1	ND	ND	ND
29	I	PB Main Office Building, (safety office)	ND	ND	1.6	6.5	ND	0.95	3.3	1.1	4.4	ND	ND	0.99
30	I	PB Main Office Building, (medical area)	ND	ND	1.2	4.4	ND	ND	2.3	0.87	3.17	ND	ND	1.1
31	I	PB Main Office Building, (1st floor lobby)	ND	ND	1.3	4.8	ND	ND	2.5	0.91	3.41	ND	ND	0.94
32	I	PB Main Office Building,(1st floor east wing)	ND	ND	1.3	5.2	ND	ND	2.5	ND	2.5	ND	ND	ND
33	I	PB Main Office Building, (1st floor west wing)	ND	ND	1.4	5	ND	0.93	3.5	1.1	4.6	ND	ND	0.97
34	I	PB Main Office Building, (2nd floor west wing)	ND	ND	1.3	4.9	ND	0.89	3.3	1.3	4.6	ND	ND	1.1

Table 2: Laboratory Analytical Results – Select Volatile Organic Compounds (VOCs) - Sunoco Philadelphia Refinery [1,2,3]

Sample	Type[4]	Location/Description	Methyl Tertiary Butyl Ether (MTBE)	1,2-dichloroethane	Benzene	Toluene	1,2 Dibromoethane	Ethylbenzene	m,p-Xylene	o-Xylene	total Xylene	Cumene	1,3,5-Trimethyl benzene	1,2,4-Trimethyl benzene
35	I	PB Main Office Building, (2nd floor center file room)	ND	ND	1.2	5.9	ND	1.0	3.7	1.4	5.1	ND	ND	0.95
36	I	PB Main Office Building, (2nd floor east conf. room)	ND	ND	0.94	4.0	ND	0.74	2.5	0.97	3.47	ND	ND	0.78
37	I	PB Lab (west lab)	ND	ND	11	88	ND	11	42	9.1	51.1	1.3	1.4	3.9
38	I	PB Lab (2nd floor office)	ND	ND	8.4	330	ND	6.0	24	7.6	31.6	2.6	3.9	11
39	I	PB Refinery Hall (2nd floor conference room)	0.96	ND	1.4	6.4	ND	1.1	3.9	1.4	5.3	ND	ND	1.1
40	I	PB Refinery Hall (2nd floor east wing)	1.6	ND	2.0	8.8	ND	1.4	5.4	1.8	7.2	ND	ND	1.5
41	I	PB Maintenance Shop (break room)	ND	ND	1.8	9.0	ND	1.3	5.2	1.9	7.1	ND	1.1	3.1
42	I	PB Maintenance Shop (office)	ND	ND	1.7	8.2	ND	1.1	4.6	1.7	6.3	ND	0.87	2.5
2	O	B&S Office (outside)	ND	ND	3.9	6.5	ND	ND	3.7	1.4	5.1	2.0	ND	1.3
16	O	GP Main Office Building (outside west)	ND	ND	1.3	4.6	ND	ND	2.0	ND	2.0	ND	ND	ND
20	O	15 Pump House (under roof w/ pump equipment, approximately 8-10' below grade)	ND	ND	2.1	7.4	ND	0.83	2.8	1.1	3.9	ND	ND	0.92
21	O	15 Pump House (outside, at grade)	ND	ND	4.9	19	ND	3.1	13	4.1	17.1	ND	1.6	3.6
23	O	North Yard Scale House (outside)	ND	ND	ND	3.8	ND	ND	ND	ND	ND	ND	ND	ND
28	O	SRTF Main Pump House (outside)	ND	ND	2.3	2	ND	ND	ND	ND	ND	ND	ND	ND
43	O	PB buildings (adjacent gate area)	ND	ND	1.2	10	ND	ND	2.8	0.99	3.79	ND	ND	0.93
24	TB	"Trip blank" - not opened	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
25	TB	"Trip blank" - not opened	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
44	TB	"Trip blank" - not opened	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

1. All units are in micrograms per cubic meter of air (ug/m^3) by volume
2. All samples were analyzed utilizing EPA Method TO-15.
3. Copies of Laboratory Analytical Results are provided as Appendix A.
4. "I"=Indoor air sample; "O"=Outdoor air sample; "TB"= Trip Blank, SUMMA canisters which were not opened, used for QA/QC.
5. "ND"=Non-Detect

Table 3: Summary Statistics – Select Volatile Organic Compounds (VOCs) - Sunoco Philadelphia Refinery [1,2,3]

	Analytes	Methyl Tertiary Butyl Ether (MTBE)	1,2-dichloroethane	Benzene	Toluene	1,2 Dibromoethane	Ethyl benzene	mp-Xylene	o-Xylene	total Xylene	Cumene	1,3,5-Trimethyl benzene	1,2,4-Trimethyl benzene
	Health Effects [4,5]	c	c	c	nc	c	c	nc	nc	nc	nc	nc	nc
Occupational and Risk-Based Screening Criteria													
	OSHA PELs [6]	--	2.02E+05	3.19E+03	7.54E+05	1.54E+05	4.34E+05	4.34E+05	4.34E+05	4.34E+05	2.46E+05	--	--
	ACGIH TLVs® [6]	1.80E+05	4.05E+04	1.60E+03	7.54E+04	--	8.68E+04	4.34E+05	4.34E+05	4.34E+05	2.46E+05	1.23E+05	1.23E+05
	EPA RSLs Industrial[7]	4.70E+02	7.70E+01	1.60E+01	2.20E+04	2.00E-01	4.90E+01	4.40E+02	4.40E+02	4.40E+02	1.80E+03	3.10E+01	3.10E+01
	PADEP IAQ Industrial [8]	3.10E+02	3.10E+00	1.10E+01	1.20E+03	3.70E-01	7.30E+01	3.00E+02	3.00E+02	3.00E+02	1.10E+03	1.70E+01	1.70E+01
	PADEP Odor	1.90E+02	2.40E+04	2.70E+03	6.40E+02	1.92E+05	6.08E+05	2.00E+03	2.00E+03	2.00E+03	6.00E+01	--	--
Summary Statistics for Indoor Samples													
Indoor	Number - total	34	34	34	34	34	34	34	34	34	34	34	34
	Non-Detects	32	34	0	0	34	4	0	1	0	17	27	3
	Detects	2	0	34	34	0	30	34	33	34	17	7	31
	Minimum	0.96	--	0.94	3.6	--	0.74	2.3	0.87	3.17	0.77	0.87	0.78
	Maximum	1.6	--	11	330	--	11	42	9.1	51.1	2.6	3.9	11
	Median	1.28	--	1.85	6.85	--	1.2	3.75	1.4	5.1	1.3	1.2	1.3
	Mean	1.28	--	2.90	18.77	--	1.77	5.67	1.85	7.50	1.42	1.53	1.96
	Std. Deviation	0.45	--	2.45	56.76	--	1.99	7.44	1.76	9.15	0.59	1.06	1.91
Summary Statistics for Outdoor Samples													
Outdoor	Number - total	7	7	7	7	7	7	7	7	7	7	7	7
	Non-Detects	7	7	1	0	7	5	2	3	2	6	6	3
	Detects	0	0	6	7	0	2	5	4	5	1	1	4
	Minimum	.	.	1.2	2	.	0.83	2	0.99	2.85	2	1.6	0.92
	Maximum	.	.	4.9	19	.	3.1	13	4.1	17.1	2	1.6	3.6
	Median	.	.	2.2	6.5	.	1.965	2.8	1.25	3.9	2	1.6	1.115
	Mean	.	.	2.62	7.61	.	1.97	4.86	1.90	6.55	2.00	1.60	1.69
	Std. Deviation	.	.	1.48	5.65	.	1.61	4.59	1.48	5.95	.	.	1.29

1. All units are in micrograms per cubic meter of air (ug/m^3)
2. All samples were analyzed utilizing EPA Method TO-15.
3. VOCs were not detected in any of the three "Trip Blank" SUMMA canisters.
4. "c" – EPA classifies as Carcinogen
5. "nc" – EPA classifies as Non-Carcinogen.
6. Occupational Safety and Health Permissible Exposure Limits (OSHA PELs) and American Conference of Industrial Hygienists Threshold Limit Values (TLVs®) were converted from parts per billion (ppb) to ug/m^3 using the following formula: ug/m^3=(ppb*MW)/24.45.
7. US EPA Regional Screening Levels, November 2012, adjusted to 1E-05 for carcinogens; HI of 1.0 for non-carcinogens.
8. Pennsylvania Department of Environmental Protection (PADEP), Bureau of Land Recycling and Land Management, Technical Guidance Manual-Section IV.A.4 Vapor Intrusion into buildings from Groundwater and Soil under the Act 2 Statewide Health Standard. January 24, 2004 (Table 3-Indoor Air Criteria).

APPENDIX A

LABORATORY REPORT

November 8, 2012

John Reiter
Stantec Consulting Services, Inc.
12075 Corporate Pkwy, Ste. 200
Mequon, WI 53092

RE: Sunoco IH Air Testing / 213402094

Dear John:

Enclosed are the results of the samples submitted to our laboratory on October 31, 2012. For your reference, these analyses have been assigned our service request number P1204493.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA200007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L11-203; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-12-3; Minnesota Department of Health, NELAP Certificate No. 362188; Washington State Department of Ecology, ELAP Lab ID: C946, State of Utah Department of Health, NELAP Certificate No. CA01527Z012-Z; Los Angeles Department of Building and Safety, Approval No: TA00001. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Samantha Henningsen
Project Manager

Client: Stantec Consulting Services, Inc. Service Request No: P1204493
Project: Sunoco IH Air Testing / 213402094

CASE NARRATIVE

The samples were received intact under chain of custody on October 31, 2012 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Volatile Organic Compound Analysis

The samples were analyzed for selected volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator.

DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.
Service Request: P1204493
Project ID: Sunoco IH Air Testing / 213402094

Date Received: 10/31/2012
Time Received: 09:10

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	TO-15 - VOC Cans
Sample 1	P1204493-001	Air	10/24/2012	14:35	AC01003	-3.85	3.67	X
Sample 2	P1204493-002	Air	10/24/2012	14:39	AC00760	-6.54	3.79	X
Sample 3	P1204493-003	Air	10/24/2012	14:50	AC01853	-3.60	3.61	X
Sample 4	P1204493-004	Air	10/24/2012	14:52	AC01010	-3.29	3.63	X
Sample 5	P1204493-005	Air	10/24/2012	15:07	AC01928	-3.21	3.60	X
Sample 6	P1204493-006	Air	10/24/2012	15:10	AC01669	-4.20	3.70	X
Sample 7	P1204493-007	Air	10/24/2012	15:13	AC00641	-3.08	3.75	X
Sample 8	P1204493-008	Air	10/24/2012	15:16	AC00747	-3.67	3.78	X
Sample 9	P1204493-009	Air	10/24/2012	16:26	AC01113	-3.10	3.67	X
Sample 10	P1204493-010	Air	10/24/2012	16:31	AC01436	-5.08	3.56	X
Sample 11	P1204493-011	Air	10/24/2012	16:33	AC01376	-3.84	3.74	X
Sample 12	P1204493-012	Air	10/24/2012	16:37	AC00672	-2.29	3.58	X
Sample 13	P1204493-013	Air	10/24/2012	16:40	AC01145	-4.00	3.75	X
Sample 14	P1204493-014	Air	10/24/2012	16:44	AC00782	0.31	3.62	X
Sample 15	P1204493-015	Air	10/24/2012	16:48	AC00475	-1.47	3.55	X
Sample 16	P1204493-016	Air	10/24/2012	16:54	AC01263	-3.77	3.76	X
Sample 17	P1204493-017	Air	10/24/2012	17:10	AC01215	-2.97	3.72	X
Sample 18	P1204493-018	Air	10/24/2012	17:13	AC01670	-2.52	3.64	X
Sample 19	P1204493-019	Air	10/24/2012	17:27	AC01930	-2.75	3.57	X
Sample 20	P1204493-020	Air	10/24/2012	17:30	AC01420	-3.07	3.72	X
Sample 21	P1204493-021	Air	10/24/2012	17:35	AC01464	-1.69	3.65	X
Sample 22	P1204493-022	Air	10/24/2012	17:51	AC00590	-2.29	3.77	X
Sample 24 TB	P1204493-023	Air	10/24/2012	00:00	AC01830	-14.50	3.68	X

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Air - Chain of Custody Record & Analytical Service Request

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

CAS Project No. P1204493

Company Name & Address (Reporting Information)	Stantec 12075 Corporate Pkwy Mequon, WI 53092
Project Manager	John Reiter
Phone	262-643-9154
Fax	262-241-4901
Email Address for Result Reporting	John.Reiter@Stantec.com
Project Name	Sunoco IH Airtesting
Project Number	21340294
P.O. # / Billing Information	John Reiter
Sampler (Print & Sign)	
CAS Contact:	

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code #- FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	Analysis Method	Comments e.g. Actual Preservative or specific instructions
Sample 1	1-3.54	10/24/12	10:35 14:35	AC01003	FCA00317	29.5	8			
Sample 2	2-6.55	10/24/12	10:37 14:39	AC00760	FCA00595	29.5	13.0			
Sample 3	3-3.63	10/24/12	10:50 14:50	AC01853	FCA00134	29.5	7.0			
Sample 4	4-3.33	10/24/12	10:53 14:53	AC01010	FCA00188	29.6	7.25			
Sample 5	5-3.14	10/24/12	11:07 15:07	AC01928	FCA00161	29.5	9.0			
Sample 6	6-4.21	10/24/12	11:10 15:10	AC01689	FCA00564	29.5	9.0			
Sample 7	7-3.57	10/24/12	11:13 15:13	AC00641	FCA00023	29.5	6.5			
Sample 8	8-3.67	10/24/12	11:16 15:16	AC00747	FCA00604	29.5	7.5			
Sample 9	9-3.14	10/24/12	12:26 16:26	AC01113	FCA00575	29.5	7.0			
Sample 10	10-5.11	10/24/12	12:31 16:31	AC01436	FCA00521	29.4	10.0			
Sample 11	11-3.87	10/24/12	12:33 16:33	AC01376	FCA00344	29.4	8.0			
Sample 12	12-2.33	10/24/12	12:36 16:37	AC00672	FCA00198	29.4	4.75			
Sample 13	13-4.03	10/24/12	12:40 16:40	AC00[redacted]145	FCA00374	29.4	6.5			
Sample 14	14-0.85	10/24/12	12:39 16:44	AC00782	FCA00298	29.6	0.0			

Report Tier Levels - please select

Tier I - Results (Default if not specified) _____
Tier II (Results + QC Summaries) _____
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Data Validation Package) 10% Surcharge _____

EDD required Yes / No
Type: _____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	10/24/12	1830		10/25/12	0910
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank Temperature ___ °C

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Air - Chain of Custody Record & Analytical Service Request

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

CAS Project No. R12-344493

CAS Contact:

Analysis Method

Company Name & Address (Reporting Information)
Stantec
12075 Corporate Pkwy
Mequon, WI 53092

Project Name: Sunoco IH Air Testing

Project Number: 2134102094

Project Manager: John Reiter

P.O. # / Billing Information: John Reiter

Phone: 262-643-9154 Fax: 262-241-4901

Email Address for Result Reporting: John.reiter@stantec.com

Sampler (Print & Sign): Richard Page

Comments e.g. Actual Preservative or specific instructions

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code #- FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume			Comments
Sample 15	(15)-1.53	10/24/12	12:48 16:49	AC00475	FCA00402	29.5	3.5				
Sample 16	(16)-3.82	10/24/12	12:58 16:54	AC01263	FCA00516	29.4	9.5				
Sample 17	(17)-3.04	10/24/12	13:10 17:10	AC01215	FCA00365	29.5	8.0				
Sample 18	(18)-2.63	10/24/12	13:13 17:13	AC01670	FCA00319	29.6	5.5				
Sample 19	(19)-2.77	10/24/12	13:27 17:27	AC01930	FCA00016	29.5	7.0				
Sample 20	(20)-3.14	10/24/12	13:38 17:38	AC01420	FCA00397	29.5	6.25				
Sample 21	(21)-1.76	10/24/12	13:35 17:35	AC01464	FAC00034	29.5	3.0				
Sample 22	(22)-2.34	10/24/12	13:51 17:51	AC00590	FCA00168	29.8	7.75				
~~Sample 23~~		~~10/24/12~~	~~13:54~~	~~AC01664~~	~~FCA00422~~	~~29.5~~					Not Collected
Sample 24TB	(23)-14.47	10/24/12	—	AC01830	—	29.4	29.4				

Report Tier Levels - please select
Tier I - Results (Default if not specified) _____
Tier II (Results + QC Summaries) _____
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Data Validation Package) 10% Surcharge _____
EDD required Yes / No
Type: _____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	10/24/12	18:30		10/25/12	0910
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank Temperature ____ °C

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Sample Acceptance Check Form

Client: Stantec Consulting Services, Inc. Work order: P1204493

Project: Sunoco IH Air Testing / 213402094

Sample(s) received on: 10/31/12 Date opened: 10/31/12 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
9	Was a **trip blank** received?	☐	☒	☐
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1204493-001.01	6.0 L Ambient Can					
P1204493-002.01	6.0 L Ambient Can					
P1204493-003.01	6.0 L Ambient Can					
P1204493-004.01	6.0 L Ambient Can					
P1204493-005.01	6.0 L Ambient Can					
P1204493-006.01	6.0 L Ambient Can					
P1204493-007.01	6.0 L Ambient Can					
P1204493-008.01	6.0 L Ambient Can					

Explain any discrepancies: (include lab sample ID numbers): _____

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

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Sample Acceptance Check Form

Client: Stantec Consulting Services, Inc. Work order: P1204493

Project: Sunoco IH Air Testing / 213402094

Sample(s) received on: 10/31/12 Date opened: 10/31/12 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1204493-009.01	6.0 L Ambient Can					
P1204493-010.01	6.0 L Ambient Can					
P1204493-011.01	6.0 L Ambient Can					
P1204493-012.01	6.0 L Ambient Can					
P1204493-013.01	6.0 L Ambient Can					
P1204493-014.01	6.0 L Ambient Can					
P1204493-015.01	6.0 L Ambient Can					
P1204493-016.01	6.0 L Ambient Can					
P1204493-017.01	6.0 L Ambient Can					
P1204493-018.01	6.0 L Ambient Can					
P1204493-019.01	6.0 L Ambient Can					
P1204493-020.01	6.0 L Ambient Can					
P1204493-021.01	6.0 L Ambient Can					
P1204493-022.01	6.0 L Ambient Can					
P1204493-023.01	6.0 L Ambient Can					

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 1** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P1204493-001

Test Code: EPA TO-15 Date Collected: 10/24/12
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 10/31/12
Analyst: Wida Ang Date Analyzed: 11/3/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01003

Initial Pressure (psig): -3.85 Final Pressure (psig): 3.67

Canister Dilution Factor: 1.69

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.85	ND	0.23	
107-06-2	1,2-Dichloroethane	ND	0.85	ND	0.21	
71-43-2	Benzene	**4.3**	0.85	**1.3**	0.26	
108-88-3	Toluene	**7.4**	0.85	**2.0**	0.22	
106-93-4	1,2-Dibromoethane	ND	0.85	ND	0.11	
100-41-4	Ethylbenzene	**1.3**	0.85	**0.31**	0.19	
179601-23-1	m,p-Xylenes	**4.5**	1.7	**1.0**	0.39	
95-47-6	o-Xylene	**1.6**	0.85	**0.37**	0.19	
98-82-8	Cumene	**2.1**	0.85	**0.43**	0.17	
108-67-8	1,3,5-Trimethylbenzene	ND	0.85	ND	0.17	
95-63-6	1,2,4-Trimethylbenzene	**1.5**	0.85	**0.30**	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 2** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P1204493-002

Test Code: EPA TO-15 Date Collected: 10/24/12
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 10/31/12
Analyst: Wida Ang Date Analyzed: 11/3/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00760

Initial Pressure (psig): -6.54 Final Pressure (psig): 3.79

Canister Dilution Factor: 2.27

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	1.1	ND	0.31	
107-06-2	1,2-Dichloroethane	ND	1.1	ND	0.28	
71-43-2	Benzene	**3.9**	1.1	**1.2**	0.36	
108-88-3	Toluene	**6.5**	1.1	**1.7**	0.30	
106-93-4	1,2-Dibromoethane	ND	1.1	ND	0.15	
100-41-4	Ethylbenzene	ND	1.1	ND	0.26	
179601-23-1	m,p-Xylenes	**3.7**	2.3	**0.86**	0.52	
95-47-6	o-Xylene	**1.4**	1.1	**0.32**	0.26	
98-82-8	Cumene	**2.0**	1.1	**0.40**	0.23	
108-67-8	1,3,5-Trimethylbenzene	ND	1.1	ND	0.23	
95-63-6	1,2,4-Trimethylbenzene	**1.3**	1.1	**0.26**	0.23	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 3**
Client Project ID: **Sunoco IH Air Testing / 213402094**

CAS Project ID: P1204493
CAS Sample ID: P1204493-003

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Wida Ang
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC01853

Date Collected: 10/24/12
Date Received: 10/31/12
Date Analyzed: 11/3/12
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.60 Final Pressure (psig): 3.61

Canister Dilution Factor: 1.65

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.83	ND	0.23	
107-06-2	1,2-Dichloroethane	ND	0.83	ND	0.20	
71-43-2	Benzene	**2.1**	0.83	**0.66**	0.26	
108-88-3	Toluene	**7.0**	0.83	**1.9**	0.22	
106-93-4	1,2-Dibromoethane	ND	0.83	ND	0.11	
100-41-4	Ethylbenzene	**1.5**	0.83	**0.35**	0.19	
179601-23-1	m,p-Xylenes	**4.0**	1.7	**0.93**	0.38	
95-47-6	o-Xylene	**1.5**	0.83	**0.35**	0.19	
98-82-8	Cumene	**1.0**	0.83	**0.21**	0.17	
108-67-8	1,3,5-Trimethylbenzene	ND	0.83	ND	0.17	
95-63-6	1,2,4-Trimethylbenzene	**1.7**	0.83	**0.35**	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 4** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P1204493-004

Test Code: EPA TO-15 Date Collected: 10/24/12
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 10/31/12
Analyst: Wida Ang Date Analyzed: 11/3/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01010

