FINAL Report

Human Health Risk Assessment Manitoba Hydro Sutherland Avenue Facility in Winnipeg, Manitoba

Prepared for

KGS Group

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Contents

Section **Page**

Figures (located in Appendix A)

Tables (located in Appendix B)

Appendixes

Acronyms and Abbreviations

µg	microgram
µg/L	micrograms per litre
µg/m^3	micrograms per cubic metre
µm	micrometre
95UCL	95 percent upper confidence limit
AEE	AGRA Earth & Environmental Limited
AF	attenuation factor
AT	averaging time
BC MOE	British Columbia Ministry of Environment
BTEX	benzene, toluene, ethylbenzene, and xylenes
BW	body weight
BWD	block-wall depressurization
C_{air}	Volatile contaminant concentration in air (mg/m^3)
CCME	Canadian Council of Ministers of the Environment
CH2M HILL	CH2M HILL Canada Limited
COC	contaminant of concern
CSM	conceptual site model
$DQRA_{CHEM}$	detailed quantitative risk assessment for chemicals
EC	exposure concentration
ED	exposure duration
EF	exposure frequency
ERA	ecological risk assessment
F1	fraction of petroleum hydrocarbons $C_6 – C_{10}$
F2	fraction of petroleum hydrocarbons $C_{10} – C_{16}$
HHRA	human health risk assessment
HQ	hazard quotient
IACR	index of additive cancer risk
ILCR	increased lifetime cancer risk
KGS Group	KGS Group Consulting Engineers
L	Litre
LOE	line-of-evidence
mbg	metres below grade
MDEP	Massachusetts Department of Environmental Protection
mg/m^3	milligram per cubic metre
MGP	manufactured gas plant

MOE	Ontario Ministry of the Environment
NOAEL	no-observed-adverse-effect-level
OHG	Occupational Hygiene Group
PAH	polycyclic aromatic hydrocarbon
PEF	potency equivalence factor
PEQ	potency equivalent
PHC	petroleum hydrocarbon
PPE	personal protective equipment
PQRA	preliminary quantitative risk assessment
PTFE	polytetrafluorethylene
QHHERA	quantitative human health and ecological risk assessment
RAGS	USEPA Supplemental Guidance for Inhalation Risk Assessment
RDL	reported detection limit
RfC	reference concentration
RfD	reference dose
RMM	risk management measure
RMP	risk management plan
SF	slope factor
Site	35 to 38 Sutherland Avenue in Winnipeg, Manitoba
SMD	sub-membrane depressurization
TRV	toxicological reference value
UR	unit risk
USEPA	United States Environmental Protection Agency
VI	vapour intrusion
WOE	weight-of-evidence

Executive Summary

KGS Group Consulting Engineers (KGS Group) retained CH2M HILL Canada Limited (CH2M HILL) to complete a human health risk assessment (HHRA) for the Manitoba Hydro property located at 35 to 38 Sutherland Avenue in Winnipeg, Manitoba (the Site; Figure 1, Appendix A). KGS Group was retained by Manitoba Hydro to complete a Long Term Monitoring Program (LTMP) for management of contaminants that have resulted from historical operations at the Site, and CH2M HILL is undertaking the HHRA component of the LTMP.

The Site was formerly the location of a Manufactured Gas Plant (MGP), which operated from 1883 to 1957 producing a combustible gas that was used for street lighting, space heating, and cooking. The MGP ceased production in 1957 with the first phase of decommissioning commencing in 1959. New buildings were erected on the Site starting in 1969 and are currently in use by Manitoba Hydro. Beginning in 1993, Manitoba Hydro has engaged various consultants to complete environmental investigations at the Site. The investigations have identified the presence of polycyclic aromatic hydrocarbons (PAHs); monocyclic aromatic hydrocarbons such as benzene, toluene, ethylbenzene, and xylenes (BTEX); and petroleum hydrocarbons (PHCs) at concentrations greater than appropriate regulatory guidelines for soil, groundwater, and river sediment.

Human Health Risk Assessment

A quantitative HHRA was completed for the Site in 2012 to determine whether contamination at the Site poses a potential risk to human receptors via the inhalation pathway. Previous environmental studies have been undertaken to assess this exposure route for onsite and offsite receptors. All previous studies indicated that risks were within acceptable limits. The 2012 HHRA was conducted within the context of the Manitoba Conservation & Water Stewardship's Director's Remediation Order and the Manitoba Hydro LTMP. The HHRA was conducted in accordance with Health Canada and Canadian Council of Ministers of the Environment (CCME) guidance documents, specifically:

- Federal Contaminated Site Risk Assessment In Canada, Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA), Version 2.0, 2010, Revised 2012
- Federal Contaminated Site Risk Assessment In Canada, Part II: Health Canada Toxicological Reference Values (TRVs) and Chemical-Specific Factors, Version 2.0, 2010
- Federal Contaminated Site Risk Assessment in Canada, Part V: Guidance on Human Health Detailed Quantitative Risk Assessment for Chemicals ($DQRA_{CHEM}$), 2010
- Federal Contaminated Site Risk Assessment in Canada, Part VII: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites, 2010
- A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines, Canadian Council of Ministers of the Environment, 2006

A critical part of risk assessment is the identification of appropriate TRVs. Toxicity values have been established by a number of regulatory agencies, including Health Canada, the United States Environmental Protection Agency (USEPA) and others. For chemical-exposure route combinations for which Health Canada has not adopted a TRV, values were obtained from the Ontario Ministry of Environment (MOE) and/or the Massachusetts Department of Environmental Protection (MDEP). There is a high degree of confidence that the TRVs selected for the HHRA are relevant and protective of human health. Reference concentrations (RfCs, tolerable concentrations of airborne contaminants) used in the assessment are protective of the human population (including sensitive members) at continuous exposure levels (that is, 24 hours per day, 7 days per week). Since the exposure term given in the Problem Formulation assumes non-continuous exposure (for example, a 50-hour work week for 48

weeks per year), use of chronic TRVs (RfCs where continuous exposure is assumed) provides an additional layer of conservatism to the risk assessment.

Two groups of contaminants were identified as contaminants of concern (COCs) for the HHRA, PHCs and PAHs, while the receptors of concern were identified as indoor workers (Manitoba Hydro staff) and offsite residents. Indoor air inhalation was determined to be the only complete exposure pathway. For indoor workers, exposures were quantified for inhalation of vapours indoors while offsite residents were evaluated qualitatively.

Non-carcinogenic COCs are often referenced by thresholds, where it is assumed that a level of exposure exists (dose) below which no health effects are expected. As the dose increases to the point at which the body can no longer process/excrete the substance, an adverse effect may occur. This point is different for each COC. Risk characterization for each non-carcinogenic COC was completed through calculation of a hazard quotient (HQ), which is the ratio of the exposure estimate to the applicable TRV. This approach does not account for potential interactions of contaminants. The approach of summing HQ values is considered to be very conservative, overly protective, and assumes that substances interact on the same cellular target and via the same mechanism of action, whereas, in reality, interactions are typically considered to be rare at environmental concentrations.

Because the risk assessment only addressed the vapour inhalation pathway, the target HQ was set to 0.2, meaning that it was assumed that 80 percent of an individual's intake of COCs would come from offsite exposures (ingestion of contaminants via supermarket goods or inhalation of contaminants in indoor air at home).For indoor workers, potentially unacceptable non-carcinogenic risks were identified from exposure to benzene (hazard quotient (HQ) of 0.62, 35 Sutherland – Elevator Basement and HQ of 0.81, 37 Sutherland – Stores Building Office), fraction of PHCs C_{10} – C_{16} (F2) (HQ of 2.0, 35 Sutherland – Elevator Exterior), and xylenes (HQ of 0.43, 37 Sutherland – Stores Building Office).

Carcinogenic risks were characterized through calculation of an incremental lifetime cancer risk (ILCR) for each applicable COC. An ILCR estimates the incremental probability that an individual will develop cancer as a result of lifetime exposure to a substance. This is in addition to the probability of developing cancer due to ambient exposures. The ILCR is calculated by multiplying the exposure estimate by a published unit risk (UR) or slope factor (SF). Generally, ILCRs between 1.0E-04 and 1.0E-06 are considered a negligible risk over background, although Health Canada has set its acceptable target cancer risk level at 1.0E-05.

Potentially unacceptable carcinogenic risks were identified from exposure to benzene (ILCR of 1.2E-05) at 37 Sutherland, Stores Building Office. Note that the potentially unacceptable risks were based on the maximum concentrations of each COC measured at each sampling location applied as the exposure point concentrations (EPCs). The concentrations measured in these locations were observed to be variable, and were not consistently measured at the maximum level. This represents a conservative approach as EPCs are typically represented by a statistic (for example, 75^{th} percentile or 95% percent of the upper confidence limit).

In situations where the calculated total HQ was greater than 0.2, or the total ILCR was greater than 1.0E-05, adverse health effects are not necessarily implied. What is implied; however, is the potential for an adverse effect. Due to the conservative nature of the underlying assumptions made in the calculation of exposure estimates, over-prediction of exposures is inherent. Airborne concentrations of benzene and xylenes measured at 37 Sutherland generally decreased from one sampling event to another in 2012, and in December 2012, no carcinogenic or non-carcinogenic risks were present via the inhalation pathway. It is possible; however, that indoor air quality at this location varies seasonally. Conversely, at 35 Sutherland, BTEX concentrations were relatively low during the first three indoor air sampling events in 2012 (July, October, November) and increased almost 10-fold for the final sampling event (December). Although potentially unacceptable non-carcinogenic human health risks were identified in this location during the December 2012 sampling event, based on the conservative assumptions used in their calculation, it is unlikely that human receptors will experience adverse health effects at this location.

For offsite residents living adjacent to the Site, the qualitative risk characterization indicated that no adverse health effects (associated with inhalation of vapours indoors) are expected.

Following the quantitative risk characterization, risk-based concentrations (RBCs) were developed for indoor air, and the indoor air data compared to the RBCs. The comparison confirmed the findings of the risk characterization, with exceedances of the RBCs noted in the same three locations. Upon consideration of the manner in which the samples were collected, the concentrations measured at the 35 Sutherland – Elevator Exterior location (which represent sub-slab rather than indoor air samples) are not considered to pose a non-carcinogenic risk to indoor workers. In the remaining two locations where exceedances were noted, 1) 35 Sutherland (Elevator Basement) and 2) 37 Sutherland (Stores Building Office), Manitoba Hydro workers are understood to work in these areas infrequently, and not on a continuous, or regular, full-time basis, which in effect decreases the potential for risk predicted from measured air concentrations. In order to reduce the potential exposures to concentrations that exceed acceptable levels for human health, risk mitigation measures are recommended that may include administrative controls, engineered controls, or a combination of both, at 35 Sutherland (Elevator Basement) and 37 Sutherland (Stores Building Office). CH2M HILL recommends that Manitoba Hydro evaluate a range of risk management and mitigation measures to address the issues identified in the HHRA.

There are several key uncertainties associated with the exposure assessment, all of which are addressed in a manner that tended to overestimate risk at the site. For example:

- The exposure scenario for workers was believed to reasonably overestimate exposures to COCs at the Site, although the true exposure patterns for Site users are unknown. It was assumed that workers would be present onsite for 10 hours per day, 5 days per week, for 48 weeks per year, over a 35 year career, with the majority of the time spent indoors.
- Exposure durations and frequencies were assumed to occur on a regular and long-term basis. However, it is reasonable to expect that receptors may relocate or change employment or job descriptions, and would be unlikely to come in routine contact with COCs. The conservative manner in which receptors have been identified in the HHRA and their activities evaluated indicates that uncertainties in the exposure assessment likely overestimate risk.
- The exposure assessment also defined the concentrations to which potential receptors may be exposed. For all COCs, the maximum contaminant concentrations were used to represent the exposure point concentration.

Uncertainties with the toxicity assessment also exist due to the limited amount of available toxicological information on the effects associated with human exposures to low levels of contaminants. Where available, human information is generally based on epidemiological studies of occupationally exposure workers; however, these studies are generally of limited scope and may not be applicable to chronic or continuous exposure to low levels of COCs. Because of this limitation, reference doses (RfDs) and cancer potency estimates for many compounds are based on the results of dose-response assessments using animals. To address weaknesses associated with extrapolating from experimental animal data too humans, uncertainty factors (generally in multiples of 10) are applied. The application of these uncertainty factors also introduces a high degree of conservatism into risk assessment and ensures, as far as possible, that limited exposures exceeding RfCs will not result in adverse human health effects.

SECTION 1

Introduction

KGS Group Consulting Engineers (KGS Group) retained CH2M HILL Canada Limited (CH2M HILL) to conduct a human health risk assessment (HHRA) for the Manitoba Hydro property located at 35 to 38 Sutherland Avenue in Winnipeg, Manitoba (the Site; Figure 1, Appendix A). KGS Group was retained by Manitoba Hydro to complete a Long Term Monitoring Program (LTMP) for management of contaminants that have resulted from historical operations at the Site. As part of the LTMP and the Manitoba Conservation & Water Stewardship's Director's Remediation Order, indoor air and soil vapour monitoring were performed by KGS Group.

The Site was formerly the location of a Manufactured Gas Plant (MGP), which operated from 1883 to 1957 producing a combustible gas that was used for street lighting, space heating, and cooking. The MGP ceased production in 1957 with the first phase of decommissioning commencing in 1959. During its operation, the MGP was owned by several different energy companies. Manitoba Hydro assumed responsibility for the Site following the acquisition of Centra Gas Manitoba Incorporated (Centra Gas) in 1999. Neither Manitoba Hydro nor Centra Gas operated the former MGP. New buildings were erected on the Site starting in 1969 and are currently in use by Manitoba Hydro.

Beginning in 1993, various consultants have been engaged by Centra Gas/Manitoba Hydro to complete environmental investigations at the Site. The investigations have identified the presence of polycyclic aromatic hydrocarbons (PAHs); monocyclic aromatic hydrocarbons such as benzene, toluene, ethylbenzene, and xylenes (BTEX); and petroleum hydrocarbons (PHCs) at concentrations greater than appropriate regulatory guidelines for soil, groundwater, and river sediment.

This report presents the quantitative HHRA completed for the Site. The specific objective of the HHRA is to quantify the potential human health risks associated with impacted environmental media (soil, groundwater, and indoor air) at the Site. Should unacceptable risks be identified for one or more receptors from exposure to COCs at the Site (or offsite), the results of the HHRA will be used to guide or inform risk management or remediation decisions.

This report is organized into the following sections:

Section 1 – Introduction: Provides general background information and objectives of this study.

Section 2 – Previous Environmental Studies: Presents the scope of work, methodology, and results of previous environmental investigations that are most relevant to the current study.

Section 3 – Human Health Risk Assessment: Describes the methodology and results of the quantitative HHRA.

Section 4 – Risk Management/Remediation Options: Reviews the risk management and remediation options (if necessary) for the Site to mitigate potential risks.

Section 5 – Conclusions and Recommendations: Presents the findings of the study.

Section 6 – References: Lists the references cited throughout the report.

SECTION 2

Previous Environmental Studies

Historical reports that are most relevant to the current study are summarized below.

In January 1995, CH2M HILL completed a Phase II Environmental Site Assessment (ESA) for the Site - “Environmental Health and Safety Assessment of the Sutherland Avenue Operations Facility in Winnipeg, Manitoba. Phase II: Detailed Site Characterisation”, submitted to Centra Gas in January 1995. The Phase II ESA assessed soil and groundwater quality across Rover Avenue toward the Red River and assessed water and sediment quality in the Red River adjacent to the Site. In addition, it included supplementary onsite hydrogeological testing, sewer inspection and sampling, biological impact assessment in the Red River, data evaluation and impact assessment, and baseline risk assessment.

A baseline HHRA was conducted to estimate whether an adverse human health risk was expected based on current land uses at the Site. The primary exposure pathway considered in the assessment was inhalation of gaseous residues. Risks due to ingestion and dermal contact were considered unlikely to be significant due to the Site conditions, and it was presumed that risk would be mitigated through the use of proper health and safety equipment (personal protective equipment [PPE]). The receptors considered in the HHRA were current and future adult workers on the Site.

An offsite risk assessment was not performed because the results of offsite sewer sampling for residues were negative, the onsite risk assessment suggested risks were within acceptable levels, and there is a lack of data on the factors required to determine offsite risks.

Inhalation risks were estimated for gaseous residues (PAHs) entering the onsite operations building using the concentrations of residues found in the northern portion of the Site (Area I). Area I contained the highest levels of residues encountered. The estimated risk in Area I did not exceed the accepted criteria (that is, one-in-a-million excess cancer risk for known carcinogens or a hazard index of one for non-carcinogens). These results indicated that risks to workers are within accepted limits. These results are also supported by the results of previous air sampling campaigns conducted in the buildings.

The HHRA was not repeated for chemicals found in the central or southern portions of the Site – Areas II and III, respectively, where residues were present at lower levels than Area I. Based on the assessment of Area I, it was concluded that risk to onsite workers from Areas II and III would be well below acceptable levels.

In December 1995, CH2M HILL completed a Phase IIB: Offsite Soil Gas Survey to determine whether residues characteristic of the MGP were present at and beyond the east and west property boundaries adjacent to areas of residential land use, and to assess the significance of offsite soil gas migration by comparison with established guidelines and by applying risk assessment techniques.

While soil gases adjacent to the Sutherland Avenue facility were found above ambient air quality for the immediate vicinity and for the City of Winnipeg, soil gases were not found at concentrations that posed an explosion hazard and were found below applicable ambient and workplace air quality criteria.

Indoor air quality in residential basements was predicted to be 3/1000's of the measured soil gas concentrations, which is far below typical indoor air quality in Canadian homes. Health risks due to calculated soil gas movement into residential buildings were within acceptable levels for both adult and child receptors. Based on the results of the Phase II soil gas investigation, there was no reason to further investigate potential soil gas movement into nearby residences nor was there a need to implement any mitigative action to address this pathway.

In August 1996, AGRA Earth & Environmental Limited (AEE) obtained three air samples from the Centra Gas Operations Building located at 35 Sutherland Avenue in Winnipeg, Manitoba (AEE, 1996). The air samples obtained were tested for PAH parameters that the previous Site investigations had identified to be present in the subsurface soil and groundwater at the Site.

Of the 16 PAH parameters tested, only naphthalene was detected at the three sample locations. The calculated concentrations of naphthalene in air at the three sample locations were 0.0016, 0.0014, and 0.0014 milligrams per cubic metre (mg/m^3). Although the measured naphthalene concentrations were higher than previously identified at the Site, they remained much lower than the available air quality standards. On this basis, it was concluded that "at the present time, the air quality within the building has not been substantially impacted." It was also noted that the test locations represented areas having the highest likelihood of impact, due to their relative proximity to the impacted soil and groundwater. Therefore, the "ambient" air in the occupied portions of the building would be expected to have lower PAH concentrations than at the three sample locations.

The results of the air testing indicated that the PAH contaminated water below the elevator was not emitting concentrations of PAH vapours into the riser pipe that were of concern based on human health considerations.

In 2000, Manitoba Hydro commissioned Occupational Hygiene Group Consulting Inc. (OHG) to address the concerns raised by onsite employees regarding perceived health effects arising from materials from a former MGP at the Sutherland Avenue Site. In consultation with the staff, the project assessed the methodology of environmental health studies that were previously undertaken at the facility, combined the findings of these works, and drew conclusions from the total body of work with respect to worker risk at the Site (OHG, 2000a, 2000b).

Worker exposure levels to COCs at the Site were estimated using mathematical modelling and the results of soil and indoor air quality testing. The predicted exposure levels were evaluated for carcinogenic and non-carcinogenic effects. The investigation concluded that the methods used in the original reports for the data analysis were correct, and the conclusions drawn were also correct.

In 2001, OHG completed a second exposure assessment with regards to onsite employees at the former MGP at the Sutherland Avenue Site. OHG came to the same conclusion in 2001 as they had in the 2000 exposure assessment – that there was no unusual risk associated with exposures in the buildings at the Sutherland Avenue Site (OHG, 2001a, 2001b). All exposure levels were very low, mostly below the level of detection. With some worst-case assumptions, estimated exposure levels were well below the exposure limits for carcinogens and non-carcinogens. Exposures within the building appeared to be similar to exposures outside the building.

SECTION 3

Quantitative Human Health Risk Assessment

3.1 Overview

A quantitative HHRA was conducted for the Site to determine whether contamination at the Site poses a potential risk to human receptors. The HHRA was conducted in accordance with Health Canada and Canadian Council of Ministers of the Environment (CCME) guidance documents, specifically:

- Federal Contaminated Site Risk Assessment In Canada, Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA), Version 2.0, 2010, Revised 2012
- Federal Contaminated Site Risk Assessment In Canada, Part II: Health Canada Toxicological Reference Values (TRVs) and Chemical-Specific Factors, Version 2.0, 2010
- Federal Contaminated Site Risk Assessment in Canada, Part V: Guidance on Human Health Detailed Quantitative Risk Assessment for Chemicals ($DQRA_{CHEM}$), 2010
- Federal Contaminated Site Risk Assessment in Canada, Part VII: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites, 2010
- A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines, Canadian Council of Ministers of the Environment, 2006

3.2 General Approach

Risk assessment has been defined as a scientific process for evaluating the likelihood that adverse effects may occur, or are occurring, as a result of exposure to one or more stressors. Typically, in the context of environmental risk assessment, the term “stressor” refers to a contaminant that may exist in various media (for example, soil, groundwater, or air). For the current HHRA, a widely accepted risk assessment framework was adopted wherein potential hazards, exposure pathways, and receptors are evaluated to determine whether or not risk(s) is (are) present, as illustrated in the following diagram:

In the absence of any one of these three components, an exposure pathway is considered incomplete and, by definition, there can be no risk associated with that particular exposure pathway.

The HHRA framework comprises the following major components:

- ***Hazard Identification***: Identification of the environmental hazards (that is, COCs) that may pose a health risk
- ***Receptor Identification***: Identification of the human receptors that may be exposed to these hazard(s)
- ***Exposure Assessment***: Qualitative or quantitative evaluation of the likelihood or degree to which the receptors will be exposed to the hazard(s)
- ***Toxicity Assessment***: Identification of published, scientifically-reviewed toxicity values to which exposure levels can be compared
- ***Risk Characterization***: Qualitative or quantitative assessment of the actual health risk each hazard poses to each receptor, based on the degree of exposure
- ***Uncertainty Assessment***: Review the uncertainty associated with the risk estimation

It is important to note that this report does not evaluate potential health concerns that may have existed in the past. Rather, it is designed to assess the potential risks associated with current and future exposures to contaminants at the Site based on present and assumed future conditions.

To complete this HHRA, it was necessary to rely on groundwater, soil vapour, and indoor air data collected by KGS Group (Tables 1 to 6, Appendix B). Because potential human health risk was primarily evaluated using the indoor air data, CH2M HILL completed a data validation report for this dataset (Appendix C). The overall conclusion of the data validation process was that the indoor air data is considered valid and can be used to support the project's decision-making process.

In 2012, air samples were collected by KGS Group at nine different sampling locations (Tables 5 and 6, Appendix B; Figure 2, Appendix A). Seven of the sampling locations were indoors, one was outdoors (ambient air), and at one location, samples were collected from a pipe that vents the sub-slab area beneath the elevator at 35 Sutherland Avenue. Further information concerning each of the air sampling locations is as follows:

33 Sutherland – Shops Area

Air sampling was conducted at the centre of the lunch room located at the west end of the building. The lunch room is separated from the welding area by a door which was kept closed during sampling.

35 Sutherland – 1st Floor Office

Air sampling was conducted in a vacant cubicle located in the centre of the west side office area. Sampling equipment was placed on the cubical desk or at 1 metre (m) above the ground using a stand.

35 Sutherland – 2nd Floor Office

Air sampling was conducted in a vacant cubicle located at the south end of the second floor office area (which runs the north-south span of the building). The cubicle is located within 2 m of a doorway which leads through a short hall to a second doorway to the south stairs of the building. Sampling equipment was placed on the cubical desk or at 1 m above the ground using a stand.

35 Sutherland – Elevator Exterior

Air samples at this location were collected from a pipe that vents the sub-slab area beneath the elevator at 35 Sutherland Avenue (northwest corner of building). The pipe is 2-inches in diameter and located outdoors at the northwest corner of the 35 Sutherland Avenue building. Samples are collected from within the pipe using polytetrafluorethylene (PTFE) tubing while sealing the pipe from the outside environment. The north parking lot is located directly north of the sampling point with an exit to the Disraeli Bridge to the west. Samples collected from this location are representative of conditions (vapour concentrations) below the elevator floor (sub-slab).

35 Sutherland – Elevator Basement

Air sampling was conducted in the northwest corner of the basement of the 35 Sutherland Avenue building. The sampling equipment was set up in the corner of a hallway that accesses the elevator of a storage room. The door between the storage room and the elevator hallway was left open throughout sampling; however, the door between the storage room and the remainder of the building was closed. Samples were collected at a height of approximately 1 m from the floor.

35 Sutherland – South Mechanical Room (Basement)

Air sampling was conducted on the west side of the basement of the 35 Sutherland Avenue building. Access to the South Mechanical Room is from the south end of the main basement hallway which runs the length of the building, and the door remains closed for the duration of sampling. The sampling equipment was placed on the floor at the sump access panel located on the east side of the room.

37 Sutherland – Stores Building Office

Air sampling was conducted in the unused lunch/office area at the south end of the building attached to the storage area. The lunch/office room is connected to the storage area by a door which is kept closed during sampling. The sampling equipment was setup along a north wall of the office/lunch room in the centre of the room.

38 Sutherland – Office Area

Air sampling was conducted in the center of a vacant office located at the south end of the building. The door opening to the hallway was left open. Sampling equipment was placed on the office desk or at 1 m above the ground using a stand.

38 Sutherland – Ambient (exterior near lunch area)

Air sampling was conducted at the exterior lunch table adjacent to the south parking area of the 38 Sutherland Avenue building. Samples collected from this location are representative of outdoor (ambient) conditions.

3.3 Objectives

The specific objective of this quantitative HHRA is to quantify the potential human health risks associated with impacted environmental media (for example, groundwater and indoor air) at the Site. The aim is to produce accurate (realistic), defensible, and representative estimates of risk. This section of the report presents the HHRA methodology and results. Should unacceptable risks be identified for one or more human receptors from exposure to COCs at the Site, risk management or remediation should be implemented to mitigate or minimize the unacceptable risks.

3.4 Problem Formulation

The Problem Formulation step is an important information gathering and interpretation stage that serves to plan and focus the approach of the HHRA. The data evaluated in this stage focuses the Site information that is relevant to the HHRA in order to identify human receptors, possible exposure pathways, and any other specific areas or issues of concern. For the current HHRA, key tasks requiring evaluation within the Problem Formulation step included the following:

- Determination of the COCs
- Human receptor selection and characterization
- Selection of exposure pathways and scenarios based on the COCs and receptors

The outcome of these tasks forms the basis of the approach taken in the current assessment, and is illustrated in a human conceptual site model (CSM). A more detailed methodology for each of these tasks is described in the respective sections that follow.

3.4.1 Identification of Contaminants of Concern

The Manitoba Hydro property located at 35 to 38 Sutherland Avenue was formerly the location of a MGP, which operated from 1883 to 1957, with the first phase of decommissioning commencing in 1959.

Beginning in 1993, various consultants have been engaged by Manitoba Hydro to complete environmental investigations at the Site. The investigations have identified the presence of PAHs; monocyclic aromatic hydrocarbons such as BTEX; and PHCs at concentrations greater than relevant regulatory guidelines for soil, groundwater, and river sediment. That being the case, the COCs for the current HHRA are PAHs and PHCs including BTEX.

In 2012, KGS Group collected groundwater (May, July, September, and December), soil vapour (July, September, and December), and indoor air (July, October, November, and December) data for the Site (Tables 1 to 6, Appendix B). These data will be used in the current HHRA to represent groundwater, soil vapour, and indoor air quality at the Site.

Data summary tables for the HHRA are presented as Tables 1 to 6, Appendix B, while the groundwater, soil vapour, and indoor air sampling locations are presented in Figure 2, Appendix A.

The specific PAHs and PHCs that will be evaluated in the HHRA include the following:

- Benzene
- Toluene
- Ethylbenzene
- Xylenes
- F1
- F2
- Acenaphthene
- Acenaphthylene
- Anthracene
- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(e)pyrene
- Benzo(g,h,i)perylene
- Benzo(k)fluoranthene
- Chrysene
- Dibenz(a,h)anthracene
- Fluoranthene
- Fluorene
- Indeno(1,2,3-c,d)pyrene
- 1-Methylnaphthalene
- 2-Methylnaphthalene
- Naphthalene
- Perylene
- Phenanthrene
- Pyrene

Exposure to mixtures of carcinogenic PAHs was also assessed in accordance with the potency equivalence factor (PEF) scheme (Table 7, Appendix B). Here, carcinogenic PAHs are adjusted to their carcinogenic potency relative to benzo(a)pyrene, and the potency equivalents (PEQ) are then summed. The PEFs presented in Health Canada (2010a) were used in this study. Potential risks posed by exposure to mixtures of carcinogenic PAHs are subsequently characterized by estimation of cancer risk employing the unit risk for benzo(a)pyrene.

3.4.2 Receptor Identification

Human receptors are persons who may potentially come into contact with the identified COCs in impacted media such as groundwater and soil, and secondary media such as indoor air. Characterization of potential human receptors should consider present and future land uses in relation to the location of the COCs. The identification of potential human receptors to be evaluated in the HHRA provides the opportunity to consider the most probable or potential Site use by people. Furthermore, knowledge of

their characteristics and habits supports appropriate assessment of the fate and behaviour of COCs in the environment.

The Site is owned and operated by Manitoba Hydro, and is zoned for commercial/industrial land use. The Site is surrounded by commercial/industrial (power substation) and residential properties to the east, commercial/industrial properties to the south, the Disraeli Freeway and residential properties to the west, and the Red River to the north. Commercial/industrial activities at the Site include office work (primarily at 35 Sutherland Avenue, but also some at 37 and 38 Sutherland Avenue), vehicle and equipment (light and heavy) storage and maintenance (33 Sutherland Avenue), and equipment and chemical storage (37 Sutherland Avenue). Workers at the Site include various types of Manitoba Hydro staff who are typically on the Site for 10 hours per day, 5 days per week, and 48 weeks per year.

It is possible that remedial works or construction will be required at the Site at some future date. However, a remedial/construction worker will not be considered in the HHRA because these workers would be potentially exposed to COCs for only a short duration and would typically don PPE that mitigates or eliminates exposure to COCs.

The majority of the Site is fenced. However, the unfenced areas of the Site (north parking lot) and the adjacent offsite areas (Rover Avenue and the riverbank) contain subsurface contamination and are unrestricted. Contact with these areas is anticipated to be limited because the Site is located in a mixed urban industrial and residential setting. Major thoroughfares including the Disraeli Bridge do not pass through the area. The general public (including recreational visitors and trespassers) is not expected to spend a substantial amount of time at the Site. However, it is possible for residents adjacent to the Site to be impacted by vapours originating from onsite soil and groundwater, and this will be evaluated qualitatively in Section 3.7.3.

Therefore, based on the known current and suspected future land use of the Site, potential human receptors that may come into contact with COCs at the Site include:

- Indoor Workers (Manitoba Hydro Staff): Adult receptors who work indoors at the Site (for example, office work or vehicle maintenance). With respect to exposure assessment, indoor workers are the most conservative human receptor (that is, they will potentially experience the greatest exposure to COCs).
- Offsite Residents: Receptors of all age groups (infant, toddler, child, teen, and adult) who reside immediately adjacent to the Site and may be exposed to COCs via inhalation of vapours in indoor air (following vapour intrusion [VI]). Residents are considered the most conservative offsite receptor for evaluation of exposure to COCs via inhalation of vapours indoors. This receptor will be evaluated qualitatively in Section 3.7.3.

Table 8 presents specific characteristics and assumptions (for example, body weight [BW] and exposure duration [ED]) for receptors requiring quantitative assessment.

3.4.3 Selection of Human Exposure Pathways

In order for contaminants to cause deleterious effects, some form of exposure or contact between the contaminant and the human receptor is necessary. The route by which this occurs is referred to as an exposure pathway. The potential exposure pathways are dictated primarily by the nature of the contaminants and the potential human receptors identified. Typically, individuals are exposed to contaminants in the environment via three basic pathways:

1. Ingestion of contaminated water, food, and soil
2. Inhalation of chemical vapours and particulates
3. Dermal contact with contaminated water, sediment, and soil

In assessing potential exposures of the identified receptors to COCs at the Site, all possible exposure pathways were evaluated in order to identify those that are considered as potentially complete. The following sections present the potential exposure pathways for the Site and the rationale for including or eliminating them from the quantitative risk assessment.

3.4.3.1 Soil – Ingestion, Inhalation, and Dermal Contact

Soil contamination at the Site is largely confined to the subsurface (at a depth greater than 5 metres below grade [mbg]) (CH2M HILL, 1994; UMA, 2003), and Indoor Workers are not expected to come into direct contact with subsurface soil. Additionally, the vast majority of the Site is paved (Figure 2, A). Therefore, the incidental-ingestion-of-soil, inhalation-of-soil-particulates, and dermal-contact-with-soil exposure pathways are not considered complete/active and will not be evaluated further in the HHRA.

3.4.3.2 Groundwater – Ingestion and Dermal Contact

Infrastructure at the Site is serviced by the City of Winnipeg water and sanitary sewer system, and there are no water wells present servicing the Site. Therefore, groundwater is not used as a source for either drinking or showering. Furthermore, onsite groundwater is located at a depth of approximately 2.0 to 3.0 mbg (CH2M HILL, 1994), and dermal contact by Indoor Workers is therefore very unlikely. Ingestion of, and dermal contact with, groundwater are not considered complete/active exposure pathways and will not be evaluated further in the HHRA.

3.4.3.3 Surface Water – Dermal Contact and Ingestion

It is unlikely that Indoor Workers would come into substantial contact with surface water of the Red River as the shore area adjacent to the Site is not known to be used for swimming purposes. The River's surface water is not used as a drinking water source for Site users or people living in the City of Winnipeg. In 1995, eight surface water samples (including a duplicate) were collected from the Red River in the vicinity of the Site and analyzed for PAHs (CH2M HILL, 1995). All analyzed parameters were found to be less than the laboratory reportable detection limits (RDLs). Similarly, in 2009, 17 surface water samples (including a duplicate) were collected from the Red River in the vicinity of the Site and analyzed for BTEX, PHC fraction F1, and PAHs (AECOM, 2011). None of the samples had analyte concentrations above the applicable guideline values. The majority of the analyzed parameters were found to be less than the laboratory RDLs. Where parameters were detected, the concentrations were well below the applicable guideline values. Considering these various factors, the dermal-contact and ingestion-of-surface-water exposure pathways will not be considered further in the HHRA.

3.4.3.4 Sediments – Dermal Contact and Ingestion

Based on a similar rationale as that already presented for dermal contact and ingestion of surface water, it is not expected that Indoor Workers would come into substantial contact with sediments in the vicinity of the Site. Therefore, the dermal-contact and ingestion-of-sediment exposure pathways will not be considered further in the HHRA.

3.4.3.5 Foodstuffs – Ingestion

Given the expected human receptors and Site uses, the ingestion of onsite foodstuffs is not considered a complete/active exposure pathway. No gardens or other edible plants are known to be present at the Site. Additionally, Site users are not known to consume fish and wildlife at the Site. Therefore, the ingestion-of-foodstuffs exposure pathway will not be considered further in the HHRA.

3.4.3.6 Vapour – Inhalation of Indoor and Outdoor Air

Because a number of the COCs have been detected in indoor air (Tables 5 and 6, Appendix B) and because the identified receptors are anticipated to spend the vast majority of their time indoors while at the Site, exposure to COCs through indoor vapour inhalation is considered a complete/active exposure pathway. There are currently a number of enclosed buildings at the Site; therefore, VI is possible (that is, migration of vapours from soil and groundwater into buildings through cracks, fissures, and joints in the floor slab). For outdoor air, it is unlikely that Indoor Workers would be exposed to soil vapours as the dilution potential for soil vapours released to outdoor air is very high. Additionally, these workers are not anticipated to spend much of their time outdoors while at the Site.

In summary, one complete/active exposure pathway will be included in the HHRA for quantitative assessment of risk: inhalation of vapours indoors.

3.4.4 Conceptual Site Model

In order to illustrate the relationships between the identified COCs, complete/active exposure pathways, and human receptors, a CSM was developed (Figure 3, Appendix A).

3.5 Exposure Assessment

The exposure assessment estimates the dose of each COC for each potential receptor. The following sections present the key parameters that were used to estimate exposures. The exposure parameters and assumptions were obtained from Health Canada's *Federal Contaminated Site Risk Assessment in Canada, "*Part 1 - Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA), Version 2.0" (2010a).

3.5.1 Receptor Characteristics

It is important that protective assumptions are made when assessing human exposures to COCs at the Site.

For threshold- and non-threshold-response contaminants (that is, non-carcinogens and carcinogens), human health risks were estimated for Indoor Workers. Table 8 summarizes the receptor characteristics for this receptor.

The exposure frequency assumptions presented in Table 8 are based on information presented in Health Canada (2010a), review of previous environmental reports for the Site, and a discussion with representatives from Manitoba Hydro. The exposure frequency assumptions are summarized as follows:

- Indoor Workers (Manitoba Hydro Staff) - Adult receptors who work indoors at the Site (for example, office work or vehicle maintenance). These workers are anticipated to be onsite for 10 hours per day, 5 days per week, 48 weeks per year, and for 35 years. Indoor Workers could be exposed to COCs in soil and groundwater via inhalation of indoor air. With respect to exposure assessment, Indoor Workers are the most conservative human receptor (that is, they will potentially experience the greatest exposure to COCs).

3.5.2 Methodology for Exposure Estimation

For this HHRA, exposure estimates (doses) were calculated using the risk assessment equation presented below and the receptor characteristics in Table 8. A sample calculation is presented in Appendix D.

As outlined in the CSM, the lone route of exposure (for COCs at the Site) that was considered in the quantitative assessment included:

- Inhalation of vapours in indoor air

It should be noted that for this particular HHRA, the intake of a chemical evaluated for carcinogenic health effects is averaged over 61 years (the duration of adulthood - 20 to 80 years of age). This value of 61 years is referred to as the averaging time. The selection of an averaging time that spans all of adulthood (or in some instances, a lifetime) is based on United States Environmental Protection Agency (USEPA) guidance: "The approach for carcinogens is based on the assumption that a high dose received over a short period of time is equivalent to a corresponding low dose spread over a lifetime" (USEPA, 1989).

The intake of contaminants evaluated for non-carcinogenic health effects uses an averaging time equivalent to the estimated period of exposure for any given exposure setting (for example, 35 years for Indoor Workers [Manitoba Hydro Staff]).

3.5.2.1 Inhalation of Volatiles

The USEPA has recently updated its inhalation guidance found in *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual,* "Part F, Supplemental Guidance for Inhalation Risk Assessment" (RAGS Part F) (2009). RAGS Part F states that intake equations developed based on

body weight and inhalation rates (for example, Health Canada, 2010a) are not consistent with the current principles of USEPA's inhalation dosimetry and derivation of inhalation toxicity values. The amount of the chemical that reaches the target site is not a simple function of the inhalation rate and body weight; therefore, intake equations developed based on these parameters are not recommended for estimating exposures to inhaled contaminants. The USEPA recommends the use of an exposure concentration, calculated as follows:

$$(1) \qquad EC = \frac{(C_{air} * EF1 * EF2 * EF3 * ED)}{AT}$$

Where: EC = Exposure concentration (mg/m^3)
C_{air} = Volatile contaminant concentration in indoor or outdoor air (mg/m^3); this concentration is obtained through environmental sampling or modelling
EF1 = Exposure frequency to indoor or outdoor air (hours/day)
EF2 = Exposure frequency to indoor or outdoor air (days/week)
EF3 = Exposure frequency to indoor or outdoor air (weeks/year)
ED = Exposure duration (years)
AT = Averaging time (hours)

The exposure concentration is then compared with the appropriate TRV to determine the level of risk.