Initial Pressure (psig): -3.29 Final Pressure (psig): 3.63

Canister Dilution Factor: 1.61

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.81	ND	0.22	
107-06-2	1,2-Dichloroethane	ND	0.81	ND	0.20	
71-43-2	Benzene	**1.8**	0.81	**0.56**	0.25	
108-88-3	Toluene	**6.8**	0.81	**1.8**	0.21	
106-93-4	1,2-Dibromoethane	ND	0.81	ND	0.10	
100-41-4	Ethylbenzene	**1.2**	0.81	**0.28**	0.19	
179601-23-1	m,p-Xylenes	**3.8**	1.6	**0.88**	0.37	
95-47-6	o-Xylene	**1.4**	0.81	**0.33**	0.19	
98-82-8	Cumene	ND	0.81	ND	0.16	
108-67-8	1,3,5-Trimethylbenzene	ND	0.81	ND	0.16	
95-63-6	1,2,4-Trimethylbenzene	**1.5**	0.81	**0.31**	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 5**
Client Project ID: **Sunoco IH Air Testing / 213402094**

CAS Project ID: P1204493
CAS Sample ID: P1204493-005

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Wida Ang
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC01928

Date Collected: 10/24/12
Date Received: 10/31/12
Date Analyzed: 11/3/12
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.21 Final Pressure (psig): 3.60

Canister Dilution Factor: 1.59

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.80	ND	0.22	
107-06-2	1,2-Dichloroethane	ND	0.80	ND	0.20	
71-43-2	Benzene	**3.5**	0.80	**1.1**	0.25	
108-88-3	Toluene	**7.2**	0.80	**1.9**	0.21	
106-93-4	1,2-Dibromoethane	ND	0.80	ND	0.10	
100-41-4	Ethylbenzene	**1.3**	0.80	**0.31**	0.18	
179601-23-1	m,p-Xylenes	**3.7**	1.6	**0.86**	0.37	
95-47-6	o-Xylene	**1.4**	0.80	**0.32**	0.18	
98-82-8	Cumene	**1.0**	0.80	**0.21**	0.16	
108-67-8	1,3,5-Trimethylbenzene	ND	0.80	ND	0.16	
95-63-6	1,2,4-Trimethylbenzene	**1.6**	0.80	**0.33**	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 6**
Client Project ID: **Sunoco IH Air Testing / 213402094**

CAS Project ID: P1204493
CAS Sample ID: P1204493-006

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Wida Ang
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC01669

Date Collected: 10/24/12
Date Received: 10/31/12
Date Analyzed: 11/3/12
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.20 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.75

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.88	ND	0.24	
107-06-2	1,2-Dichloroethane	ND	0.88	ND	0.22	
71-43-2	Benzene	**4.2**	0.88	**1.3**	0.27	
108-88-3	Toluene	**7.5**	0.88	**2.0**	0.23	
106-93-4	1,2-Dibromoethane	ND	0.88	ND	0.11	
100-41-4	Ethylbenzene	**2.2**	0.88	**0.50**	0.20	
179601-23-1	m,p-Xylenes	**4.6**	1.8	**1.1**	0.40	
95-47-6	o-Xylene	**1.7**	0.88	**0.38**	0.20	
98-82-8	Cumene	**1.3**	0.88	**0.26**	0.18	
108-67-8	1,3,5-Trimethylbenzene	ND	0.88	ND	0.18	
95-63-6	1,2,4-Trimethylbenzene	**1.8**	0.88	**0.37**	0.18	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 7**
Client Project ID: **Sunoco IH Air Testing / 213402094**

CAS Project ID: P1204493
CAS Sample ID: P1204493-007

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Wida Ang
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC00641

Date Collected: 10/24/12
Date Received: 10/31/12
Date Analyzed: 11/3/12
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.08 Final Pressure (psig): 3.75

Canister Dilution Factor: 1.59

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.80	ND	0.22	
107-06-2	1,2-Dichloroethane	ND	0.80	ND	0.20	
71-43-2	Benzene	**4.2**	0.80	**1.3**	0.25	
108-88-3	Toluene	**12**	0.80	**3.1**	0.21	
106-93-4	1,2-Dibromoethane	ND	0.80	ND	0.10	
100-41-4	Ethylbenzene	**1.8**	0.80	**0.41**	0.18	
179601-23-1	m,p-Xylenes	**6.3**	1.6	**1.4**	0.37	
95-47-6	o-Xylene	**2.2**	0.80	**0.51**	0.18	
98-82-8	Cumene	**2.0**	0.80	**0.41**	0.16	
108-67-8	1,3,5-Trimethylbenzene	**1.2**	0.80	**0.25**	0.16	
95-63-6	1,2,4-Trimethylbenzene	**4.0**	0.80	**0.82**	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 8** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P1204493-008

Test Code: EPA TO-15 Date Collected: 10/24/12
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 10/31/12
Analyst: Wida Ang Date Analyzed: 11/3/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00747

Initial Pressure (psig): -3.67 Final Pressure (psig): 3.78

Canister Dilution Factor: 1.68

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.84	ND	0.23	
107-06-2	1,2-Dichloroethane	ND	0.84	ND	0.21	
71-43-2	Benzene	**3.1**	0.84	**0.97**	0.26	
108-88-3	Toluene	**7.8**	0.84	**2.1**	0.22	
106-93-4	1,2-Dibromoethane	ND	0.84	ND	0.11	
100-41-4	Ethylbenzene	**1.5**	0.84	**0.34**	0.19	
179601-23-1	m,p-Xylenes	**4.9**	1.7	**1.1**	0.39	
95-47-6	o-Xylene	**1.8**	0.84	**0.42**	0.19	
98-82-8	Cumene	**1.5**	0.84	**0.30**	0.17	
108-67-8	1,3,5-Trimethylbenzene	**0.97**	0.84	**0.20**	0.17	
95-63-6	1,2,4-Trimethylbenzene	**3.2**	0.84	**0.65**	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 9** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P1204493-009

Test Code: EPA TO-15 Date Collected: 10/24/12
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 10/31/12
Analyst: Wida Ang Date Analyzed: 11/3/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01113

Initial Pressure (psig): -3.10 Final Pressure (psig): 3.67

Canister Dilution Factor: 1.58

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.79	ND	0.22	
107-06-2	1,2-Dichloroethane	ND	0.79	ND	0.20	
71-43-2	Benzene	**2.3**	0.79	**0.72**	0.25	
108-88-3	Toluene	**6.9**	0.79	**1.8**	0.21	
106-93-4	1,2-Dibromoethane	ND	0.79	ND	0.10	
100-41-4	Ethylbenzene	**1.3**	0.79	**0.29**	0.18	
179601-23-1	m,p-Xylenes	**4.2**	1.6	**0.97**	0.36	
95-47-6	o-Xylene	**1.5**	0.79	**0.36**	0.18	
98-82-8	Cumene	**1.4**	0.79	**0.28**	0.16	
108-67-8	1,3,5-Trimethylbenzene	ND	0.79	ND	0.16	
95-63-6	1,2,4-Trimethylbenzene	**1.6**	0.79	**0.32**	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 10** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P1204493-010

Test Code: EPA TO-15 Date Collected: 10/24/12
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 10/31/12
Analyst: Wida Ang Date Analyzed: 11/3/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01436

Initial Pressure (psig): -5.08 Final Pressure (psig): 3.56

Canister Dilution Factor: 1.90

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.95	ND	0.26	
107-06-2	1,2-Dichloroethane	ND	0.95	ND	0.23	
71-43-2	Benzene	**2.2**	0.95	**0.69**	0.30	
108-88-3	Toluene	**6.9**	0.95	**1.8**	0.25	
106-93-4	1,2-Dibromoethane	ND	0.95	ND	0.12	
100-41-4	Ethylbenzene	**1.2**	0.95	**0.27**	0.22	
179601-23-1	m,p-Xylenes	**3.6**	1.9	**0.83**	0.44	
95-47-6	o-Xylene	**1.3**	0.95	**0.31**	0.22	
98-82-8	Cumene	**1.0**	0.95	**0.20**	0.19	
108-67-8	1,3,5-Trimethylbenzene	ND	0.95	ND	0.19	
95-63-6	1,2,4-Trimethylbenzene	**1.3**	0.95	**0.26**	0.19	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 11**
Client Project ID: **Sunoco IH Air Testing / 213402094**

CAS Project ID: P1204493
CAS Sample ID: P1204493-011

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Wida Ang
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC01376

Date Collected: 10/24/12
Date Received: 10/31/12
Date Analyzed: 11/5/12
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.84 Final Pressure (psig): 3.74

Canister Dilution Factor: 1.70

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.85	ND	0.24	
107-06-2	1,2-Dichloroethane	ND	0.85	ND	0.21	
71-43-2	Benzene	**1.6**	0.85	**0.50**	0.27	
108-88-3	Toluene	**6.1**	0.85	**1.6**	0.23	
106-93-4	1,2-Dibromoethane	ND	0.85	ND	0.11	
100-41-4	Ethylbenzene	**0.86**	0.85	**0.20**	0.20	
179601-23-1	m,p-Xylenes	**2.7**	1.7	**0.63**	0.39	
95-47-6	o-Xylene	**1.0**	0.85	**0.24**	0.20	
98-82-8	Cumene	ND	0.85	ND	0.17	
108-67-8	1,3,5-Trimethylbenzene	ND	0.85	ND	0.17	
95-63-6	1,2,4-Trimethylbenzene	**0.93**	0.85	**0.19**	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 12**
Client Project ID: **Sunoco IH Air Testing / 213402094**

CAS Project ID: P1204493
CAS Sample ID: P1204493-012

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Wida Ang
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC00672

Date Collected: 10/24/12
Date Received: 10/31/12
Date Analyzed: 11/5/12
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.29 Final Pressure (psig): 3.58

Canister Dilution Factor: 1.47

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.74	ND	0.20	
107-06-2	1,2-Dichloroethane	ND	0.74	ND	0.18	
71-43-2	Benzene	**1.7**	0.74	**0.54**	0.23	
108-88-3	Toluene	**6.2**	0.74	**1.6**	0.20	
106-93-4	1,2-Dibromoethane	ND	0.74	ND	0.096	
100-41-4	Ethylbenzene	**0.99**	0.74	**0.23**	0.17	
179601-23-1	m,p-Xylenes	**2.9**	1.5	**0.67**	0.34	
95-47-6	o-Xylene	**1.1**	0.74	**0.25**	0.17	
98-82-8	Cumene	ND	0.74	ND	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.74	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	**1.0**	0.74	**0.21**	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 13**
Client Project ID: **Sunoco IH Air Testing / 213402094**

CAS Project ID: P1204493
CAS Sample ID: P1204493-013

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Wida Ang
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC01145

Date Collected: 10/24/12
Date Received: 10/31/12
Date Analyzed: 11/6/12
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.00 Final Pressure (psig): 3.75

Canister Dilution Factor: 1.72

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.86	ND	0.24	
107-06-2	1,2-Dichloroethane	ND	0.86	ND	0.21	
71-43-2	Benzene	**1.5**	0.86	**0.47**	0.27	
108-88-3	Toluene	**5.6**	0.86	**1.5**	0.23	
106-93-4	1,2-Dibromoethane	ND	0.86	ND	0.11	
100-41-4	Ethylbenzene	**0.86**	0.86	**0.20**	0.20	
179601-23-1	m,p-Xylenes	**2.6**	1.7	**0.60**	0.40	
95-47-6	o-Xylene	**0.96**	0.86	**0.22**	0.20	
98-82-8	Cumene	ND	0.86	ND	0.18	
108-67-8	1,3,5-Trimethylbenzene	ND	0.86	ND	0.18	
95-63-6	1,2,4-Trimethylbenzene	ND	0.86	ND	0.18	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 14** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P1204493-014

Test Code: EPA TO-15 Date Collected: 10/24/12
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 10/31/12
Analyst: Wida Ang Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00782

Initial Pressure (psig): 0.31 Final Pressure (psig): 3.62

Canister Dilution Factor: 1.22

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.61	ND	0.17	
107-06-2	1,2-Dichloroethane	ND	0.61	ND	0.15	
71-43-2	Benzene	**1.6**	0.61	**0.51**	0.19	
108-88-3	Toluene	**6.0**	0.61	**1.6**	0.16	
106-93-4	1,2-Dibromoethane	ND	0.61	ND	0.079	
100-41-4	Ethylbenzene	**1.1**	0.61	**0.26**	0.14	
179601-23-1	m,p-Xylenes	**3.0**	1.2	**0.70**	0.28	
95-47-6	o-Xylene	**1.1**	0.61	**0.26**	0.14	
98-82-8	Cumene	**0.79**	0.61	**0.16**	0.12	
108-67-8	1,3,5-Trimethylbenzene	ND	0.61	ND	0.12	
95-63-6	1,2,4-Trimethylbenzene	**1.0**	0.61	**0.20**	0.12	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 15** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P1204493-015

Test Code: EPA TO-15 Date Collected: 10/24/12
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 10/31/12
Analyst: Wida Ang Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00475

Initial Pressure (psig): -1.47 Final Pressure (psig): 3.55

Canister Dilution Factor: 1.38

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.69	ND	0.19	
107-06-2	1,2-Dichloroethane	ND	0.69	ND	0.17	
71-43-2	Benzene	**1.9**	0.69	**0.61**	0.22	
108-88-3	Toluene	**6.4**	0.69	**1.7**	0.18	
106-93-4	1,2-Dibromoethane	ND	0.69	ND	0.090	
100-41-4	Ethylbenzene	**1.2**	0.69	**0.28**	0.16	
179601-23-1	m,p-Xylenes	**3.4**	1.4	**0.78**	0.32	
95-47-6	o-Xylene	**1.2**	0.69	**0.29**	0.16	
98-82-8	Cumene	**1.0**	0.69	**0.21**	0.14	
108-67-8	1,3,5-Trimethylbenzene	ND	0.69	ND	0.14	
95-63-6	1,2,4-Trimethylbenzene	**1.2**	0.69	**0.25**	0.14	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 16** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P1204493-016

Test Code: EPA TO-15 Date Collected: 10/24/12
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 10/31/12
Analyst: Wida Ang Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01263

Initial Pressure (psig): -3.77 Final Pressure (psig): 3.76

Canister Dilution Factor: 1.69

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.85	ND	0.23	
107-06-2	1,2-Dichloroethane	ND	0.85	ND	0.21	
71-43-2	Benzene	**1.3**	0.85	**0.42**	0.26	
108-88-3	Toluene	**4.6**	0.85	**1.2**	0.22	
106-93-4	1,2-Dibromoethane	ND	0.85	ND	0.11	
100-41-4	Ethylbenzene	ND	0.85	ND	0.19	
179601-23-1	m,p-Xylenes	**2.0**	1.7	**0.46**	0.39	
95-47-6	o-Xylene	ND	0.85	ND	0.19	
98-82-8	Cumene	ND	0.85	ND	0.17	
108-67-8	1,3,5-Trimethylbenzene	ND	0.85	ND	0.17	
95-63-6	1,2,4-Trimethylbenzene	ND	0.85	ND	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 17**
Client Project ID: **Sunoco IH Air Testing / 213402094**

CAS Project ID: P1204493
CAS Sample ID: P1204493-017

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Wida Ang
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC01215

Date Collected: 10/24/12
Date Received: 10/31/12
Date Analyzed: 11/5/12
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.97 Final Pressure (psig): 3.72

Canister Dilution Factor: 1.57

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.79	ND	0.22	
107-06-2	1,2-Dichloroethane	ND	0.79	ND	0.19	
71-43-2	Benzene	**9.0**	0.79	**2.8**	0.25	
108-88-3	Toluene	**8.3**	0.79	**2.2**	0.21	
106-93-4	1,2-Dibromoethane	ND	0.79	ND	0.10	
100-41-4	Ethylbenzene	**1.8**	0.79	**0.41**	0.18	
179601-23-1	m,p-Xylenes	**4.3**	1.6	**0.98**	0.36	
95-47-6	o-Xylene	**1.5**	0.79	**0.34**	0.18	
98-82-8	Cumene	**2.5**	0.79	**0.50**	0.16	
108-67-8	1,3,5-Trimethylbenzene	ND	0.79	ND	0.16	
95-63-6	1,2,4-Trimethylbenzene	**1.3**	0.79	**0.25**	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 18** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P1204493-018

Test Code: EPA TO-15 Date Collected: 10/24/12
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 10/31/12
Analyst: Wida Ang Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01670

Initial Pressure (psig): -2.52 Final Pressure (psig): 3.64

Canister Dilution Factor: 1.51

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.76	ND	0.21	
107-06-2	1,2-Dichloroethane	ND	0.76	ND	0.19	
71-43-2	Benzene	**7.2**	0.76	**2.2**	0.24	
108-88-3	Toluene	**8.2**	0.76	**2.2**	0.20	
106-93-4	1,2-Dibromoethane	ND	0.76	ND	0.098	
100-41-4	Ethylbenzene	**0.97**	0.76	**0.22**	0.17	
179601-23-1	m,p-Xylenes	**3.2**	1.5	**0.75**	0.35	
95-47-6	o-Xylene	**1.2**	0.76	**0.28**	0.17	
98-82-8	Cumene	**1.9**	0.76	**0.39**	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.76	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	**1.2**	0.76	**0.24**	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 19** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P1204493-019

Test Code: EPA TO-15 Date Collected: 10/24/12
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 10/31/12
Analyst: Wida Ang Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01930

Initial Pressure (psig): -2.75 Final Pressure (psig): 3.57

Canister Dilution Factor: 1.53

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.77	ND	0.21	
107-06-2	1,2-Dichloroethane	ND	0.77	ND	0.19	
71-43-2	Benzene	**3.6**	0.77	**1.1**	0.24	
108-88-3	Toluene	**14**	0.77	**3.6**	0.20	
106-93-4	1,2-Dibromoethane	ND	0.77	ND	0.10	
100-41-4	Ethylbenzene	**2.9**	0.77	**0.66**	0.18	
179601-23-1	m,p-Xylenes	**11**	1.5	**2.6**	0.35	
95-47-6	o-Xylene	**3.7**	0.77	**0.85**	0.18	
98-82-8	Cumene	**0.77**	0.77	**0.16**	0.16	
108-67-8	1,3,5-Trimethylbenzene	**1.3**	0.77	**0.27**	0.16	
95-63-6	1,2,4-Trimethylbenzene	**3.3**	0.77	**0.68**	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 20**
Client Project ID: **Sunoco IH Air Testing / 213402094**

CAS Project ID: P1204493
CAS Sample ID: P1204493-020

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Wida Ang
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC01420

Date Collected: 10/24/12
Date Received: 10/31/12
Date Analyzed: 11/6/12
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.07 Final Pressure (psig): 3.72

Canister Dilution Factor: 1.58

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.79	ND	0.22	
107-06-2	1,2-Dichloroethane	ND	0.79	ND	0.20	
71-43-2	Benzene	**2.1**	0.79	**0.65**	0.25	
108-88-3	Toluene	**7.4**	0.79	**2.0**	0.21	
106-93-4	1,2-Dibromoethane	ND	0.79	ND	0.10	
100-41-4	Ethylbenzene	**0.83**	0.79	**0.19**	0.18	
179601-23-1	m,p-Xylenes	**2.8**	1.6	**0.65**	0.36	
95-47-6	o-Xylene	**1.1**	0.79	**0.24**	0.18	
98-82-8	Cumene	ND	0.79	ND	0.16	
108-67-8	1,3,5-Trimethylbenzene	ND	0.79	ND	0.16	
95-63-6	1,2,4-Trimethylbenzene	**0.92**	0.79	**0.19**	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 21** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P1204493-021

Test Code: EPA TO-15 Date Collected: 10/24/12
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 10/31/12
Analyst: Wida Ang Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01464

Initial Pressure (psig): -1.69 Final Pressure (psig): 3.65

Canister Dilution Factor: 1.41

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.71	ND	0.20	
107-06-2	1,2-Dichloroethane	ND	0.71	ND	0.17	
71-43-2	Benzene	**4.9**	0.71	**1.5**	0.22	
108-88-3	Toluene	**19**	0.71	**5.0**	0.19	
106-93-4	1,2-Dibromoethane	ND	0.71	ND	0.092	
100-41-4	Ethylbenzene	**3.1**	0.71	**0.70**	0.16	
179601-23-1	m,p-Xylenes	**13**	1.4	**3.0**	0.32	
95-47-6	o-Xylene	**4.1**	0.71	**0.94**	0.16	
98-82-8	Cumene	ND	0.71	ND	0.14	
108-67-8	1,3,5-Trimethylbenzene	**1.6**	0.71	**0.33**	0.14	
95-63-6	1,2,4-Trimethylbenzene	**3.6**	0.71	**0.74**	0.14	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 22** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P1204493-022

Test Code: EPA TO-15 Date Collected: 10/24/12
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 10/31/12
Analyst: Wida Ang Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00590

Initial Pressure (psig): -2.29 Final Pressure (psig): 3.77

Canister Dilution Factor: 1.49

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.75	ND	0.21	
107-06-2	1,2-Dichloroethane	ND	0.75	ND	0.18	
71-43-2	Benzene	**1.7**	0.75	**0.53**	0.23	
108-88-3	Toluene	**9.2**	0.75	**2.4**	0.20	
106-93-4	1,2-Dibromoethane	ND	0.75	ND	0.097	
100-41-4	Ethylbenzene	**1.7**	0.75	**0.39**	0.17	
179601-23-1	m,p-Xylenes	**4.6**	1.5	**1.1**	0.34	
95-47-6	o-Xylene	**1.5**	0.75	**0.34**	0.17	
98-82-8	Cumene	**0.85**	0.75	**0.17**	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.75	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	**1.2**	0.75	**0.24**	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 24 TB**
Client Project ID: **Sunoco IH Air Testing / 213402094**

CAS Project ID: P1204493
CAS Sample ID: P1204493-023

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Wida Ang
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC01830

Date Collected: 10/24/12
Date Received: 10/31/12
Date Analyzed: 11/5/12
Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-43-2	Benzene	ND	0.50	ND	0.16	
108-88-3	Toluene	ND	0.50	ND	0.13	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
98-82-8	Cumene	ND	0.50	ND	0.10	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Method Blank** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P121103-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Wida Ang Date Analyzed: 11/3/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-43-2	Benzene	ND	0.50	ND	0.16	
108-88-3	Toluene	ND	0.50	ND	0.13	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
98-82-8	Cumene	ND	0.50	ND	0.10	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Method Blank** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P121105-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Wida Ang Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-43-2	Benzene	ND	0.50	ND	0.16	
108-88-3	Toluene	ND	0.50	ND	0.13	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
98-82-8	Cumene	ND	0.50	ND	0.10	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Method Blank** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P121106-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Wida Ang Date Analyzed: 11/6/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-43-2	Benzene	ND	0.50	ND	0.16	
108-88-3	Toluene	ND	0.50	ND	0.13	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
98-82-8	Cumene	ND	0.50	ND	0.10	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