Table 8 presents general receptor characteristics, such as exposure frequencies, exposure durations, and averaging times, applied to estimate volatile COCs dose through the inhalation of indoor air for Indoor Workers.

3.5.3 Concentrations of Contaminants of Concern for the Quantitative Assessment

In 2012, four indoor air sampling events occurred for PHCs and three sampling events occurred for PAHs. Due to the low number of data points for each sampling location (that is, n=3 or n=4), the maximum COC concentrations for each sampling location observed over the course of the 2012 sampling events will be used in the quantitative assessment as exposure point concentrations (Table 9). This represents a conservative approach as exposure point concentrations are typically represented by a statistic (for example, 75th percentile or 95 percent of the upper confidence limit).

3.5.4 Exposure Estimation for Indoor Air

For Indoor Workers, exposure estimates (doses) from COCs in indoor air were calculated using the equation presented in Section 3.5.2.1. The exposure estimates for each sampling location are presented in Tables 10 through 18. Exposure estimates are presented for both carcinogenic and non-carcinogenic endpoints.

3.6 Toxicity Assessment

The types of adverse effects that a substance can cause following exposure via different routes (for example, ingestion, inhalation, and dermal), and the nature and severity of such effects associated with various levels of exposure—where increased exposure leads to increased risk of adverse effect (that is, dose-response relationship)—are described in the following sections. The toxicity assessment was completed for all identified COCs.

3.6.1 Nature of Toxicity

Two broad categories of adverse effects are considered: threshold effects and non-threshold effects. For the threshold effect category, a substance is not expected to cause adverse effects at less than a certain dose (that is, the threshold dose). For non-threshold effects, it is assumed that a substance may cause an adverse effect at any dose greater than zero. The former category is usually associated with non-cancer effects, and the latter category is generally associated with cancer effects.

Contaminants that are assumed to exhibit threshold-type dose-response relationships are contaminants that exhibit a no-observed-adverse-effect-level (NOAEL). Less than this threshold of exposure, the risk of

adverse effect is essentially zero. This threshold is the basis for a TRV called a reference dose (RfD) or tolerable daily intake, which incorporates the use of safety factors, uncertainty factors, modifying factors, or some combination. The magnitude of a factor depends on the confidence in the data and study used to derive the NOAEL and to account for inter- and intraspecies differences, duration of exposure, and overall data quality of available information. The factors can easily span several orders of magnitude. The analogous exposure limit for airborne contaminants is called a reference concentration (RfC) or tolerable concentration.

Contaminants that exhibit a non-threshold-type dose-response are assumed to have no adverse effect only when the exposure or dose is zero. This dose-response model is generally applied to genotoxic (affects genetic material in biological cells) carcinogens (causes cancer). Mathematical modelling is usually required to extrapolate cancer risk from animal studies to hypothetical human exposures. For contaminants that exhibit nonthreshold-type hazards, slope factors (SFs) and unit risks (URs) are used to determine the ILCR from exposure.

Many contaminants exhibit both types of dose-response relationships (for example, benzene), exhibiting different adverse effect endpoints.

Toxicological profiles are provided in Appendix E for the identified COCs. The toxicological profiles identify whether the COCs exhibit carcinogenic or non-carcinogenic effects (or both), and outline the potential hazards associated with exposures to each of the COCs (via various exposure routes).

3.6.2 Dose-Response Assessment

An important part of the risk assessment process is the identification of appropriate TRVs, such as RfDs, RfCs, SFs, and URs. Toxicity values have been established by a number of regulatory agencies, including Health Canada, the Ontario Ministry of the Environment (MOE), and the USEPA. TRVs are required for characterizing risks associated with exposure to environmental contaminants (that is substances that, when accidentally or deliberately introduced into the environment, may have the potential to harm people). For this HHRA, preference has been given to the TRVs adopted by Health Canada and presented in *Federal Contaminated Site Risk Assessment in Canada, "*Part II: Health Canada Toxicological Reference Values (TRVs) and Chemical-Specific Factors, Version 2.0." (2010b). For chemical-exposure route combinations for which Health Canada has not adopted a TRV, these values were obtained from the MOE (2011) and the Massachusetts Department of Environmental Protection (MDEP) (2004).

TRVs selected for inclusion in this risk assessment are presented in Table 19, and rationales for each of the toxicity values are supplied in the toxicological profiles in Appendix E.

There is high confidence that the TRVs selected to be used in this risk assessment are relevant and protective of human health. The RfCs used in this assessment are considered to be protective of the human population (including sensitive subgroups) at continuous exposure levels (that is, 24 hours per day, 7 days per week). The human receptors identified in the Problem Formulation are likely to have less than continuous exposure (for example, a 50-hour work week for 48 weeks per year). Thus, using chronic TRVs (where continuous exposure is assumed) provides another layer of conservatism to the risk assessment.

TRVs used in this risk assessment include the following:

- ***RfC***: An estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. It is expressed as the amount of substance per cubic metre of air (that is, mg/m^3).
- **UR:** The upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent at a concentration of 1 micrograms per litre (µg/L) in water or 1 microgram per cubic metre ($\mu g/m^3$) in air. The interpretation of UR would be as follows: if UR = 1.5×10^{-6} µg/L, 1.5 excess tumours are expected to develop per 1,000,000 people if exposed daily for a lifetime to 1 microgram (µg) of the chemical in 1 litre (L) of drinking water.

3.6.3 Evaluation of Potential Toxic Interactions

Typically, criteria, guidelines, and standards developed by provincial and federal regulatory agencies do not account for potential interactions of contaminants. The approach of summing HQ values is very conservative, can be overly protective, and assumes that substances interact on the same cellular target and via the same mechanism of action. In reality, interactions (synergism or antagonism) are typically considered to be rare at environmental concentrations. Currently, two groups of contaminants considered to have the potential to act similarly are carcinogenic PAHs and polychlorinated dibenzo-*p*-dioxins, dibenzofurans, and dioxin-like PCBs.

PAHs have been identified as COCs at the Site, and carcinogenic and non-carcinogenic PAHs will be evaluated individually (exposure assessment and risk characterization). In addition, exposure to mixtures of carcinogenic PAHs will also be assessed in accordance with the potency equivalence factor (PEF) scheme (Table 7, Appendix B).

3.7 Risk Characterization

The risk characterization stage brings together all of the previous components of the HHRA into an overall quantitative assessment of the potential health effects to each human receptor from exposure to the COCs.

3.7.1 Approach and Methodology

The potential health effects associated with exposure to non-carcinogenic contaminants are assessed differently than those for carcinogenic contaminants, as these two groups of substances generally have different etiologies and act via unrelated mechanisms.

3.7.1.1 Non-carcinogenic Contaminants of Concern

Non-carcinogenic contaminants are generally active through a threshold mechanism where it is assumed that there is a level of exposure (dose) below which no health effects are expected. As the level of exposure (dose) increases to a point where the body can no longer process or excrete the substance, an adverse effect may occur. This juncture is termed the threshold and is unique for every chemical.

For risk characterization of non-carcinogenic COCs, HQs were calculated for each COC-receptor combination (for each sampling location) by deriving the exposure estimates from inhalation of vapours in indoor air and weighing these against the appropriate TRV (that is, RfC). HQs were calculated as follows:

$$HQ = \frac{\text{Exposure Estimate } (mg/m^3)}{\text{TRV } (mg/m^3)}$$

Many TRVs incorporate protective assumptions designed to provide a margin of safety;therefore, an HQ greater than one (1.0) does not necessarily suggest a likelihood of adverse effects. A HQ of less than one, however, suggests that exposures will likely not have an appreciable risk of non-carcinogenic effects during a lifetime. Note that the HQ cannot be translated into a probability that adverse effects will occur, and is not likely to be proportional to risk. An HQ greater than one can best be described as only indicating that a potential may exist for adverse health effects. Because this HHRA did not address all potential exposure pathways, the target HQ was set to 0.2, rather than 1. By using a HQ benchmark of 0.2, 80 percent of an individual's intake of COCs is assumed to come from other exposures unrelated to the site, for example, ingestion of contaminants via supermarket goods, or inhalation of contaminants in indoor air at home. Unrelated exposures have not been quantified in this assessment. A calculated total HQ of less than 0.2 indicates that the intake of COCs from Site exposures does not exceed the tolerable level, and no adverse health effects are expected. If the calculated total HQ is greater than 0.2 however, this does not necessarily imply that an adverse health effect will result; rather, it only implies that there is potential for an adverse effect. Due to the conservative nature of the assumptions underlying the calculations of exposure estimates, there is an inherent tendency to overpredict exposures. As explained above, the methodologies used to derive RfDs/RfCs are essentially conservative, such as deriving RfDs/RfCs for the most sensitive toxicological endpoint observed in the most sensitive gender of the most sensitive species and using uncertainty factors to account for such unknowns as inter- and intraspecies variability and database deficiencies. Collectively, where the total HQ is greater than 0.2, the

assumptions underlying both the exposure estimates and the TRVs should be evaluated to determine whether a risk is likely to occur and whether risk management or remediation (or both) is warranted.

3.7.1.2 Carcinogenic Contaminants of Concern

For substances deemed to be carcinogenic, the estimated exposure is multiplied by the cancer slope factor (SF) or UR to derive a conservative estimate of the potential ILCR, as follows:

$$\text{ILCR} = \text{Exposure Estimate (mg/m}^3\text{)} \times \text{UR (mg/m}^3\text{)}^{-1}$$

The ILCR estimates the incremental probability that an individual will develop cancer as a result of lifetime exposure to a substance. The ILCR is in addition to the probability of developing cancer due to ambient exposures. In general, ILCR values between 1×10^{-4} and 1×10^{-6} are considered a negligible increase of risk over background.

A target cancer risk level of 1×10^{-5} (that is, 1-in-100,000) is the level of risk considered acceptable by Health Canada (2010a). Accordingly, cancer risks are deemed negligible when the estimated ILCR is less than or equal to 1-in-100,000 (1×10^{-5}).

3.7.1.3 Non-carcinogenic Risk Estimates

The calculated HQ values for Indoor Workers exposed to COCs via inhalation of vapours in indoor air are presented in Tables 20 through 28, Appendix B. HQs are presented separately for each sampling location evaluated in this HHRA.

A sample calculation is presented in Appendix D.

3.7.1.4 Carcinogenic Risk Estimates

The calculated ILCR values for Indoor Workers exposed to COCs via inhalation of vapours in indoor air are presented in Tables 20 through 28, Appendix B. HQs are presented separately for each sampling location evaluated in this HHRA.

A sample calculation is presented in Appendix D.

3.7.2 Summary of Risk Characterization

Potential risks are summarized below for each individual sampling location.

3.7.2.1 33 Sutherland – Shops Area

Under the exposure scenario described in Section 3.5.1, no unacceptable carcinogenic or non-carcinogenic risks were identified for indoor workers from exposure to COCs through inhalation of vapours in indoor air (Table 20, Appendix B). The calculated ILCRs and HQs were less than Health Canada's (2010a) recommendations of 1.0×10^{-5} and 0.2, respectively.

3.7.2.2 35 Sutherland – 1st Floor Office

Under the exposure scenario described in Section 3.5.1, no unacceptable carcinogenic or non-carcinogenic risks were identified for indoor workers from exposure to COCs through inhalation of vapours in indoor air (Table 21, Appendix B). The calculated ILCRs and HQs were less than Health Canada's (2010a) recommendations of 1.0×10^{-5} and 0.2, respectively.

3.7.2.3 35 Sutherland – 2nd Floor Office

Under the exposure scenario described in Section 3.5.1, no unacceptable carcinogenic or non-carcinogenic risks were identified for indoor workers from exposure to COCs through inhalation of vapours in indoor air (Table 22, Appendix B). The calculated ILCRs and HQs were less than Health Canada's (2010a) recommendations of 1.0×10^{-5} and 0.2, respectively.

3.7.2.4 35 Sutherland – Elevator Exterior

Air samples collected from this location are representative of conditions (vapour concentrations) below the elevator floor (sub-slab). In 1996, an elevator was installed within the 35 Sutherland Avenue building and its construction required an excavation below the basement floor. During construction, coal tar odours were noted and consequently an under-floor ventilation system was installed. The ventilation system vents to the

outside of the building (northwest corner) via a 2-inch diameter pipe. In 2012, KGS Group collected air samples from within this pipe while sealing the pipe from the outside environment.

Although potentially unacceptable non-carcinogenic risks were identified for F2 (indoor workers exposed via inhalation of vapours in indoor air) at this sampling location, this finding is not valid as the collected air samples are representative of sub-slab conditions and not indoor air quality (Table 23, Appendix B). This will be discussed further in Section 3.9. No unacceptable carcinogenic risks were identified for this location.

3.7.2.5 35 Sutherland – Elevator Basement

Under the exposure scenario defined in Section 3.5.1, potentially unacceptable non-carcinogenic risks were identified for indoor workers from exposure to benzene through inhalation of vapours in indoor air. The HQ calculated for benzene (0.62) exceeded Health Canada's (2010a) recommendation of 0.2 (Table 24, Appendix B).

No unacceptable carcinogenic risks were identified for indoor workers at this location. The calculated ILCRs were less than Health Canada's (2010a) recommendation of 1.0×10^{-5}.

3.7.2.6 35 Sutherland – South Mechanical Room (Basement)

Under the exposure scenario defined in Section 3.5.1, no unacceptable carcinogenic or non-carcinogenic risks were identified for indoor workers from exposure to COCs through inhalation of vapours in indoor air (Table 25, Appendix B). The calculated ILCRs and HQs were less than Health Canada's (2010a) recommendations of 1.0×10^{-5} and 0.2, respectively.

3.7.2.7 37 Sutherland – Stores Building Office

Under the exposure scenario defined in Section 3.5.1, potentially unacceptable non-carcinogenic risks were identified for indoor workers from exposure to benzene and xylenes through inhalation of vapours in indoor air. The HQs calculated for benzene (0.81) and xylenes (0.43) exceeded Health Canada's (2010a) recommendation of 0.2 (Table 26, Appendix B).

Under the exposure scenario defined in Section 3.5.1, potentially unacceptable carcinogenic risks were identified for indoor workers from exposure to benzene through inhalation of vapours in indoor air. The ILCR calculated for benzene (1.2×10^{-5}) marginally exceeded Health Canada's (2010a) recommendation of 1.0×10^{-5} (Table 26, Appendix B).

3.7.2.8 38 Sutherland – Office Area

Under the exposure scenario defined in Section 3.5.1, no unacceptable carcinogenic or non-carcinogenic risks were identified for indoor workers from exposure to COCs through inhalation of vapours in indoor air (Table 27, Appendix B). The calculated ILCRs and HQs were less than Health Canada's (2010a) recommendations of 1.0×10^{-5} and 0.2, respectively.

3.7.2.9 38 Sutherland – Ambient (exterior near lunch area)

Air samples collected from this location are representative of outdoor (ambient) conditions adjacent to the 38 Sutherland Avenue building (AS-38-AM; Figure 2, Appendix A). No unacceptable carcinogenic or non-carcinogenic risks were identified for workers from exposure to COCs through inhalation of vapours in ambient air (Table 28, Appendix B). The calculated ILCRs and HQs were less than Health Canada's (2010a) recommendations of 1.0×10^{-5} and 0.2, respectively.

3.7.3 Qualitative Risk Characterization

Offsite Residential Receptors

Residential properties lie within 20 m of the Site boundary (Figure 2) to the southeast and southwest of the Site. Because of the proximity of these residences to the Site, it is possible for soil vapour to migrate into these residences (vapour intrusion) and impact indoor air quality. Soil vapour can originate from contamination within soil or groundwater.

In 2009, five soil vapour probes were installed at the Site as follows (Figure 2):

1. MW-50V (onsite, near the northeast corner of the 35 Sutherland Avenue Hydro building)

2. MW-51V (onsite, near the northwest corner of 35 Sutherland Avenue)
3. MW-55V (onsite, near the southeast corner of 35 Sutherland Avenue)
4. MW-58V (offsite, adjacent to a private residence on Gladstone Street)
5. MW-59V (offsite, adjacent to a residence on Annabella Street)

New soil vapour probes were necessary as previous 'soil vapour' samples were collected from monitoring wells containing groundwater which can contribute substantially to vapour concentrations within a well (regardless whether the well has been purged or not). That being the case, historical soil vapour samples are likely biased high. The new soil vapour probes were installed to a depth of 1.5 mbg to capture soil vapours representative of those entering a building through a basement wall.

In 2012, KGS Group collected soil vapour samples from the five soil vapour probes listed above and from a sixth probe located at the northwest corner of the 33 Sutherland Avenue building (MW99V). Soil vapour samples were collected in July, September, and December and analyzed for BTEX and PAHs (Tables 1 and 2, Appendix B). For assessment of potential adverse health effects for offsite residents (via inhalation of vapours in indoor air), data collected for MW-58V will be evaluated in consideration of residents located southwest of the Site while data collected for MW-59V will be evaluated for residents located southeast of the Site.

The qualitative assessment for offsite residential receptors involved comparing the soil vapour data from MW-58V and MW-59V to target indoor air concentrations developed by Health Canada (2010d) and to generic numerical vapour standards developed by the British Columbia Ministry of Environment (BC MOE, 2011) (Tables 1 and 2, Appendix B). Prior to comparing the soil vapour data to the Health Canada target indoor air concentrations and the BC MOE standards, an attenuation factor (AF) was applied to account for attenuation along the vapour transport flow path (between the subsurface sampling location and aboveground point of exposure) (Health Canada, 2010d; BC MOE, 2011). As a conservative approach, an AF of 0.02 was applied as this value represents the minimum observed attenuation between soil vapour and indoor air (BC MOE, 2006, USEPA, 2008). As shown in Tables 1 and 2 (Appendix B), soil vapour concentrations of BTEX and PAHs (after application of the AF) were all less than the Health Canada target indoor air concentrations and the BC MOE generic numerical vapour standards. Therefore, no adverse health effects (associated with inhalation of vapour indoors) are expected for residents living adjacent to the Site.

It should be noted that the only PAH detected in soil vapour at a concentration above its respective laboratory reportable detection limit was naphthalene. This is not unexpected as PAHs with two or three rings are readily volatile while PAHs with four or more rings show insignificant volatilizational loss under all environmental conditions (Moore and Ramamoorthy, 1984).

The findings from this qualitative assessment for offsite residential receptors are in agreement with previous evaluations (CH2M HILL, 1995; AECOM, 2011).

3.8 Uncertainty Assessment

Risk estimates normally include an element of uncertainty; generally, these uncertainties are addressed by incorporating conservative assumptions in the analysis. As a result, risk assessments tend to overstate the actual risk. Although many factors are considered in preparation of a risk analysis, the results are generally only sensitive to very few of these factors. The uncertainty analysis is included to demonstrate that assumptions used are conservative, or that the analysis result is not sensitive to the key assumptions.

A risk assessment containing a high degree of confidence will be based on the following:

- Conditions where the problem is defined with a high level of certainty based on data and physical observations
- An acceptable and reasonable level of conservatism in assumptions that will ensure that risks are overstated
- An appreciation of the bounds and limitations of the final solution

The exposure assessment performed as part of this assessment was based on the following:

- Available data to describe existing groundwater, soil, soil vapour, and indoor air conditions and COC distributions
- Sound conservative assumptions for certain parameters, as required
- Well-understood and generally accepted methods for risk prediction

The following subsections describe and evaluate some of the uncertainties associated with this risk assessment. Where possible, the manner in which these uncertainties impact the conclusions of the assessment are evaluated. Collectively, it is believed that the uncertainties incorporated into this risk assessment reasonably overestimate potential human health risks.

3.8.1 Uncertainties Associated with Site Characterization

There is always a degree of uncertainty associated with the collection and analysis of environmental sampling data. Sources of uncertainty typically are as follows:

- Whether the environmental samples collected represent actual Site conditions
- Inherent variance in procedures for sample collection, shipment/storage, and laboratory analysis
- Whether the extents of contamination have been fully characterized

The potential effects of uncertainty associated with Site characterization on the risk assessment are unknown. However, sampling programs typically focus on potential “hotspots,” and it is reasonable to assume that the data collected may be representative of the highest concentrations at the Site.

An additional cause of uncertainty for the Site is related to the source of the indoor air contaminants. It is uncertain whether the contaminants measured in indoor air originated from the subsurface (contamination from historical operations), from ambient air, or from within the buildings (for example, building materials; stored materials, equipment, or chemicals; human activities [cooking, cleaning, and so on] and products [perfume, hair products, and so on]). For the current HHRA, this cause of uncertainty has been lessened through selection of sampling locations that were least likely to be impacted by confounding factors. This cause of uncertainty does not lead to risk being over- or under-estimated as the HHRA takes into consideration total contaminant concentrations in air, regardless of origin.

3.8.2 Uncertainties in Hazard Analyses/Problem Formulation

The hazard analyses and problem formulation contain very little uncertainty. In this section, the qualitative extent to which contaminants at the Site may cause adverse health effects on receptors of concern is qualitatively evaluated.

- Because contaminants (for example, PHCs and PAHs) have been measured in soil and groundwater at concentrations that exceed health-protective standards, there is a potential for health risks. The uncertainty at this step of the risk assessment has essentially no effect on the conclusions of the evaluation.
- Uncertainties associated with other components of the problem formulation (that is, receptors and pathways) are discussed in the following sections.

3.8.3 Uncertainties Associated with Exposure Assessment

There are several key uncertainties associated with the exposure assessment. The exposure scenario for Indoor Workers is believed to reasonably overestimate exposures to COCs at the Site (however, the true exposure patterns for Site users are unknown).

- Indoor Workers (Manitoba Hydro Staff) - Adult receptors who work indoors at the Site (for example, office work or vehicle maintenance). These workers are anticipated to be present onsite for 10 hours per day, with the vast majority of this time spent indoors. It is also anticipated that these receptors will be onsite 5 days per week, for 48 weeks per year, and for 35 years.

Exposure durations and frequencies were assumed to occur on a regular and long-term basis, even though it is reasonable to expect that receptors may relocate or change employment or job descriptions,

and would be unlikely to come into contact with COCs on a routine basis. The conservative manner in which receptors have been identified and their activities evaluated indicates that uncertainties in the exposure assessment most likely allow for an overestimation of risk.

The exposure assessment section also defines the concentrations to which potential receptors may be exposed. For all COCs, the maximum contaminant concentration was used to represent the exposure point concentration. This approach will overestimate risks posed by onsite COCs. Because sampling is typically biased toward highly contaminated areas (“hotspots”), maximum contaminant concentrations are likely to be much greater than the true mean concentrations of COCs at a site. This conservative approach likely results in an overestimate of exposure and associated risk to receptors.

3.8.4 Uncertainties Associated with Toxicity Assessment

There is a very limited amount of toxicological information on the effects associated with human exposures to low levels of contaminants in the environment. The available human information is generally based on epidemiological studies of occupationally exposed workers. These studies are generally limited in scope and provide results that may not be applicable to chronic or continuous exposures to low levels of contaminants. Because human toxicological information is limited, RfDs and cancer potency estimates for many compounds are based on the results of dose-response assessment studies using animals.

The use of experimental animal data to estimate potential biological effects in humans introduces uncertainties into the evaluation of potential human health effects. These estimations require that a number of assumptions be made, including:

- The toxicological effect reported in animals is relevant and could occur in humans.
- Extrapolation from high-dose studies to low-dose environmental exposures adequately represents the shape of the dose-response curve in the low-dose exposure range.
- Short-term exposures used in animal studies can be extrapolated to chronic or long-term exposures in humans.
- The uptake of a compound from a test vehicle (drinking water, food, and so on) in animals will be the same as the uptake of the chemical from environmental media (soil or air-borne particulate matter) in humans.
- The pharmacokinetic processes that occur in the test animals also occur in humans.

There are clearly a number of uncertainties associated with extrapolating from experimental animal data to humans. To address these weaknesses, regulatory agencies, such as Health Canada and the MOE, incorporate a large number of conservative assumptions to account for the uncertainties associated with this process. The uncertainties are accounted for by the use of uncertainty factors that serve to lower the RfD well below the level at which adverse health effects have been reported in the test species. Uncertainty factors are generally applied by factors of 10 and are used to account for the following types of uncertainties:

- Variation within the population (protection of sensitive members of the population)
- Differences between humans and the test species
- Differences in using short- or medium-term studies to estimate the health effects associated with long-term or chronic exposures
- Limitations in the available toxicological information

The magnitude of the uncertainty factors applied by the various regulatory agencies provides an indication of the level of confidence that should be placed in the reference value. Uncertainty factors typically range between 100 and 10,000, although some can be less than 10. The latter values are found for a few contaminants where sound and substantial human toxicological information is available to enable setting a toxicological endpoint solely on the basis of human epidemiological information.

The application of uncertainty factors is intended to introduce a high degree of conservatism into the risk assessment process and to ensure, as far as possible, that limited exposures exceeding the RfCs will not

result in adverse human health effects. Because risk assessments that use these regulatory limits incorporate the conservatism used in the development of the toxicological information, the results can generally be viewed as being extremely conservative.

3.8.5 Uncertainties in Risk Characterization

The risk characterization phase of the risk assessment integrates toxicity and exposure information to determine the potential for adverse health effects. In large part, the uncertainty resulting at this phase of the risk assessment is a direct result of those uncertainties that have already been discussed; that is, based on the foregoing evaluation, the health risk is largely overestimated. However, it is important to note that the benchmarks (for example, HQ or ILCR) constituting substantial risk are arbitrarily selected; their significance becomes a value judgment. In most instances, the risks deemed to be significant (for example, 1-in-100,000 [1×10^{-5}] cancer risks for exposures from source-related contaminants) are very small relative to health risks associated with typical activities in a modern society (for example, approximately one in three cancer risks from all societal exposures). This does not diminish the importance of the excess risk that can be identified through the risk assessment process. It does, however, place the calculated risk in a context of reasonableness, suggesting that receptors are unlikely to be adversely affected by Site-related contaminants.

There is high confidence that the TRVs selected for use in this risk assessment are relevant and protective of human health. The reference values used in this assessment (for example, RfC and cancer UR) are considered to be protective of the human population (including sensitive subgroups) at continuous exposure levels (that is, 24 hours per day, 7 days per week). The human receptors identified in the problem formulation are likely to have exposure that is less than continuous (for example, a 50-hour work week for indoor workers for 48 weeks per year). Thus, using chronic TRVs (where continuous exposure is assumed) as opposed to acute or sub-chronic TRVs provides another layer of conservatism to the risk assessment.

3.9 Risk-Based Concentrations for Indoor Air

Risk-based target concentrations (RBCs) for indoor air were developed based on the potential for inhalation exposure by an indoor worker. The RBCs were developed using a target ILCR of 1×10^{-5} (1 in 100,000), a target HQ of 0.2 for all COCs except PHC, a target HQ of 0.5 for PHC fractions, the human receptor characteristics presented in Table 8, and the TRVs presented in Table 19. The RBCs for indoor air are presented in Table 29.

Uncertainties associated with variations in the TRVs could increase or decrease the risk-based concentration estimates. However, the conclusion that these RBCs are protective of site receptors can be considered valid despite changes to the TRV since the derivation of TRVs includes modifying and uncertainty factors that may span several orders of magnitude.

3.10 Discussion and Recommendations

The purpose of the quantitative HHRA was to quantify the degree of potential human health risk posed by the presence of contamination at the Site. Based on this HHRA, two contaminant groups were identified as COCs: PHCs and PAHs. The receptors of concern were identified as indoor workers (Manitoba Hydro staff) and offsite residents. For indoor workers, exposures were quantified for inhalation of vapours indoors while offsite residents were evaluated qualitatively.

3.10.1 Onsite

3.10.1.1 Risk Characterization

For indoor workers, potentially unacceptable non-carcinogenic risks were identified from exposure to benzene (HQ of 0.62, 35 Sutherland – Elevator Basement and HQ of 0.81, 37 Sutherland – Stores Building Office), F2 (HQ of 2.0, 35 Sutherland – Elevator Exterior), and xylenes (HQ of 0.43, 37 Sutherland – Stores Building Office). Additionally, potentially unacceptable carcinogenic risks were identified from exposure to benzene (ILCR of 1.2E-05) at 37 Sutherland, Stores Building Office. For offsite residents living adjacent to the Site, the qualitative risk characterization indicated that no adverse health effects (associated with inhalation of vapours indoors) are expected.

In situations where the calculated total HQ is greater than 0.2 or the total ILCR is greater than 1.0E-05, this does not necessarily imply that an adverse health effect will result; rather, it only implies that there is potential for an adverse effect. Due to the conservative nature of the assumptions underlying the calculations of exposure estimates, there is an inherent tendency to overpredict exposures. Furthermore, the methodologies used to derive TRVs are essentially conservative, such as deriving TRVs for the most sensitive toxicological endpoint observed in the most sensitive gender of the most sensitive species and using uncertainty factors to account for such unknowns as inter- and intraspecies variability and database deficiencies. Collectively, where the total HQ is greater than 0.2 or the total ILCR is greater than 1.0E-05, the information and assumptions underlying both the exposure estimates and the TRVs should be evaluated to determine whether a risk is likely to occur and whether risk management or remediation (or both) is warranted.

The three sampling locations where potential human health risks have been identified are discussed in the paragraphs that follow.

1. 35 Sutherland – Elevator Exterior

In 1996, an elevator was installed within the 35 Sutherland Avenue building and its construction required an excavation below the basement floor. During construction, coal tar odours were noted and consequently an under-floor ventilation system was installed. The ventilation system vents to the outside of the building (northwest corner) via a 2-inch diameter pipe. In October, November, and December of 2012, KGS Group collected air samples from within this pipe (while sealing the pipe from the outside environment) and submitted the samples for laboratory analyses of PHCs and PAHs. Air samples collected from this location are representative of conditions (vapour concentrations) below the elevator floor (sub-slab).

Although potentially unacceptable non-carcinogenic risks were identified for F2 (indoor workers exposed via inhalation of vapours in indoor air) at this sampling location, this finding is not valid as the collected air samples are representative of sub-slab conditions and not indoor air quality. If we apply an attenuation factor of 0.02 (the minimum observed attenuation between soil vapour and indoor air [BC MOE, 2006; USEPA, 2008]) to the sub-slab F2 vapour concentration (20,700 µg/m^3 on July 10, 2012) we attain a concentration of 414 µg/m^3. This calculated F2 vapour concentration does not pose a non-carcinogenic risk to indoor workers.

It should be noted that for a subsequent air sampling event (October 3, 2012), and final event where F2 concentrations were measured, F2 was below the laboratory reportable detection limit at this sampling location.

2. 37 Sutherland – Stores Building Office

For indoor workers at this location, potentially unacceptable non-carcinogenic risks were identified from exposure to benzene (HQ of 0.81) and xylenes (HQ of 0.43). Additionally, potentially unacceptable carcinogenic risks were identified from exposure to benzene (ILCR of 1.2E-05).

The 37 Sutherland Avenue building is primarily used as a storage area. This building stores multiple chemicals, oils, transformers, and some fuel. Storage of these products likely accounts for the elevated BTEX concentrations observed at this location as compared to the other sampling locations (Table 5, Appendix B). The highest BTEX concentrations measured at this location were in July 11, 2012, during the first indoor air sampling event conducted by KGS Group. Concentrations have, in general, decreased during each subsequent sampling event (Table 5, Appendix B). In December 2012, BTEX concentrations at this location were at their lowest for 2012. The concentrations of benzene and xylenes measured in December 2012 are not associated with carcinogenic or non-carcinogenic human health risks. Therefore, it can be stated that under current conditions (December 2012), no carcinogenic or non-carcinogenic risks exist at this location for indoor workers exposed to benzene and xylenes through inhalation of vapours in indoor air. However, it is possible that indoor air quality has worsened during the past six months since the last indoor air sampling event was completed. Indoor air quality at this sampling location may also vary seasonally.

The indoor air concentrations measured in the Stores Building Office are not necessarily indicative of a complete VI pathway. In order to further evaluate whether the indoor air results may be attributed to

historical site contamination, sub-slab soil vapour samples could be collected, and the ratios of sub-slab soil vapour to indoor air concentrations determined. Sub-slab monitoring is not recommended at this time; as indicated above, elevated BTEX levels in this area are likely attributable to the storage of products in this area.

3. 35 Sutherland – Elevator Basement

For indoor workers at this location, potentially unacceptable non-carcinogenic risks were identified from exposure to benzene (HQ of 0.62).

BTEX concentrations at this sampling location spiked in December 2012. From November 2012 to December 2012 the benzene concentration increased almost 10-fold (from 1.89 to 18.0 µg/m^3). BTEX concentrations were relatively low during the first three indoor air sampling events at this location (July, October, and November 2012), and they were not associated with potential carcinogenic or non-carcinogenic human health risks. There are no visible contaminant sources near this sampling location other than the elevator.

Although potentially unacceptable non-carcinogenic human health risks have been identified for this location (from inhalation of benzene vapours indoors), in consideration of the magnitude of the risks (HQ of 0.62) and the conservative assumptions used in their calculation, it is unlikely that human receptors will experience adverse health effects from exposure to benzene at this location.

3.10.1.2 Comparison to Risk-Based Concentrations

Following the quantitative risk characterization, risk-based concentrations (RBCs) were developed for indoor air. These RBCs represent the concentrations below which no adverse risk or hazard are expected for workers at Manitoba Hydro. A comparison of the indoor air data to the RBCs confirmed the findings of the risk characterization (refer to Section 3.10.1.1), with exceedances of the RBCs noted in the same locations as the exceedances of risk or hazard.

At the 37 Sutherland – Stores Building Office sampling location, two of the four collected samples had benzene results that exceeded the corresponding RBC, and one of the four collected samples had xylenes results that exceeded the corresponding RBC. Exceedances of the RBCs for benzene and xylenes were measured in the July sampling event, and an exceedance of the RBC for benzene was measured in the November sampling event. As previously noted, the indoor air concentrations measured at this location are variable, and potentially attributable to the storage of multiple chemicals, oils, transformers, and some fuel in the building.

At the 35 Sutherland – Elevator Basement sampling location, one of the four collected samples had benzene results that exceeded the corresponding RBC. The RBC exceedance was measured in December, with the results of the other three sampling events approximately one order of magnitude lower, and less than the RBC. Although potentially unacceptable non-carcinogenic human health risks have been identified for this location, in consideration of the magnitude of the risks and the conservative assumptions used in their calculation, it is unlikely that human receptors will experience adverse health effects from exposure to benzene at this location.

At the 35 Sutherland – Elevator Exterior sampling location, one of the two collected samples had F2 results that exceeded the corresponding RBC. The RBC exceedance was measured in July, with the results of the October sampling event non-detect for F2, with a detection limit approximately three orders of magnitude less than the concentration measured in July. As explained previously in Section 3.10.1.1, these analytical results are not appropriate for direct comparison to indoor air standards. The collected air samples are actually representative of sub-slab conditions and not indoor air quality. If we apply an attenuation factor of 0.02 (the minimum observed attenuation between soil vapour and indoor air [BC MOE, 2006; USEPA, 2008]) to the sub-slab F2 vapour concentration (20,700 µg/m^3 on July 10, 2012) we attain a concentration of 414 µg/m^3. This calculated F2 vapour concentration does not exceed the RBC for F2, and does not pose a non-carcinogenic risk to indoor workers.

3.10.2 Offsite

Soil vapour data collected from the property boundaries was applied to evaluate the potential for risk to offsite residents located to the southwest and southeast of the Site. A conservative attenuation factor was applied to the soil vapour data to allow comparison of the collected data to both Health Canada target indoor air concentrations and the BC MOE vapour standards. All soil vapour concentrations of BTEX and PAHs (after application of the AF) were less than the Health Canada target indoor air concentrations and the BC MOE generic numerical vapour standards. Therefore, no adverse health effects (associated with inhalation of vapour indoors) are expected for residents living adjacent to the Site.

3.10.3 Summary and Recommendations

Of the nine locations where air samples were collected, the air concentrations in seven sampling locations met conservative indoor air standards and indoor air RBCs. As a result, no unacceptable carcinogenic or non-carcinogenic risks are expected for indoor workers from exposure to COCs through inhalation of vapours in indoor air in these locations. These seven locations include the shops and offices where Manitoba Hydro workers are understood to spend the majority of their working hours. Two locations had concentrations that exceeded the RBCs for indoor air (37 Sutherland – Stores Building Office, and 35 Sutherland – Elevator Basement), indicating the potential for risk above acceptable levels. Manitoba Hydro workers are understood to work in these areas infrequently, and not on a continuous, nor regular, full-time basis, which in effect decreases the potential for risk predicted from measured air concentrations.

The concentrations measured in the Stores Building Office at 37 Sutherland are potentially attributable to the storage of multiple chemicals, oils, transformers, and some fuel in the building. Collection of sub-slab data in this building could provide an additional line of evidence in determining whether VI from a soil or groundwater source is occurring and whether indoor air concentrations are attributable to sub-slab contamination.

In order to reduce the potential exposures to concentrations that exceed acceptable levels for human health, risk mitigation measures should be evaluated for use at 35 Sutherland (Elevator Basement) and 37 Sutherland (Stores Building Office). Risk mitigation measures are discussed in Section 4.

SECTION 4

Risk Management/Remediation Options

As discussed in Section 3.10, there are two locations at the Site that require evaluation of risk management measures (RMMs) to reduce the potential risk to receptors. As indicated in Section 3.10.3, risk above acceptable levels is possible at 35 Sutherland (Elevator Basement) and 37 Sutherland (Stores Building Office). The performance objective of RMMs is to reduce the potential risk to acceptable target levels (that is, for human receptors, ILCR reduced to less than or equal to 1×10^{-5}; HQ reduced to less than or equal to 0.2 [for PHCs, HQ ≤ 0.5]. Risk management can be achieved through either administrative controls, engineered controls, or a combination of both.

Engineered VI RMMs will be considered effective if indoor air samples collected as part of the as part of the LTMP and the Manitoba Conservation & Water Stewardship's Director's Remediation Order meet (or are lower than) the indoor air RBCs provided in Table 29.

This section provides an overview of VI mitigation for existing buildings where building mitigation is determined to be warranted. Section 4.1 summarizes temporary measures that generally can be implemented relatively quickly to reduce indoor air concentrations. Section 4.2 identifies and summarizes the most commonly implemented engineered control methods for existing buildings.

4.1 Temporary Measures for Existing Buildings

If measured indoor air concentrations are elevated or expected to be elevated and mitigation will be delayed or require substantial planning to complete, it may be appropriate to implement *temporary measures* in advance of permanent building mitigation solutions. Temporary measures may include:

- Increasing building ventilation, for example using fans or natural ventilation
- Sealing major soil gas entry routes
- Limiting workers time spent in the elevator basement or stores building
- Treating indoor air

Each of these options is summarized in the remainder of this section.

Increasing building ventilation (that is, increasing the rate at which indoor air is replaced with outdoor air) can reduce the buildup of indoor air contaminants within a structure. Natural ventilation may be accomplished by opening windows, doors, and vents. Forced or mechanical ventilation may be accomplished by using a fan to blow air into or out of the building. Increased ventilation is easiest and least costly to implement in locations where the air is not conditioned (heated or cooled). If indoor air is conditioned, increased ventilation can be a costly option because the conditioned air is ventilated to the outdoors. This drawback can be partly overcome by use of heat exchangers, but they are also costly. Another concern is that exhausting air from the building will generally contribute to under-pressurization of the building, relative to the subsurface, thereby potentially resulting in an increased rate of soil gas entry (that is, VI) unless ambient air entry into the building is increased equivalently. In some cases, ventilation may not be capable of reducing indoor air concentrations to acceptable levels. In addition, building occupants may find it uncomfortable to increase the air exchange rate by more than a factor of three or four.