SURROGATE SPIKE RECOVERY RESULTS

Client: **Stantec Consulting Services, Inc.**
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Project ID: P1204493

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date(s) Collected: 10/24/12
Analyst: Wida Ang Date(s) Received: 10/31/12
Sample Type: 6.0 L Summa Canister(s) Date(s) Analyzed: 11/3 - 11/6/12
Test Notes:

Client Sample ID	CAS Sample ID	1,2-Dichloroethane-d4 Percent Recovered	Toluene-d8 Percent Recovered	Bromofluorobenzene Percent Recovered	Acceptance Limits	Data Qualifier
Method Blank	P121103-MB	**97**	**98**	**102**	70-130	
Method Blank	P121105-MB	**96**	**102**	**104**	70-130	
Method Blank	P121106-MB	**94**	**100**	**106**	70-130	
Lab Control Sample	P121103-LCS	**99**	**101**	**104**	70-130	
Lab Control Sample	P121105-LCS	**97**	**98**	**106**	70-130	
Lab Control Sample	P121106-LCS	**97**	**100**	**108**	70-130	
Sample 1	P1204493-001	**97**	**99**	**104**	70-130	
Sample 2	P1204493-002	**101**	**98**	**102**	70-130	
Sample 3	P1204493-003	**100**	**98**	**104**	70-130	
Sample 3	P1204493-003DUP	**98**	**95**	**103**	70-130	
Sample 4	P1204493-004	**102**	**96**	**105**	70-130	
Sample 5	P1204493-005	**97**	**98**	**106**	70-130	
Sample 6	P1204493-006	**98**	**98**	**105**	70-130	
Sample 7	P1204493-007	**98**	**96**	**107**	70-130	
Sample 8	P1204493-008	**96**	**100**	**108**	70-130	
Sample 9	P1204493-009	**99**	**98**	**107**	70-130	
Sample 10	P1204493-010	**97**	**100**	**105**	70-130	
Sample 11	P1204493-011	**98**	**98**	**106**	70-130	
Sample 12	P1204493-012	**95**	**101**	**106**	70-130	
Sample 13	P1204493-013	**96**	**97**	**107**	70-130	
Sample 14	P1204493-014	**96**	**101**	**107**	70-130	
Sample 15	P1204493-015	**97**	**100**	**103**	70-130	
Sample 15	P1204493-015DUP	**94**	**104**	**110**	70-130	
Sample 16	P1204493-016	**97**	**97**	**105**	70-130	
Sample 17	P1204493-017	**99**	**98**	**109**	70-130	
Sample 18	P1204493-018	**96**	**100**	**106**	70-130	
Sample 19	P1204493-019	**96**	**101**	**107**	70-130	
Sample 20	P1204493-020	**95**	**101**	**108**	70-130	
Sample 21	P1204493-021	**98**	**98**	**102**	70-130	
Sample 22	P1204493-022	**97**	**99**	**100**	70-130	
Sample 24 TB	P1204493-023	**94**	**105**	**103**	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Lab Control Sample** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P121103-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Wida Ang Date Analyzed: 11/03/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	CAS Acceptance Limits	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	204	**231**	**113**	67-116	
107-06-2	1,2-Dichloroethane	208	**220**	**106**	70-118	
71-43-2	Benzene	208	**214**	**103**	66-121	
108-88-3	Toluene	208	**211**	**101**	67-111	
106-93-4	1,2-Dibromoethane	208	**228**	**110**	73-122	
100-41-4	Ethylbenzene	206	**217**	**105**	71-117	
179601-23-1	m,p-Xylenes	412	**427**	**104**	70-116	
95-47-6	o-Xylene	200	**212**	**106**	70-116	
98-82-8	Cumene	196	**210**	**107**	70-116	
108-67-8	1,3,5-Trimethylbenzene	208	**230**	**111**	71-121	
95-63-6	1,2,4-Trimethylbenzene	200	**228**	**114**	73-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Lab Control Sample** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P121105-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Wida Ang Date Analyzed: 11/05/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	CAS Acceptance Limits	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	204	**210**	**103**	67-116	
107-06-2	1,2-Dichloroethane	208	**199**	**96**	70-118	
71-43-2	Benzene	208	**199**	**96**	66-121	
108-88-3	Toluene	208	**191**	**92**	67-111	
106-93-4	1,2-Dibromoethane	208	**211**	**101**	73-122	
100-41-4	Ethylbenzene	206	**205**	**100**	71-117	
179601-23-1	m,p-Xylenes	412	**407**	**99**	70-116	
95-47-6	o-Xylene	200	**202**	**101**	70-116	
98-82-8	Cumene	196	**198**	**101**	70-116	
108-67-8	1,3,5-Trimethylbenzene	208	**216**	**104**	71-121	
95-63-6	1,2,4-Trimethylbenzene	200	**213**	**107**	73-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Lab Control Sample** CAS Project ID: P1204493
Client Project ID: **Sunoco IH Air Testing / 213402094** CAS Sample ID: P121106-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Wida Ang Date Analyzed: 11/06/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	CAS Acceptance Limits	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	204	**221**	**108**	67-116	
107-06-2	1,2-Dichloroethane	208	**209**	**100**	70-118	
71-43-2	Benzene	208	**203**	**98**	66-121	
108-88-3	Toluene	208	**202**	**97**	67-111	
106-93-4	1,2-Dibromoethane	208	**221**	**106**	73-122	
100-41-4	Ethylbenzene	206	**210**	**102**	71-117	
179601-23-1	m,p-Xylenes	412	**416**	**101**	70-116	
95-47-6	o-Xylene	200	**206**	**103**	70-116	
98-82-8	Cumene	196	**206**	**105**	70-116	
108-67-8	1,3,5-Trimethylbenzene	208	**226**	**109**	71-121	
95-63-6	1,2,4-Trimethylbenzene	200	**223**	**112**	73-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

LABORATORY DUPLICATE SUMMARY RESULTS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 3**
Client Project ID: **Sunoco IH Air Testing / 213402094**

CAS Project ID: P1204493
CAS Sample ID: P1204493-003DUP

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Wida Ang
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC01853

Date Collected: 10/24/12
Date Received: 10/31/12
Date Analyzed: 11/3/12
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.60 Final Pressure (psig): 3.61

Canister Dilution Factor: 1.65

Compound	Sample Result µg/m³	Sample Result ppbV	Duplicate Sample Result **µg/m³**	Duplicate Sample Result ppbV	Average µg/m³	**% RPD**	RPD Limit	**Data Qualifier**
Methyl tert-Butyl Ether	ND	ND	ND	ND	-	-	25	
1,2-Dichloroethane	ND	ND	ND	ND	-	-	25	
Benzene	2.12	0.663	2.30	0.721	2.21	**8**	25	
Toluene	6.97	1.85	6.97	1.85	6.97	**0**	25	
1,2-Dibromoethane	ND	ND	ND	ND	-	-	25	
Ethylbenzene	1.53	0.352	1.58	0.364	1.555	**3**	25	
m,p-Xylenes	4.03	0.928	4.16	0.957	4.095	**3**	25	
o-Xylene	1.51	0.348	1.54	0.356	1.525	**2**	25	
Cumene	1.02	0.209	1.03	0.210	1.025	**1**	25	
1,3,5-Trimethylbenzene	ND	ND	ND	ND	-	-	25	
1,2,4-Trimethylbenzene	1.73	0.352	1.78	0.362	1.755	**3**	25	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

LABORATORY DUPLICATE SUMMARY RESULTS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 15**
Client Project ID: **Sunoco IH Air Testing / 213402094**

CAS Project ID: P1204493
CAS Sample ID: P1204493-015DUP

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9
Analyst: Wida Ang
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC00475

Date Collected: 10/24/12
Date Received: 10/31/12
Date Analyzed: 11/5/12
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.47 Final Pressure (psig): 3.55

Canister Dilution Factor: 1.38

Compound	Sample Result µg/m³	Sample Result ppbV	Duplicate Sample Result µg/m³	Duplicate Sample Result ppbV	Average µg/m³	% RPD	RPD Limit	Data Qualifier
Methyl tert-Butyl Ether	ND	ND	ND	ND	-	-	25	
1,2-Dichloroethane	ND	ND	ND	ND	-	-	25	
Benzene	1.95	0.609	2.06	0.645	2.005	**5**	25	
Toluene	6.44	1.71	6.80	1.80	6.62	**5**	25	
1,2-Dibromoethane	ND	ND	ND	ND	-	-	25	
Ethylbenzene	1.21	0.279	1.21	0.279	1.21	**0**	25	
m,p-Xylenes	3.40	0.784	3.41	0.785	3.405	**0.3**	25	
o-Xylene	1.25	0.288	1.28	0.294	1.265	**2**	25	
Cumene	1.01	0.205	1.08	0.220	1.045	**7**	25	
1,3,5-Trimethylbenzene	ND	ND	ND	ND	-	-	25	
1,2,4-Trimethylbenzene	1.24	0.251	1.28	0.261	1.26	**3**	25	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

LABORATORY REPORT

November 8, 2012

John Reiter
Stantec Consulting Services, Inc.
12075 Corporate Pkwy, Ste. 200
Mequon, WI 53092

RE: Sunoco IH Air Testing / 213402094

Dear John:

Enclosed are the results of the samples submitted to our laboratory on October 31, 2012. For your reference, these analyses have been assigned our service request number P1204494.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. dba ALS Environmental (ALS) is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA200007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L11-203; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-12-3; Minnesota Department of Health, NELAP Certificate No. 362188; Washington State Department of Ecology, ELAP Lab ID: C946, State of Utah Department of Health, NELAP Certificate No. CA01527Z012-Z; Los Angeles Department of Building and Safety, Approval No: TA00001. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Samantha Henningsen
Project Manager

Client: Stantec Consulting Services, Inc. Service Request No: P1204494
Project: Sunoco IH Air Testing / 213402094

CASE NARRATIVE

The samples were received intact under chain of custody on October 31, 2012 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Volatile Organic Compound Analysis

The samples were analyzed for selected volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator.

DETAIL SUMMARY REPORT

Client: Stantec Consulting Services, Inc.
Service Request: P1204494
Project ID: Sunoco IH Testing / 213402094

Date Received: 10/31/2012
Time Received: 09:10

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	TO-15 - VOC Cans
Sample 23	P1204494-001	Air	10/25/2012	12:17	AC01664	-6.14	3.79	X
Sample 25	P1204494-002	Air	10/25/2012	00:00	AC01093	-14.50	3.74	X
Sample 26	P1204494-003	Air	10/25/2012	12:59	AC00540	-3.15	3.59	X
Sample 27	P1204494-004	Air	10/25/2012	13:08	AC01810	-4.85	3.59	X
Sample 28	P1204494-005	Air	10/25/2012	13:10	AC01350	-2.60	3.71	X
Sample 29	P1204494-006	Air	10/25/2012	12:23	AC00716	-0.41	4.20	X
Sample 30	P1204494-007	Air	10/25/2012	12:29	AC00501	-2.50	3.61	X
Sample 31	P1204494-008	Air	10/25/2012	12:34	AC00765	-3.73	3.68	X
Sample 32	P1204494-009	Air	10/25/2012	12:37	AC01403	-5.30	3.76	X
Sample 33	P1204494-010	Air	10/25/2012	12:41	AC01573	-0.55	3.66	X
Sample 34	P1204494-011	Air	10/25/2012	12:44	AC00947	-2.79	3.49	X
Sample 35	P1204494-012	Air	10/25/2012	12:48	AC00033	-2.24	3.50	X
Sample 36	P1204494-013	Air	10/25/2012	12:51	AC01790	-2.23	3.48	X
Sample 37	P1204494-014	Air	10/25/2012	13:00	AC01886	-3.04	3.62	X
Sample 38	P1204494-015	Air	10/25/2012	13:08	AC01487	-2.38	3.62	X
Sample 39	P1204494-016	Air	10/25/2012	13:40	AC01115	-3.59	3.71	X
Sample 40	P1204494-017	Air	10/25/2012	13:43	AC01243	-0.40	3.96	X
Sample 41	P1204494-018	Air	10/25/2012	13:51	AC01218	-3.00	3.67	X
Sample 42	P1204494-019	Air	10/25/2012	13:55	AC01179	-1.52	3.71	X
Sample 43	P1204494-020	Air	10/25/2012	14:00	AC00870	-3.27	3.76	X
Sample 44	P1204494-021	Air	10/25/2012	10:05	AC00993	-14.47	3.72	X

Columbia Analytical Services

Air - Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

CAS Project No.: P1204494

CAS Contact:

Company Name & Address (Reporting Information): Stantec, 12075 Corporate Pky, Mequon, WI 53092

Project Name: Sunoco IH Testing

Project Number: 21340294

Project Manager: John Reiter

P.O. # / Billing Information: John Reiter

Phone: 262-

Fax: 262-241-4901

Email Address for Result Reporting: John.REITER@Stantec.com

Sampler (Print & Sign): Richard Pager

Analysis Method

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	Comments e.g. Actual Preservative or specific instructions
Sample 23	①-6.16	10/25/12	8:17 12:17	AC01664	FCA00422	29.0	11.0		
Sample 25	②-14.45	10/25/12		AC01093	FCA00058	29.5	—		Field Blank
Sample 26	③-3.18	10/25/12	8:59 12:59	AC00540	FCA00482	29.3	8.5		
Sample 27	④-4.58	10/25/12	9:07 13:07 ok	AC01830	FCA00609	29.4	8.0		
Sample 28	⑤-2.65	10/25/12	9:19 13:19	AC01350	FCA00454	29.5	5.0		
Sample 29	⑥-0.47	10/25/12	8:23 12:23	AC00716	FCA00239	29.5	0.0		
Sample 30	⑦-2.59	10/25/12	8:29 12:29	AC00501	FCA00015	29.5	6.0		
Sample 31	⑧-3.74	10/25/12	8:34 12:34	AC00765	FCA00303	29.5	5.75		
Sample 32	⑨-5.62	10/25/12	8:37 12:37	AC01403	FCA00432	29.5	10.0		
Sample 33	⑩-0.55	10/25/12	8:41 12:41	AC01573	FCA00449	29.5	3.0		
Sample 34	⑪-2.74	10/25/12	8:44 12:44	AC00947	FCA00632	29.5	5.0		
Sample 35	⑫-2.27	10/25/12	8:48 12:48	AC00933	FCA00473	29.5	4.0		
Sample 36	⑬-2.23	10/25/12	8:51 12:51	AC01790	FCA00538	29.5	3.5		
Sample 37	⑭-3.03	10/25/12	9:00 13:00	AC01886	FCA00275	29.5	5.0		

Report Tier Levels - please select

Tier I - Results (Default if not specified) _____
Tier II (Results + QC Summaries) _____
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Data Validation Package) 10% Surcharge _____

EDD required Yes / No
Type: _____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Richard Pager	10/25	15:09		10/26/12	0910
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank Temperature ____ °C

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Air - Chain of Custody Record & Analytical Service Request

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

CAS Project No. R1204494

Company Name & Address (Reporting Information)	Project Name	CAS Contact:	Comments e.g. Actual Preservative or specific instructions
	Project Number	**Analysis Method**	
Project Manager	P.O. # / Billing Information		
Phone / Fax			
Email Address for Result Reporting	Sampler (Print & Sign) Richard Pager Richard Pager		

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume
Sample 38	(15)-2.26	10/25/12	9:08 13:08	AC01487	FCA00418	29.5	4.5	
Sample 39	(16)-3.56	10/25/12	9:40 13:40	AC01115	FCA00503	29.6	6.5	
Sample 40	(17)-0.45	10/25/12	9:43 13:43	AC01243	FCA00603	29.4	2.0	
Sample 41	(18)-3.00	10/25/12	9:51 13:51	AC01218	FCA00405	29.6	9.0	
Sample 42	(19)-1.55	10/25/12	9:55 13:55	AC01179	FCA00040	29.6	4.75	
Sample 43	(20)-3.31	10/25/12	10:00 14:00	AC00870	FCA00215	29.5	6.0	
Sample 44	(21)-14.40	10/25/12	10:05	AC00993	FCA00619	29.3	~~Ref~~ Field	Blank
	-1941(3)							

Report Tier Levels - please select
Tier I - Results (Default if not specified) ____
Tier II (Results + QC Summaries) ____
Tier III (Results + QC & Calibration Summaries) ____
Tier IV (Data Validation Package) 10% Surcharge ____
EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Richard Pager	10/25	15:09	[illegible]	10/26/12	0940
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank Temperature ____ °C

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Sample Acceptance Check Form

Client: Stantec Consulting Services, Inc. Work order: P1204494

Project: Sunoco IH Testing / 213402094

Sample(s) received on: 10/31/12 Date opened: 10/31/12 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☐	☒	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☐	☒	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
9	Was a **trip blank** received?	☐	☒	☐
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1204494-001.01	6.0 L Ambient Can					
P1204494-002.01	6.0 L Ambient Can					
P1204494-003.01	6.0 L Ambient Can					
P1204494-004.01	6.0 L Ambient Can					
P1204494-005.01	6.0 L Ambient Can					
P1204494-006.01	6.0 L Ambient Can					
P1204494-007.01	6.0 L Ambient Can					
P1204494-008.01	6.0 L Ambient Can					

Explain any discrepancies: (include lab sample ID numbers):

Sample -002 has an ID of "Sample 25" on the COC, and "Sample 28" on the canister tag.

Sample -004 has canister SN AC01830, we received canister AC01810.

Sample -018 has an ID of "Sample 41" on the COC, and "Sample 40" on the canister tag.

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

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Sample Acceptance Check Form

Client: Stantec Consulting Services, Inc. Work order: P1204494

Project: Sunoco IH Testing / 213402094

Sample(s) received on: 10/31/12 Date opened: 10/31/12 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1204494-009.01	6.0 L Ambient Can					
P1204494-010.01	6.0 L Ambient Can					
P1204494-011.01	6.0 L Ambient Can					
P1204494-012.01	6.0 L Ambient Can					
P1204494-013.01	6.0 L Ambient Can					
P1204494-014.01	6.0 L Ambient Can					
P1204494-015.01	6.0 L Ambient Can					
P1204494-016.01	6.0 L Ambient Can					
P1204494-017.01	6.0 L Ambient Can					
P1204494-018.01	6.0 L Ambient Can					
P1204494-019.01	6.0 L Ambient Can					
P1204494-020.01	6.0 L Ambient Can					
P1204494-021.01	6.0 L Ambient Can					

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 23** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-001

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/2/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01664

Initial Pressure (psig): -6.14 Final Pressure (psig): 3.79

Canister Dilution Factor: 2.16

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	1.1	ND	0.30	
107-06-2	1,2-Dichloroethane	ND	1.1	ND	0.27	
71-43-2	Benzene	ND	1.1	ND	0.34	
108-88-3	Toluene	**3.8**	1.1	**1.0**	0.29	
106-93-4	1,2-Dibromoethane	ND	1.1	ND	0.14	
100-41-4	Ethylbenzene	ND	1.1	ND	0.25	
179601-23-1	m,p-Xylenes	ND	2.2	ND	0.50	
95-47-6	o-Xylene	ND	1.1	ND	0.25	
98-82-8	Cumene	ND	1.1	ND	0.22	
108-67-8	1,3,5-Trimethylbenzene	ND	1.1	ND	0.22	
95-63-6	1,2,4-Trimethylbenzene	ND	1.1	ND	0.22	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 25**
Client Project ID: **Sunoco IH Testing / 213402094**

CAS Project ID: P1204494
CAS Sample ID: P1204494-002

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Lusine Hakobyan
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC01093

Date Collected: 10/25/12
Date Received: 10/31/12
Date Analyzed: 11/2/12
Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-43-2	Benzene	ND	0.50	ND	0.16	
108-88-3	Toluene	ND	0.50	ND	0.13	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
98-82-8	Cumene	ND	0.50	ND	0.10	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 26** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-003

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/2/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00540

Initial Pressure (psig): -3.15 Final Pressure (psig): 3.59

Canister Dilution Factor: 1.58

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.79	ND	0.22	
107-06-2	1,2-Dichloroethane	ND	0.79	ND	0.20	
71-43-2	Benzene	**2.1**	0.79	**0.67**	0.25	
108-88-3	Toluene	**4.0**	0.79	**1.1**	0.21	
106-93-4	1,2-Dibromoethane	ND	0.79	ND	0.10	
100-41-4	Ethylbenzene	**0.99**	0.79	**0.23**	0.18	
179601-23-1	m,p-Xylenes	**3.8**	1.6	**0.87**	0.36	
95-47-6	o-Xylene	**1.3**	0.79	**0.31**	0.18	
98-82-8	Cumene	**1.1**	0.79	**0.22**	0.16	
108-67-8	1,3,5-Trimethylbenzene	ND	0.79	ND	0.16	
95-63-6	1,2,4-Trimethylbenzene	**1.4**	0.79	**0.29**	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 27** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-004

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/2/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01810

Initial Pressure (psig): -4.85 Final Pressure (psig): 3.59

Canister Dilution Factor: 1.86

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.93	ND	0.26	
107-06-2	1,2-Dichloroethane	ND	0.93	ND	0.23	
71-43-2	Benzene	**2.3**	0.93	**0.71**	0.29	
108-88-3	Toluene	**3.6**	0.93	**0.96**	0.25	
106-93-4	1,2-Dibromoethane	ND	0.93	ND	0.12	
100-41-4	Ethylbenzene	ND	0.93	ND	0.21	
179601-23-1	m,p-Xylenes	**3.0**	1.9	**0.69**	0.43	
95-47-6	o-Xylene	**1.1**	0.93	**0.26**	0.21	
98-82-8	Cumene	ND	0.93	ND	0.19	
108-67-8	1,3,5-Trimethylbenzene	ND	0.93	ND	0.19	
95-63-6	1,2,4-Trimethylbenzene	ND	0.93	ND	0.19	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 28** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-005

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/2/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01350

Initial Pressure (psig): -2.60 Final Pressure (psig): 3.71

Canister Dilution Factor: 1.52

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.76	ND	0.21	
107-06-2	1,2-Dichloroethane	ND	0.76	ND	0.19	
71-43-2	Benzene	**2.3**	0.76	**0.70**	0.24	
108-88-3	Toluene	**2.0**	0.76	**0.54**	0.20	
106-93-4	1,2-Dibromoethane	ND	0.76	ND	0.099	
100-41-4	Ethylbenzene	ND	0.76	ND	0.18	
179601-23-1	m,p-Xylenes	ND	1.5	ND	0.35	
95-47-6	o-Xylene	ND	0.76	ND	0.18	
98-82-8	Cumene	ND	0.76	ND	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.76	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	ND	0.76	ND	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 29** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-006