VI into the building can also be reduced by sealing foundational openings using products such as synthetic rubbers, acrylics, oil-based sealants, swelling cement, silicon, or elastomeric polymers. The selected sealants should be screened to make sure they do not contain or emit vapour-forming chemicals that might pose a health risk to building occupants. This mitigation approach is among the easiest and least expensive to implement. In some cases, sealing openings may not be capable of reducing indoor air concentrations to acceptable levels.

Limiting in the time workers spend in areas with elevated COC concentrations reduces the potential for risk. The risk estimates and RBCs assume workers are continuously exposed at concentration levels that

were measured in air for the duration of the assumed work week (up to 10 hours per day, 5 days per week). It is understood that workers have limited occupancy in the two areas where carcinogenic and non-carcinogenic risks were above the target levels of 1.0E-05 and 0.2, respectively (that is, 35 Sutherland (Elevator Basement) and 37 Sutherland (Stores Building Office). Therefore, for these workers, the potential risk is less than the values predicted. If the use of these areas changes such that workers can be expected to occupy the rooms more in line with the assumptions used to estimate risk, other risk mitigation approaches may be required to reduce air concentrations.

Commercially available indoor air cleaners include both in-duct models and portable air cleaners. These devices operate on various principles, including zeolite and carbon sorption and photocatalytic oxidation. Methods that rely on adsorption generate a waste that must be disposed of appropriately or regenerated and require periodic replacement of the adsorption medium.

4.2 Engineering Controls for Existing Buildings

This section provides a brief overview of engineered VI mitigation technologies that can be used in existing buildings, along with a summary of steps and considerations for selecting an appropriate mitigation method for a given building. The focus is on active depressurization technologies most commonly employed for building mitigation.

Active depressurization technologies (ADT) have been used successfully to mitigate the intrusion of radon into buildings and have also been successfully installed and operated in residential, commercial, and school buildings to control VI from subsurface vapour-forming chemicals. ADT systems are widely considered the most practical VI mitigation strategy for most existing buildings, including those with basement slabs or slab-on-grade foundations. ADT systems are generally recommended for consideration for vapour intrusion mitigation because of their demonstrated capability to achieve significant concentration reductions in a wide variety of buildings and their moderate cost.

Sub-slab depressurization (SSD) systems, a common type of ADT system, function by creating a pressure differential across the building slab to prevent soil gas entry into the building (that is, overcoming the building's natural under-pressurization, which is the driving force for VI). Creating this pressure differential is accomplished by extracting soil gas from beneath the slab and venting it to the atmosphere. Construction of SSD systems entails opening one or more holes in the existing slab, removing soil from beneath the slab to create a "suction pit" (6 to 18 inch radius), placing vertical suction pipes into the holes, and sealing the openings around the pipes. These pipes are then connected together to a fan, which draws soil gas from the sub-slab area through the piping and vents it to the outdoors. SSD systems were first developed for radon reduction and operate under similar design principles as radon mitigation methods.

When sumps and associated drain tile systems are present, they may also be depressurized to prevent soil gas entry into the building (again, overcoming the building's natural under-pressurization). This variation on active depressurization is often referred to as drain-tile depressurization (DTD). Depressurization of drain tiles located near a foundation wall can help control soil gas entry at the joint between the foundation wall and slab.

If the building has hollow block walls, the usual sub-slab suction point may not adequately mitigate the wall cavities, which may be particularly important if the outside surfaces are in contact with the soil. In these situations, the void network within the wall may be depressurized by drawing air from inside the wall and venting it to the outside. This method, called "block-wall depressurization" (BWD) is often used in combination with SSD. Because uniform depressurization of block walls can be difficult and in some cases counterproductive, BWD is generally recommended only when sub-slab or DTD prove inadequate to control VI.

In buildings with a crawl space foundation or a basement with a dirt floor, a flexible membrane may be installed over the floor to facilitate depressurization of the soil gas beneath the membrane, which prevents its intruding into the crawl space or basement air. For such sub-membrane depressurization

(SMD) system to be effective, the membrane should cover the entire floor area and be sealed at all seams and penetrations.

Extensive guidance is available for the design, sizing, installation, and testing of ADT systems for radon control in existing and new homes and large institutional (for example, school) and commercial buildings. The USEPA recommends that ADT systems be designed and installed by qualified persons, typically environmental professionals and licensed radon contractors.

SECTION 5

Conclusions and Recommendations

Of the nine locations where air samples were collected, the air concentrations in seven sampling locations met conservative indoor air standards and indoor air RBCs. As a result, no unacceptable carcinogenic or non-carcinogenic risks are expected for indoor workers from exposure to COCs through inhalation of vapours in indoor air in these seven locations, which include the shops and offices where Manitoba Hydro workers are understood to spend the majority of their working hours.

Two sampling locations had concentrations that exceeded the RBCs for indoor air (37 Sutherland – Stores Building Office, and 35 Sutherland – Elevator Basement), indicating the potential for risk above acceptable levels. The concentrations measured in both locations were variable, and did not consistently exceed the RBCs. In addition, Manitoba Hydro workers are not understood to work in these areas on a regular, full-time basis, which decreases their exposure to elevated concentrations and thus reduces their risk.

The concentrations measured in the Stores Building Office at 37 Sutherland are potentially attributable to the storage of multiple chemicals, oils, transformers, and some fuel within the building. The collection of sub-slab data in this building could be used to determine the relative contribution to indoor air concentrations of sub-slab contamination. In order to reduce potential exposure to concentrations that exceed acceptable levels for human health, risk mitigation measures are recommended to be implemented at 35 Sutherland (Elevator Basement) and 37 Sutherland (Stores Building Office). Temporary measures that could be implemented relatively easily include increasing building ventilation, for example using fans or natural ventilation; sealing major soil gas entry routes; limiting time occupying the space; and treating indoor air. The measures will be considered effective if indoor air samples collected as part of the as part of the LTMP and the Manitoba Conservation & Water Stewardship's Director's Remediation Order meet (or are lower than) the indoor air RBCs provided in Table 29. CH2M HILL recommends that Manitoba Hydro evaluate a range of risk management and mitigation measures to address the issues identified in the HHRA.

SECTION 6

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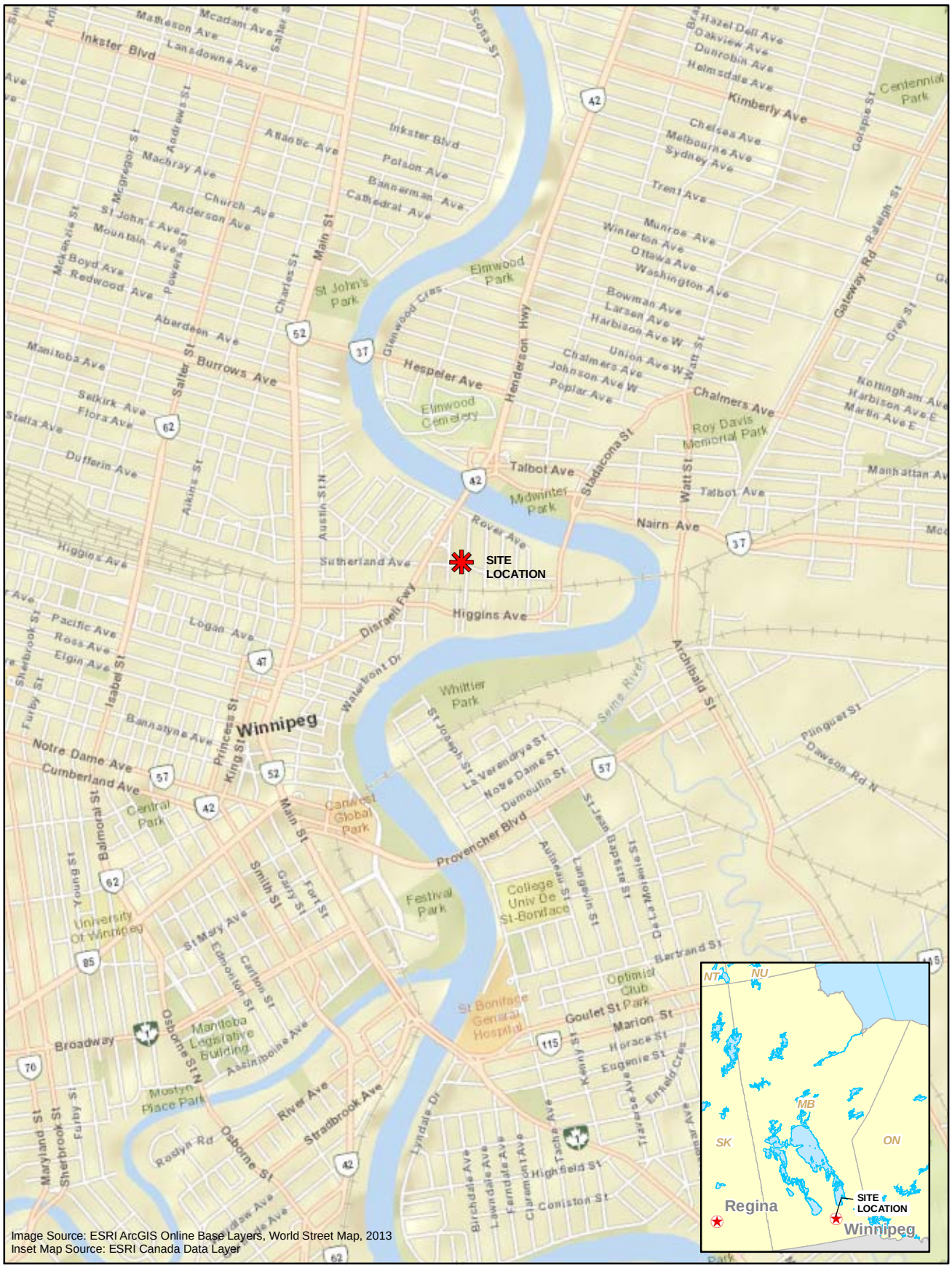
Appendix A
Figures



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Metres

Figure 1
Site Location Map
Manitoba Hydro Sutherland Ave Facility
35 to 38 Sutherland Avenue
Winnipeg, MB

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N

0 10 20 30 40 50
Meters

- Monitoring Well
- Monitoring Well - Destroyed
- Soil Vapour Probe
- Air Sampling Location (2012)
- Ambient Air Sampling (Before 2012)

Figure 2
Site Plan and Sampling Locations
Manitoba Hydro Sutherland Ave Facility
35 to 38 Sutherland Avenue
Winnipeg, MB

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Human Health Conceptual Site Model

EXPOSURE MEDIUM	POTENTIAL EXPOSURE ROUTES	POTENTIAL HUMAN RECEPTORS	
		Indoor Workers (Manitoba Hydro Staff)	**Offsite Residents**
Soil / Groundwater →	Vapour Inhalation Indoors	X	X

COCs - PHCs and PAHs

Figure 3
Human Health Conceptual Site Model
Manitoba Hydro Sutherland Ave Facility
35 to 38 Sutherland Avenue
Winnipeg, MB

Appendix B
Tables

TABLE 1
PETROLEUM HYDROCARBONS IN SOIL VAPOUR 2012
FORMER SUTHERLAND AVENUE MANUFACTURED GAS PLANT SITE
WINNIPEG, MB

Sample No.	Date Sampled	Air Volume (L) [1]	Parameter (µg/m^3) [Note 2]							
			Benzene		Toluene		Ethylbenzene		Xylenes	
			AF=0	AF=2E-02	AF=0	AF=2E-02	AF=0	AF=2E-02	AF=0	AF=2E-02
MW-50V	24-Jul-12	5.52	2	0.04	31.5	0.63	22.5	0.45	105	2.1
MW50V (Pump ID: 301017)	24-Sep-12	4.83	5.8	0.116	31.5	0.63	12	0.24	69.2	1.384
MW50V (Pump ID: 301035)	17-Dec-12	4.98	<2.0	<0.04	<2.0	<0.04	<2.0	<0.04	<6.0	<0.12
MW-51V	24-Jul-12	6.01	4.7	0.094	106	2.12	63	1.26	336	6.72
MW51V (Pump ID: 301018)	24-Sep-12	4.34	5.5	0.11	53.7	1.074	25.4	0.508	127	2.54
MW51V (Pump ID: 301033)	17-Dec-12	4.68	10	0.2	8.3	0.166	3	0.06	7.7	0.154
MW-55V	24-Jul-12	6.00	50.2	1.004	49.5	0.99	33.2	0.664	164	3.28
MW55V (Pump ID: 301017)	24-Sep-12	5.04	284	5.68	90.3	1.806	36.5	0.73	155	3.1
MW55V (Pump ID: 301034)	17-Dec-12	5.04	<2.0	<0.04	<2.0	<0.04	<2.0	<0.04	<6.0	<0.12
MW-58V	24-Jul-12	5.52	3.4	0.068	73.7	1.474	48.4	0.968	270	5.4
MW58V (Pump ID: 301016)	24-Sep-12	4.84	7	0.14	47.7	0.954	20.9	0.418	111	2.22
MW58V (Pump ID: 301035)	14-Dec-12	4.98	3.2	0.064	4	0.08	<2.0	<0.04	<6.0	<0.12
MW-59V	24-Jul-12	6.00	<1.7	<0.034	36.8	0.736	33.8	0.676	173	3.46
MW59V (Pump ID: 301018)	24-Sep-12	4.32	4.9	0.098	64.1	1.282	29.2	0.584	153	3.06
MW59V (Pump ID: 301033)	14-Dec-12	4.68	12	0.24	4.5	0.09	<2.1	<0.042	<6.4	<0.256
MW-99V	24-Jul-12	5.52	5.6	0.112	74.3	1.486	60.5	1.21	355	7.1
MW99V (Pump ID: 301016)	24-Sep-12	4.81	11	0.22	78.6	1.572	33.1	0.662	164	3.28
MW-99V	14-Dec-12	-	Monitoring Well Damaged - Could Not Sample							
Evaluation Criteria										
Winnipeg Ambient Air Quality (2005) [Note 3]			0.78		2.85		0.43		1.96	
US EPA Reference Concentrations [Note 4]			30		5000		1000		100	
Ontario Ministry of the Environment - Health Based Indoor Air Criteria, Industrial (10^5) [Note 5]			16.3		3580		201		501	
Health Canada TRV [Note 6]			3.3 [a]		3800 [b]		-		180 [b]	
Health Canada Target Indoor Air Concentrations: Carcinogens [Note 7]			3.0		--		--		--	
Health Canada Target Indoor Air Concentrations: Non-Carcinogens [Note 7]			--		760		200		36	
BC Ministry of Environment [Note 8] Schedule 11 - Generic Numerical Vapour Standards - Residential			1.5		5000		1000		100	
BC Ministry of Environment [Note 8] Schedule 11 - Generic Numerical Vapour Standards - Commercial			4		15000		3000		300	
BC Ministry of Environment [Note 8] Schedule 11 - Generic Numerical Vapour Standards - Industrial			10		45000		9000		900	

Notes:

1. Air samples collected using tubes in parallel connected to the same sampling pump using a y-splitter (cardbotrap tube for BTEX and XAD tube for PAHs). Sampling was over 8 hours at a rate of approximately 20 mL/min (10 mL/min through each sampling tube).
2. Detection limits vary due to volume of air extracted for sample.
3. Manitoba Conservation - Manitoba Ambient Air Quality Annual Reports for 2003, 2004 and 2005. Table 10 - 2005 data. Report No. 2008-01. January 2008. (arithmetic mean derived from 60 samples). Station 9119, Downtown Sample 65 Ellen St.
4. United States Environmental Protection Agency Integrated Risk Information System (IRIS). Accessed December 2012.
5. Ontario Ministry of the Environmental - Health Based Indoor Air Criteria (10^5). Accessed November 2013.
6. Heath Canada Toxicological Reference Values. Accessed December 2012.
   a. Carcinogenic Toxicological Reference Values - Inhalation unit risk from TC_{05}. Inhalation unit risk derived as $URInh = 0.05/TC_{05}$.
   b. Non-carcinogenic Toxicological Reference Values - Health Canada TC.
7. Health Canada. 2010d. Federal Contaminated Site Risk Assessment in Canada, Part VII: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites. Health Canada, Contaminated Sites Division, Safe Environments Directorate, September 2010.
8. BC - British Columbia Guidelines - Environmental Management Act, Contaminated Sites Regulation. B.C. Reg. 375/96, Schedule 11. Accessed December 2012. AF = Attenuation factor recommended by BC MOE.

- Exceeds minimum indoor air criteria (comparison to ambient air standards excluded).

TABLE 2
POLYCYCLIC AROMATIC HYDROCARBONS IN SOIL VAPOUR 2012
FORMER SUTHERLAND AVENUE MANUFACTURED GAS PLANT SITE
WINNIPEG, MB

Sample No.	Date Sampled	Air Volume (L) [1]	Parameter (µg/m^3)															
			Acenaphthene		Acenaphthylene		Anthracene		Benzo(a)anthracene		Benzo(a)pyrene		Benzo(b/k)fluoranthene		Benzo(g,h,i)perylene		Chrysene	
			AF=0	AF=2E-02	AF=0	AF=2E-02	AF=0	AF=2E-02	AF=0	AF=2E-02	AF=0	AF=2E-02	AF=0	AF=2E-02	AF=0	AF=2E-02	AF=0	AF=2E-02
MW-50V	24-Jul-12	5.52	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182
MW50V (Pump ID: 301017)	24-Sep-12	4.72	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22
MW50V (Pump ID: 301035)	17-Dec-12	4.98	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2
MW-51V	24-Jul-12	6.01	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166
MW51V (Pump ID: 301018)	24-Sep-12	5.78	<8.6	<0.172	<8.6	<0.172	<8.6	<0.172	<8.6	<0.172	<8.6	<0.172	<8.6	<0.172	<8.6	<0.172	<8.6	<0.172
MW51V (Pump ID: 301033)	17-Dec-12	4.68	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22
MW-55V	25-Jul-12	6.00	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166
MW55V (Pump ID: 301017)	25-Sep-12	4.92	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2
MW55V (Pump ID: 301034)	17-Dec-12	5.04	<9.9	<0.198	<9.9	<0.198	<9.9	<0.198	<9.9	<0.198	<9.9	<0.198	<9.9	<0.198	<9.9	<0.198	<9.9	<0.198
MW-58V	25-Jul-12	5.52	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182
MW58V (Pump ID: 301016)	24-Sep-12	3.87	<13	<0.26	<13	<0.26	<13	<0.26	<13	<0.26	<13	<0.26	<13	<0.26	<13	<0.26	<13	<0.26
MW58V (Pump ID: 301035)	14-Dec-12	4.98	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2
MW-59V	26-Jul-12	6.00	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166
MW59V (Pump ID: 301018)	25-Sep-12	5.76	<8.7	<0.174	<8.7	<0.174	<8.7	<0.174	<8.7	<0.174	<8.7	<0.174	<8.7	<0.174	<8.7	<0.174	<8.7	<0.174
MW59V (Pump ID: 301033)	14-Dec-12	4.68	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22
MW-99V	26-Jul-12	5.52	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182
MW99V (Pump ID: 301016)	25-Sep-12	3.85	<13	<0.26	<13	<0.26	<13	<0.26	<13	<0.26	<13	<0.26	<13	<0.26	<13	<0.26	<13	<0.26
MW-99V	14-Dec-12	-	Monitoring Well Damaged - Could Not Sample															
Evaluation Criteria																		
Winnipeg Ambient Air Quality (2005) [Note 2]			0.0012		0.00174		0.00054		0.00011		0.00008		0.00031		0.00018		0.00019	
US EPA Reference Concentrations [Note 3]			-		-		-		-		-		-		-		-	
Ontario Ministry of the Environment - Health Based Indoor Air Criteria, Industrial (10^{-5}) [Note 4]			32.5		3.25		NV		0.325		0.0325		0.325		3.25		3.25	
Health Canada TRV [Note 5]			-		-		-		-		31[a]		1.9/1.3[a,b]		-		-	
Health Canada Target Indoor Air Concentrations: Carcinogens [Note 6]			-		-		-		0.11		0.32		5.3/7.7		-		11	
Health Canada Target Indoor Air Concentrations: Non-Carcinogens [Note 6]			24		-		120		-		-		-		-		-	
BC Ministry of Environment [Note 7] Schedule 11 - Generic Numerical Vapour Standards - Residential			-		-		-		-		-		-		-		-	
BC Ministry of Environment [Note 7] Schedule 11 - Generic Numerical Vapour Standards - Commercial			-		-		-		-		-		-		-		-	
BC Ministry of Environment [Note 7] Schedule 11 - Generic Numerical Vapour Standards - Industrial			-		-		-		-		-		-		-		-	

Notes:

1. Air samples collected using tubes in parallel connected to the same sampling pump using a y-splitter (cardbotrap tube for BTEX and XAD tube for PAHs). Sampling was over 8 hours at a rate of approximately 20 mL/min (10 mL/min through each sampling tube).
2. Manitoba Conservation - Manitoba Ambient Air Quality Annual Reports for 2003, 2004 and 2005. Tables 11 and 12. Report No. 2008-01. January 2008. (arithmetic mean derived from 56-67 samples)
3. United States Environmental Protection Agency Integrated Risk Information System (IRIS). Accessed December 2012.
4. Ontario Ministry of the Environmental - Health Based Indoor Air Criteria (10^{-5}). Accessed November 2013.
5. Heath Canada Toxicological Reference Values. Accessed December 2012.
   a. Carcinogenic Toxicological Reference Values - Inhalation unit risk from TC_{05}. Inhalation unit risk derived as URInh =0.05/TC_{05}.
   b. Shown as benzo(b)fluoranthene/benzo(k)fluoranthene.
6. Health Canada. 2010d. Federal Contaminated Site Risk Assessment in Canada, Part VII: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites. Health Canada, Contaminated Sites Division, Safe Environments Directorate, September 2010.
7. BC - British Columbia Guidelines - Environmental Management Act, Contaminated Sites Regulation. B.C. Reg. 375/96, Schedule 11. Accessed December 2012.
   AF = Attenuation factor recommended by BC MOE.

TABLE 2
POLYCYCLIC AROMATIC HYDROCARBONS IN SOIL VAPOUR 2012
FORMER SUTHERLAND AVENUE MANUFACTURED GAS PLANT SITE
WINNIPEG, MB

Sample No.	Date Sampled	Air Volume (L) [1]	Parameter (µg/m³)													
			Dibenzo(a,h)anthracene		Fluoranthene		Fluorene		Indeno(1,2,3-c,d)pyrene		Naphthalene		Phenanthrene		Pyrene	
			AF=0	AF=2E-02	AF=0	AF=2E-02	AF=0	AF=2E-02	AF=0	AF=2E-02	AF=0	AF=2E-02	AF=0	AF=2E-02	AF=0	AF=2E-02
MW-50V	24-Jul-12	5.52	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	12	0.240	<9.1	<0.182	<9.1	<0.182
MW50V (Pump ID: 301017)	24-Sep-12	4.72	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	12	0.240	<11	<0.22	<11	<0.22
MW50V (Pump ID: 301035)	17-Dec-12	4.98	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2
MW-51V	24-Jul-12	6.01	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	20	0.400	<8.3	<0.166	<8.3	<0.166
MW51V (Pump ID: 301018)	24-Sep-12	5.78	<8.6	<0.172	<8.6	<0.172	<8.6	<0.172	<8.6	<0.172	12	0.240	<8.6	<0.172	<8.6	<0.172
MW51V (Pump ID: 301033)	17-Dec-12	4.68	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22
MW-55V	25-Jul-12	6.00	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	17	0.340	<8.3	<0.166	<8.3	<0.166
MW55V (Pump ID: 301017)	25-Sep-12	4.92	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	11	0.220	<10	<0.2	<10	<0.2
MW55V (Pump ID: 301034)	17-Dec-12	5.04	<9.9	<0.198	<9.9	<0.198	<9.9	<0.198	<9.9	<0.198	<9.9	<0.198	<9.9	<0.198	<9.9	<0.198
MW-58V	25-Jul-12	5.52	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	15	0.300	<9.1	<0.182	<9.1	<0.182
MW58V (Pump ID: 301016)	24-Sep-12	3.87	<13	<0.26	<13	<0.26	<13	<0.26	<13	<0.26	18	0.360	<13	<0.26	<13	<0.26
MW58V (Pump ID: 301035)	14-Dec-12	4.98	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2	<10	<0.2
MW-59V	26-Jul-12	6.00	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166	<8.3	<0.166
MW59V (Pump ID: 301018)	25-Sep-12	5.76	<8.7	<0.174	<8.7	<0.174	<8.7	<0.174	<8.7	<0.174	9	0.188	<8.7	<0.174	<8.7	<0.174
MW59V (Pump ID: 301033)	14-Dec-12	4.68	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22	<11	<0.22
MW-99V	26-Jul-12	5.52	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182	<9.1	<0.182
MW99V (Pump ID: 301016)	25-Sep-12	3.85	<13	<0.26	<13	<0.26	<13	<0.26	<13	<0.26	15	0.300	<13	<0.26	<13	<0.26
MW-99V	14-Dec-12	-	Monitoring Well Damaged - Could Not Sample													
Evaluation Criteria																
Winnipeg Ambient Air Quality (2005) [Note 2]			0.00002		0.00154		0.00243		0.00013		0.00011		0.00649		0.0013	
US EPA Reference Concentrations [Note 3]			-		-		-		-		3		-		-	
Ontario Ministry of the Environment - Health Based Indoor Air Criteria, Industrial (10^{-5}) [Note 4]			0.0325		3.25		NV		0.325		NV		NV		32.5	
Health Canada TRV [Note 5]			-		-		-		3.8[a]		-		-		-	
Health Canada Target Indoor Air Concentrations: Carcinogens [Note 6]			0.011		-		1.1		1.1		-		-		-	
Health Canada Target Indoor Air Concentrations: Non-Carcinogens [Note 6]			-		16		-		-		0.6		-		12	
BC Ministry of Environment [Note 7] Schedule 11 - Generic Numerical Vapour Standards - Residential			-		-		-		-		3		-		-	
BC Ministry of Environment [Note 7] Schedule 11 - Generic Numerical Vapour Standards - Commercial			-		-		-		-		9		-		-	
BC Ministry of Environment [Note 7] Schedule 11 - Generic Numerical Vapour Standards - Industrial			-		-		-		-		25		-		-	

Notes:

1. Air samples collected using tubes in parallel connected to the same sampling pump using a y-splitter (cardbotrap tube for BTEX and XAD tube for PAHs). Sampling was over 8 hours at a rate of approximately 20 mL/min (10 mL/min through each sampling tube).
2. Manitoba Conservation - Manitoba Ambient Air Quality Annual Reports for 2003, 2004 and 2005. Tables 11 and 12. Report No. 2008-01. January 2008. (arithmetic mean derived from 56-67 samples)
3. United States Environmental Protection Agency Integrated Risk Information System (IRIS). Accessed December 2012.
4. Ontario Ministry of the Environmental - Health Based Indoor Air Criteria (10^{-5}). Accessed November 2013.
5. Heath Canada Toxicological Reference Values. Accessed December 2012.
   a. Carcinogenic Toxicological Reference Values - Inhalation unit risk from TC_{05}. Inhalation unit risk derived as URInh =0.05/TC_{05}.
   b. Shown as benzo(b)fluoranthene/benzo(k)fluoranthene.
6. Health Canada. 2010d. Federal Contaminated Site Risk Assessment in Canada, Part VII: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites. Health Canada, Contaminated Sites Division, Safe Environments Directorate, September 2010.
7. BC - British Columbia Guidelines - Environmental Management Act, Contaminated Sites Regulation. B.C. Reg. 375/96, Schedule 11. Accessed December 2012. AF = Attenuation factor recommended by BC MOE.

TABLE 3

PETROLEUM HYDROCARBONS IN GROUNDWATER 2012

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Sample No.	Duplicate ID	Date	Parameter (µg/L)				
			Benzene	Toluene	Ethyl-benzene	Xylenes (-o,-m,-p)	F1 (C6 - C10)
BD-01A		7-May-12	1590 (5)	<1.0	1.3	<1.5	4000 (5)
		19-Jul-12	1770 (5)	<1.0	3.39	<1.5	1900 (5)
		27-Sep-12	2680 (5)	<1.0	3.4	<1.5	3400 (5)
		17-Dec-12	3160 (5)	<1.0	3.7	<1.5	4100 (5)
BD-01B		7-May-12	2620 (5)	2.2	27.1	20	6200 (5)
		19-Jul-12	6420 (5)	6	142	63.4	*8400* (5)
	MW-101	19-Jul-12	9460 (5)	5.5	120	54.6	*13300* (5)
		27-Sep-12	13100 (5)	6.7	196	91.6	*23000* (5)
		17-Dec-12	21700 (5)	6.3	232	104	*14800* (5)
MW-23A		7-May-12	955 (5)	5.7	718 (5)	287	4300 (5)
	MW-102	7-May-12	918 (5)	5.5	624 (5)	230	3900 (5)
		19-Jul-12	1070 (5)	12.7	737 (5)	344	2400 (5)
		27-Sep-12	1030 (5)	15	665 (5)	300	2600 (5)
	MW-300	28-Sep-12	993 (5)	15.1	444 (5)	277	1880
		26-Nov-12	1510 (5)	49 (5)	1070 (5)	542 (5)	3500 (5)
	MW100	26-Nov-12	1490 (5)	52 (5)	1100 (5)	551 (5)	2900 (5)
MW-23B		7-May-12	6530 (5)	10.4	11.5	1640 (5)	*16000* (5)
		19-Jul-12	7310 (5)	11.8	14.1	1530 (5)	*11000* (5)
		27-Sep-12	5960 (5)	10.8	14.5	1960 (5)	*8200* (5)
		17-Dec-12	11100 (5)	14.7	23	3070 (5)	*16500* (5)
MW-23C		7-May-12	**45900** (5)	5890 (5)	4830 (5)	3930 (5)	*150000* (5)
		19-Jul-12	**53600** (5)	8760 (5)	5550 (5)	4410	*75000* (5)
		27-Sep-12	**45100** (5)	8540 (5)	4840 (5)	3560 (5)	*56400* (5)
MW-23D		7-May-12	20300 (5)	331 (5)	1110 (5)	2130 (5)	*43000* (5)
		19-Jul-12	22700 (5)	296 (5)	1010 (5)	2600 (5)	*30000* (5)
		27-Sep-12	16800 (5)	204	459 (5)	1420 (5)	*18900* (5)
		26-Nov-12	20300 (5)	381(5)	799 (5)	1970 (5)	*27200* (5)
MW-24A		7-May-12	<0.50	2.9	<0.50	<1.5	<100
		19-Jul-12	<0.50	<1.0	<0.50	<1.5	<100
	MW-102	19-Jul-12	<0.50	<1.0	<0.50	<1.5	<100
		27-Sep-12	0.55	<1.0	<0.50	<1.5	<100
		17-Dec-12	<0.50	<1.0	<0.50	<1.5	<100
MW-24B		7-May-12	27600 (5)	158	2090 (5)	1490 (5)	*54000* (5)
		19-Jul-12	**35200** (5)	246 (5)	2170 (5)	1640 (5)	*42000* (5)
		27-Sep-12	27600 (5)	238 (5)	1340 (5)	1100 (5)	*22200* (5)
		17-Dec-12	**65900** (5)	230	2560 (5)	2050 (5)	*48800* (5)
MW-24C		7-May-12	9350 (5)	27.7	1560 (5)	662 (5)	*24000* (5)
		19-Jul-12	8000 (5)	25.9	1310 (5)	547 (5)	*11000* (5)
		27-Sep-12	8240 (5)	24.4	1050 (5)	455	*7600* (5)
		17-Dec-12	13800 (5)	33.8	2120 (5)	960 (5)	*22000* (5)

MW-24D		7-May-12	22900 (5)	65.6	2170 (5)	1460 (5)	*45000* (5)
		19-Jul-12	28600 (5)	68.9	2570 (5)	1890 (5)	*36000* (5)
		27-Sep-12	26200 (5)	76.3	2220 (5)	1760 (5)	*27900* (5)
		17-Dec-12	**55400** (5)	123	3150 (5)	2780 (5)	*80000* (5)
MW-27A (on-site)		27-Sep-12	<0.50	<1.0	<0.50	<1.5	<100
MW-27B (on-site)		27-Sep-12	<0.50	<1.0	<0.50	<1.5	<100
MW-27C (on-site)		27-Sep-12	<0.50	<1.0	<0.50	<1.5	<100
MW-28A (on-site)		27-Sep-12	<0.5	<1.0	<0.50	<1.5	<100
MW-28B (on-site)		27-Sep-12	3990 (5)	29.6	32.7	257	6300 (5)
MW-41A		7-May-12	<0.50	<1.0	<0.50	<1.5	<100
		19-Jul-12	<0.50	<1.0	<0.50	<1.5	<100
		27-Sep-12	<0.5	<1.0	<0.5	<1.5	<100
		17-Dec-12	<0.50	<1.0	<0.50	<1.5	<100
MW-41B		7-May-12	<0.50	<1.0	<0.50	<1.5	<100
		19-Jul-12	<0.50	<1.0	<0.50	<1.5	<100
		27-Sep-12	<0.5	<1.0	<0.5	<1.5	<100
		17-Dec-12	0.57	<1.0	<0.50	<1.5	<100
MW-41C		7-May-12	<0.50	<1.0	<0.50	<1.5	<100
		19-Jul-12	1.1	<1.0	0.59	<1.5	<100
		27-Sep-12	<0.5	<1.0	<0.5	<1.5	<100
		17-Dec-12	0.59	<1.0	<0.50	<1.5	<100
MW-42A		7-May-12	462 (5)	3.3	31.9	46.1	1150 (5)
		19-Jul-12	808 (5)	5.5	102	88.7	1010 (5)
		27-Sep-12	912 (5)	5.8	114	105	1170
		17-Dec-12	1040 (5)	4.3	40.2	96.8	630
	MW-101	17-Dec-12	1200 (5)	4.2	45.8	93.4	640
MW-42B		7-May-12	1620 (5)	1.8	38.8	33.6	3800 (5)
		19-Jul-12	1720 (5)	1.4	39.1	37.1	2100 (5)
		27-Sep-12	2580 (5)	2	53.5	40.3	*20200* (5)
MW-42C		7-May-12	1370 (5)	13.1	308 (5)	260	6300 (5)
	MW-101	7-May-12	1390 (5)	14	311 (5)	272	6500 (5)
		19-Jul-12	3450 (5)	24.5	581 (5)	605 (5)	4800 (5)
		27-Sep-12	3600 (5)	24.8	601 (5)	664 (5)	*8100* (5)
	MW-200	27-Sep-12	3360 (6)	27.7	354 (5)	422 (5)	3500 (5)
MW-46		3-Dec-12	33.8	<1	<0.5	<1.5	<100
MW-47		3-Dec-12	0.51	<1	<0.5	<1.5	<100
MW-48		27-Sep-12	9690 (5)	6710 (5)	3130 (5)	2340 (5)	*28000* (5)
		3-Dec-12	6880 (5)	4900 (5)	1790 (5)	3950 (5)	*35200* (5)
MW-49		3-Dec-12	1350 (5)	4.1	170	155	1510
FIELD		7-May-12	<0.50	<1.0	<0.50	<1.5	<100
		19-Jul-12	0.87	<1.0	<0.50	<1.5	<100
		28-Sep-12	<0.50	<1.0	<0.5	<1.5	<100
		17-Dec-12	<0.50	<1.0	<0.50	<1.5	<100

TRIP		7-May-12	<0.50	<1.0	<0.50	<1.5	<100
		19-Jul-12	<0.50	<1.0	<0.50	<1.5	<100
		28-Sep-12	<0.5	<1.0	<0.5	<1.5	<100
		17-Dec-12	<0.50	<1.0	<0.50	<1.5	<100
BW-46		7-May-12	<0.50	<1.0	<0.50	<1.5	<100
(Bedrock well)	MW-100	7-May-12	<0.50	<1.0	<0.50	<1.5	<100
		19-Jul-12	<0.50	<1.0	<0.50	<1.5	<100
	MW-100	19-Jul-12	0.59	<1.0	<0.50	<1.5	<100
		27-Sep-12	<0.50	<1.0	<0.50	<1.5	<100
	MW-100	27-Sep-12	<0.50	<1.0	<0.50	<1.5	<100
		17-Dec-12	<0.50	<1.0	<0.50	<1.5	<100
	MW-100	17-Dec-12	0.50	<1.0	<0.50	<1.5	<100
EQL			*0.5 - 100*	*1.0 - 10.0*	*0.5 - 5.0*	*1.5 - 7.0*	*100 - 20,000*
CCME [1]							
Freshwater Aquatic Life			370	2	90	-	-
Federal Interim Water Quality Guidelines [2] - Residential/Parkland Land Use [3] - Fine grained soil							
TIER II - SITE-SPECIFIC CRITERIA (For Uses/Pathways Applicable to Site)							
Inhalation			2,800	NGR	NGR	80,000	19,000
Soil Organisms Direct Contact			100,000	82,000	42,000	21,000	6,500
Freshwater Life [4]			33,000	NGR	NGR	NGR	NGR
Federal Interim Water Quality Guidelines [2] - Commercial/Industrial Land Use [3] - Fine grained soil							
TIER II - SITE-SPECIFIC CRITERIA (For Uses/Pathways Applicable to Site)							
Inhalation			19,000	NGR	NGR	NGR	NGR
Soil Organisms Direct Contact			540,000	240,000	150,000	74,000	9,900
Freshwater Life [4]			33,000	NGR	NGR	NGR	NGR

Notes:

EQL = Estimated Quantitation Limit = Lowest level of the parameter that can be quantified with confidence.

"-" = No Data

NGR = No Guideline Required; calculated guideline exceeds solubility limit.

1. CCME - Canadian Council of Ministers of the Environment. Canadian Environmental Quality Guidelines 1999. Updated January 2011. Chapter 4 - Aquatic Life
2. Federal Interim Groundwater Quality Guidelines, Environment Canada, November 2012.
   Residential/Parkland Land Use Guidelines apply to off-site areas
   Commercial Guidelines apply to the following on-site areas: MW-27A/B/C; MW-28A/B
   Fine grained soil criteria are used.
3. All values adopted from Alberta Environment (AESRD) (2010a) unless otherwise specified.
4. Where AESRD (2010a) guideline was not based on the *Canadian Water Quality Guidelines (CWQG) for the Protection of* Aquatic Life for freshwater environments (CCME 1999), and a CWQG exists, the groundwater quality guideline was re-calculated based on the CWQG.
5. Detection limit adjusted for required dilution by laboratory. See laboratory report for individual detection limits.

	- Exceedance of CCME Freshwater Aquatic Life Guidelines
<u>Underlined</u>	- Exceedance of Federal Interim GW Quality Inhalation Guidelines
Italicized	- Exceedance of Federal Interim GW Quality Soil Organism Direct Contact Guidelines
BOLD	- Exceedance of Federal Interim GW Quality Freshwater Life Guidelines

TABLE 4

POLYCYCLIC AROMATIC HYDROCARBONS IN GROUNDWATER 2012

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Sample No.	Duplicate ID	Date	Parameter (µg/L)																			
			Ace-naphthene	Ace-naphthylene	Acridine	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-c,d) pyrene	1-Methyl-naphthalene	2-Methyl-naphthalene	Naphthalene	Phenanthrene	Pyrene	Quinoline
BD-01A		7-May-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	0.03	0.048	0.357	<0.050	<0.010	<0.020
		19-Jul-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	0.027	0.289	<0.050	<0.010	<0.020
		27-Sep-12	<0.020	<0.020	<0.020	**0.018**	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.070 (10)	<0.10 (10)	<1.0 (10)	<0.050	<0.010	0.037
		17-Dec-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	0.021	0.51	<0.050	0.011	<0.020
BD-01B		7-May-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	**4.4**	<0.050	<0.010	1.51
		19-Jul-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	**10.1** (7)	<0.050	<0.010	1.4
	MW-101	19-Jul-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	0.034	0.025	**9.16** (7)	<0.050	<0.010	1.18
		27-Sep-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.050 (10)	<0.050 (10)	**14.1** (7)	<0.050	<0.010	0.761
		17-Dec-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	0.024	<0.020	<0.010	<0.020	<0.020	**17** (7)	<0.050	0.024	<0.020
MW-23A		7-May-12	**25.8** (7)	1.03 (7)	0.032	**0.10**	0.013	0.0097	<0.010	<0.020	<0.010	<0.020	<0.0050	**0.042**	1.58	<0.010	38.1 (7)	13.5 (7)	**1530** (7)	**0.606**	**0.056**	2.67 (7)
	MW-102	7-May-12	**21.7** (7)	0.89 (7)	<0.020	**0.069**	<0.010	0.0068	<0.010	<0.020	<0.010	<0.020	<0.0050	**0.042**	1.11	<0.010	32.7 (7)	11.7 (7)	**2010** (7)	**0.502**	**0.054**	2.32 (7)
		19-Jul-12	**28** (7)	1.02	<0.020	**0.117**	0.012	0.0059	0.012	<0.020	<0.010	<0.020	<0.0050	<0.020	1.22	<0.010	37.9 (7)	13.9 (7)	**1580** (7)	**0.706**	**0.057**	0.139
		27-Sep-12	**34.7** (7)	1.15	<0.020	**0.133**	0.011	0.0069	<0.010	<0.020	<0.010	<0.020	<0.0050	**0.057**	1.88	<0.010	49.1 (7)	18.4 (7)	**2060** (7)	**0.899**	**0.076**	1.14
	MW-300	28-Sep-12	**32.3** (7)	1.27 (7)	<0.020 (7)	**0.10** (7)	0.012	0.0104	0.011	<0.020	<0.010	<0.020	<0.0050	**0.069**	1.47 (7)	<0.010	44.9 (7)	16.9 (7)	**2190** (7)	**0.71** (7)	**0.089**	3.84 (7)
		26-Nov-12	**32.5** (7)	1.06	0.032	**0.16**	**0.033**	**0.0227**	0.019	0.02	0.01	0.021	0.005	**0.079**	1.67	0.01	45.5 (7)	17.7 (7)	**1780** (7)	**1.24**	**0.101**	0.843
	MW100	26-Nov-12	**32.4** (7)	1.09	0.031	**0.164**	**0.029**	**0.0228**	0.019	<0.020	<0.01	<0.02	0.005	**0.079**	1.64	<0.01	45.8 (7)	17.9 (7)	**1990** (7)	**1.13**	**0.097**	0.739
MW-23B		7-May-12	**13.8** (7)	**206** (7)	<0.20 (7)	**5.41** (7)	**2.05**	**2.65**	**2.57**	**1.67**	**0.695**	**1.83**	0.222	**4.69**	**26.2** (7)	**1.47**	**334** (7)	**444** (7)	**12000** (7)	**36.5** (7)	**4.88** (7)	13.7 (7)
		19-Jul-12	**9.89** (7)	**141** (7)	0.131	**5.53** (7)	**2.16**	**2.69**	**2.39**	**1.68**	**0.795**	1.16	0.205	**4.2**	**17.9** (7)	**1.84**	**257** (7)	**315** (7)	**6570** (7)	**26.4** (7)	**5.09** (7)	0.207
		27-Sep-12	**17.7** (7)	**218** (7)	0.24 (7)	**8.07** (7)	**3.28**	**3.99**	**3.44**	**2.76**	**1.18**	**3.07**	**0.346**	**6.63** (7)	**30.8** (7)	**2.18**	**359** (7)	**692** (7)	**15900** (7)	**45.7** (7)	**8.97** (7)	12 (7)
		17-Dec-12	**18.2** (7)	**250** (7)	<0.20 (7)	**7.49** (7)	**1.05**	**1.44**	**1.15**	**0.941**	0.345	0.85	0.126	**3.87** (7)	**29.5** (7)	**0.84**	**397** (7)	**505** (7)	**11200** (7)	**40.6** (7)	**4.57** (7)	2 (7)
MW-23C		7-May-12	**233** (7)	2.15 (7)	<0.020	**1.29**	0.016	0.008	<0.010	<0.020	<0.010	<0.020	<0.0050	**0.134**	**14.8** (7)	<0.010	**253** (7)	**372** (7)	**13500** (7)	**8.65** (7)	**0.083**	9.13 (7)
		19-Jul-12	**216** (7)	2.35	0.22	**1.62**	**0.029**	**0.0177**	0.016	<0.020	<0.010	<0.020	<0.0050	**0.184**	**12.2** (7)	<0.010	**228** (7)	**314** (7)	**9460** (7)	**11.5** (7)	**0.117**	8.69 (7)
		27-Sep-12	**203** (7)	2.6 (7)	<0.20 (7)	**1.48** (7)	0.018	0.0122	0.014	<0.020	<0.010	<0.020	<0.005	**0.17**	**15.5** (7)	<0.010	**206** (7)	**298** (7)	**15300** (7)	**11.1** (7)	**0.11**	12.3 (7)
MW-23D		7-May-12	**47.9** (7)	**90.6** (7)	0.38 (7)	**22.4** (7)	**11.8** (7)	***11.8*** (7)	**10.4** (7)	**6.32** (7)	**2.68** (7)	**8.64** (7)	**0.899** (7)	**28.8** (7)	**43.6** (7)	**6.47** (7)	**310** (7)	**419** (7)	**8120** (7)	**88** (7)	**38.4** (7)	12 (7)
		19-Jul-12	**58.2** (7)	**91.6** (7)	0.028	***25.6*** (7)	**18.3** (7)	***15.8*** (7)	**13.4** (7)	**7** (7)	**2**	**10.2** (7)	**1**	**34.7** (7)	**32.8** (7)	**7.87** (7)	**301** (7)	**359** (7)	**7080** (7)	**126** (7)	**47.9** (7)	<0.020
		27-Sep-12	**59** (7)	**103** (7)	0.87 (7)	**19.7** (7)	**7.63** (7)	**7.35** (7)	**6.92** (7)	**6.57** (7)	**3.11**	**5.73** (7)	**0.749**	**23.7** (7)	**43.8** (7)	**4.94**	**348** (7)	**430** (7)	**10200** (7)	**98.2** (7)	**31.9** (7)	12 (7)
		26-Nov-12	**147** (7)	**203** (7)	6.9 (7)	***112*** (7)	**85.9** (7)	***83.9*** (7)	**78.4** (7)	**39.9** (7)	**20.5** (7)	**71.5** (7)	**4.84** (7)	**196** (7)	**104** (7)	**39.1** (7)	**601** (7)	**743** (7)	**9060** (7)	**454** (7)	**266** (7)	4.15 (7)
MW-24A		7-May-12	<0.020	0.021	<0.020	<0.010	**0.034**	**0.0284**	0.087	0.049	0.046	0.04	0.0382	0.025	<0.020	0.046	0.026	0.042	0.39	<0.050	**0.034**	<0.020
		19-Jul-12	<0.020	0.04	<0.020	<0.010	**0.026**	0.0129	0.016	<0.020	<0.010	<0.020	<0.0050	**0.049**	0.029	<0.010	<0.020	<0.020	<0.050	<0.050	**0.069**	<0.020
	MW-102	19-Jul-12	0.041	0.057	<0.020	**0.013**	**0.032**	**0.0259**	0.03	<0.020	<0.010	<0.020	<0.0050	**0.05**	0.036	0.016	0.059	0.091	0.777	<0.050	**0.07**	<0.020
		27-Sep-12	0.026	<0.050 (10)	<0.020	<0.010	0.013	**0.0088**	<0.010	<0.020	<0.010	<0.020	<0.0050	0.034	0.02	<0.010	<0.10 (10)	<0.10 (10)	**<1.5** (10)	<0.050	**0.051**	<0.020
		17-Dec-12	<0.020	0.043	<0.020	**0.025**	**0.044**	**0.0507**	0.051	0.027	0.016	0.047	<0.0050	**0.092**	<0.020	0.023	<0.020	<0.020	0.071	0.061	**0.143**	<0.020
MW-24B		7-May-12	**79.7** (7)	2.88 (7)	<0.020	**0.816**	**0.142**	**0.118**	0.116	0.062	0.036	0.109	0.0102	**0.497**	**8.29** (7)	0.064	177 (7)	**226** (7)	**9360** (7)	**5.98** (7)	**0.585**	5.71 (7)
		19-Jul-12	**79.5** (7)	1.9	0.022	**0.952**	**0.354**	**0.342**	0.38	0.147	0.106	0.202	0.0252	**0.942**	**8.77** (7)	0.198	163 (7)	**193** (7)	**6420** (7)	**7.85** (7)	**1.1**	6.99 (7)
		27-Sep-12	**95.1** (7)	2.67 (7)	0.051	**2.11**	**0.146**	**0.0958**	0.098	0.056	0.044	0.117	0.0097	**1.1**	**10.7** (7)	0.044	171 (7)	**222** (7)	**8370** (7)	**10.1** (7)	**1.29**	7.59 (7)
		17-Dec-12	**81** (7)	2.71	0.029	**1.21**	**0.122**	**0.0993**	0.089	0.055	0.026	0.102	0.0076	**0.924**	**9.26** (5)	0.052	154 (7)	**197** (7)	**5530** (7)	**7.23** (7)	**1.09**	0.83 (7)

TABLE 4

POLYCYCLIC AROMATIC HYDROCARBONS IN GROUNDWATER 2012

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Sample No.	Duplicate ID	Date	Parameter (µg/L)																			
			Ace-naphthene	Ace-naphthylene	Acridine	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-c,d) pyrene	1-Methyl-naphthalene	2-Methyl-naphthalene	Naphthalene	Phenanthrene	Pyrene	Quinoline
MW-24C		7-May-12	**34.7** (7)	**94** (7)	0.103	**5.93** (7)	**0.1**	0.0088	0.023	<0.020	<0.010	0.104	<0.0050	**3.57**	**17.5** (7)	<0.010	**422** (7)	171 (7)	**6640** (7)	**28.1** (7)	**3.73**	6.47 (7)
		19-Jul-12	**35.7** (7)	**62.5** (7)	<0.020	***35*** (7)	**0.221**	**0.0296**	0.039	<0.020	<0.010	0.119	<0.0050	**3.71**	**13.9** (7)	0.013	**297** (7)	118 (7)	**3680** (7)	**30.9** (7)	**4.55**	<0.020
		27-Sep-12	**41.6** (7)	**66.7** (7)	0.08	**3.83**	**0.171**	**0.024**	0.027	<0.020	0.011	0.155	<0.0050	**4.75**	**16.1** (7)	0.01	**321** (7)	126 (7)	**5580** (7)	**31.3** (7)	**4.63** (7)	8.52 (7)
		17-Dec-12	**38.8** (7)	**64** (7)	0.137	**5.6** (7)	**0.342**	**0.0637**	0.056	0.033	0.017	0.339	<0.0050	**4.47** (7)	**15.4** (7)	0.03	**307** (7)	120 (7)	**3690** (7)	**32.9** (7)	**5.5** (7)	1.91 (7)
MW-24D		7-May-12	**35.7** (7)	**162** (7)	0.36 (7)	**15.6** (7)	**6.79** (7)	***6.92*** (7)	**6.46** (7)	**3.87** (7)	**1.95** (7)	**5.5** (7)	**0.553** (7)	**16.7** (7)	**46.1** (7)	**3.85** (7)	**287** (7)	**387** (7)	**8170** (7)	**79.1** (7)	**22.2** (7)	9.5 (7)
		19-Jul-12	**38.1** (7)	**172** (7)	<0.020	**15.7** (7)	**6.25** (7)	***6.59*** (7)	**5.25** (7)	**2.68**	**1.77**	**3.47**	**0.357**	**16.2** (7)	**43.4** (7)	**3.21**	**290** (7)	**380** (7)	**8650** (7)	**95.2** (7)	**21.1** (7)	5.27 (7)
		27-Sep-12	**42** (7)	**151** (7)	<0.020 (7)	**11.8** (7)	**1.46**	**1.31**	**1.13**	**0.646**	**0.441**	**1.2**	**0.095**	**7.42** (7)	**40.3** (7)	**0.565**	**260** (7)	**353** (7)	**14400** (7)	**54.3** (7)	**9.13** (7)	8.73 (7)
		17-Dec-12	**44.6** (7)	**168** (7)	<0.20 (7)	**12.6** (7)	**1.71**	**1.86**	**1.56**	**1.02**	0.44	**1.47**	0.126	**7.49** (7)	**42.7** (7)	**0.874**	**304** (7)	**405** (7)	**6670** (7)	**65.9** (7)	**8.71** (7)	1.85 (7)
MW-27A (on-site)		27-Sep-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.050 (10)	<0.020	<0.10 (10)	<0.050	0.011	0.057
MW-27B (on-site)		27-Sep-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	0.589
MW-27C (on-site)		27-Sep-12	<0.020	<0.10 (10)	<0.020	**0.015**	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	0.071	<0.010	<0.10 (10)	<0.050 (10)	<0.50 (10)	0.056	<0.010	1.13
MW-28A (on-site)		27-Sep-12	<0.020	<0.10 (10)	<0.020	**0.015**	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	0.072	<0.010	<0.10 (10)	<0.050 (10)	<0.50 (10)	0.052	<0.010	1.01
MW-28B (on-site)		27-Sep-12	4.44 (7)	14 (7)	<0.020 (7)	**0.41** (7)	**0.021**	0.0164	0.02	<0.020	<0.010	<0.020	<0.0050	**0.286**	**16** (7)	<0.010	101 (7)	70.4 (7)	**7540** (7)	**2.99** (7)	**0.173**	0.7 (7)
MW-41A		7-May-12	0.034	0.024	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	0.032	<0.010	0.146	0.226	**1.9**	<0.050	<0.010	<0.020
		19-Jul-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	0.048	0.058	0.078	<0.050	<0.010	<0.020
		27-Sep-12	0.597	<0.20 (10)	0.435	**0.111**	0.017	0.0098	0.014	<0.020	<0.010	<0.020	<0.0050	**0.128**	0.966	<0.010	6.41	7.08	**1.94**	**1.37**	**0.13**	0.206
		17-Dec-12	0.055	0.027	0.037	**0.015**	**0.03**	**0.0231**	0.024	<0.020	<0.010	0.023	<0.0050	**0.045**	0.06	<0.010	0.19	0.224	0.194	0.086	**0.066**	<0.020
MW-41B		7-May-12	0.02	<0.020	<0.020	<0.010	0.012	0.0077	0.012	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	0.056	0.09	0.874	<0.050	0.014	<0.020
		19-Jul-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
		27-Sep-12	<0.020	<0.020	<0.020	**0.038**	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.050 (10)	<0.050 (10)	<0.050	<0.050	<0.010	0.083
		17-Dec-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	0.023	<0.020	<0.010	0.035	0.056	0.099	<0.050	0.023	<0.020
MW-41C		7-May-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	0.027	<0.010	0.049	0.094	0.614	0.063	<0.010	<0.020
		19-Jul-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	0.0083	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	0.052	0.016	<0.020
		27-Sep-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.10 (10)	<0.050	<0.010	0.341
		17-Dec-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	0.017	<0.020
MW-42A		7-May-12	0.729	0.092	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	0.072	<0.010	1.19	0.7	**36.9** (7)	<0.050	<0.010	0.077
		19-Jul-12	2.19	0.273	<0.020	**0.038**	0.013	0.0055	0.012	<0.020	<0.010	<0.020	<0.0050	<0.020	0.255	<0.010	3.58	3.07	**272** (7)	0.145	0.025	0.218
		27-Sep-12	2.46	<0.40 (10)	<0.020	**0.035**	**0.027**	**0.0243**	0.021	<0.020	<0.010	0.021	<0.0050	**0.059**	0.263	0.012	4.05	3.56	**210** (10)	0.175	**0.09**	0.257
		17-Dec-12	1.58	0.212	<0.020	**0.036**	**0.031**	**0.0316**	0.022	<0.020	<0.010	0.029	<0.0050	**0.093**	0.174	0.013	2.16	0.96	**31** (7)	0.124	**0.118**	<0.020
	MW-101	17-Dec-12	1.55	0.197	<0.020	**0.029**	**0.026**	**0.0231**	0.019	<0.020	<0.010	0.021	<0.0050	**0.068**	0.187	<0.010	2.18	0.996	**35.8** (7)	0.117	**0.088**	<0.020
MW-42B		7-May-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	0.031	0.038	**30.7** (7)	<0.050	<0.010	<0.020
		19-Jul-12	<0.020	0.045	<0.020	**0.014**	0.013	0.0078	0.012	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	0.073	0.079	**57.7** (7)	0.056	**0.028**	<0.020
		27-Sep-12	0.02	<0.20 (10)	<0.020	**0.053**	0.016	0.0125	0.014	<0.020	<0.010	<0.020	<0.0050	**0.075**	0.06	<0.010	<0.20 (10)	<0.20 (10)	**62.9** (7)	0.231	**0.11**	0.028
MW-42C		7-May-12	**15.6** (7)	**66.2** (7)	0.026	**1.51**	**0.026**	**0.0189**	0.019	<0.020	<0.010	0.021	<0.0050	**0.356**	**6.76** (7)	<0.010	130 (7)	74.4 (7)	**2120** (7)	**6.35** (7)	**0.355**	3.4 (7)
	MW-101	7-May-12	**13** (7)	**47.1** (7)	0.034	**1.43**	**0.026**	**0.0194**	0.02	<0.020	<0.010	0.023	<0.0050	**0.357**	**5.78** (7)	<0.010	107 (7)	63.4 (7)	**1940** (7)	**5.35** (7)	**0.352**	2.88 (7)
		19-Jul-12	**22.2** (7)	**72.1** (7)	<0.020	**1.41**	**0.067**	**0.049**	0.054	0.026	0.013	0.034	<0.0050	**0.815**	**12.2** (7)	0.032	123 (7)	105 (7)	**2090** (7)	**11.4** (7)	**0.756**	0.088
		27-Sep-12	**29.4** (7)	**86.4** (7)	<0.020 (7)	**2.53** (7)	**0.085**	**0.0713**	0.058	0.043	0.031	0.07	0.0073	**1.16**	**15** (7)	0.036	136 (7)	135 (7)	**4250** (7)	**14.1** (7)	**1.09**	5.18 (7)
	MW-200	27-Sep-12	**31.4** (7)	**103** (7)	<0.020 (7)	**2.68** (7)	**0.079**	**0.0612**	0.056	0.036	0.025	0.071	0.0067	**1.13**	**16.3** (7)	0.034	154 (7)	151 (7)	**2850** (7)	**15.1** (7)	**1.03**	5.07 (7)
MW-46		3-Dec-12	0.082	0.06	<0.02	**0.041**	0.017	0.0079	<0.01	<0.02	<0.01	<0.02	<0.0050	**0.14**	0.156	<0.01	0.056	0.072	0.203	0.18	**0.118**	<0.02
MW-47		3-Dec-12	0.82	1.31	<0.02	**0.107**	**0.026**	**0.0283**	0.027	0.021	0.013	0.033	<0.0050	**0.289**	0.826	0.019	1	0.114	0.85	**1.49**	**0.289**	<0.02

TABLE 4

POLYCYCLIC AROMATIC HYDROCARBONS IN GROUNDWATER 2012

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Sample No.	Duplicate ID	Date	Parameter (µg/L)																			
			Ace-naphthene	Ace-naphthylene	Acridine	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-c,d) pyrene	1-Methyl-naphthalene	2-Methyl-naphthalene	Naphthalene	Phenanthrene	Pyrene	Quinoline
MW-48		27-Sep-12	**31** (7)	**468** (7)	1.67 (7)	**22.3** (7)	**7.77** (7)	**7.73** (7)	**7.21** (7)	**6.58** (7)	**3.72**	**5.93** (7)	**0.784**	**27.2** (7)	**49.2** (7)	**5.03** (7)	**353** (7)	**704** (7)	**15200** (7)	**96.6** (7)	**32.9** (7)	6.81 (7)
		3-Dec-12	**42** (7)	**514** (7)	5.02 (7)	**111** (7)	**57.7** (7)	**59.5** (7)	**54.2** (7)	**46** (7)	**24.1** (9)	**57.4** (7)	**6.78**	**173** (7)	**117** (7)	**48.5** (7)	**381** (7)	**643** (7)	**7950** (7)	**414** (7)	**222** (7)	8.69 (7)
MW-49		3-Dec-12	**32.7** (7)	13.7 (7)	0.043	**0.332** (9)	**0.024**	0.0114	0.012	<0.02	<0.01 (9)	0.029 (9)	<0.0050	**0.293**	3	<0.01	71.2 (7)	6.93 (7)	**1180** (7)	**1.78**	**0.264**	3.6 (9)
BW-46		7-May-12	0.042	<0.020	0.038	**0.031**	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	0.036	<0.010	0.27	0.157	0.213	0.06	<0.010	<0.020
	MW-100	7-May-12	0.028	<0.020	0.04	**0.019**	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	0.042	<0.010	0.262	0.16	0.153	0.062	<0.010	<0.020
		19-Jul-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.020 (8)	<0.020	<0.010	<0.020	0.009	<0.020	<0.020	<0.010	<0.020	0.021	<0.050	<0.050	0.018	<0.020
	MW-100	19-Jul-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.020 (8)	<0.020	<0.010	<0.020	0.0124	<0.020	<0.020	<0.010	<0.020	0.022	<0.050	<0.050	0.019	<0.020
		27-Sep-12	<0.020	<0.020	<0.020	**0.017**	<0.010	<0.0050	0.016	<0.020	<0.010	<0.020	0.0175	0.028	<0.020	<0.010	<0.050 (10)	<0.10 (10)	<0.50 (10)	0.075	**0.037**	0.325
	MW-100	27-Sep-12	<0.020	<0.050 (10)	<0.020	<0.010	<0.010	<0.0050	0.018	<0.020	<0.010	<0.020	0.0209	<0.020	0.031	<0.010	<0.15 (10)	<0.10 (10)	**3.12**	<0.050	0.013	0.221
		17-Dec-12	<0.020	<0.020	<0.020	<0.010	<0.010	0.0069	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	0.011	<0.020
	MW-100	17-Dec-12	<0.020	<0.020	<0.020	<0.010	<0.010	0.0124	<0.010	<0.020	<0.010	<0.020	0.0121	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	0.013	<0.020
TRIP		7-May-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	0.023	0.021	0.26	<0.050	<0.010	<0.020
	Trip A	19-Jul-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
	Trip B	19-Jul-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
		28-Sep-12	<0.020	<0.050 (10)	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.050 (10)	<0.050 (10)	<0.50 (10)	<0.050	<0.010	<0.020
		17-Dec-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
FIELD		7-May-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		19-Jul-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	0.165	<0.050	<0.010	<0.020
		28-Sep-12	<0.020	<0.050 (10)	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.15 (10)	<0.15 (10)	<1.5 (10)	<0.050	<0.010	<0.020
		17-Dec-12	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
EQL			*0.02/2.0*	*0.02/2.0*	*0.02/2.0*	*0.01/1.0*	*0.01*	*0.005*	*0.01*	*0.02*	*0.01*	*0.02*	*0.005*	*0.02*	*0.02*	*0.01*	*0.020/2.0*	*0.020/2.0*	*0.05/50*	*0.05/50*	*0.01*	*0.02*
CCME (1)																						
Freshwater Aquatic Life			5.8	-	4.4	0.012	0.018	0.015	-	-	-	-	-	0.04	3	-	-	-	1.1	0.4	0.025/0.1	3.4
Federal Interim Water Quality Guidelines (2) - Residential/Parkland Land Use (3) - Fine grained soil																						
TIER II - SITE-SPECIFIC CRITERIA (For Uses/Pathways Applicable to Site)																						
Inhalation			NGR	-	-	NGR	-	-	-	-	-	-	-	NGR	NGR	-	35,000 (6)	35,000 (6)	14,000	-	NGR	-
Soil Organisms Direct Contact			-	-	-	25	-	1.8	-	-	-	-	-	240	-	-	-	-	-	-	-	-
Freshwater Life (4)			5.8	46	-	0.012	0.018	0.017	0.48	0.21	0.48	1.4	0.28	0.04	3	0.23	180 (5,6)	180 (5,6)	1.1	0.4	0.025	-
Federal Interim Water Quality Guidelines (2) - Commercial/Industrial Land Use (3) - Fine grained soils																						
TIER II - SITE-SPECIFIC CRITERIA (For Uses/Pathways Applicable to Site)																						
Inhalation			NGR	-	-	NGR	-	-	-	-	-	-	-	NGR	NGR	-	150,000 (6)	150,000 (6)	NGR	-	NGR	-
Soil Organisms Direct Contact			-	-	-	320	-	6.6	-	-	-	-	-	860	-	-	-	-	-	-	-	-
Freshwater Life (4)			5.8	46	-	0.012	0.018 (11)	0.017 (11)	0.48 (11)	0.21 (11)	0.48 (11)	1.4 (11)	0.28 (11)	0.04	3	0.23 (11)	180 (5,6)	180 (5,6)	1.1	0.4	0.025	-

Notes:

EQL = Estimated Quantitation Limit = Lowest level of the parameter that can be quantified with confidence.

"-" = No Data

NGR = No Guideline Required; calculated guideline exceeds solubility limit.

Guidelines may not apply if underlying assumptions are not met (see Section 4.2 in *Guidance Document on Federal Interim Groundwater Quality Guidelines* (May 2010)).

1. CCME - Canadian Council of Ministers of the Environment. Canadian Water Quality Guidelines, 1999. Updated January 2011.
   Chapter 4 - Aquatic Life
2. Federal Interim Groundwater Quality Guidelines, Environment Canada, November 2012.
   Residential/Parkland Land Use Guidelines apply to off-site areas
   Commercial Guidelines apply to the following on-site areas: MW-27A/B/C; MW-28A/B.
   Fine grained soil criteria are used.
3. All values adopted from Alberta Environment (AESRD) (2010a) unless otherwise specified.
4. Where AESRD (2010a) guideline was not based on the *Canadian Water Quality Guidelines (CWQG) for the Protection of Aquatic Life* for freshwater environments (CCME 1999), and a CWQG exists, the groundwater quality guideline was re-calculated based on the CWQG.
5. 10 x factor for dillution in surface water was removed from the guideline value.
6. Adopted from Ontario Ministry of Environment and Energy (OMOE) (2010).
7. Detection Limit Adjusted For required dilution by laboratory. See laboratory report for individual detection limits.
8. Detection Limit Adjusted For Sample Matrix Effects by laboratory. See laboratory report for individual detection limits.
9. Estimated maximum possible concentration. Parameter detected but did not meet all the criteria for positive identification.
10. Detection limit was raised by laboratory due to detection of analyte at comparable level in method blank.
11. For ecological receptors only.

	- Exceedance of CCME Freshwater Aquatic Life Guidelines
Underlined	- Exceedance of Federal Interim GW Quality Inhalation Guidelines
Italicized	- Exceedance of Federal Interim GW Quality Soil Organism Direct Contact Guidelines
BOLD	- Exceedance of Federal Interim GW Quality Freshwater Life Guidelines

TABLE 5
PETROLEUM HYDROCARBONS IN AIR 2012
FORMER SUTHERLAND AVENUE MANUFACTURED GAS PLANT SITE
WINNIPEG, MB

Sample Location	Sample No.	Date Sampled	Vacuum Measured by Laboratory in Summa canister after sampling (PSIA) (Note 1a)	Parameter (µg/m^3) (Note 1)					
				Benzene	Toluene	Ethylbenzene	Xylenes (o,-m,-p)	F1 (C_6 - C_{10}) (2)	F2 (C_{10} - C_{16}) (2)
33 Sutherland - Shops Area	AS-33-01 (CANISTER#00134 REG#02505)	11-Jul-12	14.4	4.53	9.37	4.90	24.6	70	106
	AS-33-LR (CANISTER #ED01545) (FLOW CONTROLLER #01369)	2-Oct-12	12.4	<0.64	107	<0.87	<2.6	<30	<30
	AS-33-LR (CANISTER #268)(REGULATOR#01385)	7-Nov-12	14.6	0.99	3	<0.87	<2.6	-	-
	AS-33-LR (CANISTER #242)(REGULATOR#01363)	11-Dec-12	14	1.35	7.1	1.78	9.2	-	-
35 Sutherland - 1st Floor Office	AS-35-01 (CANISTER#00136 REG#00700)	11-Jul-12	14.4	2.68	6.21	1.52	6.2	<30	<30
	AS-35-01 (CANISTER #205) (FLOW CONTROLLER #00550)	3-Oct-12	14.5	3.92	1,900 (Note 3)	3.08	13.0	349 (Note 3)	<60 (Note 3)
	AS-35-01 (CANISTER#0243)(REGULATOR#01365)	5-Nov-12	14.2	3.95	10.90	1.86	7.4	-	-
	AS-35-01 (CANISTER#320)(REGULATOR#02643)	11-Dec-12	13.9	2.12	6.8	1.42	7.4	-	
35 Sutherland - 2nd Floor Office	AS-35-02 (CANISTER#00130 REG#02507)	10-Jul-12	14.5	1.50	8.01	2.04	9.5	<30	<30
	AS-35-02 (CANISTER #220) (FLOW CONTROLLER #00340)	3-Oct-12	14.5	3.45	160	2.08	8.5	45	<30
	AS-35-02 (CANISTER #00113)(REGULATOR#00534)	6-Nov-12	14.2	1.85	9	1.40	5.7	-	-
	AS-35-02 (CANISTER #326)(REGULATOR#0.2504)	11-Dec-12	13.9	3.43	17.4	3.30	18.4	-	-
35 Sutherland - Elevator Exterior	AS-35-EE (CANISTER#213 REG#00661)	10-Jul-12	13.6	2.36	73.1	11.1	27.7	7890 (Note 3)	20700 (Note 3)
	AS-35-EE (CANISTER #1187) (FLOW CONTROLLER #02500)	3-Oct-12	15	1.02	97.2	<0.87	<2.6	<30	<30
	AS-35-EE2 (CANISTER #00107)(REGULATOR#00447)	8-Nov-12	15.6	<0.64	4.0	1.24	<2.6	-	-
	AS-35-EE (CANISTER #1187)(REGULATOR#01380)	12-Dec-12	15.9	0.81	1.9	<0.87	<0.60	-	-
35 Sutherland - Elevator Basement	AS-35-EL (CANISTER#00123)	10-Jul-12	14.4	1.56	3.65	0.95	2.7	48	<30
	AS-35-EL (CANISTER #325) (FLOW CONTROLLER #00536)	3-Oct-12	2.6 (Note 1b)	<0.64	1.24	<0.87	<2.6	<30	<30
	AS-35-EL (CANISTER#00956)(REGULATOR#02507)	5-Nov-12	14.3	1.89	8.13	1.34	5.0	-	-
	AS-35-EL (CANISTER#264)(REGULATOR#02644)	10-Dec-12	11.4	18.00	65.4	13.30	69.4	-	-
35 Sutherland - South Mechanical Room (Basement)	AS-35-SM (CANISTER#00113 REG#01362)	10-Jul-12	14.3	1.31	6.58	2.43	9.8	51	<30
	AS-35-SM (CANISTER #00107) (FLOW CONTROLLER #01369)	3-Oct-12	12.6	1.88	85.8	1.43	5.5	<30	<30
	AS-35-SM2 (CANISTER #00123)(REGULATOR#01304)	7-Nov-12	14.4	1.90	8.1	1.20	4.7	-	-
	AS-35-SM (CANISTER #00123)(REGULATOR#01304)	11-Dec-12	14.3	5.60	14.5	3.56	20.5	-	-
37 Sutherland - Stores Building Office	AS-37-01 (CANISTER#220)	11-Jul-12	14.2	23.6	363	49.4	280	1230	589
	AS-37-OF (CANISTER #241) (FLOW CONTROLLER #00532)	2-Oct-12	14.2	4.4	112	7.24	39.9	165	174
	AS-37-OF (CANISTER #1192)(REGULATOR#02502)	6-Nov-12	14.5	10.5	118	12.8	63.3	-	-
	AS-37-OF (CANISTER #325)(REGULATOR#01383)	11-Dec-12	13.6	2.8	34	3.3	16.3	-	-
38 Sutherland - Office Area	AS-38-OF (CANISTER#346 REG#01362)	11-Jul-12	14.2	3.19	14.6	<0.87	<2.6	<30	<30
	AS-38-OF (CANISTER #326) (FLOW CONTROLLER #01381)	2-Oct-12	14.2	<0.64	28.9	<0.87	<2.6	<30	<30
	AS-38-OF (CANISTER #211)(REGULATOR#01372)	6-Nov-12	14.4	<0.64	8.2	<0.87	<2.6	-	-
	AS-38-OF2 (CANISTER #204)(REGULATOR#02503)	12-Dec-12	13.9	1.85	11.7	0.99	4.5	-	-
38 Sutherland - Ambient (exterior near lunch area)	AS-38-AM (CANISTER#330, REG#02505)	11-Jul-12	13.7	<0.64	1.32	<0.87	<2.6	53	<30
	AS-38-AM (CANISTER #238) (FLOW CONTROLLER #00536)	2-Oct-12	9.2 (note 1c)	<0.64	26.8	<0.87	<2.6	<30	<30
	AS-38-AM (CANISTER #352)(REGULATOR#00666)	6-Nov-12	13.6	<0.64	1.0	<0.87	<2.6	-	-
	AS-38-AM (CANISTER #245)(REGULATOR#02504)	10-Dec-12	15.8	0.65	1.6	<0.87	<2.6	-	
Evaluation Criteria									
Winnipeg Ambient Air Quality (2005) (Note 4)				0.78	2.85	0.43	1.96	-	-
US EPA Reference Concentrations (Note 5)				30	5,000	1000	100		
Ontario Ministry of the Environment - Health Based Indoor Air Criteria, Industrial (10 $^{-5}$) (Note 6)				16.3	3,580	201	501	8,540	1,610
Health Canada TRV (Note 7)				3.3 (a)	3800 (b)	-	180 (b)	-	-
BC Ministry of Environment (Note 8) Schedule 11 - Generic Numerical Vapour Standards - Residential				1.5	5,000	1,000	100	-	-
BC Ministry of Environment (Note 8) Schedule 11 - Generic Numerical Vapour Standards - Commercial				4	15,000	3,000	300	-	-
BC Ministry of Environment (Note 8) Schedule 11 - Generic Numerical Vapour Standards - Industrial				10	45,000	9,000	900	-	-

Notes:

1. a. Air samples collected in a 1.6L Summa canister. 13.7PSIA = -1PSIG = -2.0359 mmHg.
   b. Canister did not sample correctly. Results based on small volume.
   c. Canister sample volume was lower than normal.
2. F1 and F2 are not required parameters for this program.
3. Indicates Detection Limit Adjusted for required dilution.
4. Manitoba Conservation - Manitoba Ambient Air Quality Annual Reports for 2003, 2004 and 2005. Table 10 - 2005 data. Report No. 2008-01. January 2008.
   (arithmetic mean derived from 60 samples). Station 9119, Downtown Sample 65 Ellen St.
5. United States Environmental Protection Agency Integrated Risk Information System (IRIS). Accessed December 2012.
6. Ontario Ministry of the Environmental - Health Based Indoor Air Criteria (10 $^{-5}$). Accessed November 2013.
7. Heath Canada Toxicological Reference Values. Accessed December 2012.
   a. Carcinogenic Toxicological Reference Values - Inhalation unit risk from TC_{05}. Inhalation unit risk derived as URInh =0.05/TC_{05}.
   b. Non-carcinogenic Toxicological Reference Values - Health Canada TC.
8. BC - British Columbia Guidelines - Environmental Management Act, Contaminated Sites Regulation. B.C. Reg. 375/96, Schedule 11. Accessed December 2012.

- Exceeds minimum indoor air criteria (comparison to ambient air standards excluded).