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/2/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00716

Initial Pressure (psig): -0.41 Final Pressure (psig): 4.20

Canister Dilution Factor: 1.32

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.66	ND	0.18	
107-06-2	1,2-Dichloroethane	ND	0.66	ND	0.16	
71-43-2	Benzene	**1.6**	0.66	**0.50**	0.21	
108-88-3	Toluene	**6.5**	0.66	**1.7**	0.18	
106-93-4	1,2-Dibromoethane	ND	0.66	ND	0.086	
100-41-4	Ethylbenzene	**0.95**	0.66	**0.22**	0.15	
179601-23-1	m,p-Xylenes	**3.3**	1.3	**0.76**	0.30	
95-47-6	o-Xylene	**1.1**	0.66	**0.25**	0.15	
98-82-8	Cumene	ND	0.66	ND	0.13	
108-67-8	1,3,5-Trimethylbenzene	ND	0.66	ND	0.13	
95-63-6	1,2,4-Trimethylbenzene	**0.99**	0.66	**0.20**	0.13	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 30** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-007

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/2/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00501

Initial Pressure (psig): -2.50 Final Pressure (psig): 3.61

Canister Dilution Factor: 1.50

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.75	ND	0.21	
107-06-2	1,2-Dichloroethane	ND	0.75	ND	0.19	
71-43-2	Benzene	**1.2**	0.75	**0.36**	0.23	
108-88-3	Toluene	**4.4**	0.75	**1.2**	0.20	
106-93-4	1,2-Dibromoethane	ND	0.75	ND	0.098	
100-41-4	Ethylbenzene	ND	0.75	ND	0.17	
179601-23-1	m,p-Xylenes	**2.3**	1.5	**0.53**	0.35	
95-47-6	o-Xylene	**0.87**	0.75	**0.20**	0.17	
98-82-8	Cumene	ND	0.75	ND	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.75	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	**1.1**	0.75	**0.23**	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 31** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-008

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/2/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00765

Initial Pressure (psig): -3.73 Final Pressure (psig): 3.68

Canister Dilution Factor: 1.68

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.84	ND	0.23	
107-06-2	1,2-Dichloroethane	ND	0.84	ND	0.21	
71-43-2	Benzene	**1.3**	0.84	**0.41**	0.26	
108-88-3	Toluene	**4.8**	0.84	**1.3**	0.22	
106-93-4	1,2-Dibromoethane	ND	0.84	ND	0.11	
100-41-4	Ethylbenzene	ND	0.84	ND	0.19	
179601-23-1	m,p-Xylenes	**2.5**	1.7	**0.57**	0.39	
95-47-6	o-Xylene	**0.91**	0.84	**0.21**	0.19	
98-82-8	Cumene	ND	0.84	ND	0.17	
108-67-8	1,3,5-Trimethylbenzene	ND	0.84	ND	0.17	
95-63-6	1,2,4-Trimethylbenzene	**0.94**	0.84	**0.19**	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 32** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-009

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/2/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01403

Initial Pressure (psig): -5.30 Final Pressure (psig): 3.76

Canister Dilution Factor: 1.96

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.98	ND	0.27	
107-06-2	1,2-Dichloroethane	ND	0.98	ND	0.24	
71-43-2	Benzene	**1.3**	0.98	**0.41**	0.31	
108-88-3	Toluene	**5.2**	0.98	**1.4**	0.26	
106-93-4	1,2-Dibromoethane	ND	0.98	ND	0.13	
100-41-4	Ethylbenzene	ND	0.98	ND	0.23	
179601-23-1	m,p-Xylenes	**2.5**	2.0	**0.58**	0.45	
95-47-6	o-Xylene	ND	0.98	ND	0.23	
98-82-8	Cumene	ND	0.98	ND	0.20	
108-67-8	1,3,5-Trimethylbenzene	ND	0.98	ND	0.20	
95-63-6	1,2,4-Trimethylbenzene	ND	0.98	ND	0.20	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 33** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-010

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/2/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01573

Initial Pressure (psig): -0.55 Final Pressure (psig): 3.66

Canister Dilution Factor: 1.30

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.65	ND	0.18	
107-06-2	1,2-Dichloroethane	ND	0.65	ND	0.16	
71-43-2	Benzene	**1.4**	0.65	**0.45**	0.20	
108-88-3	Toluene	**5.0**	0.65	**1.3**	0.17	
106-93-4	1,2-Dibromoethane	ND	0.65	ND	0.085	
100-41-4	Ethylbenzene	**0.93**	0.65	**0.21**	0.15	
179601-23-1	m,p-Xylenes	**3.5**	1.3	**0.81**	0.30	
95-47-6	o-Xylene	**1.1**	0.65	**0.26**	0.15	
98-82-8	Cumene	ND	0.65	ND	0.13	
108-67-8	1,3,5-Trimethylbenzene	ND	0.65	ND	0.13	
95-63-6	1,2,4-Trimethylbenzene	**0.97**	0.65	**0.20**	0.13	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 34** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-011

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/3/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00947

Initial Pressure (psig): -2.79 Final Pressure (psig): 3.49

Canister Dilution Factor: 1.53

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.77	ND	0.21	
107-06-2	1,2-Dichloroethane	ND	0.77	ND	0.19	
71-43-2	Benzene	**1.3**	0.77	**0.41**	0.24	
108-88-3	Toluene	**4.9**	0.77	**1.3**	0.20	
106-93-4	1,2-Dibromoethane	ND	0.77	ND	0.10	
100-41-4	Ethylbenzene	**0.89**	0.77	**0.21**	0.18	
179601-23-1	m,p-Xylenes	**3.3**	1.5	**0.75**	0.35	
95-47-6	o-Xylene	**1.3**	0.77	**0.30**	0.18	
98-82-8	Cumene	ND	0.77	ND	0.16	
108-67-8	1,3,5-Trimethylbenzene	ND	0.77	ND	0.16	
95-63-6	1,2,4-Trimethylbenzene	**1.1**	0.77	**0.23**	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 35** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-012

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/3/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00033

Initial Pressure (psig): -2.24 Final Pressure (psig): 3.50

Canister Dilution Factor: 1.46

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.73	ND	0.20	
107-06-2	1,2-Dichloroethane	ND	0.73	ND	0.18	
71-43-2	Benzene	**1.2**	0.73	**0.39**	0.23	
108-88-3	Toluene	**5.9**	0.73	**1.6**	0.19	
106-93-4	1,2-Dibromoethane	ND	0.73	ND	0.095	
100-41-4	Ethylbenzene	**1.0**	0.73	**0.24**	0.17	
179601-23-1	m,p-Xylenes	**3.7**	1.5	**0.84**	0.34	
95-47-6	o-Xylene	**1.4**	0.73	**0.31**	0.17	
98-82-8	Cumene	ND	0.73	ND	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.73	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	**0.95**	0.73	**0.19**	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 36** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-013

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01790

Initial Pressure (psig): -2.23 Final Pressure (psig): 3.48

Canister Dilution Factor: 1.46

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.73	ND	0.20	
107-06-2	1,2-Dichloroethane	ND	0.73	ND	0.18	
71-43-2	Benzene	**0.94**	0.73	**0.29**	0.23	
108-88-3	Toluene	**4.0**	0.73	**1.1**	0.19	
106-93-4	1,2-Dibromoethane	ND	0.73	ND	0.095	
100-41-4	Ethylbenzene	**0.74**	0.73	**0.17**	0.17	
179601-23-1	m,p-Xylenes	**2.5**	1.5	**0.59**	0.34	
95-47-6	o-Xylene	**0.97**	0.73	**0.22**	0.17	
98-82-8	Cumene	ND	0.73	ND	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.73	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	**0.78**	0.73	**0.16**	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 37** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-014

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01886

Initial Pressure (psig): -3.04 Final Pressure (psig): 3.62

Canister Dilution Factor: 1.57

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.79	ND	0.22	
107-06-2	1,2-Dichloroethane	ND	0.79	ND	0.19	
71-43-2	Benzene	**11**	0.79	**3.6**	0.25	
108-88-3	Toluene	**88**	0.79	**23**	0.21	
106-93-4	1,2-Dibromoethane	ND	0.79	ND	0.10	
100-41-4	Ethylbenzene	**11**	0.79	**2.5**	0.18	
179601-23-1	m,p-Xylenes	**42**	1.6	**9.7**	0.36	
95-47-6	o-Xylene	**9.1**	0.79	**2.1**	0.18	
98-82-8	Cumene	**1.3**	0.79	**0.26**	0.16	
108-67-8	1,3,5-Trimethylbenzene	**1.4**	0.79	**0.28**	0.16	
95-63-6	1,2,4-Trimethylbenzene	**3.9**	0.79	**0.79**	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 38**
Client Project ID: **Sunoco IH Testing / 213402094**

CAS Project ID: P1204494
CAS Sample ID: P1204494-015

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Lusine Hakobyan
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC01487

Date Collected: 10/25/12
Date Received: 10/31/12
Date Analyzed: 11/5/12
Volume(s) Analyzed: 1.00 Liter(s)
0.10 Liter(s)

Initial Pressure (psig): -2.38 Final Pressure (psig): 3.62

Canister Dilution Factor: 1.49

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.75	ND	0.21	
107-06-2	1,2-Dichloroethane	ND	0.75	ND	0.18	
71-43-2	Benzene	**8.4**	0.75	**2.6**	0.23	
108-88-3	Toluene	**330**	7.5	**87**	2.0	**D**
106-93-4	1,2-Dibromoethane	ND	0.75	ND	0.097	
100-41-4	Ethylbenzene	**6.0**	0.75	**1.4**	0.17	
179601-23-1	m,p-Xylenes	**24**	1.5	**5.5**	0.34	
95-47-6	o-Xylene	**7.6**	0.75	**1.8**	0.17	
98-82-8	Cumene	**2.6**	0.75	**0.52**	0.15	
108-67-8	1,3,5-Trimethylbenzene	**3.9**	0.75	**0.80**	0.15	
95-63-6	1,2,4-Trimethylbenzene	**11**	0.75	**2.2**	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
D = The reported result is from a dilution.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 39** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-016

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01115

Initial Pressure (psig): -3.59 Final Pressure (psig): 3.71

Canister Dilution Factor: 1.66

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	**0.96**	0.83	**0.27**	0.23	
107-06-2	1,2-Dichloroethane	ND	0.83	ND	0.21	
71-43-2	Benzene	**1.4**	0.83	**0.45**	0.26	
108-88-3	Toluene	**6.4**	0.83	**1.7**	0.22	
106-93-4	1,2-Dibromoethane	ND	0.83	ND	0.11	
100-41-4	Ethylbenzene	**1.1**	0.83	**0.25**	0.19	
179601-23-1	m,p-Xylenes	**3.9**	1.7	**0.89**	0.38	
95-47-6	o-Xylene	**1.4**	0.83	**0.32**	0.19	
98-82-8	Cumene	ND	0.83	ND	0.17	
108-67-8	1,3,5-Trimethylbenzene	ND	0.83	ND	0.17	
95-63-6	1,2,4-Trimethylbenzene	**1.1**	0.83	**0.23**	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 40** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-017