TABLE 6
POLYCYCLIC AROMATIC HYDROCARBONS IN AIR 2012
FORMER SUTHERLAND AVENUE MANUFACTURED GAS PLANT SITE
WINNIPEG, MB

Sample Location	Sample No.	Date Sampled	Laboratory Instrument Detection Limit (µg)	Air Volume (m^3) (Note 6)	Parameter (µg/m^3)																		
					Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo (b) fluoranthene	Benzo(e)pyrene	Benzo (g,h,i) perylene	Benzo(k)fluor anthene	Chrysene	Dibenzo (a,h) anthracene	Fluoran-thene	Fluorene	Indeno (1,2,3-c,d) pyrene	1-Methyl Naphthalene	2-Methyl Naphthalene	Naphthalene	Perylene	Phenanthrene	Pyrene
33 Sutherland - Shops Area	AS-33-LR (PUMP#308002E)	3-Oct-12	0.01	2.45	0.0285	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	0.0218	<0.0041	0.0384	0.0779	0.162	<0.0041	0.0403	<0.0041
	AS-33-LR (PUMP# 194950)	5-Nov-12	0.01	2.45	0.0264	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	0.0181	<0.0041	0.0477	0.0958	0.146	<0.0041	0.0407	<0.0041
	AS-33-LR (PUMP #194952)	11-Dec-12	0.01	2.68	0.0264	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	<0.0037	0.023	<0.0037	0.093	0.189	0.437	<0.0037	0.0549	<0.0037
35 Sutherland - 1st Floor Office	AS-35-01 (PUMP#308013)	2-Oct-12	0.01	3.73	0.03	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	0.0189	<0.0027	0.14	0.276	0.421	<0.0027	0.026	<0.0027
	AS-35-01 (PUMP# 194720)	6-Nov-12	0.01	2.47	0.035	<0.0040	0.051	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.023	<0.0040	0.145	0.297	0.389	<0.0040	0.051	<0.0040
	AS-35-01 (PUMP# 194999)	10-Dec-12	0.01	2.39	0.0506	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042	<0.0042	0.0291	<0.0042	0.321	0.657	0.908	<0.0042	0.051	<0.0042
35 Sutherland - 2nd Floor Office	AS-35-02 (PUMP#308011)	2-Oct-12	0.01	2.19	0.0444	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	0.0289	<0.0046	0.134	0.267	0.444	<0.0046	0.0421	<0.0046
	AS-35-02 (PUMP# 194952)	6-Nov-12	0.01	2.41	0.0286	<0.0041	0.0447	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	0.0195	<0.0041	0.109	0.221	0.298	<0.0041	0.0439	<0.0041
	AS-35-02 (PUMP #194950)	10-Dec-12	0.01	2.33	0.0382	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	0.0265	<0.0043	0.233	0.468	0.717	<0.0043	0.0507	<0.0043
35 Sutherland - Elevator Basement	AS-35-EL (PUMP#308012E)	2-Oct-12	0.01	2.85	0.0379	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	0.0212	<0.0035	0.0803	0.152	0.262	<0.0035	0.035	<0.0035
	AS-35-EL (PUMP# 194999)	6-Nov-12	0.01	2.27	0.032	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	0.0195	<0.0044	0.0913	0.178	0.265	<0.0044	0.0359	<0.0044
	AS-35-EL (PUMP #194952)	11-Dec-12	0.01	2.47	0.0341	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0296	<0.0040	0.146	0.284	0.53	<0.0040	0.0992	<0.0040
35 Sutherland - Elevator Exterior	AS-35-EE (PUMP#308002E)	2-Oct-12	0.01	2.41	0.0311	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	0.0185	<0.0041	0.0111	0.0221	0.0423	<0.0041	0.033	<0.0041
	AS-35-EE (PUMP# 194950)	6-Nov-12	0.01	2.47	0.0249	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0172	<0.0040	0.006	0.0108	0.0151	<0.0040	0.0428	<0.0040
	AS-35-EE (PUMP #194725)	11-Dec-12	0.01	2.29	0.0279	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	0.0205	<0.0044	0.0208	0.042	0.0813	<0.0044	0.0503	<0.0044
35 Sutherland - South Mechanical Room (Basement)	AS-35-SM (PUMP#308014)	2-Oct-12	0.01	2.67	0.028	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	0.023	<0.0038	0.09	0.181	0.322	<0.0038	0.0289	<0.0038
	AS-35-SM (PUMP# 194725)	6-Nov-12	0.01	2.45	0.0334	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	0.0192	<0.0041	0.114	0.231	0.351	<0.0041	0.0306	<0.0041
	AS-35-SM (PUMP #194952)	10-Dec-10	0.01	2.47	0.0425	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0244	<0.0040	0.182	0.361	0.595	<0.0040	0.0421	<0.0040
37 Sutherland - Stores Building Office	AS-37-OF (PUMP#308013)	3-Oct-12	0.01	3.73	0.0496	0.004	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	0.0033	0.0325	<0.0027	0.319	0.646	1.32	0.0034	0.0547	0.0031
	AS-37-OF (PUMP# 194725)	5-Nov-12	0.01	2.43	0.0548	0.0046	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	0.0353	<0.0041	0.361	0.75	1	<0.0041	0.0523	<0.0041
	AS-37-OF (PUMP #194720)	10-Dec-12	0.01	2.43	0.0626	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	0.0412	<0.0041	0.302	0.609	0.901	<0.0041	0.0959	<0.0041
38 Sutherland - Office Area	AS-38-OF (PUMP#308012E)	3-Oct-12	0.01	2.84	0.0335	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	0.0046	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	0.0289	<0.0035	0.0311	0.0622	0.668	<0.0035	0.0552	<0.0035
	AS-38-OF (PUMP# 194999)	5-Nov-12	0.01	2.24	0.0375	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	0.0291	<0.0045	0.0232	0.0455	0.0949	<0.0045	0.0557	<0.0045
	AS-38-OF (PUMP #194725)	10-Dec-12	0.01	2.46	0.0329	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	0.0328	<0.0041	0.0229	0.0427	0.121	<0.0041	0.0993	<0.0041
38 Sutherland - Ambient (exterior near lunch area)	AS-38-AM (PUMP#308011)	3-Oct-12	0.01	2.19	0.0293	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	0.009	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	0.02	<0.0046	0.0163	0.0342	0.781	0.0056	0.035	<0.0046
	AS-38-AM (PUMP# 194950)	5-Nov-12	0.01	2.46	0.0229	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	0.0149	<0.0041	0.0125	0.0225	0.0556	<0.0041	0.025	<0.0041
	AS-38-AM (PUMP #194720)	11-Dec-12	0.01	2.42	0.0299	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	<0.0041	0.02	<0.0041	0.0222	0.0431	0.0952	<0.0041	0.0359	<0.0041
Evaluation Criteria																								
Winnipeg Ambient Air Quality (2005) (Note 1)					0.0012	0.00174	0.00054	0.00011	0.00008	0.00024	0.00012	0.00018	0.00007	0.00019	0.00002	0.00154	0.00243	0.00013	-	-	0.11	0.00002	0.00649	0.0013
US EPA Reference Concentrations (Note 2)					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
Ontario Ministry of the Environment - Health Based Indoor Air Criteria, Industrial (10^{-5}) (Note 3)					32.5	3.25	NV	0.325	0.0325	0.325	-	3.25	0.325	3.25	0.0325	3.25	NV	0.325	-	-	NV	-	NV	32.5
Health Canada TRV (Note 4)					-	-	-	-	31 (a)	1.9 (a)	-	-	-	-	-	-	-	3.8 (a)	-	-	-	-	-	-
BC Ministry of Environment (Note 5) Schedule 11 - Generic Numerical Vapour Standards - Residential					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
BC Ministry of Environment (Note 5) Schedule 11 - Generic Numerical Vapour Standards - Commercial					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-
BC Ministry of Environment (Note 5) Schedule 11 - Generic Numerical Vapour Standards - Industrial					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	-	-	-

Notes:

1. Manitoba Conservation - Manitoba Ambient Air Quality Annual Reports for 2003, 2004 and 2005. Report No. 2008-01. January 2008. Station 9119, Downtown Sample 65 Ellen Street.
   PAHs Tables 11 - 2003 To 2005 data. Collected with teflon filters and PUF tubes analyzed by Environment Canada. Arithmetic mean of 67 samples May 9, 2003 to December 31, 2005. Naphthalene Table 10 - 2005 data (60 samples).
2. United States Environmental Protection Agency Integrated Risk Information System (IRIS). Accessed December 2012.
3. Ontario Ministry of the Environmental - Health Based Indoor Air Criteria (10^{-5}). Accessed November 2013.
4. Heath Canada Toxicological Reference Values. Accessed December 2012.
   a. Carcinogenic Toxicological Reference Values - Inhalation unit risk from TC_{05}. Inhalation unit risk derived as URInh =0.05/TC_{05}.
5. BC - British Columbia Guidelines - Environmental Management Act, Contaminated Sites Regulation. B.C. Reg. 375/96, Schedule 11. Accessed December 2012.
6. Samples taken over an 8 hour period with a diaphragm sampling pump at a rate of approximately 5 L per minute.
   An average rate is calculated from pre and post calibration data. Slight variations in the reported air volume and resulting sample detection limits (µg/m^3) are due to variations in pre and post calibration pump rate data.

TABLE 7

EVALUATION OF MIXTURES OF CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Sample Location	**33 Sutherland Shops Area**	**PEF**	**PEQ**	**33 Sutherland Shops Area**	**PEF**	**PEQ**	**33 Sutherland Shops Area**	**PEF**	**PEQ**
Sample No.	AS-33-LR (PUMP #308002E)			AS-33-LR (PUMP #194950)			AS-33-LR (PUMP #194952)		
Date Sampled	3-Oct-12			5-Nov-12			11-Dec-12		
Acenaphthene	0.0285			0.0264			0.0264		
Acenaphthylene	0.00205			0.00205			0.00185		
Anthracene	0.00205			0.00205			0.00185		
Benzo(a)anthracene	0.00205	0.1	0.000205	0.00205	0.1	0.000205	0.00185	0.1	0.000185
Benzo(a)pyrene	0.00205	**1**	0.00205	0.00205	**1**	0.00205	0.00185	**1**	0.00185
Benzo(b)fluoranthene	0.00205	0.1	0.000205	0.00205	0.1	0.000205	0.00185	0.1	0.000185
Benzo(e)pyrene	0.00205			0.00205			0.00185		
Benzo(g,h,i)perylene	0.00205	0.01	0.0000205	0.00205	0.01	0.0000205	0.00185	0.01	0.0000185
Benzo(k)fluoranthene	0.00205	**0.1**	0.000205	0.00205	**0.1**	0.000205	0.00185	**0.1**	0.000185
Chrysene	0.00205	0.01	0.0000205	0.00205	0.01	0.0000205	0.00185	0.01	0.0000185
Dibenzo(a,h)anthracene	0.00205	**1**	0.00205	0.00205	**1**	0.00205	0.00185	**1**	0.00185
Fluoranthene	0.00205	0.001	0.00000205	0.00205	0.001	0.00000205	0.00185	0.001	0.00000185
Fluorene	0.0218			0.0181			0.023		
Indeno(1,2,3-c,d)pyrene	0.00205	0.1	0.000205	0.00205	0.1	0.000205	0.00185	0.1	0.000185
1-Methylnaphthalene	0.0384			0.0477			0.093		
2-Methylnaphthalene	0.0779			0.0958			0.189		
Naphthalene	0.162			0.146			0.437		
Perylene	0.00205			0.00205			0.00185		
Phenanthrene	0.0403	0.001	0.0000403	0.0407	0.001	0.0000407	0.0549	0.001	0.0000549
Pyrene	0.00205			0.00205			0.00185		
SUM of PEQ			0.0050034			**0.0050038**			0.0045338

Notes:

Units are µg/m^3 (microgram per cubic metre)

PEF, potency equivalence factor

PEQ, potency equivalents

highest benzo(a)pyrene PEQ per sampling area

TABLE 7

EVALUATION OF MIXTURES OF CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Sample Location	35 Sutherland 1st Floor Office	PEF	PEQ	35 Sutherland 1st Floor Office	PEF	PEQ	35 Sutherland 1st Floor Office	PEF	PEQ
Sample No.	AS-35-01 (PUMP #308013)			AS-35-01 (PUMP #194720)			AS-35-01 (PUMP #194999)		
Date Sampled	2-Oct-12			6-Nov-12			10-Dec-12		
Acenaphthene	0.03			0.035			0.0506		
Acenaphthylene	0.00135			0.002			0.0021		
Anthracene	0.00135			0.051			0.0021		
Benzo(a)anthracene	0.00135	0.1	0.000135	0.002	0.1	0.0002	0.0021	0.1	0.00021
Benzo(a)pyrene	0.00135	**1**	0.00135	0.002	**1**	0.002	0.0021	**1**	0.0021
Benzo(b)fluoranthene	0.00135	0.1	0.000135	0.002	0.1	0.0002	0.0021	0.1	0.00021
Benzo(e)pyrene	0.00135			0.002			0.0021		
Benzo(g,h,i)perylene	0.00135	0.01	0.0000135	0.002	0.01	0.00002	0.0021	0.01	0.000021
Benzo(k)fluoranthene	0.00135	**0.1**	0.000135	0.002	**0.1**	0.0002	0.0021	**0.1**	0.00021
Chrysene	0.00135	0.01	0.0000135	0.002	0.01	0.00002	0.0021	0.01	0.000021
Dibenzo(a,h)anthracene	0.00135	**1**	0.00135	0.002	**1**	0.002	0.0021	**1**	0.0021
Fluoranthene	0.00135	0.001	0.00000135	0.002	0.001	0.000002	0.0021	0.001	0.0000021
Fluorene	0.0189			0.023			0.0291		
Indeno(1,2,3-c,d)pyrene	0.00135	0.1	0.000135	0.002	0.1	0.0002	0.0021	0.1	0.00021
1-Methylnaphthalene	0.14			0.145			0.321		
2-Methylnaphthalene	0.276			0.297			0.657		
Naphthalene	0.421			0.389			0.908		
Perylene	0.00135			0.002			0.0021		
Phenanthrene	0.026	0.001	0.000026	0.051	0.001	0.000051	0.051	0.001	0.000051
Pyrene	0.00135			0.002			0.0021		
SUM of PEQ			0.0032944			0.0048930			**0.0051351**

Notes:

Units are µg/m^3 (microgram per cubic metre)

PEF, potency equivalence factor

PEQ, potency equivalents

highest benzo(a)pyrene PEQ per sampling area

TABLE 7

EVALUATION OF MIXTURES OF CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Sample Location	35 Sutherland 2nd Floor Office	PEF	PEQ	35 Sutherland 2nd Floor Office	PEF	PEQ	35 Sutherland 2nd Floor Office	PEF	PEQ
Sample No.	AS-35-02 (PUMP #308011)			AS-35-02 (PUMP #194952)			AS-35-02 (PUMP #194950)		
Date Sampled	2-Oct-12			6-Nov-12			10-Dec-12		
Acenaphthene	0.0444			0.0286			0.0382		
Acenaphthylene	0.0023			0.00205			0.00215		
Anthracene	0.0023			0.0447			0.00215		
Benzo(a)anthracene	0.0023	0.1	0.00023	0.00205	0.1	0.000205	0.00215	0.1	0.000215
Benzo(a)pyrene	0.0023	**1**	0.0023	0.00205	**1**	0.00205	0.00215	**1**	0.00215
Benzo(b)fluoranthene	0.0023	0.1	0.00023	0.00205	0.1	0.000205	0.00215	0.1	0.000215
Benzo(e)pyrene	0.0023			0.00205			0.00215		
Benzo(g,h,i)perylene	0.0023	0.01	0.000023	0.00205	0.01	0.0000205	0.00215	0.01	0.0000215
Benzo(k)fluoranthene	0.0023	**0.1**	0.00023	0.00205	**0.1**	0.000205	0.00215	**0.1**	0.000215
Chrysene	0.0023	0.01	0.000023	0.00205	0.01	0.0000205	0.00215	0.01	0.0000215
Dibenzo(a,h)anthracene	0.0023	**1**	0.0023	0.00205	**1**	0.00205	0.00215	**1**	0.00215
Fluoranthene	0.0023	0.001	0.0000023	0.00205	0.001	0.00000205	0.00215	0.001	0.00000215
Fluorene	0.0289			0.0195			0.0265		
Indeno(1,2,3-c,d)pyrene	0.0023	0.1	0.00023	0.00205	0.1	0.000205	0.00215	0.1	0.000215
1-Methylnaphthalene	0.134			0.109			0.233		
2-Methylnaphthalene	0.267			0.221			0.468		
Naphthalene	0.444			0.298			0.717		
Perylene	0.0023			0.00205			0.00215		
Phenanthrene	0.0421	0.001	0.0000421	0.0439	0.001	0.0000439	0.0507	0.001	0.0000507
Pyrene	0.0023			0.00205			0.00215		
SUM of PEQ			**0.0056104**			0.0050070			0.0052559

Notes:

Units are µg/m^3 (microgram per cubic metre)

PEF, potency equivalence factor

PEQ, potency equivalents

highest benzo(a)pyrene PEQ per sampling area

TABLE 7

EVALUATION OF MIXTURES OF CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Sample Location	35 Sutherland Elevator Basement	PEF	PEQ	35 Sutherland Elevator Basement	PEF	PEQ	35 Sutherland Elevator Basement	PEF	PEQ
Sample No.	AS-35-EL (PUMP #308012E)			AS-35-EL (PUMP #194999)			AS-35-EL (PUMP #194952)		
Date Sampled	2-Oct-12			6-Nov-12			11-Dec-12		
Acenaphthene	0.0379			0.032			0.0341		
Acenaphthylene	0.00175			0.0022			0.002		
Anthracene	0.00175			0.0022			0.002		
Benzo(a)anthracene	0.00175	0.1	0.000175	0.0022	0.1	0.00022	0.002	0.1	0.0002
Benzo(a)pyrene	0.00175	**1**	0.00175	0.0022	**1**	0.0022	0.002	**1**	0.002
Benzo(b)fluoranthene	0.00175	0.1	0.000175	0.0022	0.1	0.00022	0.002	0.1	0.0002
Benzo(e)pyrene	0.00175			0.0022			0.002		
Benzo(g,h,i)perylene	0.00175	0.01	0.0000175	0.0022	0.01	0.000022	0.002	0.01	0.00002
Benzo(k)fluoranthene	0.00175	**0.1**	0.000175	0.0022	**0.1**	0.00022	0.002	**0.1**	0.0002
Chrysene	0.00175	0.01	0.0000175	0.0022	0.01	0.000022	0.002	0.01	0.00002
Dibenzo(a,h)anthracene	0.00175	**1**	0.00175	0.0022	**1**	0.0022	0.002	**1**	0.002
Fluoranthene	0.00175	0.001	0.00000175	0.0022	0.001	0.0000022	0.002	0.001	0.000002
Fluorene	0.0212			0.0195			0.0296		
Indeno(1,2,3-c,d)pyrene	0.00175	0.1	0.000175	0.0022	0.1	0.00022	0.002	0.1	0.0002
1-Methylnaphthalene	0.0803			0.0913			0.146		
2-Methylnaphthalene	0.152			0.178			0.284		
Naphthalene	0.262			0.265			0.53		
Perylene	0.00175			0.0022			0.002		
Phenanthrene	0.035	0.001	0.000035	0.0359	0.001	0.0000359	0.0992	0.001	0.0000992
Pyrene	0.00175			0.0022			0.002		
SUM of PEQ			0.0042718			**0.0053621**			0.0049412

Notes:

Units are µg/m^3 (microgram per cubic metre)

PEF, potency equivalence factor

PEQ, potency equivalents

highest benzo(a)pyrene PEQ per sampling area

TABLE 7

EVALUATION OF MIXTURES OF CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Sample Location	35 Sutherland Elevator Exterior	PEF	PEQ	35 Sutherland Elevator Exterior	PEF	PEQ	35 Sutherland Elevator Exterior	PEF	PEQ
Sample No.	AS-35-EE (PUMP #308002E)			AS-35-EE (PUMP #194950)			AS-35-EE (PUMP #194725)		
Date Sampled	2-Oct-12			6-Nov-12			11-Dec-12		
Acenaphthene	0.0311			0.0249			0.0279		
Acenaphthylene	0.00205			0.002			0.0022		
Anthracene	0.00205			0.002			0.0022		
Benzo(a)anthracene	0.00205	0.1	0.000205	0.002	0.1	0.0002	0.0022	0.1	0.00022
Benzo(a)pyrene	0.00205	**1**	0.00205	0.002	**1**	0.002	0.0022	**1**	0.0022
Benzo(b)fluoranthene	0.00205	0.1	0.000205	0.002	0.1	0.0002	0.0022	0.1	0.00022
Benzo(e)pyrene	0.00205			0.002			0.0022		
Benzo(g,h,i)perylene	0.00205	0.01	0.0000205	0.002	0.01	0.00002	0.0022	0.01	0.000022
Benzo(k)fluoranthene	0.00205	**0.1**	0.000205	0.002	**0.1**	0.0002	0.0022	**0.1**	0.00022
Chrysene	0.00205	0.01	0.0000205	0.002	0.01	0.00002	0.0022	0.01	0.000022
Dibenzo(a,h)anthracene	0.00205	**1**	0.00205	0.002	**1**	0.002	0.0022	**1**	0.0022
Fluoranthene	0.00205	0.001	0.00000205	0.002	0.001	0.000002	0.0022	0.001	0.0000022
Fluorene	0.0185			0.0172			0.0205		
Indeno(1,2,3-c,d)pyrene	0.00205	0.1	0.000205	0.002	0.1	0.0002	0.0022	0.1	0.00022
1-Methylnaphthalene	0.0111			0.006			0.0208		
2-Methylnaphthalene	0.0221			0.0108			0.042		
Naphthalene	0.0423			0.0151			0.0813		
Perylene	0.00205			0.002			0.0022		
Phenanthrene	0.033	0.001	0.000033	0.0428	0.001	0.0000428	0.0503	0.001	0.0000503
Pyrene	0.00205			0.002			0.0022		
SUM of PEQ			0.0049961			0.0048848			**0.0053765**

Notes:

Units are µg/m^3 (microgram per cubic metre)

PEF, potency equivalence factor

PEQ, potency equivalents

highest benzo(a)pyrene PEQ per sampling area

TABLE 7

EVALUATION OF MIXTURES OF CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Sample Location	35 Sutherland South Mechanical Rm (Basement)	PEF	PEQ	35 Sutherland South Mechanical Rm (Basement)	PEF	PEQ	35 Sutherland South Mechanical Rm (Basement)	PEF	PEQ
Sample No.	AS-35-SM (PUMP #308014)			AS-35-SM (PUMP #194725)			AS-35-SM (PUMP #194952)		
Date Sampled	2-Oct-12			6-Nov-12			10-Dec-10		
Acenaphthene	0.028			0.0334			0.0425		
Acenaphthylene	0.0019			0.00205			0.002		
Anthracene	0.0019			0.00205			0.002		
Benzo(a)anthracene	0.0019	0.1	0.00019	0.00205	0.1	0.000205	0.002	0.1	0.0002
Benzo(a)pyrene	0.0019	**1**	0.0019	0.00205	**1**	0.00205	0.002	**1**	0.002
Benzo(b)fluoranthene	0.0019	0.1	0.00019	0.00205	0.1	0.000205	0.002	0.1	0.0002
Benzo(e)pyrene	0.0019			0.00205			0.002		
Benzo(g,h,i)perylene	0.0019	0.01	0.000019	0.00205	0.01	0.0000205	0.002	0.01	0.00002
Benzo(k)fluoranthene	0.0019	**0.1**	0.00019	0.00205	**0.1**	0.000205	0.002	**0.1**	0.0002
Chrysene	0.0019	0.01	0.000019	0.00205	0.01	0.0000205	0.002	0.01	0.00002
Dibenzo(a,h)anthracene	0.0019	**1**	0.0019	0.00205	**1**	0.00205	0.002	**1**	0.002
Fluoranthene	0.0019	0.001	0.0000019	0.00205	0.001	0.00000205	0.002	0.001	0.000002
Fluorene	0.023			0.0192			0.0244		
Indeno(1,2,3-c,d)pyrene	0.0019	0.1	0.00019	0.00205	0.1	0.000205	0.002	0.1	0.0002
1-Methylnaphthalene	0.09			0.114			0.182		
2-Methylnaphthalene	0.181			0.231			0.361		
Naphthalene	0.322			0.351			0.595		
Perylene	0.0019			0.00205			0.002		
Phenanthrene	0.0289	0.001	0.0000289	0.0306	0.001	0.0000306	0.0421	0.001	0.0000421
Pyrene	0.0019			0.00205			0.002		
SUM of PEQ			0.0046288			**0.0049937**			0.0048841

Notes:

Units are µg/m^3 (microgram per cubic metre)

PEF, potency equivalence factor

PEQ, potency equivalents

highest benzo(a)pyrene PEQ per sampling area

TABLE 7

EVALUATION OF MIXTURES OF CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Sample Location	37 Sutherland Stores Building Office	PEF	PEQ	37 Sutherland Stores Building Office	PEF	PEQ	37 Sutherland Stores Building Office	PEF	PEQ
Sample No.	AS-37-OF (PUMP #308013)			AS-37-OF (PUMP #194725)			AS-37-OF (PUMP #194720)		
Date Sampled	3-Oct-12			5-Nov-12			10-Dec-12		
Acenaphthene	0.0496			0.0548			0.0626		
Acenaphthylene	0.0040			0.0046			0.00205		
Anthracene	0.00135			0.00205			0.00205		
Benzo(a)anthracene	0.00135	0.1	0.000135	0.00205	0.1	0.000205	0.00205	0.1	0.000205
Benzo(a)pyrene	0.00135	**1**	0.00135	0.00205	**1**	0.00205	0.00205	**1**	0.00205
Benzo(b)fluoranthene	0.00135	0.1	0.000135	0.00205	0.1	0.000205	0.00205	0.1	0.000205
Benzo(e)pyrene	0.00135			0.00205			0.00205		
Benzo(g,h,i)perylene	0.00135	0.01	0.0000135	0.00205	0.01	0.0000205	0.00205	0.01	0.0000205
Benzo(k)fluoranthene	0.00135	**0.1**	0.000135	0.00205	**0.1**	0.000205	0.00205	**0.1**	0.000205
Chrysene	0.00135	0.01	0.0000135	0.00205	0.01	0.0000205	0.00205	0.01	0.0000205
Dibenzo(a,h)anthracene	0.00135	**1**	0.00135	0.00205	**1**	0.00205	0.00205	**1**	0.00205
Fluoranthene	0.0033	0.001	0.0000033	0.00205	0.001	0.00000205	0.00205	0.001	0.00000205
Fluorene	0.0325			0.0353			0.0412		
Indeno(1,2,3-c,d)pyrene	0.00135	0.1	0.000135	0.00205	0.1	0.000205	0.00205	0.1	0.000205
1-Methylnaphthalene	0.319			0.361			0.302		
2-Methylnaphthalene	0.646			0.750			0.609		
Naphthalene	1.32			1.00			0.901		
Perylene	0.0034			0.00205			0.00205		
Phenanthrene	0.0547	0.001	0.0000547	0.0523	0.001	0.0000523	0.0959	0.001	0.0000959
Pyrene	0.0031			0.00205			0.00205		
SUM of PEQ			0.0033250			0.0050154			**0.0050590**

Notes:

Units are µg/m^3 (microgram per cubic metre)

PEF, potency equivalence factor

PEQ, potency equivalents

highest benzo(a)pyrene PEQ per sampling area

TABLE 7

EVALUATION OF MIXTURES OF CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Sample Location	38 Sutherland Office Area	PEF	PEQ	38 Sutherland Office Area	PEF	PEQ	38 Sutherland Office Area	PEF	PEQ
Sample No.	AS-38-OF (PUMP #308012E)			AS-38-OF (PUMP #194999)			AS-38-OF (PUMP #194725)		
Date Sampled	3-Oct-12			5-Nov-12			10-Dec-12		
Acenaphthene	0.0335			0.0375			0.0329		
Acenaphthylene	0.00175			0.00225			0.00205		
Anthracene	0.00175			0.00225			0.00205		
Benzo(a)anthracene	0.00175	0.1	0.000175	0.00225	0.1	0.000225	0.00205	0.1	0.000205
Benzo(a)pyrene	0.00175	**1**	0.00175	0.00225	**1**	0.00225	0.00205	**1**	0.00205
Benzo(b)fluoranthene	0.00175	0.1	0.000175	0.00225	0.1	0.000225	0.00205	0.1	0.000205
Benzo(e)pyrene	0.0046			0.00225			0.00205		
Benzo(g,h,i)perylene	0.00175	0.01	0.0000175	0.00225	0.01	0.0000225	0.00205	0.01	0.0000205
Benzo(k)fluoranthene	0.00175	**0.1**	0.000175	0.00225	**0.1**	0.000225	0.00205	**0.1**	0.000205
Chrysene	0.00175	0.01	0.0000175	0.00225	0.01	0.0000225	0.00205	0.01	0.0000205
Dibenzo(a,h)anthracene	0.00175	**1**	0.00175	0.00225	**1**	0.00225	0.00205	**1**	0.00205
Fluoranthene	0.00175	0.001	0.00000175	0.00225	0.001	0.00000225	0.00205	0.001	0.00000205
Fluorene	0.0289			0.0291			0.0328		
Indeno(1,2,3-c,d)pyrene	0.00175	0.1	0.000175	0.00225	0.1	0.000225	0.00205	0.1	0.000205
1-Methylnaphthalene	0.0311			0.0232			0.0229		
2-Methylnaphthalene	0.0622			0.0455			0.0427		
Naphthalene	0.668			0.0949			0.121		
Perylene	0.00175			0.00225			0.00205		
Phenanthrene	0.0552	0.001	0.0000552	0.0557	0.001	0.0000557	0.0993	0.001	0.0000993
Pyrene	0.00175			0.00225			0.00205		
SUM of PEQ			0.0042920			**0.0055030**			0.0050624

Notes:

Units are µg/m^3 (microgram per cubic metre)

PEF, potency equivalence factor

PEQ, potency equivalents

highest benzo(a)pyrene PEQ per sampling area

TABLE 7

EVALUATION OF MIXTURES OF CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Sample Location	38 Sutherland Ambient (exterior near lunch area)	PEF	PEQ	38 Sutherland Ambient (exterior near lunch area)	PEF	PEQ	38 Sutherland Ambient (exterior near lunch area)	PEF	PEQ
Sample No.	AS-38-AM (PUMP #308011)			AS-38-AM (PUMP #194950)			AS-38-AM (PUMP #194720)		
Date Sampled	3-Oct-12			5-Nov-12			11-Dec-12		
Acenaphthene	0.0293			0.0229			0.0299		
Acenaphthylene	0.0023			0.00205			0.00205		
Anthracene	0.0023			0.00205			0.00205		
Benzo(a)anthracene	0.0023	0.1	0.00023	0.00205	0.1	0.000205	0.00205	0.1	0.000205
Benzo(a)pyrene	0.0023	**1**	0.0023	0.00205	**1**	0.00205	0.00205	**1**	0.00205
Benzo(b)fluoranthene	0.0023	0.1	0.00023	0.00205	0.1	0.000205	0.00205	0.1	0.000205
Benzo(e)pyrene	0.009			0.00205			0.00205		
Benzo(g,h,i)perylene	0.0023	0.01	0.000023	0.00205	0.01	0.0000205	0.00205	0.01	0.0000205
Benzo(k)fluoranthene	0.0023	**0.1**	0.00023	0.00205	**0.1**	0.000205	0.00205	**0.1**	0.000205
Chrysene	0.0023	0.01	0.000023	0.00205	0.01	0.0000205	0.00205	0.01	0.0000205
Dibenzo(a,h)anthracene	0.0023	**1**	0.0023	0.00205	**1**	0.00205	0.00205	**1**	0.00205
Fluoranthene	0.0023	0.001	0.0000023	0.00205	0.001	0.00000205	0.00205	0.001	0.00000205
Fluorene	0.02			0.0149			0.02		
Indeno(1,2,3-c,d)pyrene	0.0023	0.1	0.00023	0.00205	0.1	0.000205	0.00205	0.1	0.000205
1-Methylnaphthalene	0.0163			0.0125			0.0222		
2-Methylnaphthalene	0.0342			0.0225			0.0431		
Naphthalene	0.781			0.0556			0.0952		
Perylene	0.0056			0.00205			0.00205		
Phenanthrene	0.035	0.001	0.000035	0.025	0.001	0.000025	0.0359	0.001	0.0000359
Pyrene	0.0023			0.00205			0.00205		
SUM of PEQ			**0.0056033**			0.0049881			0.0049990

Notes:

Units are µg/m^3 (microgram per cubic metre)

PEF, potency equivalence factor

PEQ, potency equivalents

highest benzo(a)pyrene PEQ per sampling area

TABLE 8

HUMAN RECEPTOR CHARATERISTICS

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Exposure Parameter	Manitoba Hydro Staff	Source
Age (yr)	>20	Health Canada (2010a)
Exposure duration (yr)	35	Health Canada (2010a)
Hours per day on site	10	Health Canada (2010a)
Days per week on site	5	Health Canada (2010a)
Weeks per year on site	48	Health Canada (2010a)
Life expectancy (yr)	80	Health Canada (2010a)
Averaging time (NC) - days	12,775	Calculated
Averaging time (C) - days	22,265	Calculated
Body weight (kg)	70.7	Health Canada (2010a)
Soil ingestion rate (mg/day)	20	Health Canada (2010a)
Water ingestion rate (L/day)	1.5	Health Canada (2010a)
Inhalation rate (m^3/day)	16.6	Health Canada (2010a)

Notes:

C - carcinogen

m^3 - cubic metre

NC - non-carcinogen

yr - year

Table 9

CHEMICALS OF CONCERN AND THEIR MAXIMUM CONCENTRATIONS

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

COC	Unit	**33 Sutherland** Shops Area	**35 Sutherland** 1st Floor Office	**35 Sutherland** 2nd Floor Office	**35 Sutherland** Elevator Exterior	**35 Sutherland** Elevator Basement	**35 Sutherland** South Mechanical Rm	**37 Sutherland** Stores Building	**38 Sutherland** Office Area	**38 Sutherland** Ambient
Petroleum Hydrocarbons										
Benzene	µg/m^3	4.53	3.95	3.45	2.36	18	5.6	23.6	3.19	0.65
Toluene	µg/m^3	107	1,900	160	97.2	65.4	85.8	363	28.9	26.8
Ethylbenzene	µg/m^3	4.9	3.08	3.3	11.1	13.3	3.56	49.4	0.99	<0.87
Xylenes (-o,-m,-p)	µg/m^3	24.6	13	18.4	27.7	69.4	20.5	280	4.5	<2.6
F1 (C_6 - C_{10})	µg/m^3	70	349	45	7,890	48	51	1230	<30	53
F2 ($C_{>10}$ - C_{16})	µg/m^3	106	<60	<30	20,700	<30	<30	589	<30	<30
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	µg/m^3	0.0285	0.0506	0.0444	0.0311	0.0379	0.0425	0.0626	0.0375	0.0299
Acenaphthylene	µg/m^3	<0.0041	<0.0042	<0.0046	<0.0044	<0.0044	<0.0041	0.0046	<0.0045	<0.0046
Anthracene	µg/m^3	<0.0041	0.051	0.0447	<0.0044	<0.0044	<0.0041	<0.0041	<0.0045	<0.0046
Benz(a)anthracene	µg/m^3	<0.0041	<0.0042	<0.0046	<0.0044	<0.0044	<0.0041	<0.0041	<0.0045	<0.0046
Benzo(a)pyrene	µg/m^3	<0.0041	<0.0042	<0.0046	<0.0044	<0.0044	<0.0041	<0.0041	<0.0045	<0.0046
Benzo(b)fluoranthene	µg/m^3	<0.0041	<0.0042	<0.0046	<0.0044	<0.0044	<0.0041	<0.0041	<0.0045	<0.0046
Benzo(e)pyrene	µg/m^3	<0.0041	<0.0042	<0.0046	<0.0044	<0.0044	<0.0041	<0.0041	<0.0045	0.009
Benzo(g,h,i)perylene	µg/m^3	<0.0041	<0.0042	<0.0046	<0.0044	<0.0044	<0.0041	<0.0041	<0.0045	<0.0046
Benzo(k)fluoranthene	µg/m^3	<0.0041	<0.0042	<0.0046	<0.0044	<0.0044	<0.0041	<0.0041	<0.0045	<0.0046
Chrysene	µg/m^3	<0.0041	<0.0042	<0.0046	<0.0044	<0.0044	<0.0041	<0.0041	<0.0045	<0.0046
Dibenz(a,h)anthracene	µg/m^3	<0.0041	<0.0042	<0.0046	<0.0044	<0.0044	<0.0041	<0.0041	<0.0045	<0.0046
Fluoranthene	µg/m^3	<0.0041	<0.0042	<0.0046	<0.0044	<0.0044	<0.0041	0.0033	<0.0045	<0.0046
Fluorene	µg/m^3	0.023	0.0291	0.0289	0.0205	0.0296	0.0244	0.0412	0.0328	0.02
Indeno(1,2,3-c,d)pyrene	µg/m^3	<0.0041	<0.0042	<0.0046	<0.0044	<0.0044	<0.0041	<0.0041	<0.0045	<0.0046
1-Methylnaphthalene	µg/m^3	0.093	0.321	0.233	0.0208	0.146	0.182	0.361	0.0311	0.0222
2-Methylnaphthalene	µg/m^3	0.189	0.657	0.468	0.042	0.284	0.361	0.75	0.0622	0.0431
Naphthalene	µg/m^3	0.437	0.908	0.717	0.0813	0.53	0.595	1.32	0.668	0.781
Perylene	µg/m^3	<0.0041	<0.0042	<0.0046	<0.0044	<0.0044	<0.0041	0.0034	<0.0045	0.0056
Phenanthrene	µg/m^3	0.0549	0.051	0.0507	0.0503	0.0992	0.0421	0.0959	0.0993	0.0359
Pyrene	µg/m^3	<0.0041	<0.0042	<0.0046	<0.0044	<0.0044	<0.0041	0.0031	<0.0045	<0.0046
Benzo(a)pyrene PEQ	µg/m^3	0.0050	0.0051	0.0056	0.0054	0.0054	0.0050	0.0051	0.0055	0.0056

Notes:

µg/m^3, microgram per cubic metre

PEQ, potency equivalents

< - value is less than the laboratory reportable detection limit

TABLE 10

Predicted Exposure from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 33 Sutherland - Shops Area

Receptor	Indoor Worker	
Parameter/Dose	EC_{ca} (mg/m^3)	EC_{nc} (mg/m^3)
Benzene	7.12E-04	1.24E-03
Toluene	1.68E-02	2.93E-02
Ethylbenzene	7.70E-04	1.34E-03
Xylenes (o,-m,-p)	3.87E-03	6.74E-03
Acenaphthene	4.48E-06	7.81E-06
Acenaphthylene	3.22E-07	5.62E-07
Anthracene	3.22E-07	5.62E-07
Benzo(a)anthracene	3.22E-07	5.62E-07
Benzo(a)pyrene	3.22E-07	5.62E-07
Benzo(b)fluoranthene	3.22E-07	5.62E-07
Benzo(e)pyrene	3.22E-07	5.62E-07
Benzo(g,h,i)perylene	3.22E-07	5.62E-07
Benzo(k)fluoranthene	3.22E-07	5.62E-07
Chrysene	3.22E-07	5.62E-07
Dibenzo(a,h)anthracene	3.22E-07	5.62E-07
Fluoranthene	3.22E-07	5.62E-07
Fluorene	3.62E-06	6.30E-06
Indeno(1,2,3-c,d)pyrene	3.22E-07	5.62E-07
2-(1-)Methylnaphthalene	4.43E-05	7.73E-05
Naphthalene	6.87E-05	1.20E-04
Perylene	3.22E-07	5.62E-07
Phenanthrene	8.63E-06	1.50E-05
Pyrene	3.22E-07	5.62E-07
Benzo(a)pyrene PEQ	3.22E-07	5.62E-07
Petroleum Hydrocarbons F1		
Aliphatic C>6-C8	9.40E-03	1.64E-02
Aliphatic C>8-C10	1.55E-03	2.70E-03
Aromatic C>8-C10	5.50E-05	9.59E-05
Petroleum Hydrocarbons F2		
Aliphatic C>10-C12	1.28E-02	2.23E-02
Aliphatic C>12-C16	3.42E-03	5.95E-03
Aromatic C>10-C12	3.83E-04	6.68E-04
Aromatic C>12-C16	8.33E-05	1.45E-04

Notes:

EC_{ca} - Exposure Concentration for Carcinogenic Effects

EC_{nc} - Exposure Concentration for Non-Carcinogenic Effects

PEQ - Potency Equivalent

TABLE 11

Predicted Exposure from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 35 Sutherland - 1st Floor Office

Receptor	Indoor Worker	
Parameter/Dose	EC_{ca} (mg/m^3)	EC_{nc} (mg/m^3)
Benzene	6.21E-04	1.08E-03
Toluene	2.99E-01	5.21E-01
Ethylbenzene	4.84E-04	8.44E-04
Xylenes (o,-m,-p)	2.04E-03	3.56E-03
Acenaphthene	7.95E-06	1.39E-05
Acenaphthylene	3.30E-07	5.75E-07
Anthracene	8.02E-06	1.40E-05
Benzo(a)anthracene	3.30E-07	5.75E-07
Benzo(a)pyrene	3.30E-07	5.75E-07
Benzo(b)fluoranthene	3.30E-07	5.75E-07
Benzo(e)pyrene	3.30E-07	5.75E-07
Benzo(g,h,i)perylene	3.30E-07	5.75E-07
Benzo(k)fluoranthene	3.30E-07	5.75E-07
Chrysene	3.30E-07	5.75E-07
Dibenzo(a,h)anthracene	3.30E-07	5.75E-07
Fluoranthene	3.30E-07	5.75E-07
Fluorene	4.57E-06	7.97E-06
Indeno(1,2,3-c,d)pyrene	3.30E-07	5.75E-07
2-(1-)Methylnaphthalene	1.54E-04	2.68E-04
Naphthalene	1.43E-04	2.49E-04
Perylene	3.30E-07	5.75E-07
Phenanthrene	8.02E-06	1.40E-05
Pyrene	3.30E-07	5.75E-07
Benzo(a)pyrene PEQ	3.30E-07	5.75E-07
Petroleum Hydrocarbons F1		
Aliphatic C>6-C8	4.69E-02	8.17E-02
Aliphatic C>8-C10	7.74E-03	1.35E-02
Aromatic C>8-C10	2.74E-04	4.78E-04
Petroleum Hydrocarbons F2		
Aliphatic C>10-C12	3.62E-03	6.30E-03
Aliphatic C>12-C16	9.67E-04	1.68E-03
Aromatic C>10-C12	1.08E-04	1.89E-04
Aromatic C>12-C16	2.36E-05	4.11E-05

Notes:

EC_{ca} - Exposure Concentration for Carcinogenic Effects

EC_{nc} - Exposure Concentration for Non-Carcinogenic Effects

PEQ - Potency Equivalent

TABLE 12

Predicted Exposure from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 35 Sutherland - 2nd Floor Office

Receptor	Indoor Worker	
Parameter/Dose	EC_{ca} (mg/m^3)	EC_{nc} (mg/m^3)
Benzene	5.42E-04	9.45E-04
Toluene	2.52E-02	4.38E-02
Ethylbenzene	5.19E-04	9.04E-04
Xylenes (o,-m,-p)	2.89E-03	5.04E-03
Acenaphthene	6.98E-06	1.22E-05
Acenaphthylene	3.62E-07	6.30E-07
Anthracene	7.03E-06	1.22E-05
Benzo(a)anthracene	3.62E-07	6.30E-07
Benzo(a)pyrene	3.62E-07	6.30E-07
Benzo(b)fluoranthene	3.62E-07	6.30E-07
Benzo(e)pyrene	3.62E-07	6.30E-07
Benzo(g,h,i)perylene	3.62E-07	6.30E-07
Benzo(k)fluoranthene	3.62E-07	6.30E-07
Chrysene	3.62E-07	6.30E-07
Dibenzo(a,h)anthracene	3.62E-07	6.30E-07
Fluoranthene	3.62E-07	6.30E-07
Fluorene	4.54E-06	7.92E-06
Indeno(1,2,3-c,d)pyrene	3.62E-07	6.30E-07
2-(1-)Methylnaphthalene	1.10E-04	1.92E-04
Naphthalene	1.13E-04	1.96E-04
Perylene	3.62E-07	6.30E-07
Phenanthrene	7.97E-06	1.39E-05
Pyrene	3.62E-07	6.30E-07
Benzo(a)pyrene PEQ	3.62E-07	6.30E-07
Petroleum Hydrocarbons F1		
Aliphatic C>6-C8	6.04E-03	1.05E-02
Aliphatic C>8-C10	9.97E-04	1.74E-03
Aromatic C>8-C10	3.54E-05	6.16E-05
Petroleum Hydrocarbons F2		
Aliphatic C>10-C12	1.81E-03	3.15E-03
Aliphatic C>12-C16	4.83E-04	8.42E-04
Aromatic C>10-C12	5.42E-05	9.45E-05
Aromatic C>12-C16	1.18E-05	2.05E-05

Notes:

EC_{ca} - Exposure Concentration for Carcinogenic Effects

EC_{nc} - Exposure Concentration for Non-Carcinogenic Effects

PEQ - Potency Equivalent

TABLE 13

Predicted Exposure from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 35 Sutherland - Elevator Exterior

Receptor	Indoor Worker	
Parameter/Dose	EC_{ca} (mg/m^3)	EC_{nc} (mg/m^3)
Benzene	3.71E-04	6.47E-04
Toluene	1.53E-02	2.66E-02
Ethylbenzene	1.74E-03	3.04E-03
Xylenes (o,-m,-p)	4.35E-03	7.59E-03
Acenaphthene	4.89E-06	8.52E-06
Acenaphthylene	3.46E-07	6.03E-07
Anthracene	3.46E-07	6.03E-07
Benzo(a)anthracene	3.46E-07	6.03E-07
Benzo(a)pyrene	3.46E-07	6.03E-07
Benzo(b)fluoranthene	3.46E-07	6.03E-07
Benzo(e)pyrene	3.46E-07	6.03E-07
Benzo(g,h,i)perylene	3.46E-07	6.03E-07
Benzo(k)fluoranthene	3.46E-07	6.03E-07
Chrysene	3.46E-07	6.03E-07
Dibenzo(a,h)anthracene	3.46E-07	6.03E-07
Fluoranthene	3.46E-07	6.03E-07
Fluorene	3.22E-06	5.62E-06
Indeno(1,2,3-c,d)pyrene	3.46E-07	6.03E-07
2-(1-)Methylnaphthalene	9.87E-06	1.72E-05
Naphthalene	1.28E-05	2.23E-05
Perylene	3.46E-07	6.03E-07
Phenanthrene	7.91E-06	1.38E-05
Pyrene	3.46E-07	6.03E-07
Benzo(a)pyrene PEQ	3.46E-07	6.03E-07
Petroleum Hydrocarbons F1		
Aliphatic C>6-C8	1.06E+00	1.85E+00
Aliphatic C>8-C10	1.75E-01	3.05E-01
Aromatic C>8-C10	6.20E-03	1.08E-02
Petroleum Hydrocarbons F2		
Aliphatic C>10-C12	2.50E+00	4.35E+00
Aliphatic C>12-C16	6.67E-01	1.16E+00
Aromatic C>10-C12	7.48E-02	1.30E-01
Aromatic C>12-C16	1.63E-02	2.84E-02

Notes:

EC_{ca} - Exposure Concentration for Carcinogenic Effects

EC_{nc} - Exposure Concentration for Non-Carcinogenic Effects

PEQ - Potency Equivalent

TABLE 14

Predicted Exposure from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 35 Sutherland - Elevator Basement

Receptor	Indoor Worker	
Parameter/Dose	EC_{ca} (mg/m^3)	EC_{nc} (mg/m^3)
Benzene	2.83E-03	4.93E-03
Toluene	1.03E-02	1.79E-02
Ethylbenzene	2.09E-03	3.64E-03
Xylenes (o,-m,-p)	1.09E-02	1.90E-02
Acenaphthene	5.96E-06	1.04E-05
Acenaphthylene	3.46E-07	6.03E-07
Anthracene	3.46E-07	6.03E-07
Benzo(a)anthracene	3.46E-07	6.03E-07
Benzo(a)pyrene	3.46E-07	6.03E-07
Benzo(b)fluoranthene	3.46E-07	6.03E-07
Benzo(e)pyrene	3.46E-07	6.03E-07
Benzo(g,h,i)perylene	3.46E-07	6.03E-07
Benzo(k)fluoranthene	3.46E-07	6.03E-07
Chrysene	3.46E-07	6.03E-07
Dibenzo(a,h)anthracene	3.46E-07	6.03E-07
Fluoranthene	3.46E-07	6.03E-07
Fluorene	4.65E-06	8.11E-06
Indeno(1,2,3-c,d)pyrene	3.46E-07	6.03E-07
2-(1-)Methylnaphthalene	6.76E-05	1.18E-04
Naphthalene	8.33E-05	1.45E-04
Perylene	3.46E-07	6.03E-07
Phenanthrene	1.56E-05	2.72E-05
Pyrene	3.46E-07	6.03E-07
Benzo(a)pyrene PEQ	3.46E-07	6.03E-07
Petroleum Hydrocarbons F1		
Aliphatic C>6-C8	6.44E-03	1.12E-02
Aliphatic C>8-C10	1.06E-03	1.85E-03
Aromatic C>8-C10	3.77E-05	6.58E-05
Petroleum Hydrocarbons F2		
Aliphatic C>10-C12	1.81E-03	3.15E-03
Aliphatic C>12-C16	4.83E-04	8.42E-04
Aromatic C>10-C12	5.42E-05	9.45E-05
Aromatic C>12-C16	1.18E-05	2.05E-05

Notes:

EC_{ca} - Exposure Concentration for Carcinogenic Effects

EC_{nc} - Exposure Concentration for Non-Carcinogenic Effects

PEQ - Potency Equivalent

TABLE 15

Predicted Exposure from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 35 Sutherland - South Mechanical Room (Basement)

Receptor	Indoor Worker	
Parameter/Dose	EC_{ca} (mg/m^3)	EC_{nc} (mg/m^3)
Benzene	8.80E-04	1.53E-03
Toluene	1.35E-02	2.35E-02
Ethylbenzene	5.60E-04	9.75E-04
Xylenes (o,-m,-p)	3.22E-03	5.62E-03
Acenaphthene	6.68E-06	1.16E-05
Acenaphthylene	3.22E-07	5.62E-07
Anthracene	3.22E-07	5.62E-07
Benzo(a)anthracene	3.22E-07	5.62E-07
Benzo(a)pyrene	3.22E-07	5.62E-07
Benzo(b)fluoranthene	3.22E-07	5.62E-07
Benzo(e)pyrene	3.22E-07	5.62E-07
Benzo(g,h,i)perylene	3.22E-07	5.62E-07
Benzo(k)fluoranthene	3.22E-07	5.62E-07
Chrysene	3.22E-07	5.62E-07
Dibenzo(a,h)anthracene	3.22E-07	5.62E-07
Fluoranthene	3.22E-07	5.62E-07
Fluorene	3.84E-06	6.68E-06
Indeno(1,2,3-c,d)pyrene	3.22E-07	5.62E-07
2-(1-)Methylnaphthalene	8.54E-05	1.49E-04
Naphthalene	9.35E-05	1.63E-04
Perylene	3.22E-07	5.62E-07
Phenanthrene	6.62E-06	1.15E-05
Pyrene	3.22E-07	5.62E-07
Benzo(a)pyrene PEQ	3.22E-07	5.62E-07
Petroleum Hydrocarbons F1		
Aliphatic C>6-C8	6.85E-03	1.19E-02
Aliphatic C>8-C10	1.13E-03	1.97E-03
Aromatic C>8-C10	4.01E-05	6.99E-05
Petroleum Hydrocarbons F2		
Aliphatic C>10-C12	1.81E-03	3.15E-03
Aliphatic C>12-C16	4.83E-04	8.42E-04
Aromatic C>10-C12	5.42E-05	9.45E-05
Aromatic C>12-C16	1.18E-05	2.05E-05

Notes:

EC_{ca} - Exposure Concentration for Carcinogenic Effects

EC_{nc} - Exposure Concentration for Non-Carcinogenic Effects

PEQ - Potency Equivalent

TABLE 16

Predicted Exposure from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 37 Sutherland - Stores Building Office

Receptor	Indoor Worker	
Parameter/Dose	EC_{ca} (mg/m^3)	EC_{nc} (mg/m^3)
Benzene	3.71E-03	6.47E-03
Toluene	5.71E-02	9.95E-02
Ethylbenzene	7.77E-03	1.35E-02
Xylenes (o,-m,-p)	4.40E-02	7.67E-02
Acenaphthene	9.84E-06	1.72E-05
Acenaphthylene	7.23E-07	1.26E-06
Anthracene	3.22E-07	5.62E-07
Benzo(a)anthracene	3.22E-07	5.62E-07
Benzo(a)pyrene	3.22E-07	5.62E-07
Benzo(b)fluoranthene	3.22E-07	5.62E-07
Benzo(e)pyrene	3.22E-07	5.62E-07
Benzo(g,h,i)perylene	3.22E-07	5.62E-07
Benzo(k)fluoranthene	3.22E-07	5.62E-07
Chrysene	3.22E-07	5.62E-07
Dibenzo(a,h)anthracene	3.22E-07	5.62E-07
Fluoranthene	3.22E-07	5.62E-07
Fluorene	6.48E-06	1.13E-05
Indeno(1,2,3-c,d)pyrene	3.22E-07	5.62E-07
2-(1-)Methylnaphthalene	1.75E-04	3.04E-04
Naphthalene	2.08E-04	3.62E-04
Perylene	3.22E-07	5.62E-07
Phenanthrene	1.51E-05	2.63E-05
Pyrene	3.22E-07	5.62E-07
Benzo(a)pyrene PEQ	3.22E-07	5.62E-07
Petroleum Hydrocarbons F1		
Aliphatic C>6-C8	1.65E-01	2.88E-01
Aliphatic C>8-C10	2.73E-02	4.75E-02
Aromatic C>8-C10	9.67E-04	1.68E-03
Petroleum Hydrocarbons F2		
Aliphatic C>10-C12	7.10E-02	1.24E-01
Aliphatic C>12-C16	1.90E-02	3.31E-02
Aromatic C>10-C12	2.13E-03	3.71E-03
Aromatic C>12-C16	4.63E-04	8.07E-04

Notes:

EC_{ca} - Exposure Concentration for Carcinogenic Effects

EC_{nc} - Exposure Concentration for Non-Carcinogenic Effects

PEQ - Potency Equivalent

TABLE 17

Predicted Exposure from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 38 Sutherland - Office Area

Receptor	Indoor Worker	
Parameter/Dose	EC_{ca} (mg/m^3)	EC_{nc} (mg/m^3)
Benzene	5.01E-04	8.74E-04
Toluene	4.54E-03	7.92E-03
Ethylbenzene	1.56E-04	2.71E-04
Xylenes (o,-m,-p)	7.07E-04	1.23E-03
Acenaphthene	5.89E-06	1.03E-05
Acenaphthylene	3.54E-07	6.16E-07
Anthracene	3.54E-07	6.16E-07
Benzo(a)anthracene	3.54E-07	6.16E-07
Benzo(a)pyrene	3.54E-07	6.16E-07
Benzo(b)fluoranthene	3.54E-07	6.16E-07
Benzo(e)pyrene	7.23E-07	1.26E-06
Benzo(g,h,i)perylene	3.54E-07	6.16E-07
Benzo(k)fluoranthene	3.54E-07	6.16E-07
Chrysene	3.54E-07	6.16E-07
Dibenzo(a,h)anthracene	3.54E-07	6.16E-07
Fluoranthene	3.54E-07	6.16E-07
Fluorene	5.16E-06	8.99E-06
Indeno(1,2,3-c,d)pyrene	3.54E-07	6.16E-07
2-(1-)Methylnaphthalene	1.47E-05	2.56E-05
Naphthalene	1.05E-04	1.83E-04
Perylene	3.54E-07	6.16E-07
Phenanthrene	1.56E-05	2.72E-05
Pyrene	3.54E-07	6.16E-07
Benzo(a)pyrene PEQ	3.54E-07	6.16E-07
Petroleum Hydrocarbons F1		
Aliphatic C>6-C8	2.01E-03	3.51E-03
Aliphatic C>8-C10	3.32E-04	5.79E-04
Aromatic C>8-C10	1.18E-05	2.05E-05
Petroleum Hydrocarbons F2		
Aliphatic C>10-C12	1.81E-03	3.15E-03
Aliphatic C>12-C16	4.83E-04	8.42E-04
Aromatic C>10-C12	5.42E-05	9.45E-05
Aromatic C>12-C16	1.18E-05	2.05E-05

Notes:

EC_{ca} - Exposure Concentration for Carcinogenic Effects

EC_{nc} - Exposure Concentration for Non-Carcinogenic Effects

PEQ - Potency Equivalent

TABLE 18

Predicted Exposure from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 38 Sutherland - Ambient (exterior near lunch area)

Receptor	Indoor Worker	
Parameter/Dose	EC_{ca} (mg/m^3)	EC_{nc} (mg/m^3)
Benzene	1.02E-04	1.78E-04
Toluene	4.21E-03	7.34E-03
Ethylbenzene	6.84E-05	1.19E-04
Xylenes (o,-m,-p)	2.04E-04	3.56E-04
Acenaphthene	4.70E-06	8.19E-06
Acenaphthylene	3.62E-07	6.30E-07
Anthracene	3.62E-07	6.30E-07
Benzo(a)anthracene	3.62E-07	6.30E-07
Benzo(a)pyrene	3.62E-07	6.30E-07
Benzo(b)fluoranthene	3.62E-07	6.30E-07
Benzo(e)pyrene	1.41E-06	2.47E-06
Benzo(g,h,i)perylene	3.62E-07	6.30E-07
Benzo(k)fluoranthene	3.62E-07	6.30E-07
Chrysene	3.62E-07	6.30E-07
Dibenzo(a,h)anthracene	3.62E-07	6.30E-07
Fluoranthene	3.62E-07	6.30E-07
Fluorene	3.14E-06	5.48E-06
Indeno(1,2,3-c,d)pyrene	3.62E-07	6.30E-07
2-(1-)Methylnaphthalene	1.03E-05	1.79E-05
Naphthalene	1.23E-04	2.14E-04
Perylene	8.80E-07	1.53E-06
Phenanthrene	5.64E-06	9.84E-06
Pyrene	3.62E-07	6.30E-07
Benzo(a)pyrene PEQ	3.62E-07	6.30E-07
Petroleum Hydrocarbons F1		
Aliphatic C>6-C8	7.12E-03	1.24E-02
Aliphatic C>8-C10	1.17E-03	2.05E-03
Aromatic C>8-C10	4.17E-05	7.26E-05
Petroleum Hydrocarbons F2		
Aliphatic C>10-C12	1.81E-03	3.15E-03
Aliphatic C>12-C16	4.83E-04	8.42E-04
Aromatic C>10-C12	5.42E-05	9.45E-05
Aromatic C>12-C16	1.18E-05	2.05E-05

Notes:

EC_{ca} - Exposure Concentration for Carcinogenic Effects

EC_{nc} - Exposure Concentration for Non-Carcinogenic Effects

PEQ - Potency Equivalent

TABLE 19
INHALATION TOXICITY REFERENCE VALUES FOR HHRA
MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

COC	Exposure Limit	Reference
Non-Carcinogenic TRVs		
Benzene	8.0E-03 mg/m^3	Health Canada (2010d)
Toluene	3.8 mg/m^3	Health Canada (2010b)
Ethylbenzene	1.0 mg/m^3	Health Canada (2010b)
Xylenes (-o,-m,-p)	1.8E-01 mg/m^3	Health Canada (2010b)
F1 - Aliphatic C_6-C_8	4.0E+02 mg/m^3	Health Canada (2010d)
F1 - Aliphatic $C_{>8}$-C_{10}	1.8E+04 mg/m^3	Health Canada (2010d)
F1 - Aromatic C_6-C_8	4.0E+02 mg/m^3	Health Canada (2010d)
F1 - Aromatic $C_{>8}$-C_{10}	2.0E+02 mg/m^3	Health Canada (2010d)
F2 - Aliphatic $C_{>10}$-C_{12}	1.0E+03 mg/m^3	Health Canada (2010d)
F2 - Aliphatic $C_{>12}$-C_{16}	1.0 mg/m^3	MOE (2011)
F2 - Aromatic $C_{>10}$-C_{12}	2.0E-01 mg/m^3	MOE (2011)
F2 - Aromatic $C_{>12}$-C_{16}	2.0E-01 mg/m^3	MOE (2011)
Acenaphthene	1.2E-01 mg/m^3	Health Canada (2010d)
Acenaphthylene	--	--
Anthracene	6.0E-01 mg/m^3	Health Canada (2010d)
Benz(a)anthracene	--	--
Benzo(a)pyrene	--	--
Benzo(b)fluoranthene	--	--
Benzo(e)pyrene	--	--
Benzo(g,h,i)perylene	--	--
Benzo(k)fluoranthene	--	--
Chrysene	8.8E-04 mg/m^3	Health Canada (2010d)
Dibenz(a,h)anthracene	--	--
Fluoranthene	8.0E-02 mg/m^3	Health Canada (2010d)
Fluorene	8.0E-02 mg/m^3	Health Canada (2010d)
Indeno(1,2,3-c,d)pyrene	--	--
1-Methylnaphthalene	5.0E-02 mg/m^3	MDEP (2004)
2-Methylnaphthalene	5.0E-02 mg/m^3	MDEP (2004)
Naphthalene	3.0E-03 mg/m^3	Health Canada (2010d)
Perylene	--	--
Phenanthrene	5.0E-02 mg/m^3	MDEP (2004)
Pyrene	6.0E-02 mg/m^3	Health Canada (2010d)
Carcinogenic TRVs		
Benzene	3.3E-03 $(mg/m^3)^{-1}$	Health Canada (2010b)
Toluene	--	--
Ethylbenzene	--	--
Xylenes (-o,-m,-p)	--	--
F1 - Aliphatic C_6-C_8	--	--
F1 - Aliphatic $C_{>8}$-C_{10}	--	--
F1 - Aromatic $C_{>8}$-C_{10}	--	--
F2 - Aliphatic $C_{>10}$-C_{12}	--	--
F2 - Aliphatic $C_{>12}$-C_{16}	--	--
F2 - Aromatic $C_{>10}$-C_{12}	--	--
F2 - Aromatic $C_{>12}$-C_{16}	--	--

COC	Exposure Limit	Reference
Carcinogenic TRVs		
Acenaphthene	1.1E-03 $(mg/m^3)^{-1}$	MOE (2011)
Acenaphthylene	1.1E-02 $(mg/m^3)^{-1}$	MOE (2011)
Anthracene	--	--
Benz(a)anthracene	8.8E-02 $(mg/m^3)^{-1}$	Health Canada (2010d)
Benzo(a)pyrene	3.1E-02 $(mg/m^3)^{-1}$	Health Canada (2010b)
Benzo(b)fluoranthene	1.9E-03 $(mg/m^3)^{-1}$	Health Canada (2010d)
Benzo(e)pyrene [(1)]	1.1E-03 $(mg/m^3)^{-1}$	MOE (2011)
Benzo(g,h,i)perylene	1.1E-02 $(mg/m^3)^{-1}$	MOE (2011)
Benzo(k)fluoranthene	1.3E-03 $(mg/m^3)^{-1}$	Health Canada (2010d)
Chrysene	8.8E-04 $(mg/m^3)^{-1}$	Health Canada (2010d)
Dibenz(a,h)anthracene	8.8E-01 $(mg/m^3)^{-1}$	Health Canada (2010d)
Fluoranthene	1.1E-02 $(mg/m^3)^{-1}$	MOE (2011)
Fluorene	9.0E-03 $(mg/m^3)^{-1}$	Health Canada (2010d)
Indeno(1,2,3-c,d)pyrene	8.8E-03 $(mg/m^3)^{-1}$	Health Canada (2010d)
1-Methylnaphthalene	--	--
2-Methylnaphthalene	--	--
Naphthalene	--	--
Perylene [(2)]	1.1E-02 $(mg/m^3)^{-1}$	MOE (2011)
Phenanthrene	--	--
Pyrene	1.1E-03 $(mg/m^3)^{-1}$	MOE (2011)

Notes:

COC, contaminant of concern; mg/m^3, milligrams per cubic metre; NA, not available; TRV, toxicological reference value.

[1] An inhalation TRV could not be identified for benzo(e)pyrene and the inhalation TRV for pyrene was used as a surrogate.

[2] An inhalation TRV could not be identified for perylene and the inhalation TRV for benzo(g,h,i)perylene was used as a surrogate.

Health Canada. 2010b. Part II: Health Canada Toxicological Reference Values (TRVs) and Chemical-Specific Factors, Version 2.0. Federal Contaminated Site Risk Assessment in Canada. Contaminated Sites Division, Safe Environments Directorate. September.

Health Canada. 2010d. Federal Contaminated Site Risk Assessment in Canada, Part VII: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites. Health Canada, Contaminated Sites Division, Safe Environments Directorate, September 2010.

MOE (Ontario Ministry of the Environment). 2011. Rationale for the Development of Soil and Ground Water Standards for Use at Contaminated Sites in Ontario. MOE, Standards Development Branch, April 15, 2011.

MDEP (Massachusetts Department of Environmental Protection). 2004. Revisions to Dose-Response Values used in Human Health Risk Assessment. Executive Office of Environmental Affairs, MDEP, Boston, MA, August 18, 2004.

TABLE 20

Predicted Risk from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 33 Sutherland - Shops Area

Receptor	Indoor Worker	
Parameter/Dose	Estimated ILCR	Estimated HQ
Benzene	2.3E-06	1.6E-01
Toluene	--	7.7E-03
Ethylbenzene	--	1.3E-03
Xylenes (o,-m,-p)	--	3.7E-02
Acenaphthene	4.9E-09	6.5E-05
Acenaphthylene	3.5E-09	--
Anthracene	--	9.4E-07
Benzo(a)anthracene	2.8E-08	--
Benzo(a)pyrene	1.0E-08	--
Benzo(b)fluoranthene	6.1E-10	--
Benzo(e)pyrene	3.5E-10	--
Benzo(g,h,i)perylene	3.5E-09	--
Benzo(k)fluoranthene	4.2E-10	--
Chrysene	2.8E-10	6.4E-04
Dibenzo(a,h)anthracene	2.8E-07	--
Fluoranthene	3.5E-09	7.0E-06
Fluorene	3.3E-08	7.9E-05
Indeno(1,2,3-c,d)pyrene	2.8E-09	--
2-(1-)Methylnaphthalene	--	1.5E-03
Naphthalene	--	4.0E-02
Perylene	3.5E-09	--
Phenanthrene	--	3.0E-04
Pyrene	3.5E-10	9.4E-06
Benzo(a)pyrene PEQ	1.0E-08	--
Petroleum Hydrocarbons F1	--	4.2E-05
Aliphatic C>6-C8	--	4.1E-05
Aliphatic C>8-C10	--	1.5E-07
Aromatic C>8-C10	--	4.8E-07
Petroleum Hydrocarbons F2	--	1.0E-02
Aliphatic C>10-C12	--	2.2E-05
Aliphatic C>12-C16	--	6.0E-03
Aromatic C>10-C12	--	3.3E-03
Aromatic C>12-C16	--	7.3E-04

Notes:

ILCR - Incremental Lifetime Cancer Risk

HQ - Hazard Quotient

PEQ - Potency Equivalent

Bold/shaded values indicate a predicted risk above Health Canada target risk values (that is, ILCR>10^{-5}, HQ>0.2)

TABLE 21

Predicted Risk from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 35 Sutherland - 1st Floor Office

Receptor	Indoor Worker	
Parameter/Dose	Estimated ILCR	Estimated HQ
Benzene	2.0E-06	1.4E-01
Toluene	--	1.4E-01
Ethylbenzene	--	8.4E-04
Xylenes (o,-m,-p)	--	2.0E-02
Acenaphthene	8.7E-09	1.2E-04
Acenaphthylene	3.6E-09	--
Anthracene	--	2.3E-05
Benzo(a)anthracene	2.9E-08	--
Benzo(a)pyrene	1.0E-08	--
Benzo(b)fluoranthene	6.3E-10	--
Benzo(e)pyrene	3.6E-10	--
Benzo(g,h,i)perylene	3.6E-09	--
Benzo(k)fluoranthene	4.3E-10	--
Chrysene	2.9E-10	6.5E-04
Dibenzo(a,h)anthracene	2.9E-07	--
Fluoranthene	3.6E-09	7.2E-06
Fluorene	4.1E-08	1.0E-04
Indeno(1,2,3-c,d)pyrene	2.9E-09	--
2-(1-)Methylnaphthalene	--	5.4E-03
Naphthalene	--	8.3E-02
Perylene	3.6E-09	--
Phenanthrene	--	2.8E-04
Pyrene	3.6E-10	9.6E-06
Benzo(a)pyrene PEQ	1.0E-08	--
Petroleum Hydrocarbons F1	--	2.1E-04
Aliphatic C>6-C8	--	2.0E-04
Aliphatic C>8-C10	--	7.5E-07
Aromatic C>8-C10	--	2.4E-06
Petroleum Hydrocarbons F2	--	2.8E-03
Aliphatic C>10-C12	--	6.3E-06
Aliphatic C>12-C16	--	1.7E-03
Aromatic C>10-C12	--	9.5E-04
Aromatic C>12-C16	--	2.1E-04

Notes:

ILCR - Incremental Lifetime Cancer Risk

HQ - Hazard Quotient

PEQ - Potency Equivalent

Bold/shaded values indicate a predicted risk above Health Canada target risk values (that is, ILCR>10^{-5}, HQ>0.2)

TABLE 22

Predicted Risk from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 35 Sutherland - 2nd Floor Office

Receptor	Indoor Worker	
Parameter/Dose	Estimated ILCR	Estimated HQ
Benzene	1.8E-06	1.2E-01
Toluene	--	1.2E-02
Ethylbenzene	--	9.0E-04
Xylenes (o,-m,-p)	--	2.8E-02
Acenaphthene	7.7E-09	1.0E-04
Acenaphthylene	4.0E-09	--
Anthracene	--	2.0E-05
Benzo(a)anthracene	3.2E-08	--
Benzo(a)pyrene	1.1E-08	--
Benzo(b)fluoranthene	6.9E-10	--
Benzo(e)pyrene	4.0E-10	--
Benzo(g,h,i)perylene	4.0E-09	--
Benzo(k)fluoranthene	4.7E-10	--
Chrysene	3.2E-10	7.2E-04
Dibenzo(a,h)anthracene	3.2E-07	--
Fluoranthene	4.0E-09	7.9E-06
Fluorene	4.1E-08	9.9E-05
Indeno(1,2,3-c,d)pyrene	3.2E-09	--
2-(1-)Methylnaphthalene	--	3.8E-03
Naphthalene	--	6.5E-02
Perylene	4.0E-09	--
Phenanthrene	--	2.8E-04
Pyrene	4.0E-10	1.1E-05
Benzo(a)pyrene PEQ	1.1E-08	--
Petroleum Hydrocarbons F1	--	2.7E-05
Aliphatic C>6-C8	--	2.6E-05
Aliphatic C>8-C10	--	9.7E-08
Aromatic C>8-C10	--	3.1E-07
Petroleum Hydrocarbons F2	--	1.4E-03
Aliphatic C>10-C12	--	3.2E-06
Aliphatic C>12-C16	--	8.4E-04
Aromatic C>10-C12	--	4.7E-04
Aromatic C>12-C16	--	1.0E-04

Notes:

ILCR - Incremental Lifetime Cancer Risk

HQ - Hazard Quotient

PEQ - Potency Equivalent

Bold/shaded values indicate a predicted risk above Health Canada target risk values (that is, ILCR>10^{-5}, HQ>0.2)

TABLE 23

Predicted Risk from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 35 Sutherland - Elevator Exterior

Receptor	Indoor Worker	
Parameter/Dose	Estimated ILCR	Estimated HQ
Benzene	1.2E-06	8.1E-02
Toluene	--	7.0E-03
Ethylbenzene	--	3.0E-03
Xylenes (o,-m,-p)	--	4.2E-02
Acenaphthene	5.4E-09	7.1E-05
Acenaphthylene	3.8E-09	--
Anthracene	--	1.0E-06
Benzo(a)anthracene	3.0E-08	--
Benzo(a)pyrene	1.1E-08	--
Benzo(b)fluoranthene	6.6E-10	--
Benzo(e)pyrene	3.8E-10	--
Benzo(g,h,i)perylene	3.8E-09	--
Benzo(k)fluoranthene	4.5E-10	--
Chrysene	3.0E-10	6.8E-04
Dibenzo(a,h)anthracene	3.0E-07	--
Fluoranthene	3.8E-09	7.5E-06
Fluorene	2.9E-08	7.0E-05
Indeno(1,2,3-c,d)pyrene	3.0E-09	--
2-(1-)Methylnaphthalene	--	3.4E-04
Naphthalene	--	7.4E-03
Perylene	3.8E-09	--
Phenanthrene	--	2.8E-04
Pyrene	3.8E-10	1.0E-05
Benzo(a)pyrene PEQ	1.1E-08	--
Petroleum Hydrocarbons F1	--	4.7E-03
Aliphatic C>6-C8	--	4.6E-03
Aliphatic C>8-C10	--	1.7E-05
Aromatic C>8-C10	--	5.4E-05
Petroleum Hydrocarbons F2	--	2.0E+00
Aliphatic C>10-C12	--	4.3E-03
Aliphatic C>12-C16	--	1.2E+00
Aromatic C>10-C12	--	6.5E-01
Aromatic C>12-C16	--	1.4E-01

Notes:

ILCR - Incremental Lifetime Cancer Risk

HQ - Hazard Quotient

PEQ - Potency Equivalent

Bold/shaded values indicate a predicted risk above Health Canada target risk values (that is, ILCR>10^{-5}, HQ>0.2)

TABLE 24

Predicted Risk from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 35 Sutherland - Elevator Basement

Receptor	Indoor Worker	
Parameter/Dose	Estimated ILCR	Estimated HQ
Benzene	9.3E-06	**6.2E-01**
Toluene	--	4.7E-03
Ethylbenzene	--	3.6E-03
Xylenes (o,-m,-p)	--	1.1E-01
Acenaphthene	6.6E-09	8.7E-05
Acenaphthylene	3.8E-09	--
Anthracene	--	1.0E-06
Benzo(a)anthracene	3.0E-08	--
Benzo(a)pyrene	1.1E-08	--
Benzo(b)fluoranthene	6.6E-10	--
Benzo(e)pyrene	3.8E-10	--
Benzo(g,h,i)perylene	3.8E-09	--
Benzo(k)fluoranthene	4.5E-10	--
Chrysene	3.0E-10	6.8E-04
Dibenzo(a,h)anthracene	3.0E-07	--
Fluoranthene	3.8E-09	7.5E-06
Fluorene	4.2E-08	1.0E-04
Indeno(1,2,3-c,d)pyrene	3.0E-09	--
2-(1-)Methylnaphthalene	--	2.4E-03
Naphthalene	--	4.8E-02
Perylene	3.8E-09	--
Phenanthrene	--	5.4E-04
Pyrene	3.8E-10	1.0E-05
Benzo(a)pyrene PEQ	1.1E-08	--
Petroleum Hydrocarbons F1	--	2.9E-05
Aliphatic C>6-C8	--	2.8E-05
Aliphatic C>8-C10	--	1.0E-07
Aromatic C>8-C10	--	3.3E-07
Petroleum Hydrocarbons F2	--	1.4E-03
Aliphatic C>10-C12	--	3.2E-06
Aliphatic C>12-C16	--	8.4E-04
Aromatic C>10-C12	--	4.7E-04
Aromatic C>12-C16	--	1.0E-04

Notes:

ILCR - Incremental Lifetime Cancer Risk

HQ - Hazard Quotient

PEQ - Potency Equivalent

Bold/shaded values indicate a predicted risk above Health Canada target risk values (that is, ILCR>10^{-5}, HQ>0.2)

TABLE 25

Predicted Risk from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 35 Sutherland - South Mechanical Room (Basement)

Receptor	Indoor Worker	
Parameter/Dose	Estimated ILCR	Estimated HQ
Benzene	2.9E-06	1.9E-01
Toluene	--	6.2E-03
Ethylbenzene	--	9.8E-04
Xylenes (o,-m,-p)	--	3.1E-02
Acenaphthene	7.3E-09	9.7E-05
Acenaphthylene	3.5E-09	--
Anthracene	--	9.4E-07
Benzo(a)anthracene	2.8E-08	--
Benzo(a)pyrene	1.0E-08	--
Benzo(b)fluoranthene	6.1E-10	--
Benzo(e)pyrene	3.5E-10	--
Benzo(g,h,i)perylene	3.5E-09	--
Benzo(k)fluoranthene	4.2E-10	--
Chrysene	2.8E-10	6.4E-04
Dibenzo(a,h)anthracene	2.8E-07	--
Fluoranthene	3.5E-09	7.0E-06
Fluorene	3.5E-08	8.4E-05
Indeno(1,2,3-c,d)pyrene	2.8E-09	--
2-(1-)Methylnaphthalene	--	3.0E-03
Naphthalene	--	5.4E-02
Perylene	3.5E-09	--
Phenanthrene	--	2.3E-04
Pyrene	3.5E-10	9.4E-06
Benzo(a)pyrene PEQ	1.0E-08	--
Petroleum Hydrocarbons F1	--	3.0E-05
Aliphatic C>6-C8	--	3.0E-05
Aliphatic C>8-C10	--	1.1E-07
Aromatic C>8-C10	--	3.5E-07
Petroleum Hydrocarbons F2	--	1.4E-03
Aliphatic C>10-C12	--	3.2E-06
Aliphatic C>12-C16	--	8.4E-04
Aromatic C>10-C12	--	4.7E-04
Aromatic C>12-C16	--	1.0E-04

Notes:

ILCR - Incremental Lifetime Cancer Risk

HQ - Hazard Quotient

PEQ - Potency Equivalent

Bold/shaded values indicate a predicted risk above Health Canada target risk values (that is, ILCR>10^{-5}, HQ>0.2)

TABLE 26

Predicted Risk from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 37 Sutherland - Stores Building Office

Receptor	Indoor Worker	
Parameter/Dose	Estimated ILCR	Estimated HQ
Benzene	1.2E-05	8.1E-01
Toluene	--	2.6E-02
Ethylbenzene	--	1.4E-02
Xylenes (o,-m,-p)	--	4.3E-01
Acenaphthene	1.1E-08	1.4E-04
Acenaphthylene	8.0E-09	--
Anthracene	--	9.4E-07
Benzo(a)anthracene	2.8E-08	--
Benzo(a)pyrene	1.0E-08	--
Benzo(b)fluoranthene	6.1E-10	--
Benzo(e)pyrene	3.5E-10	--
Benzo(g,h,i)perylene	3.5E-09	--
Benzo(k)fluoranthene	4.2E-10	--
Chrysene	2.8E-10	6.4E-04
Dibenzo(a,h)anthracene	2.8E-07	--
Fluoranthene	3.5E-09	7.0E-06
Fluorene	5.8E-08	1.4E-04
Indeno(1,2,3-c,d)pyrene	2.8E-09	--
2-(1-)Methylnaphthalene	--	6.1E-03
Naphthalene	--	1.2E-01
Perylene	3.5E-09	--
Phenanthrene	--	5.3E-04
Pyrene	3.5E-10	9.4E-06
Benzo(a)pyrene PEQ	1.0E-08	--
Petroleum Hydrocarbons F1	--	7.3E-04
Aliphatic C>6-C8	--	7.2E-04
Aliphatic C>8-C10	--	2.6E-06
Aromatic C>8-C10	--	8.4E-06
Petroleum Hydrocarbons F2	--	5.6E-02
Aliphatic C>10-C12	--	1.2E-04
Aliphatic C>12-C16	--	3.3E-02
Aromatic C>10-C12	--	1.9E-02
Aromatic C>12-C16	--	4.0E-03

Notes:

ILCR - Incremental Lifetime Cancer Risk

HQ - Hazard Quotient

PEQ - Potency Equivalent

Bold/shaded values indicate a predicted risk above Health Canada target risk values (that is, ILCR>10^{-5}, HQ>0.2)

TABLE 27

Predicted Risk from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 38 Sutherland - Office Area

Receptor	Indoor Worker	
Parameter/Dose	Estimated ILCR	Estimated HQ
Benzene	1.7E-06	1.1E-01
Toluene	--	2.1E-03
Ethylbenzene	--	2.7E-04
Xylenes (o,-m,-p)	--	6.8E-03
Acenaphthene	6.5E-09	8.6E-05
Acenaphthylene	3.9E-09	--
Anthracene	--	1.0E-06
Benzo(a)anthracene	3.1E-08	--
Benzo(a)pyrene	1.1E-08	--
Benzo(b)fluoranthene	6.7E-10	--
Benzo(e)pyrene	8.0E-10	--
Benzo(g,h,i)perylene	3.9E-09	--
Benzo(k)fluoranthene	4.6E-10	--
Chrysene	3.1E-10	7.0E-04
Dibenzo(a,h)anthracene	3.1E-07	--
Fluoranthene	3.9E-09	7.7E-06
Fluorene	4.6E-08	1.1E-04
Indeno(1,2,3-c,d)pyrene	3.1E-09	--
2-(1-)Methylnaphthalene	--	5.1E-04
Naphthalene	--	6.1E-02
Perylene	3.9E-09	--
Phenanthrene	--	5.4E-04
Pyrene	3.9E-10	1.0E-05
Benzo(a)pyrene PEQ	1.1E-08	--
Petroleum Hydrocarbons F1	--	8.9E-06
Aliphatic C>6-C8	--	8.8E-06
Aliphatic C>8-C10	--	3.2E-08
Aromatic C>8-C10	--	1.0E-07
Petroleum Hydrocarbons F2	--	1.4E-03
Aliphatic C>10-C12	--	3.2E-06
Aliphatic C>12-C16	--	8.4E-04
Aromatic C>10-C12	--	4.7E-04
Aromatic C>12-C16	--	1.0E-04

Notes:

ILCR - Incremental Lifetime Cancer Risk

HQ - Hazard Quotient

PEQ - Potency Equivalent

Bold/shaded values indicate a predicted risk above Health Canada target risk values (that is, ILCR>10^{-5}, HQ>0.2)

TABLE 28

Predicted Risk from Inhalation of Vapours in Indoor Air

Manitoba Hydro Sutherland Avenue Facility, Winnipeg, Manitoba - 38 Sutherland - Ambient (exterior near lunch area)

Receptor	Indoor Worker	
Parameter/Dose	Estimated ILCR	Estimated HQ
Benzene	3.4E-07	2.2E-02
Toluene	--	1.9E-03
Ethylbenzene	--	1.2E-04
Xylenes (o,-m,-p)	--	2.0E-03
Acenaphthene	5.2E-09	6.8E-05
Acenaphthylene	4.0E-09	--
Anthracene	--	1.1E-06
Benzo(a)anthracene	3.2E-08	--
Benzo(a)pyrene	1.1E-08	--
Benzo(b)fluoranthene	6.9E-10	--
Benzo(e)pyrene	1.6E-09	--
Benzo(g,h,i)perylene	4.0E-09	--
Benzo(k)fluoranthene	4.7E-10	--
Chrysene	3.2E-10	7.2E-04
Dibenzo(a,h)anthracene	3.2E-07	--
Fluoranthene	4.0E-09	7.9E-06
Fluorene	2.8E-08	6.8E-05
Indeno(1,2,3-c,d)pyrene	3.2E-09	--
2-(1-)Methylnaphthalene	--	3.6E-04
Naphthalene	--	7.1E-02
Perylene	9.7E-09	--
Phenanthrene	--	2.0E-04
Pyrene	4.0E-10	1.1E-05
Benzo(a)pyrene PEQ	1.1E-08	--
Petroleum Hydrocarbons F1	--	3.1E-05
Aliphatic C>6-C8	--	3.1E-05
Aliphatic C>8-C10	--	1.1E-07
Aromatic C>8-C10	--	3.6E-07
Petroleum Hydrocarbons F2	--	1.4E-03
Aliphatic C>10-C12	--	3.2E-06
Aliphatic C>12-C16	--	8.4E-04
Aromatic C>10-C12	--	4.7E-04
Aromatic C>12-C16	--	1.0E-04

Notes:

ILCR - Incremental Lifetime Cancer Risk

HQ - Hazard Quotient

PEQ - Potency Equivalent

Bold/shaded values indicate a predicted risk above Health Canada target risk values (that is, ILCR>10^{-5}, HQ>0.2)

TABLE 29

RISK BASED TARGET CONCENTRATIONS FOR INDOOR AIR

MANITOBA HYDRO SUTHERLAND AVENUE FACILITY

Receptor	Indoor Worker		
Parameter/Dose	Target Indoor Air Concentration Based on Carcinogenic Effects (mg/m^3)	Target Indoor Air Concentration Based on Non-Carcinogen Effects (mg/m^3)	Overall Target Indoor Air Concentration [1] ($\mu g/m^3$)
Benzene	1.93E-02	5.84E-03	5.84E+00
Toluene	--	2.77E+00	2.77E+03
Ethylbenzene	--	7.30E-01	7.30E+02
Xylenes (o,-m,-p)	--	1.31E-01	1.31E+02
Acenaphthene	5.78E-02	8.76E-02	5.78E+01
Acenaphthylene	5.78E-03	--	5.78E+00
Anthracene	--	4.38E-01	4.38E+02
Benzo(a)anthracene	7.23E-04	--	7.23E-01
Benzo(a)pyrene	2.05E-03	--	2.05E+00
Benzo(b)fluoranthene	3.35E-02	--	3.35E+01
Benzo(e)pyrene	5.78E-02	--	5.78E+01
Benzo(g,h,i)perylene	5.78E-03	--	5.78E+00
Benzo(k)fluoranthene	4.89E-02	--	4.89E+01
Chrysene	7.23E-02	6.42E-04	6.42E-01
Dibenzo(a,h)anthracene	7.23E-05	--	7.23E-02
Fluoranthene	5.78E-03	5.84E-02	5.78E+00
Fluorene	7.07E-03	5.84E-02	7.07E+00
Indeno(1,2,3-c,d)pyrene	7.23E-03	--	7.23E+00
2-(1-)Methylnaphthalene	--	3.65E-02	3.65E+01
Naphthalene	--	2.19E-03	2.19E+00
Perylene	5.78E-03	--	5.78E+00
Phenanthrene	--	3.65E-02	3.65E+01
Pyrene	5.78E-02	4.38E-02	4.38E+01
Benzo(a)pyrene PEQ	2.05E-03	--	2.05E+00
PHC F1	--	8.45E+02	8.45E+05
Aliphatic C>6-C8	--	7.30E+02	7.30E+05
Aliphatic C>8-C10	--	3.29E+04	3.29E+07
Aromatic C>8-C10	--	3.65E+02	3.65E+05
PHC F2		5.34E+00	5.34E+03
Aliphatic C>10-C12	--	1.83E+03	1.83E+06
Aliphatic C>12-C16	--	1.83E+00	1.83E+03
Aromatic C>10-C12	--	3.65E-01	3.65E+02
Aromatic C>12-C16	--	3.65E-01	3.65E+02

Notes:

[1.] The selected risk-based concentration is the lower of the carcinogenic and the non-carcinogenic risk-based concentrations.