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01243

Initial Pressure (psig): -0.40 Final Pressure (psig): 3.96

Canister Dilution Factor: 1.30

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	**1.6**	0.65	**0.43**	0.18	
107-06-2	1,2-Dichloroethane	ND	0.65	ND	0.16	
71-43-2	Benzene	**2.0**	0.65	**0.64**	0.20	
108-88-3	Toluene	**8.8**	0.65	**2.3**	0.17	
106-93-4	1,2-Dibromoethane	ND	0.65	ND	0.085	
100-41-4	Ethylbenzene	**1.4**	0.65	**0.33**	0.15	
179601-23-1	m,p-Xylenes	**5.4**	1.3	**1.2**	0.30	
95-47-6	o-Xylene	**1.8**	0.65	**0.42**	0.15	
98-82-8	Cumene	ND	0.65	ND	0.13	
108-67-8	1,3,5-Trimethylbenzene	ND	0.65	ND	0.13	
95-63-6	1,2,4-Trimethylbenzene	**1.5**	0.65	**0.31**	0.13	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 41** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-018

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01218

Initial Pressure (psig): -3.00 Final Pressure (psig): 3.67

Canister Dilution Factor: 1.57

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.79	ND	0.22	
107-06-2	1,2-Dichloroethane	ND	0.79	ND	0.19	
71-43-2	Benzene	**1.8**	0.79	**0.55**	0.25	
108-88-3	Toluene	**9.0**	0.79	**2.4**	0.21	
106-93-4	1,2-Dibromoethane	ND	0.79	ND	0.10	
100-41-4	Ethylbenzene	**1.3**	0.79	**0.31**	0.18	
179601-23-1	m,p-Xylenes	**5.2**	1.6	**1.2**	0.36	
95-47-6	o-Xylene	**1.9**	0.79	**0.44**	0.18	
98-82-8	Cumene	ND	0.79	ND	0.16	
108-67-8	1,3,5-Trimethylbenzene	**1.1**	0.79	**0.22**	0.16	
95-63-6	1,2,4-Trimethylbenzene	**3.1**	0.79	**0.64**	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 42** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-019

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01179

Initial Pressure (psig): -1.52 Final Pressure (psig): 3.71

Canister Dilution Factor: 1.40

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.70	ND	0.19	
107-06-2	1,2-Dichloroethane	ND	0.70	ND	0.17	
71-43-2	Benzene	**1.7**	0.70	**0.53**	0.22	
108-88-3	Toluene	**8.2**	0.70	**2.2**	0.19	
106-93-4	1,2-Dibromoethane	ND	0.70	ND	0.091	
100-41-4	Ethylbenzene	**1.1**	0.70	**0.25**	0.16	
179601-23-1	m,p-Xylenes	**4.6**	1.4	**1.1**	0.32	
95-47-6	o-Xylene	**1.7**	0.70	**0.38**	0.16	
98-82-8	Cumene	ND	0.70	ND	0.14	
108-67-8	1,3,5-Trimethylbenzene	**0.87**	0.70	**0.18**	0.14	
95-63-6	1,2,4-Trimethylbenzene	**2.5**	0.70	**0.50**	0.14	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 43** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-020

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC00870

Initial Pressure (psig): -3.27 Final Pressure (psig): 3.76

Canister Dilution Factor: 1.62

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.81	ND	0.22	
107-06-2	1,2-Dichloroethane	ND	0.81	ND	0.20	
71-43-2	Benzene	**1.2**	0.81	**0.37**	0.25	
108-88-3	Toluene	**10**	0.81	**2.7**	0.22	
106-93-4	1,2-Dibromoethane	ND	0.81	ND	0.11	
100-41-4	Ethylbenzene	ND	0.81	ND	0.19	
179601-23-1	m,p-Xylenes	**2.8**	1.6	**0.65**	0.37	
95-47-6	o-Xylene	**0.99**	0.81	**0.23**	0.19	
98-82-8	Cumene	ND	0.81	ND	0.16	
108-67-8	1,3,5-Trimethylbenzene	ND	0.81	ND	0.16	
95-63-6	1,2,4-Trimethylbenzene	**0.93**	0.81	**0.19**	0.16	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 44**
Client Project ID: **Sunoco IH Testing / 213402094**

CAS Project ID: P1204494
CAS Sample ID: P1204494-021

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Lusine Hakobyan
Sample Type: 6.0 L Summa Canister
Test Notes:
Container ID: AC00993

Date Collected: 10/25/12
Date Received: 10/31/12
Date Analyzed: 11/5/12
Volume(s) Analyzed: 1.00 Liter(s)

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-43-2	Benzene	ND	0.50	ND	0.16	
108-88-3	Toluene	ND	0.50	ND	0.13	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
98-82-8	Cumene	ND	0.50	ND	0.10	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Method Blank** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P121102-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 11/2/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-43-2	Benzene	ND	0.50	ND	0.16	
108-88-3	Toluene	ND	0.50	ND	0.13	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
98-82-8	Cumene	ND	0.50	ND	0.10	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

RESULTS OF ANALYSIS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Method Blank** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P121105-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-43-2	Benzene	ND	0.50	ND	0.16	
108-88-3	Toluene	ND	0.50	ND	0.13	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
98-82-8	Cumene	ND	0.50	ND	0.10	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

SURROGATE SPIKE RECOVERY RESULTS

Client: **Stantec Consulting Services, Inc.**
Client Project ID: **Sunoco IH Testing / 213402094** CAS Project ID: P1204494

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date(s) Collected: 10/25/12
Analyst: Lusine Hakobyan Date(s) Received: 10/31/12
Sample Type: 6.0 L Summa Canister(s) Date(s) Analyzed: 11/2 - 11/5/12
Test Notes:

Client Sample ID	CAS Sample ID	1,2-Dichloroethane-d4 Percent Recovered	Toluene-d8 Percent Recovered	Bromofluorobenzene Percent Recovered	Acceptance Limits	Data Qualifier
Method Blank	P121102-MB	**101**	**99**	**96**	70-130	
Method Blank	P121105-MB	**102**	**100**	**97**	70-130	
Lab Control Sample	P121102-LCS	**99**	**99**	**100**	70-130	
Lab Control Sample	P121105-LCS	**99**	**100**	**99**	70-130	
Sample 23	P1204494-001	**101**	**101**	**95**	70-130	
Sample 25	P1204494-002	**101**	**101**	**95**	70-130	
Sample 26	P1204494-003	**101**	**101**	**97**	70-130	
Sample 27	P1204494-004	**102**	**100**	**97**	70-130	
Sample 28	P1204494-005	**101**	**100**	**96**	70-130	
Sample 29	P1204494-006	**101**	**100**	**97**	70-130	
Sample 30	P1204494-007	**101**	**100**	**97**	70-130	
Sample 31	P1204494-008	**101**	**99**	**96**	70-130	
Sample 32	P1204494-009	**102**	**99**	**97**	70-130	
Sample 33	P1204494-010	**101**	**99**	**97**	70-130	
Sample 34	P1204494-011	**102**	**100**	**97**	70-130	
Sample 35	P1204494-012	**101**	**100**	**97**	70-130	
Sample 36	P1204494-013	**100**	**101**	**97**	70-130	
Sample 37	P1204494-014	**100**	**101**	**97**	70-130	
Sample 38	P1204494-015	**99**	**100**	**98**	70-130	
Sample 39	P1204494-016	**101**	**100**	**98**	70-130	
Sample 40	P1204494-017	**101**	**100**	**97**	70-130	
Sample 40	P1204494-017DUP	**100**	**100**	**96**	70-130	
Sample 41	P1204494-018	**101**	**101**	**97**	70-130	
Sample 42	P1204494-019	**100**	**102**	**96**	70-130	
Sample 43	P1204494-020	**101**	**101**	**98**	70-130	
Sample 44	P1204494-021	**100**	**101**	**96**	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Lab Control Sample** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P121102-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 11/02/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	CAS Acceptance Limits	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	204	**187**	**92**	67-116	
107-06-2	1,2-Dichloroethane	208	**180**	**87**	70-118	
71-43-2	Benzene	208	**187**	**90**	66-121	
108-88-3	Toluene	208	**172**	**83**	67-111	
106-93-4	1,2-Dibromoethane	208	**182**	**88**	73-122	
100-41-4	Ethylbenzene	206	**170**	**83**	71-117	
179601-23-1	m,p-Xylenes	412	**328**	**80**	70-116	
95-47-6	o-Xylene	200	**163**	**82**	70-116	
98-82-8	Cumene	196	**160**	**82**	70-116	
108-67-8	1,3,5-Trimethylbenzene	208	**169**	**81**	71-121	
95-63-6	1,2,4-Trimethylbenzene	200	**165**	**83**	73-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Lab Control Sample** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P121105-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 11/05/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	CAS Acceptance Limits	Data Qualifier
1634-04-4	Methyl tert-Butyl Ether	204	**191**	**94**	67-116	
107-06-2	1,2-Dichloroethane	208	**184**	**88**	70-118	
71-43-2	Benzene	208	**190**	**91**	66-121	
108-88-3	Toluene	208	**178**	**86**	67-111	
106-93-4	1,2-Dibromoethane	208	**189**	**91**	73-122	
100-41-4	Ethylbenzene	206	**174**	**84**	71-117	
179601-23-1	m,p-Xylenes	412	**338**	**82**	70-116	
95-47-6	o-Xylene	200	**167**	**84**	70-116	
98-82-8	Cumene	196	**164**	**84**	70-116	
108-67-8	1,3,5-Trimethylbenzene	208	**173**	**83**	71-121	
95-63-6	1,2,4-Trimethylbenzene	200	**171**	**86**	73-127	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

LABORATORY DUPLICATE SUMMARY RESULTS

Client: **Stantec Consulting Services, Inc.**
Client Sample ID: **Sample 40** CAS Project ID: P1204494
Client Project ID: **Sunoco IH Testing / 213402094** CAS Sample ID: P1204494-017DUP

Test Code: EPA TO-15 Date Collected: 10/25/12
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/31/12
Analyst: Lusine Hakobyan Date Analyzed: 11/5/12
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC01243

Initial Pressure (psig): -0.40 Final Pressure (psig): 3.96

Canister Dilution Factor: 1.30

Compound	Sample Result µg/m³	Sample Result ppbV	Duplicate Sample Result µg/m³	Duplicate Sample Result ppbV	Average µg/m³	% RPD	RPD Limit	Data Qualifier
Methyl tert-Butyl Ether	1.55	0.431	1.57	0.436	1.56	**1**	25	
1,2-Dichloroethane	ND	ND	ND	ND	-	-	25	
Benzene	2.03	0.637	2.03	0.634	2.03	**0**	25	
Toluene	8.79	2.33	8.75	2.32	8.77	**0.5**	25	
1,2-Dibromoethane	ND	ND	ND	ND	-	-	25	
Ethylbenzene	1.45	0.333	1.43	0.329	1.44	**1**	25	
m,p-Xylenes	5.39	1.24	5.35	1.23	5.37	**0.7**	25	
o-Xylene	1.83	0.422	1.82	0.419	1.825	**0.5**	25	
Cumene	ND	ND	ND	ND	-	-	25	
1,3,5-Trimethylbenzene	ND	ND	ND	ND	-	-	25	
1,2,4-Trimethylbenzene	1.54	0.314	1.53	0.311	1.535	**0.7**	25	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.