Appendix C
Data Validation Report

Data Validation Report for Indoor Air Data Collected from Sutherland Avenue Facility, Winnipeg, MB

Introduction

This data validation (DV) report assesses the quality of analytical results for samples collected at the Manitoba Hydro property located at 35 to 38 Sutherland Avenue in Winnipeg, Manitoba (the Site). KGS Group collected indoor air samples using sampling trains to include filters, XAD-2 resin, and Summa Canisters from the Site between July 11, 2012 and December 12, 2012.

Guidance for this data quality evaluation report came from professional judgment based on the United States Environmental Protection Agency (USEPA) *Contract Laboratory National Functional Guidelines (NFG) for Organic Methods Data Review, June, 2008; California Air Resources Board (CARB) Method 429, NIOSH method 5515, and individual Method TO-15 requirements, for the determination of Volatile Organic Compounds (VOCs) in air collected in specially-prepared canisters and analyzed by Gas Chromatography/Mass Spectrometry (GC/MS).*

The analytical results were validated using the criteria of precision, accuracy, representativeness, comparability, and completeness (PARCC) as described in the USEPA guidance documents.

This report is intended as a general data validation assessment designed to summarize any data issues.

Analytical Data

Indoor air samples were collected from the Site at the locations specified in the HHRA. Sampling was completed at a total of nine locations during each of the various sampling events, and the analytical results are reported from the laboratories in certificates of analysis (COAs) L1179112, L1219965, L1220198, L1235449, L1236456, L1249458, and L1249498.

Samples were collected and sent to ALS Laboratories in Edmonton, Alberta and Winnipeg, Manitoba. The samples were analyzed using method TO-15 for benzene, toluene, ethylbenzene, xylenes (BTEX) fractionation, by California EPA Air Resources Board (CARB) Method 429, and NIOSH Method 5515 for polycyclic aromatic hydrocarbons (PAHs).

There was limited Quality Assurance/Quality Control (QA/QC) information received in the laboratory COA reports. The following areas of each report were reviewed:

- Chain-of-custody (CoC) documentation
- Holding time compliance
- Laboratory Duplicates
- Method blanks
- Laboratory control samples (LCS)
- Surrogate spike recoveries
- Laboratory general comments

Multiple flags are routinely applied to specific sample method/matrix/analyte combinations, but only one final flag is applied. The final flag applied to the data is the most conservative of the applied validation flags. The final flag also includes matrix and blank sample effects.

The data flags are those listed in the NFG and are defined as follows:

U = The analyte was analyzed for but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit; however, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R = The sample result was rejected because of serious deficiencies in the ability to analyze the sample and meet the QC criteria. The presence or absence of the analyte could not be verified. Data flagged "R" were not used in the decision-making process.

In addition to the data qualifier flags, validation reason codes were applied. The codes are defined as follows:

SUR<LCL: The surrogate recovery was less than the lower control limit

LR: The concentration exceeded linear calibration range

The overall summaries of the data validation are contained in the following sections. The sample results (Form 1s) are provided as Attachment 1.

Air Sampling Procedures

Sampling for BTEX in indoor and ambient air was conducted using Summa canisters while sampling for PAHs was conducted using polyurethane foam (PUF) tubes and an area sampling pump capable of 20 liters per minute flow rate. The standard operating procedures (SOPs) used by KGS Group are attached (Attachment 2).

Based on a review of the SOPs and available supporting information (such as initial Summa canister vacuum and final pressure), the sampling procedures can be considered adequate.

Holding Time and Preservation

The holding time criteria applied for the air matrix samples in Method TO-15 is 30 days, for CARB Method 429 extraction must be performed within 21 days and the extract analyzed within 40 days after extraction. For NIOSH Method 5515, although the holding time was not specified, the laboratory used criteria of 7 days from collection to extraction and the extract must be analyzed within 40 days of extraction. For the samples in COA L1220198, the laboratory commented that samples were extracted 15 days from the date of sample collection, and analyzed within 40 days of extraction. As noted above, the extraction holding time for CARB Method 429 is 21 days therefore no qualifiers were applied to the data.

All samples collected for laboratory analysis were accompanied by chain-of-custody (CoC) forms, where tracking of sample movement was recorded.

The samples were analyzed within the required analysis holding time.

Laboratory QC Samples

A laboratory method blank is an unused, certified canister or clean XAD-2 resin or filters that did not leave the laboratory. The blank canister is pressurized with ultra-pure zero air and carried through the same analytical procedure as a field sample. To monitor for possible laboratory contamination, laboratory method blanks were analyzed at the required frequency for the target parameters of interest. All blanks were free of contamination, with one exception. Naphthalene was detected in the laboratory method blank in COA L1220198, QC Batch R2465122 at 11 nanograms (ng). All sample concentrations were greater than ten times the amount in the blank, therefore no qualifiers were applied.

Surrogates were added to samples and all recoveries provided by the laboratory met acceptance criteria, except as noted below.

The recoveries of selected labeled extraction standards were below the method control limits in samples reported in COAs L1220198 and L1235449. The associated parameter results were qualified "J/UJ", as estimated.

Laboratory control spike samples were prepared and analyzed for PAHS and VOCs. All LCS recoveries were within the control limits.

General Comments

The sample times listed for each sample in COA L1219965 are the same date and time of the first sample.

All of the results for naphthalene in the rear tube for samples in COA L1179112 were greater than 10% of the front tube, indicating possible breakthrough. Therefore, the laboratory results were reported with a greater than sign ">" to indicate the results were most likely greater than the numeric value due to potential breakthrough.

Selected samples were diluted due to the concentration of target parameters. When this occurred, the Laboratory provided the following comment: "Dilution checked against the original run of the can and they match both visually and discrete numbers. The dilution factors and sequences all match. The DLA qualifiers are used when the results are diluted to fall within the curve. The detection limit is raised based on that dilution. DLA qualifiers on F1/F2 data are based on peak heights of the standards." The definition of DLA is: Detection Limit Adjusted for required dilution.

For sample L1220198-6, the laboratory qualified the naphthalene results with an "E" to signify "the analyte was detected above the level of the highest calibration standard". A secondary dilution was not reported therefore a data qualifier of "J" was applied to indicate it was an estimated result.

PARCCs

The goal of this assessment is to demonstrate that the resulting analytical data can be used to support the decision making process. The following summary highlights the PARCC findings for this event:

- Precision is defined as the agreement between duplicate results, and was verified through the review of the laboratory data quality indicators such as the lab duplicates. The precision between the native/field duplicate samples indicates that the sample matrix did not significantly interfere with the overall analytical process. The precision between the duplicate laboratory control samples indicates that the analytical systems were in control.
- Accuracy is a measure of the agreement between an experimental determination and the true value of the parameter. The surrogate recoveries are used to determine if the sample matrix may affect the analytical results. The LCS results demonstrate accuracy of the method. Accuracy of the data was verified through the review of the LCS and surrogate recoveries, as well as the evaluation of lab blank data. Naphthalene was detected in a single method blank as noted in the previous section. All of the sample detections were above ten times the blank concentration. Therefore, the positive detection found in the method blank was not considered representative of potential contamination in the samples. As a result, no flags were applied to the data due to field blank detections. Surrogates recoveries were found within control limits with the exception of the surrogates noted in the above section. Associated data was flagged "J/UJ" as estimated. All of the LCS spike recoveries were within QC limits indicating that sample results are accurate and that the analytical systems were in control.
- Representativeness of the data was verified through verification of holding time compliance. Holding time requirements were successfully met.
- Comparability is another qualitative measure designed to express the confidence with which one data set may be compared to another. Factors that affect comparability are sample collection and handling techniques, sample matrix type, and analytical method. Data sets can be compared with confidence only when precision and accuracy are known. Data from the different sampling events are comparable with other previous data collected at the Site due to the consistent use of proper sample collection and sample handling techniques and use of USEPA methods to analyze the samples.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Valid data are defined as all data that are not rejected for project use. No data has been rejected. All data are considered valid.

Summary and Conclusions

Conclusions of the data validation process include the following:

- The laboratory analyzed the samples according to the USEPA methods requested.
- Concentrations of blank contaminants were evaluated according to USEPA guidance documents but no data qualification was necessary.
- Sample results for target organic compounds above the method detection limit (MDL) but less than the reporting limit (RL) should be considered as uncertain but indicative of the presence of that compound at an estimated concentration.
- The low number of surrogate spike recoveries, LCS recoveries, and laboratory duplicate results that were outside of acceptance limits indicates that the sample matrix did not significantly interfere with the overall analytical process.
- The results for naphthalene in COA L1179112 were reported with a ">" sign indicating the concentration may be above the numeric value, as the results from the rear tube indicated potential breakthrough.
- There were no results rejected due to QC failures such that there is not a valid result for each target compound for each sample.

The analytical data with the qualifications as described above, is considered valid and can be used to support the project decision making process.

References

United States Environmental Protection Agency (USEPA). 1999. *Compendium of Methods for Toxic Organic Air Pollutants. 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).* Second Edition. January 1999.

United States Environmental Protection Agency (USEPA). 2008. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review.* EPA540/R08/01. June 2008.

California Environmental Protection Agency, Air Resources Board. 1997. Method 429. Determination of polycyclic Aromatic Hydrocarbon (PAH) Emissions from Stationary Sources, July 1997

National Institute for Occupational Safety and Health (NIOSH). 1994. Polynuclear Aromatic Hydrocarbons by GC, Method 5515, Issue 2, August 1994.

Attachment 1 - Form 1s

KGS Group Consultants (Winnipeg)
865 Waverly Street - 3rd Floor
Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-35-EL(CANISTER#264,REGULATOR#02644)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-1
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	16.0		ppb			04-JAN-13
Xylenes (Total)	69.4		ug/m3			04-JAN-13
Note: Canister Pressure= 11.4psia						
Toluene						
Toluene	17.4		ppb			04-JAN-13
Toluene	65.4		ug/m3			04-JAN-13
Note: Canister Pressure= 11.4psia						
Ethyl Benzene						
Ethylbenzene	3.07		ppb			04-JAN-13
Ethylbenzene	13.3		ug/m3			04-JAN-13
Note: Canister Pressure= 11.4psia						
Benzene - air						
Benzene	18.0		ug/m3			04-JAN-13
Benzene	5.64		ppb			04-JAN-13
Note: Canister Pressure= 11.4psia						

CDWQG = Health Canada Guideline Limits updated

* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit.
* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

Approved by

Jessica Spira
Account Manager

KGS Group Consultants (Winnipeg)
865 Waverly Street - 3rd Floor
Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-38-AM(CANISTER#245,REGULATOR#02504)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-2
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	<2.6		ug/m3			04-JAN-13
Xylenes (Total)	<0.60		ppb			04-JAN-13
Note: Canister Pressure= 15.8psia						
Toluene						
Toluene	0.43		ppb			04-JAN-13
Toluene	1.62		ug/m3			04-JAN-13
Note: Canister Pressure= 15.8psia						
Ethyl Benzene						
Ethylbenzene	<0.87		ug/m3			04-JAN-13
Ethylbenzene	<0.20		ppb			04-JAN-13
Note: Canister Pressure= 15.8psia						
Benzene - air						
Benzene	0.65		ug/m3			04-JAN-13
Benzene	0.21		ppb			04-JAN-13
Note: Canister Pressure= 15.8psia						

CDWQG = Health Canada Guideline Limits updated

* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit.
* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

Approved by

Jessica Spira
Account Manager

KGS Group Consultants (Winnipeg)
865 Waverly Street - 3rd Floor

Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-35-EE(CANISTER#1187,REGULATOR#01380)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-3
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	<2.6		ug/m3			04-JAN-13
Xylenes (Total)	<0.60		ppb			04-JAN-13
Note: Canister Pressure= 15.9psia						
Toluene						
Toluene	0.50		ppb			04-JAN-13
Toluene	1.89		ug/m3			04-JAN-13
Note: Canister Pressure= 15.9psia						
Ethyl Benzene						
Ethylbenzene	<0.20		ppb			04-JAN-13
Ethylbenzene	<0.87		ug/m3			04-JAN-13
Note: Canister Pressure= 15.9psia						
Benzene - air						
Benzene	0.26		ppb			04-JAN-13
Benzene	0.81		ug/m3			04-JAN-13
Note: Canister Pressure= 15.9psia						

CDWQG = Health Canada Guideline Limits updated

* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit.
* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

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Jessica Spira
Account Manager

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865 Waverly Street - 3rd Floor

Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-38-OF2(CANISTER#204,REGULATOR#02503)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-4
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	4.5		ug/m3			04-JAN-13
Xylenes (Total)	1.03		ppb			04-JAN-13
Note: Canister Pressure= 13.9psia						
Toluene						
Toluene	3.11		ppb			04-JAN-13
Toluene	11.7		ug/m3			04-JAN-13
Note: Canister Pressure= 13.9psia						
Ethyl Benzene						
Ethylbenzene	0.99		ug/m3			04-JAN-13
Ethylbenzene	0.23		ppb			04-JAN-13
Note: Canister Pressure= 13.9psia						
Benzene - air						
Benzene	0.58		ppb			04-JAN-13
Benzene	1.85		ug/m3			04-JAN-13
Note: Canister Pressure= 13.9psia						

CDWQG = Health Canada Guideline Limits updated

* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit.
* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

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Jessica Spira
Account Manager

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865 Waverly Street - 3rd Floor
Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-33-LR(CANISTER#242,REGULATOR#01363)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-5
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	9.2		ug/m3			04-JAN-13
Xylenes (Total)	2.12		ppb			04-JAN-13
Note: Canister Pressure= 14.0psia						
Toluene						
Toluene	7.06		ug/m3			04-JAN-13
Toluene	1.88		ppb			04-JAN-13
Note: Canister Pressure= 14.0psia						
Ethyl Benzene						
Ethylbenzene	1.78		ug/m3			04-JAN-13
Ethylbenzene	0.41		ppb			04-JAN-13
Note: Canister Pressure= 14.0psia						
Benzene - air						
Benzene	0.42		ppb			04-JAN-13
Benzene	1.35		ug/m3			04-JAN-13
Note: Canister Pressure= 14.0psia						

CDWQG = Health Canada Guideline Limits updated

* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit.
* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

Approved by

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Account Manager

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865 Waverly Street - 3rd Floor
Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-35-01(CANISTER#320,REGULATOR#02643)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-6
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	1.72		ppb			04-JAN-13
Xylenes (Total)	7.4		ug/m3			04-JAN-13
Note: Canister Pressure= 13.9psia						
Toluene						
Toluene	6.75		ug/m3			04-JAN-13
Toluene	1.80		ppb			04-JAN-13
Note: Canister Pressure= 13.9psia						
Ethyl Benzene						
Ethylbenzene	0.33		ppb			04-JAN-13
Ethylbenzene	1.42		ug/m3			04-JAN-13
Note: Canister Pressure= 13.9psia						
Benzene - air						
Benzene	2.12		ug/m3			04-JAN-13
Benzene	0.66		ppb			04-JAN-13
Note: Canister Pressure= 13.9psia						

CDWQG = Health Canada Guideline Limits updated

* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit.
* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

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ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-35-02(CANISTER#326,REGUALTOR#02504)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-7
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	18.4		ug/m3			04-JAN-13
Xylenes (Total)	4.25		ppb			04-JAN-13
Note: Canister Pressure= 13.9psia						
Toluene						
Toluene	4.63		ppb			04-JAN-13
Toluene	17.4		ug/m3			04-JAN-13
Note: Canister Pressure= 13.9psia						
Ethyl Benzene						
Ethylbenzene	0.76		ppb			04-JAN-13
Ethylbenzene	3.30		ug/m3			04-JAN-13
Note: Canister Pressure= 13.9psia						
Benzene - air						
Benzene	3.43		ug/m3			04-JAN-13
Benzene	1.07		ppb			04-JAN-13
Note: Canister Pressure= 13.9psia						

CDWQG = Health Canada Guideline Limits updated

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* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

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865 Waverly Street - 3rd Floor

Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-35-SM(CANISTER#00131,REGULATOR#00447)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-8
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	20.5		ug/m3			04-JAN-13
Xylenes (Total)	4.73		ppb			04-JAN-13
Note: Canister Pressure= 14.3psia						
Toluene						
Toluene	14.5		ug/m3			04-JAN-13
Toluene	3.85		ppb			04-JAN-13
Note: Canister Pressure= 14.3psia						
Ethyl Benzene						
Ethylbenzene	3.56		ug/m3			04-JAN-13
Ethylbenzene	0.82		ppb			04-JAN-13
Note: Canister Pressure= 14.3psia						
Benzene - air						
Benzene	1.62		ppb			04-JAN-13
Benzene	5.16		ug/m3			04-JAN-13
Note: Canister Pressure= 14.3psia						

CDWQG = Health Canada Guideline Limits updated

* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit.
* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

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Account Manager

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Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-37-OF(CANISTER#325,REGUALTOR#01383)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-9
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	16.3		ug/m3			04-JAN-13
Xylenes (Total)	3.75		ppb			04-JAN-13
Note: Canister Pressure= 13.6psia						
Toluene						
Toluene	34.0		ug/m3			04-JAN-13
Toluene	9.02		ppb			04-JAN-13
Note: Canister Pressure= 13.6psia						
Ethyl Benzene						
Ethylbenzene	3.27		ug/m3			04-JAN-13
Ethylbenzene	0.76		ppb			04-JAN-13
Note: Canister Pressure= 13.6psia						
Benzene - air						
Benzene	0.86		ppb			04-JAN-13
Benzene	2.75		ug/m3			04-JAN-13
Note: Canister Pressure= 13.6psia						

CDWQG = Health Canada Guideline Limits updated

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* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

Approved by

Jessica Spira
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-1 AS-35-01 (PUMP #194999, ID # L1242937-7)							
Sampled By: CLIENT on 10-DEC-12 @ 09:00							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.391			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.321		0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
1-Methyl Naphthalene	768		10	ng	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	0.657		0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	1570		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	0.0506		0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	121		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Anthracene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(ghi)perylene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Chrysene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluorene	0.0291		0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Fluorene	70		10	ng	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Naphthalene	0.908		0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Naphthalene	2170		10	ng	17-DEC-12	31-DEC-12	R2504965
Perylene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	0.0510		0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	122		10	ng	17-DEC-12	31-DEC-12	R2504965
Pyrene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Surrogate: 2-Methylnaphthalene-D10	98.4		30-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Acenaphthylene d8	103.2		40-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Anthracene-D10	123.7		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benz(a)anthracene-D12	88.3		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(a)pyrene d12	121.3		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(b)fluoranthene-D12	121.7		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(g,h,i)perylene d12	94.4		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(k)fluoranthene-D12	107.0		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Chrysene d12	78.4		50-150	%	17-DEC-12	31-DEC-12	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-1 AS-35-01 (PUMP #194999, ID # L1242937-7)							
Sampled By: CLIENT on 10-DEC-12 @ 09:00							
Matrix: PUF							
CARB 429 PAH LR							
Surrogate: Dibenz(a,h)anthracene-D14	115.1	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Fluoranthene d10	111.2		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	117.9	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Naphthalene d8	93.4		20-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Perylene d12	125.6	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Phenanthrene d10	119.2		50-150	%	17-DEC-12	31-DEC-12	R2504965
L1249458-2 AS-35-02 (PUMP #194950, ID # L1242937-8)							
Sampled By: CLIENT on 10-DEC-12 @ 09:06							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.328			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.233		0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
1-Methyl Naphthalene	542		10	ng	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	0.468		0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	1090		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	0.0382		0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	89		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Anthracene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(ghi)perylene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Chrysene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluorene	0.0265		0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Fluorene	62		10	ng	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Naphthalene	0.717		0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Naphthalene	1670		10	ng	17-DEC-12	31-DEC-12	R2504965
Perylene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	0.0507		0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	118		10	ng	17-DEC-12	31-DEC-12	R2504965
Pyrene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-2 AS-35-02 (PUMP #194950, ID # L1242937-8)							
Sampled By: CLIENT on 10-DEC-12 @ 09:06							
Matrix: PUF							
CARB 429 PAH LR							
Pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Surrogate: 2-Methylnaphthalene-D10	97.0		30-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Acenaphthylene d8	98.1		40-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Anthracene-D10	112.3		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benz(a)anthracene-D12	83.8		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(a)pyrene d12	114.0		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(b)fluoranthene-D12	107.7		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(g,h,i)perylene d12	86.3		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(k)fluoranthene-D12	100.3		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Chrysene d12	76.6		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	98.9	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Fluoranthene d10	102.2		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	113.8	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Naphthalene d8	92.9		20-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Perylene d12	116.6	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Phenanthrene d10	110.0		50-150	%	17-DEC-12	31-DEC-12	R2504965
L1249458-3 AS-35-SM (PUMP #194952, ID # L1242937-9)							
Sampled By: CLIENT on 10-DEC-12 @ 09:22							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.471			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.182		0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
1-Methyl Naphthalene	449		10	ng	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	0.361		0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	893		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	0.0425		0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	105		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Anthracene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(ghi)perylene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Chrysene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluorene	0.0244		0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-3 AS-35-SM (PUMP #194952, ID # L1242937-9)							
Sampled By: CLIENT on 10-DEC-12 @ 09:22							
Matrix: PUF							
CARB 429 PAH LR							
Fluorene	60		10	ng	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Naphthalene	0.595		0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Naphthalene	1470		10	ng	17-DEC-12	31-DEC-12	R2504965
Perylene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	0.0421		0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	104		10	ng	17-DEC-12	31-DEC-12	R2504965
Pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Surrogate: 2-Methylnaphthalene-D10	100.9		30-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Acenaphthylene d8	104.0		40-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Anthracene-D10	118.6		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benz(a)anthracene-D12	86.0		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(a)pyrene d12	108.6	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(b)fluoranthene-D12	113.9		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(g,h,i)perylene d12	89.0		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(k)fluoranthene-D12	103.4		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Chrysene d12	78.8		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	95.4	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Fluoranthene d10	108.7		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	102.7	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Naphthalene d8	99.4		20-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Perylene d12	119.6	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Phenanthrene d10	115.0	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
L1249458-4 AS-37-OF (PUMP #194720, ID # L1242937-1)							
Sampled By: CLIENT on 10-DEC-12 @ 09:38							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.43			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.302		0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
1-Methyl Naphthalene	735		10	ng	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	0.609		0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	1480		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	0.0626		0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	152		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(ghi)perylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-4 AS-37-OF (PUMP #194720, ID # L1242937-1)							
Sampled By: CLIENT on 10-DEC-12 @ 09:38							
Matrix: PUF							
CARB 429 PAH LR							
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Chrysene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluorene	0.0412		0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Fluorene	100		10	ng	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Naphthalene	0.901		0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Naphthalene	2190		10	ng	17-DEC-12	31-DEC-12	R2504965
Perylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	0.0959		0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	233		10	ng	17-DEC-12	31-DEC-12	R2504965
Pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Surrogate: 2-Methylnaphthalene-D10	100.0		30-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Acenaphthylene d8	104.4		40-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Anthracene-D10	120.7		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benz(a)anthracene-D12	92.1		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(a)pyrene d12	117.7		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(b)fluoranthene-D12	115.3		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(g,h,i)perylene d12	93.5		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(k)fluoranthene-D12	106.1		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Chrysene d12	84.9		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	91.9	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Fluoranthene d10	110.3		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	107.3	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Naphthalene d8	98.7		20-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Perylene d12	118.6	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Phenanthrene d10	117.2		50-150	%	17-DEC-12	31-DEC-12	R2504965
L1249458-5 AS-38-OF (PUMP #194725, ID # L1242937-3)							
Sampled By: CLIENT on 10-DEC-12 @ 09:47							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.457			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0229		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
1-Methyl Naphthalene	56		10	ng	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	0.0427		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	105		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	0.0329		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	81		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-5 AS-38-OF (PUMP #194725, ID # L1242937-3)							
Sampled By: CLIENT on 10-DEC-12 @ 09:47							
Matrix: PUF							
CARB 429 PAH LR							
Anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Chrysene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluorene	0.0328		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluorene	81		10	ng	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Naphthalene	0.121		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Naphthalene	297		10	ng	17-DEC-12	01-JAN-13	R2504965
Perylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	0.0993		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	244		10	ng	17-DEC-12	01-JAN-13	R2504965
Pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Surrogate: 2-Methylnaphthalene-D10	114.6		30-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Acenaphthylene d8	113.7		40-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Anthracene-D10	126.1	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benz(a)anthracene-D12	98.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(a)pyrene d12	129.1		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(b)fluoranthene-D12	126.9		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(g,h,i)perylene d12	98.3		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(k)fluoranthene-D12	118.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Chrysene d12	89.9		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	106.6	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Fluoranthene d10	122.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	121.9	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Naphthalene d8	108.0		20-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Perylene d12	128.2	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Phenanthrene d10	125.5	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
L1249458-6 AS-35-EL (PUMP #194952, ID # L1242937-2)							
Sampled By: CLIENT on 11-DEC-12 @ 07:21							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.471			m3		03-JAN-13	R2504954

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-6 AS-35-EL (PUMP #194952, ID # L1242937-2)							
Sampled By: CLIENT on 11-DEC-12 @ 07:21							
Matrix: PUF							
CARB 429 PAH LR							
1-Methyl Naphthalene	0.146		0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
1-Methyl Naphthalene	361		10	ng	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	0.284		0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	702		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	0.0341		0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	84		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Anthracene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Chrysene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluorene	0.0296		0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluorene	73		10	ng	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Naphthalene	0.530		0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Naphthalene	1310		10	ng	17-DEC-12	01-JAN-13	R2504965
Perylene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	0.0992		0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	245		10	ng	17-DEC-12	01-JAN-13	R2504965
Pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Surrogate: 2-Methylnaphthalene-D10	114.7		30-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Acenaphthylene d8	111.7		40-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Anthracene-D10	127.2		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benz(a)anthracene-D12	92.7		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(a)pyrene d12	126.7		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(b)fluoranthene-D12	123.9		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(g,h,i)perylene d12	96.0		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(k)fluoranthene-D12	114.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Chrysene d12	86.5		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	113.3	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Fluoranthene d10	117.1		50-150	%	17-DEC-12	01-JAN-13	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-6 AS-35-EL (PUMP #194952, ID # L1242937-2)							
Sampled By: CLIENT on 11-DEC-12 @ 07:21							
Matrix: PUF							
CARB 429 PAH LR							
Surrogate: Indeno(1,2,3,cd)pyrene-D12	110.9	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Naphthalene d8	109.3		20-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Perylene d12	128.9	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Phenanthrene d10	120.5	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
L1249458-7 AS-38-AM (PUMP #194720, ID # L1242937-10)							
Sampled By: CLIENT on 11-DEC-12 @ 08:13							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.415			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0222		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
1-Methyl Naphthalene	54		10	ng	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	0.0431		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	104		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	0.0299		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	72		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Chrysene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluorene	0.0200		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluorene	48		10	ng	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Naphthalene	0.0952		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Naphthalene	230		10	ng	17-DEC-12	01-JAN-13	R2504965
Perylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	0.0359		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	87		10	ng	17-DEC-12	01-JAN-13	R2504965
Pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Surrogate: 2-Methylnaphthalene-D10	102.8		30-150	%	17-DEC-12	01-JAN-13	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-7 AS-38-AM (PUMP #194720, ID # L1242937-10)							
Sampled By: CLIENT on 11-DEC-12 @ 08:13							
Matrix: PUF							
CARB 429 PAH LR							
Surrogate: Acenaphthylene d8	104.7		40-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Anthracene-D10	116.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benz(a)anthracene-D12	85.8		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(a)pyrene d12	119.2		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(b)fluoranthene-D12	120.8		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(g,h,i)perylene d12	86.6		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(k)fluoranthene-D12	105.8		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Chrysene d12	78.8		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	93.4	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Fluoranthene d10	110.9		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	101.8	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Naphthalene d8	97.5		20-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Perylene d12	94.5		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Phenanthrene d10	116.6		50-150	%	17-DEC-12	01-JAN-13	R2504965
L1249458-8 AS-35-EE (PUMP #194725, ID # L1242937-4)							
Sampled By: CLIENT on 11-DEC-12 @ 08:57							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.288			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0208		0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
1-Methyl Naphthalene	48		10	ng	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	0.0420		0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	96		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	0.0279		0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	64		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Anthracene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Chrysene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluorene	0.0205		0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluorene	47		10	ng	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-8 AS-35-EE (PUMP #194725, ID # L1242937-4)							
Sampled By: CLIENT on 11-DEC-12 @ 08:57							
Matrix: PUF							
CARB 429 PAH LR							
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Naphthalene	0.0813		0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Naphthalene	186		10	ng	17-DEC-12	01-JAN-13	R2504965
Perylene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	0.0503		0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	115		10	ng	17-DEC-12	01-JAN-13	R2504965
Pyrene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Surrogate: 2-Methylnaphthalene-D10	104.5		30-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Acenaphthylene d8	103.1		40-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Anthracene-D10	115.5		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benz(a)anthracene-D12	86.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(a)pyrene d12	123.3		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(b)fluoranthene-D12	114.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(g,h,i)perylene d12	76.8		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(k)fluoranthene-D12	103.7		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Chrysene d12	81.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	101.2	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Fluoranthene d10	106.9		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	108.3	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Naphthalene d8	104.2		20-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Perylene d12	100.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Phenanthrene d10	115.9		50-150	%	17-DEC-12	01-JAN-13	R2504965
L1249458-9 AS-33-LR (PUMP #194952, ID # L1242937-5)							
Sampled By: CLIENT on 11-DEC-12 @ 22:50							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.677			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0930		0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
1-Methyl Naphthalene	249		10	ng	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	0.189		0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	507		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	0.0264		0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	71		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Anthracene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-9 AS-33-LR (PUMP #194952, ID # L1242937-5)							
Sampled By: CLIENT on 11-DEC-12 @ 22:50							
Matrix: PUF							
CARB 429 PAH LR							
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Chrysene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluorene	0.0230		0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluorene	62		10	ng	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Naphthalene	0.437		0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Naphthalene	1170		10	ng	17-DEC-12	01-JAN-13	R2504965
Perylene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	0.0549		0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	147		10	ng	17-DEC-12	01-JAN-13	R2504965
Pyrene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Surrogate: 2-Methylnaphthalene-D10	108.8		30-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Acenaphthylene d8	108.4		40-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Anthracene-D10	119.8		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benz(a)anthracene-D12	86.1		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(a)pyrene d12	123.1		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(b)fluoranthene-D12	121.3		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(g,h,i)perylene d12	86.8		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(k)fluoranthene-D12	108.5		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Chrysene d12	76.5		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	109.7	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Fluoranthene d10	112.9		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	105.0	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Naphthalene d8	107.3		20-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Perylene d12	98.5		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Phenanthrene d10	123.3		50-150	%	17-DEC-12	01-JAN-13	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1236456-1 AS-35-EL (CANISTER#00956)(REGULATOR#02507)							
Sampled By: NRH/KEM on 05-NOV-12 @ 15:17							
Matrix: air							
Miscellaneous Parameters							
Canister Pressure	14.3		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	1.89		0.64	ug/m3		26-NOV-12	R2488588
Benzene	0.59		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	1.34		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	0.31		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	8.13		0.75	ug/m3		26-NOV-12	R2488588
Toluene	2.16		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	5.0		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	1.16		0.60	ppb		26-NOV-12	R2488588
L1236456-2 AS-35-01 (CANISTER#0243)(REGULATOR#01365)							
Sampled By: NRH/KEM on 05-NOV-12 @ 15:41							
Matrix: air							
Miscellaneous Parameters							
Canister Pressure	14.2		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	3.95		0.64	ug/m3		26-NOV-12	R2488588
Benzene	1.24		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	1.86		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	0.43		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	10.9		0.75	ug/m3		26-NOV-12	R2488588
Toluene	2.89		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	7.4		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	1.71		0.60	ppb		26-NOV-12	R2488588
L1236456-3 AS-35-02 (CANISTER #00113)(REGULATOR#00534)							
Sampled By: NRH/KEM on 06-NOV-12 @ 15:52							
Matrix: air							
Miscellaneous Parameters							
Canister Pressure	14.2		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	1.85		0.64	ug/m3		26-NOV-12	R2488588
Benzene	0.58		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	1.40		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	0.32		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	8.63		0.75	ug/m3		26-NOV-12	R2488588
Toluene	2.29		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	5.7		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	1.31		0.60	ppb		26-NOV-12	R2488588
L1236456-4 AS-38-OF (CANISTER #211)(REGULATOR#01372)							
Sampled By: NRH/KEM on 06-NOV-12 @ 15:59							
Matrix: air							
Miscellaneous Parameters							

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1236456-4 AS-38-OF (CANISTER #211)(REGULATOR#01372)							
Sampled By: NRH/KEM on 06-NOV-12 @ 15:59							
Matrix: air							
Canister Pressure	14.4		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	<0.64		0.64	ug/m3		26-NOV-12	R2488588
Benzene	<0.20		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	<0.87		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	<0.20		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	8.16		0.75	ug/m3		26-NOV-12	R2488588
Toluene	2.17		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	<2.6		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	<0.60		0.60	ppb		26-NOV-12	R2488588
L1236456-5 AS-38-AM (CANISTER #352)(REGULATOR#00666)							
Sampled By: NRH/KEM on 06-NOV-12 @ 16:05							
Matrix: air							
Miscellaneous Parameters							
Canister Pressure	13.6		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	<0.64		0.64	ug/m3		26-NOV-12	R2488588
Benzene	<0.20		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	<0.87		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	<0.20		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	1.04		0.75	ug/m3		26-NOV-12	R2488588
Toluene	0.28		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	<2.6		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	<0.60		0.60	ppb		26-NOV-12	R2488588
L1236456-6 AS-37-OF (CANISTER #1192)(REGULATOR#02502)							
Sampled By: NRH/KEM on 06-NOV-12 @ 16:16							
Matrix: air							
Miscellaneous Parameters							
Canister Pressure	14.5		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	10.5		0.64	ug/m3		26-NOV-12	R2488588
Benzene	3.30		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	12.8		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	2.96		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	118		0.75	ug/m3		26-NOV-12	R2488588
Toluene	31.3		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	63.3		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	14.6		0.60	ppb		26-NOV-12	R2488588
L1236456-7 AS-33-LR (CANISTER #268)(REGULATOR#01385)							
Sampled By: NRH/KEM on 07-NOV-12 @ 06:53							
Matrix: air							
Miscellaneous Parameters							

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1236456-7 AS-33-LR (CANISTER #268)(REGULATOR#01385)							
Sampled By: NRH/KEM on 07-NOV-12 @ 06:53							
Matrix: air							
Canister Pressure	14.6		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	0.99		0.64	ug/m3		26-NOV-12	R2488588
Benzene	0.31		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	<0.87		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	<0.20		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	2.96		0.75	ug/m3		26-NOV-12	R2488588
Toluene	0.79		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	<2.6		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	<0.60		0.60	ppb		26-NOV-12	R2488588
L1236456-8 AS-35-SM2 (CANISTER #00123)(REGULATOR#01304)							
Sampled By: NRH/KEM on 07-NOV-12 @ 06:58							
Matrix: air							
Miscellaneous Parameters							
Canister Pressure	14.4		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	1.90		0.64	ug/m3		26-NOV-12	R2488588
Benzene	0.59		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	1.20		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	0.28		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	8.14		0.75	ug/m3		26-NOV-12	R2488588
Toluene	2.16		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	4.7		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	1.09		0.60	ppb		26-NOV-12	R2488588
L1236456-9 AS-35-EE2 (CANISTER #00107)(REGULATOR#00447)							
Sampled By: NRH/KEM on 08-NOV-12 @ 17:26							
Matrix: air							
Miscellaneous Parameters							
Canister Pressure	15.6		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	<0.64		0.64	ug/m3		26-NOV-12	R2488588
Benzene	<0.20		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	1.24		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	0.29		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	4.04		0.75	ug/m3		26-NOV-12	R2488588
Toluene	1.08		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	<2.6		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	<0.60		0.60	ppb		26-NOV-12	R2488588

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-1 AS-38-OF (PUMP# 194999)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.244			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0232		0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	52		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.0455		0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	102		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0375		0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	84		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0291		0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	65		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.0949		0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	213		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0557		0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	125		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	86.2		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	93.7		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	100.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	84.1		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	98.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	108.1		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	58.7	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	114.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	76.1		50-150	%	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-1 AS-38-OF (PUMP# 194999)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Surrogate: Dibenz(a,h)anthracene-D14	61.8	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	99.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	54.9	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	86.9		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	94.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	96.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
L1235449-2 AS-37-OF (PUMP# 194725)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.428			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.361		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	876		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.750		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	1820		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0548		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	133		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	0.0046		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	11		10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0041		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10		10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0353		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	86		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	1.00		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	2430		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0523		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	127		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-2 AS-37-OF (PUMP# 194725)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	98.9		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	108.3		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	118.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	87.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	108.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	120.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	68.4	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	122.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	78.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	64.1	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	113.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	63.9	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	100.2		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	107.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	113.0		50-150	%	09-NOV-12	24-NOV-12	R2479079
L1235449-3 AS-38-AM (PUMP# 194950)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.464			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0125		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	31		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.0225		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	56		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0229		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	56		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0149		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-3 AS-38-AM (PUMP# 194950)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Fluorene	37		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.0556		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	137		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0250		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	62		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	102.3		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	109.3		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	119.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	88.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	111.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	121.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	55.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	126.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	81.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	54.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	114.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	66.1	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	102.7		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	114.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	115.0		50-150	%	09-NOV-12	24-NOV-12	R2479079
L1235449-4 AS-33-LR (PUMP# 194950)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.453			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0477		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	117		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.0958		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	235		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0264		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	65		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-4 AS-33-LR (PUMP# 194950)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Benzo(ghi)perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0181		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	45		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.146		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	358		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0407		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	100		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	85.4		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	92.1		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	99.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	76.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	98.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	102.3		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	57.5	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	109.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	68.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	57.3	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	97.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	52.7	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	87.4		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	95.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	95.1		50-150	%	09-NOV-12	24-NOV-12	R2479079
L1235449-5 AS-35-EL (PUMP# 194999)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.267			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0913		0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	207		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.178		0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	404		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0320		0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	73		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-5 AS-35-EL (PUMP# 194999)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0195		0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	44		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.265		0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	601		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0359		0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	81		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	93.7		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	102.2		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	114.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	77.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	106.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	111.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	53.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	118.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	70.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	57.6	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	108.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	62.6	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	93.8		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	104.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	110.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
L1235449-6 AS-35-SM (PUMP# 194725)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.454			m3		28-NOV-12	R2486948

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-6 AS-35-SM (PUMP# 194725)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
1-Methyl Naphthalene	0.114		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	279		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.231		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	566		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0334		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	82		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0192		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	47		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.351		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	862		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0306		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	75		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	92.5		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	101.2		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	109.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	79.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	106.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	112.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	51.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	119.0		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	73.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	56.2	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	105.9		50-150	%	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-6 AS-35-SM (PUMP# 194725)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Surrogate: Indeno(1,2,3,cd)pyrene-D12	56.3	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	91.9		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	104.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	104.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
L1235449-7 AS-35-01 (PUMP# 194720)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.471			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.145		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	359		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.297		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	733		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0350		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	87		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	0.0510		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	126		10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene UJ - SUR<LCL	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene UJ - SUR<LCL	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene UJ - SUR<LCL	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene UJ - SUR<LCL	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0230		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	57		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.389		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	961		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0510		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	126		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	84.3		30-150	%	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-7 AS-35-01 (PUMP# 194720)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Surrogate: Acenaphthylene d8	89.9		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	99.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	68.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	95.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	92.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	43.4	G	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	111.3		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	62.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	41.0	G	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	96.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	43.6	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	84.5		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	89.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	95.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Note: The recovery of selected surrogates are below method control. The associated targets are not detected in the sample therefore no negative impact to data quality.							
L1235449-8 AS-35-02 (PUMP# 194952)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.414			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.109		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	262		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.221		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	533		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0286		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	69		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	0.0447		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	108		10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene UJ - SUR<LCL	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene UJ - SUR<LCL	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-8 AS-35-02 (PUMP# 194952)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Fluorene	0.0195		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	47		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.298		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	719		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0439		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	106		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	92.3		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	98.7		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	107.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	76.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	104.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	107.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	48.8	G	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	114.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	70.3		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	46.2	G	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	104.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	52.5	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	94.2		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	100.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	103.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Note: The recovery of selected surrogates are below method control. The associated targets are not detected in the sample therefore no negative impact to data quality.							
L1235449-9 AS-35-EE (PUMP# 194950)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.474			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0060		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	15		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.0108		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	27		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0249		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	62		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-9 AS-35-EE (PUMP# 194950)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0172		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	43		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.0151		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	37		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0428		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	106		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	99.6		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	106.6		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	118.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	82.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	111.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	112.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	57.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	134.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	75.0		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	52.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	114.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	62.4	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	101.2		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	110.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	113.2		50-150	%	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-1 AS-35-EL (PUMP#308012E)							
Sampled By: CLIENT on 02-OCT-12 @ 08:20							
Matrix: PUF/XAD							
Miscellaneous Parameters							
Air volume	2.850887			m3		30-OCT-12	R2465326
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0803		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene	229		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	0.152		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	432		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	0.0379		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	108		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene	0.0212		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene	61		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene	0.262		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene	746		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene UJ - SUR<LCL	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	0.0350		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	100		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10	70.9		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8	58.5		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10	80.5		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12	33.4	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12	54.4		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12	60.4		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12	46.0	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12	60.9	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12	33.3	G	50-150	%	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-1 AS-35-EL (PUMP#308012E)							
Sampled By: CLIENT on 02-OCT-12 @ 08:20							
Matrix: PUF/XAD							
CARB 429 PAH LR							
Surrogate: Dibenz(a,h)anthracene-D14	43.8	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10	61.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12	46.8	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8	71.1		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12	48.0	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10	85.3		50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-2 AS-35-01 (PUMP#308013)							
Sampled By: CLIENT on 02-OCT-12 @ 08:38							
Matrix: PUF/XAD							
Miscellaneous Parameters							
Air volume	3.72864			m3		30-OCT-12	R2465326
CARB 429 PAH LR							
1-Methyl Naphthalene	0.140		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene	522		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	0.276		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	1030		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	0.0300		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	112		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene UJ - SUR<LCL	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<0.0027		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<10		10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene	0.0189		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene	70		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene	0.421		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene	1570		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	0.0260		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	97		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-2 AS-35-01 (PUMP#308013)							
Sampled By: CLIENT on 02-OCT-12 @ 08:38							
Matrix: PUF/XAD							
CARB 429 PAH LR							
Pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10	80.2		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8	76.9		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10	98.2		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12	45.4	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12	66.1		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12	71.1		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12	51.2		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12	81.0	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12	44.4	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14	51.9	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10	77.2		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12	60.5	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8	76.8		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12	55.3		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10	104.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-3 AS-35-02 (PUMP#308011)							
Sampled By: CLIENT on 02-OCT-12 @ 08:49							
Matrix: PUF/XAD							
Miscellaneous Parameters							
Air volume	2.19072			m3		30-OCT-12	R2465326
CARB 429 PAH LR							
1-Methyl Naphthalene	0.134		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene	293		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	0.267		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	586		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	0.0444		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	97		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene	0.0289		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-3 AS-35-02 (PUMP#308011)							
Sampled By: CLIENT on 02-OCT-12 @ 08:49							
Matrix: PUF/XAD							
CARB 429 PAH LR							
Fluorene	63		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene	0.444		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene	972		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene UJ - SUR<LCL	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	0.0421		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	92		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10	74.9		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8	67.7		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10	84.3		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12	38.7	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12	50.0		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12	61.2		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12	50.4	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12	60.4	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12	38.8	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14	49.1	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10	70.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12	53.3	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8	70.6		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12	36.9	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10	92.8		50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-4 AS-35-SM (PUMP#308014)							
Sampled By: CLIENT on 02-OCT-12 @ 09:01							
Matrix: PUF/XAD							
Miscellaneous Parameters							
Air volume	2.666517			m3		30-OCT-12	R2465326
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0900		0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene	240		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	0.181		0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	482		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	0.0280	M	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	75	M	10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene UJ - SUR<LCL	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-4 AS-35-SM (PUMP#308014)								
Sampled By: CLIENT on 02-OCT-12 @ 09:01								
Matrix: PUF/XAD								
CARB 429 PAH LR								
Benzo(ghi)perylene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene		<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene	UJ - SUR<LCL	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene	UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene		<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene		<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene		0.0230	M	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene		61	M	10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene		<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene		0.322		0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene		858		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene	UJ - SUR<LCL	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene	UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene		0.0289		0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene		77		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene		<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10		73.9		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8		64.8		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10		90.1		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12		41.5	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12		58.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12		67.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12		48.7	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12		60.2		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12		44.8	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14		51.8	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10		77.9		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12		51.3	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8		75.3		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12		46.4	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10		92.4		50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-5 AS-35-EE (PUMP#308002E)								
Sampled By: CLIENT on 02-OCT-12 @ 09:20								
Matrix: PUF/XAD								
Miscellaneous Parameters								
Air volume		2.41274			m3		30-OCT-12	R2465326
CARB 429 PAH LR								
1-Methyl Naphthalene		0.0111		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene		27		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene		0.0221		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene		53		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene		0.0311		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene		75		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-5 AS-35-EE (PUMP#308002E)							
Sampled By: CLIENT on 02-OCT-12 @ 09:20							
Matrix: PUF/XAD							
CARB 429 PAH LR							
Anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene	0.0185		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene	45		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene	0.0423		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene	102		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	0.0330		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	80		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10	92.8		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8	82.3		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10	109.1		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12	47.2	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12	51.2		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12	62.3		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12	43.0	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12	54.4	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12	49.2	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14	42.2	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10	89.9		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12	47.9	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8	88.7		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12	40.2	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10	118.0		50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-6 AS-37-OF (PUMP#308013)							
Sampled By: CLIENT on 03-OCT-12 @ 08:05							
Matrix: PUF/XAD							
Miscellaneous Parameters							
Air volume	3.72864			m3		30-OCT-12	R2465326

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-6 AS-37-OF (PUMP#308013)								
Sampled By: CLIENT on 03-OCT-12 @ 08:05								
Matrix: PUF/XAD								
CARB 429 PAH LR								
1-Methyl Naphthalene		0.319		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene		1190		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene		0.646		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene		2410		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene		0.0496		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene		185		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene		0.0040		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene		15		10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene		<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	UJ - SUR<LCL	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene		<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene		<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene		<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	UJ - SUR<LCL	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene		<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene	UJ - SUR<LCL	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene		<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene		0.0033		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene		12		10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene		0.0325		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene		121		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene		<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene	J - LR	1.32	[E]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene	J - LR	4910	[E]	10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene		0.0034		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene		13		10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene		0.0547		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene		204		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene		0.0031		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene		11		10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10		74.6		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8		60.1		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10		94.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12		47.5	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12		57.0		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12		74.5		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12		48.7	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12		62.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12		48.3	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14		46.5	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10		78.5		50-150	%	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-6 AS-37-OF (PUMP#308013)							
Sampled By: CLIENT on 03-OCT-12 @ 08:05							
Matrix: PUF/XAD							
CARB 429 PAH LR							
Surrogate: Indeno(1,2,3,cd)pyrene-D12	55.4	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8	75.2		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12	51.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10	101.9		50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-7 AS-38-OF (PUMP#308012E)							
Sampled By: CLIENT on 03-OCT-12 @ 08:15							
Matrix: PUF/XAD							
Miscellaneous Parameters							
Air volume	2.84496			m3		30-OCT-12	R2465326
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0311		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene	88		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	0.0622		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	177		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	0.0335		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	95		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene UJ - SUR<LCL	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	0.0046		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	13		10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene	0.0289		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene	82		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene	0.668		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene	1900		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	0.0552		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	157		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10	92.6		30-150	%	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-7 AS-38-OF (PUMP#308012E)							
Sampled By: CLIENT on 03-OCT-12 @ 08:15							
Matrix: PUF/XAD							
CARB 429 PAH LR							
Surrogate: Acenaphthylene d8	88.5		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10	125.7	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12	44.8	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12	71.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12	84.5		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12	57.0		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12	66.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12	45.8	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14	50.5		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10	95.0		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12	63.6	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8	89.2		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12	62.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10	138.8	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-8 AS-38-AM (PUMP#308011)							
Sampled By: CLIENT on 03-OCT-12 @ 08:25							
Matrix: PUF/XAD							
Miscellaneous Parameters							
Air volume	2.19072			m3		30-OCT-12	R2465326
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0163		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene	36		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	0.0342		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	75		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	0.0293		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	64		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	0.0090		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	20		10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene	0.0200		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene	44		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-8	AS-38-AM (PUMP#308011)							
Sampled By:	CLIENT on 03-OCT-12 @ 08:25							
Matrix:	PUF/XAD							
CARB 429 PAH LR								
Indeno(1,2,3 cd)pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene		0.781		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene		1710		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene		0.0056		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene		12		10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene		0.0350		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene		77		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene		<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10		100.1		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8		91.5		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10		146.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12		67.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12		82.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12		100.3		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12		72.2		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12		90.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12		67.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14		72.5		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10		100.0		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12		84.1	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8		97.1		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12		91.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10		145.3		50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-9	AS-33-LR (PUMP#308002E)							
Sampled By:	CLIENT on 03-OCT-12 @ 20:58							
Matrix:	PUF/XAD							
Miscellaneous Parameters								
Air volume		2.45262			m3		30-OCT-12	R2465326
CARB 429 PAH LR								
1-Methyl Naphthalene		0.0384		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene		94		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene		0.0779		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene		191		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene		0.0285		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene		70		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-9 AS-33-LR (PUMP#308002E)							
Sampled By: CLIENT on 03-OCT-12 @ 20:58							
Matrix: PUF/XAD							
CARB 429 PAH LR							
Benzo(k)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene	0.0218		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene	53		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene	0.162		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene	398		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	0.0403		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	99		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10	83.4		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8	76.3		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10	126.8		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12	39.5	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12	66.8		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12	70.1		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12	48.1	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12	60.1		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12	44.2	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14	45.9	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10	81.4		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12	58.9	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8	79.1		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12	55.3		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10	128.5		50-150	%	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1219965-1 AS-37-OF (CANISTER #241) (FLOW CONTROLLER #00532)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	14.2		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	4.40		0.64	ug/m3		09-OCT-12	R2454333
Benzene	1.38		0.20	ppb		09-OCT-12	R2454333
Toluene	112		0.75	ug/m3		09-OCT-12	R2454333
Toluene	29.8		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	7.24		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	1.67		0.20	ppb		09-OCT-12	R2454333
Xylenes	39.9		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	9.21		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	165		30	ug/m3		09-OCT-12	R2454333
F2	174		30	ug/m3		09-OCT-12	R2454333
L1219965-2 AS-38-OF (CANISTER #326) (FLOW CONTROLLER #01381)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	14.2		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	<0.64		0.64	ug/m3		09-OCT-12	R2454333
Benzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Toluene	28.9		0.75	ug/m3		09-OCT-12	R2454333
Toluene	7.68		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	<0.87		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Xylenes	<2.6		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	<0.60		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	<30		30	ug/m3		09-OCT-12	R2454333
F2	<30		30	ug/m3		09-OCT-12	R2454333
L1219965-3 AS-38-AM (CANISTER #238) (FLOW CONTROLLER #00536)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	9.2		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	<0.64		0.64	ug/m3		09-OCT-12	R2454333
Benzene	0.20		0.20	ppb		09-OCT-12	R2454333
Toluene	26.8		0.75	ug/m3		09-OCT-12	R2454333
Toluene	7.12		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	<0.87		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Xylenes	<2.6		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	<0.60		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	<30		30	ug/m3		09-OCT-12	R2454333
F2	<30		30	ug/m3		09-OCT-12	R2454333
L1219965-4 AS-37-LR (CANISTER #ED01545) (FLOW CONTROLLER #01369)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	12.4		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1219965-4 AS-37-LR (CANISTER #ED01545) (FLOW CONTROLLER #01369)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	<0.64		0.64	ug/m3		09-OCT-12	R2454333
Benzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Toluene	107		0.75	ug/m3		09-OCT-12	R2454333
Toluene	28.4		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	<0.87		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Xylenes	<2.6		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	<0.60		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	<30		30	ug/m3		09-OCT-12	R2454333
F2	<30		30	ug/m3		09-OCT-12	R2454333
L1219965-5 AS-35-EL (CANISTER #325) (FLOW CONTROLLER #00536)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	2.6		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	<0.64		0.64	ug/m3		09-OCT-12	R2454333
Benzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Toluene	1.24		0.75	ug/m3		09-OCT-12	R2454333
Toluene	0.33		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	<0.87		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Xylenes	<2.6		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	<0.60		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	<30		30	ug/m3		09-OCT-12	R2454333
F2	<30		30	ug/m3		09-OCT-12	R2454333
L1219965-6 AS-35-SM (CANISTER #00107) (FLOW CONTROLLER #01369)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	12.6		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	1.88		0.64	ug/m3		09-OCT-12	R2454333
Benzene	0.59		0.20	ppb		09-OCT-12	R2454333
Toluene	85.8		0.75	ug/m3		09-OCT-12	R2454333
Toluene	22.8		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	1.43		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	0.33		0.20	ppb		09-OCT-12	R2454333
Xylenes	5.5		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	1.27		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	<30		30	ug/m3		09-OCT-12	R2454333
F2	<30		30	ug/m3		09-OCT-12	R2454333
L1219965-7 AS-35-02 (CANISTER #220) (FLOW CONTROLLER #00340)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	14.5		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	3.45		0.64	ug/m3		09-OCT-12	R2454333
Benzene	1.08		0.20	ppb		09-OCT-12	R2454333

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1219965-7 AS-35-02 (CANISTER #220) (FLOW CONTROLLER #00340)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Toluene	160		0.75	ug/m3		09-OCT-12	R2454333
Toluene	42.4		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	2.08		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	0.48		0.20	ppb		09-OCT-12	R2454333
Xylenes	8.5		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	1.97		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	45		30	ug/m3		09-OCT-12	R2454333
F2	<30		30	ug/m3		09-OCT-12	R2454333
L1219965-8 AS-35-EE (CANISTER #1187) (FLOW CONTROLLER #02500)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	15		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	1.02		0.64	ug/m3		09-OCT-12	R2454333
Benzene	0.32		0.20	ppb		09-OCT-12	R2454333
Toluene	97.2		0.75	ug/m3		09-OCT-12	R2454333
Toluene	25.8		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	<0.87		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Xylenes	<2.6		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	<0.60		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	<30		30	ug/m3		09-OCT-12	R2454333
F2	<30		30	ug/m3		09-OCT-12	R2454333
L1219965-9 AS-35-01 (CANISTER #205) (FLOW CONTROLLER #00550)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	14.5		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	3.92		0.64	ug/m3		09-OCT-12	R2454333
Benzene	1.23		0.20	ppb		09-OCT-12	R2454333
Toluene	1900	DLA	6.0	ug/m3		09-OCT-12	R2454333
Toluene	504	DLA	1.6	ppb		09-OCT-12	R2454333
Ethylbenzene	3.08		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	0.71		0.20	ppb		09-OCT-12	R2454333
Xylenes	13.0		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	3.00		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	349	DLA	60	ug/m3		09-OCT-12	R2454333
F2	<60	DLA	60	ug/m3		09-OCT-12	R2454333

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-1 AS-35-EL (CANISTER#00123)							
Sampled By: CLIENT on 10-JUL-12 @ 16:56							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	1.56		0.64	ug/m3		02-AUG-12	R2412138
Benzene	0.49		0.20	ppb		02-AUG-12	R2412138
Toluene	3.65		0.75	ug/m3		02-AUG-12	R2412138
Toluene	0.97		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	0.95		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	0.22		0.20	ppb		02-AUG-12	R2412138
Xylenes	2.7		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	0.63		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	48		30	ug/m3		02-AUG-12	R2412138
F2	<30		30	ug/m3		02-AUG-12	R2412138
L1179112-2 AS-35-EE (CANISTER#213 REG#00661)							
Sampled By: CLIENT on 10-JUL-12 @ 17:30							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	2.36		0.64	ug/m3		02-AUG-12	R2412138
Benzene	0.74		0.20	ppb		02-AUG-12	R2412138
Toluene	73.1		0.75	ug/m3		02-AUG-12	R2412138
Toluene	19.4		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	11.1		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	2.55		0.20	ppb		02-AUG-12	R2412138
Xylenes	27.7		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	6.39		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	7890	DLA	120	ug/m3		02-AUG-12	R2412138
F2	20700	DLA	120	ug/m3		02-AUG-12	R2412138
L1179112-3 AS-35-02 (CANISTER#00130 REG#02507)							
Sampled By: CLIENT on 10-JUL-12 @ 17:14							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	1.50		0.64	ug/m3		02-AUG-12	R2412138
Benzene	0.47		0.20	ppb		02-AUG-12	R2412138
Toluene	8.01		0.75	ug/m3		02-AUG-12	R2412138
Toluene	2.13		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	2.04		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	0.47		0.20	ppb		02-AUG-12	R2412138
Xylenes	9.5		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	2.18		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	<30		30	ug/m3		02-AUG-12	R2412138
F2	<30		30	ug/m3		02-AUG-12	R2412138
L1179112-4 AS-35-SM (CANISTER#00113 REG#01362)							
Sampled By: CLIENT on 10-JUL-12 @ 16:40							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	1.31		0.64	ug/m3		02-AUG-12	R2412138
Benzene	0.41		0.20	ppb		02-AUG-12	R2412138
Toluene	6.58		0.75	ug/m3		02-AUG-12	R2412138
Toluene	1.75		0.20	ppb		02-AUG-12	R2412138

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-4 AS-35-SM (CANISTER#00113 REG#01362)							
Sampled By: CLIENT on 10-JUL-12 @ 16:40							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Ethylbenzene	2.43		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	0.56		0.20	ppb		02-AUG-12	R2412138
Xylenes	9.8		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	2.26		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	51		30	ug/m3		02-AUG-12	R2412138
F2	<30		30	ug/m3		02-AUG-12	R2412138
L1179112-5 AS-38-OF (CANISTER#346 REG#01362)							
Sampled By: CLIENT on 11-JUL-12 @ 16:18							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	3.19		0.64	ug/m3		02-AUG-12	R2412138
Benzene	1.00		0.20	ppb		02-AUG-12	R2412138
Toluene	14.6		0.75	ug/m3		02-AUG-12	R2412138
Toluene	3.88		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	<0.87		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	<0.20		0.20	ppb		02-AUG-12	R2412138
Xylenes	<2.6		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	<0.60		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	<30		30	ug/m3		02-AUG-12	R2412138
F2	<30		30	ug/m3		02-AUG-12	R2412138
L1179112-6 AS-33-01 (CANISTER#00134 REG#02505)							
Sampled By: CLIENT on 11-JUL-12 @ 16:18							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	4.53		0.64	ug/m3		02-AUG-12	R2412138
Benzene	1.42		0.20	ppb		02-AUG-12	R2412138
Toluene	9.37		0.75	ug/m3		02-AUG-12	R2412138
Toluene	2.49		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	4.90		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	1.13		0.20	ppb		02-AUG-12	R2412138
Xylenes	24.6		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	5.68		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	70		30	ug/m3		02-AUG-12	R2412138
F2	106		30	ug/m3		02-AUG-12	R2412138
L1179112-7 AS-38-AM (CANISTER#330, REG#02505)							
Sampled By: CLIENT on 11-JUL-12 @ 16:34							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	<0.64		0.64	ug/m3		02-AUG-12	R2412138
Benzene	<0.20		0.20	ppb		02-AUG-12	R2412138
Toluene	1.32		0.75	ug/m3		02-AUG-12	R2412138
Toluene	0.35		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	<0.87		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	<0.20		0.20	ppb		02-AUG-12	R2412138
Xylenes	<2.6		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	<0.60		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	53		30	ug/m3		02-AUG-12	R2412138

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-7 AS-38-AM (CANISTER#330, REG#02505)							
Sampled By: CLIENT on 11-JUL-12 @ 16:34							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
F2	<30		30	ug/m3		02-AUG-12	R2412138
L1179112-8 AS-37-01 (CANISTER#220)							
Sampled By: CLIENT on 11-JUL-12 @ 16:08							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	23.6		0.64	ug/m3		02-AUG-12	R2412138
Benzene	7.40		0.20	ppb		02-AUG-12	R2412138
Toluene	363		0.75	ug/m3		02-AUG-12	R2412138
Toluene	96.5		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	49.4		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	11.4		0.20	ppb		02-AUG-12	R2412138
Xylenes	280		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	64.7		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	1230		30	ug/m3		02-AUG-12	R2412138
F2	589		30	ug/m3		02-AUG-12	R2412138
L1179112-9 AS-35-01 (CANISTER#00136 REG#00700)							
Sampled By: CLIENT on 11-JUL-12 @ 16:49							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	2.68		0.64	ug/m3		02-AUG-12	R2412138
Benzene	0.84		0.20	ppb		02-AUG-12	R2412138
Toluene	6.21		0.75	ug/m3		02-AUG-12	R2412138
Toluene	1.65		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	1.52		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	0.35		0.20	ppb		02-AUG-12	R2412138
Xylenes	6.2		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	1.43		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	<30		30	ug/m3		02-AUG-12	R2412138
F2	<30		30	ug/m3		02-AUG-12	R2412138
L1179112-10 AS-37-01 (2768703134)							
Sampled By: CLIENT on 10-JUL-12 @ 18:12							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	9800			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	0.0000088		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	0.086		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-10 AS-37-01 (2768703134)							
Sampled By: CLIENT on 10-JUL-12 @ 18:12							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	0.0000073		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	0.072		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.00054	B>10%F	0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	3.87		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	1.44		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	0.000010		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	0.101		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-11 AS-38-OF (2768703142)							
Sampled By: CLIENT on 10-JUL-12 @ 18:43							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	10100			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-11 AS-38-OF (2768703142)							
Sampled By: CLIENT on 10-JUL-12 @ 18:43							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.000079	B>10%F	0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	0.602		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.192		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-12 AS-38-AM (2768703135)							
Sampled By: CLIENT on 10-JUL-12 @ 18:54							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	10000			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	0.000010		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	0.101		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-12 AS-38-AM (2768703135)							
Sampled By: CLIENT on 10-JUL-12 @ 18:54							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	0.0000059		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	0.059		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.000025	B>10%F	0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	0.178		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.074		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	0.0000095		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	0.095		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-13 AS-37-01 (2768703140)							
Sampled By: CLIENT on 11-JUL-12 @ 02:58							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	10160			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-13 AS-37-01 (2768703140)							
Sampled By: CLIENT on 11-JUL-12 @ 02:58							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.00017	B>10%F	0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	1.29		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.444		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-14 AS-35-SM (2768703137)							
Sampled By: CLIENT on 11-JUL-12 @ 17:21							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	9600			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	0.000014		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	0.136		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-14 AS-35-SM (2768703137)							
Sampled By: CLIENT on 11-JUL-12 @ 17:21							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.00030	B>10%F	0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	2.15		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.706		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-15 AS-35-E2 (2768703139)							
Sampled By: CLIENT on 11-JUL-12 @ 17:33							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	10000			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-15 AS-35-E2 (2768703139)							
Sampled By: CLIENT on 11-JUL-12 @ 17:33							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.000059	B>10%F	0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	0.455		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.134		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-16 AS-35-02 (2768703138)							
Sampled By: CLIENT on 11-JUL-12 @ 17:57							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	10000			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-16 AS-35-02 (2768703138)							
Sampled By: CLIENT on 11-JUL-12 @ 17:57							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.00018	B>10%F	0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	1.45		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.342		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-17 AS-35-01 (2768703136)							
Sampled By: CLIENT on 12-JUL-12 @ 15:25							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	10000			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-17 AS-35-01 (2768703136)							
Sampled By: CLIENT on 12-JUL-12 @ 15:25							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.00013	B>10%F	0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	0.909		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.376		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-19 AS-35-EE (2768703141)							
Sampled By: CLIENT on 12-JUL-12 @ 15:56							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	10200			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-19 AS-35-EE (2768703141)							
Sampled By: CLIENT on 12-JUL-12 @ 15:56							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.000057	B>10%F	0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	0.434		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.149		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

Attachment 2 – Standard Operating Procedures

Standard Operating Procedure for Indoor Air Sampling at Sutherland Avenue Former Manufactured Gas Plant

1.0 INTRODUCTION

The objective of the Standard Operating Procedure (SOP) is to describe the equipment and techniques used in the collection of Integrated Sampling using Summa canisters for sampling of Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) and using area sample pumps and polyurethane foam (PUF) tubes for sampling of Polycyclic Aromatic Hydrocarbons (PAHs) at the Manitoba Hydro Sutherland Avenue Former Manufactured Gas Plant in Winnipeg, Manitoba.

2.0 SAMPLING LOCATIONS

A total of 9 sampling locations are recommended for the Air Quality Monitoring Program. The following is a list of the MB Hydro Sutherland Avenue Former Manufactured Gas Plant indoor air quality sampling locations for BTEX and PAH_{16}:

35 Sutherland

- South Mechanical Room (basement)
  - On the floor beside the sump, which represents a 'worst case' scenario and preferential pathway.
- Beside Elevator (basement)
  - On the floor where wall and floor converge.
- Elevator pit
  - Via exterior ventilation tube on northeast corner of the building
- First Floor
  - At breathing height between 3 and 5 feet
- Second Floor within stairwell (opposite side of building as First Floor sample)
  - At breathing zone height between 3 and 5 feet

Note: If the stairwells open to the outside environment, there is some concern that opening of doors to the outside will 'ventilate' the stairwells and potentially dilute chemicals within the indoor air. Other sampling locations should be considered within actual office space (breathing zone) on the First and Second Floors rather than the stairwells, as this is most representative of air that will be inhaled by the staff.

38 Sutherland

- Inside office area (west side of building)
  - At breathing zone height between 3 and 5 feet

33 Sutherland

- Lunchroom (away from garage/vehicle maintenance activities)
  - This sample should be collected from the breathing zone and from as far away from the door to the garage as possible. It will be difficult to collect a representative sample from this location due to the number of potential confounders (for example, cleaning agents, vehicle exhaust, and so on). It may be necessary to collect this sample at night or over the weekend when the HVAC can be shutdown and the lunchroom door closed (for the entire duration of sampling).

37 Sutherland (Stores)

- Inside office area (west end of building, away from hazardous materials storage areas)
  - At breathing zone height between 3 and 5 feet

Ambient Outdoor Air Sample

At least one ambient outdoor (upwind) air sample should be collected during the air quality monitoring and ensure that there are no confounding factors near the sampling location, such as building exhaust fans, idling vehicles, etc. This will provide reference concentrations to which the indoor air samples can be compared.

3.0 SAMPLING EQUIPMENT

Summa Canisters (BTEX)

Integrated Sampling for indoor air samples of BTEX is to be conducted using specially prepared (cleaned and certified) 6 L Summa canisters. The air flow into the canister is regulated by a pneumatic flow control attached to an in-line particulate filter. The flow controller will be precalibrated by ALS Laboratory Group in Edmonton, Alberta for a sample collection time of 8 hours.

A vacuum gauge is used to measure and record the initial canister vacuum. The initial canister vacuum should be at least -25 inches of mercury (in HG). If the initial vacuum is less than -25 in Hg, the canister should be rejected and returned to the laboratory.

The canister vacuum will be affected if there is a significant difference between the altitude of the laboratory and the sampling site. Generally, a 1,000 ft elevation difference corresponds to 1-inch of vacuum (air pressure decreases with elevation). The laboratory must be notified when preparing the Summa canister so they can account for any elevation differences (the elevation of Winnipeg is approximately 240 masl).

Area Sampling Pumps (PAH_{16})

Indoor air samples of PAH_{16} are to be collected on polyurethane foam (PUF) tubes using an area sampling pump capable of 20 L/min flow rate. The pumps will be precalibrated by ALS Laboratory Group in Edmonton, Alberta.

4.0 BUILDING ASSESSMENT

A building assessment should be completed before sampling to obtain current information on each structure from which the sample is collected. The building review in included on the attached Indoor Air Sampling Form (Attachment 1) and includes a list of potential VOC containing products and source(s).

An effort should be made to remove all potential confounding factors from the vicinity of the sampling devices, including cleaning products, paints, cooking appliances (for example, stovetops), personal care products, and so on.

5.0 PRELIMINARY SCREENING

Preliminary screening of the sampling area may be conducted using a photoionization detector (PID) and/or a combustible gas indicator (methane). Screening will be conducted in the centre of the room away from obstructions in the breathing zone, near potential sources, basements and crawl spaces. Screening equipment is to be checked and calibrated according to manufacturers' specifications.

6.0 SAMPLING PROCEDURES

Simultaneously sampling using two separate instruments for BTEX and PAHs is not recommended as the pump used for the PAH sampling flows at 20 L/min and is likely to change the indoor air conditions. For this reason, BTEX and PAH sampling should be completed at separate times.

Summa Canisters (BTEX)

Specific instructions and/or diagrams for system assembly, if any, are obtained from the laboratory supplying the canisters. Record the local outdoor temperature, relative humidity and barometric pressure on the Indoor Air Sampling Form (Attachment 1).

In general assembly of the sampling apparatus, sample collection and documentations should be performed as follows:

- Verify the initial vacuum of the canister by confirming that the valve is closed (knob should already be tightened clockwise). Remove the brass cap. Attach the gauge and attach the brass cap to side of gauge tee fitting to ensure closed train. Open valve for a few seconds and then close. Read vacuum on gauge and record on the Indoor Air Sampling Form. Verify the canister valve is closed and remove gauge.
- Connect the flow controller, with attached in-line filter and vacuum gauge, to the canister utilizing the compression fitting.
- Connect a sampling tube (if used) to the sample inlet on the filter.
- Place the canister in the predetermined location and begin sampling by turning the canister valve counter-clockwise 1 full turn or as specified by the laboratory instructions.
- Record sample number, location, date, flow controller and canister serial numbers and start time on the identification tag attached to the canister and the Indoor Air Sampling Form.
- Monitor the integrated sampling process at regular intervals. The volume of air sampled is a linear function of the canister volume. For example, halfway (4 hours) into the sampling event, the canister should be half filled (3 L) and the gauge should read approximately 15 in Hg (note: the sampling flow rate isn't linear over time; it starts out a bit faster as there is a greater vacuum in the canister and slows down as the canister fills; therefore, it would be a rare case that the canister would actually read -15" Hg halfway through sampling, but should be close to this).

- After sampling is complete, close the canister valve by turning it clockwise 1 turn or as specified by the laboratory instructions. Record the end time and final canister vacuum on the canister identification tag and the Indoor

Air Sampling Form. Do not over tighten the valves or compression fittings.

- Package the canisters and flow controllers in the laboratory provided shipping container and transport to the laboratory under chain-of-custody protocol. Some residual vacuum, ideally approximately -2 to -5 “Hg so that this residual vacuum can be confirmed by the lab upon receipt of the canister to show that the canister didn’t leak during shipment.

Area Sampling Pumps (PAH_{16})

Specific instructions and/or diagrams for system assembly, if any, are obtained from the laboratory or the rental company supplying the pumps. The area sampling pumps should be set up in the sample locations as the Summa canisters.

In general, assembly of the sampling apparatus, sample collection and documentations should be performed as follows:

- Verify that the area sampling pump is calibrated to sample at 20 L/min.
- Connect the area sampling pump to the PUF tube and sampling tube (if used).
- Place the pump in the predetermined location and begin sampling by turning the pump on.
- Record sample number, locations, date, tube serial number and start time in field book.
- Monitoring the area sampling pump on a regular basis to insure that the pump is continuously working. Sample volume for PAHs is approximately 10,000 L, therefore pumps should run for 8.3 hours.
- After sampling time is complete, turn off the pump. Record the end time in the field book. Remove sampling tube from pump.
- Package the sample tube in the laboratory provided shipping container and transport to the laboratory under chain-of-custody protocol.

Clean Sampling Protocols

Clean sampling protocols shall apply to the air quality monitoring program, including the storage and handling of all sample containers and equipment used. Disposal gloves shall be used when handling all samples, with a new pair of gloves used for each sample. Specially prepared Summa cannisters (cleaned and certified) and PUF tubes are supplied by the laboratory. Sampling personnel should not smoke, use sharpie markers, or wear perfumes or dry cleaned clothing during sampling. The canisters should not be stored or transported with gas powered equipment.

4.0 SAMPLE ANALYSES

In general, the laboratory analytical method for analyzing BTEX collected with Summa cannisters is the USEPA Method TO-15 and the analytical method for analysing PAH_{16} collected with PUF tubes is USEPA IP-7.

Standard Operating Procedure for Indoor Air Sampling at Sutherland Avenue Former Manufactured Gas Plant

1.0 INTRODUCTION

The objective of the Standard Operating Procedure (SOP) is to describe the equipment and techniques used in the collection of Integrated Sampling using Summa canisters for sampling of Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) and using area sample pumps and polyurethane foam (PUF) tubes for sampling of Polycyclic Aromatic Hydrocarbons (PAHs) at the Manitoba Hydro Sutherland Avenue Former Manufactured Gas Plant in Winnipeg, Manitoba.

2.0 SAMPLING LOCATIONS

A total of 9 sampling locations are recommended for the Air Quality Monitoring Program. The following is a list of the MB Hydro Sutherland Avenue Former Manufactured Gas Plant indoor air quality sampling locations for BTEX and PAH_{16}:

35 Sutherland

- South Mechanical Room (basement)
  - On the floor beside the sump, which represents a 'worst case' scenario and preferential pathway.
- Beside Elevator (basement)
  - On the floor where wall and floor converge.
- Elevator pit
  - Via exterior ventilation tube on northeast corner of the building
- First Floor
  - At breathing height between 3 and 5 feet
- Second Floor within stairwell (opposite side of building as First Floor sample)
  - At breathing zone height between 3 and 5 feet

Note: If the stairwells open to the outside environment, there is some concern that opening of doors to the outside will 'ventilate' the stairwells and potentially dilute chemicals within the indoor air. Other sampling locations should be considered within actual office space (breathing zone) on the First and Second Floors rather than the stairwells, as this is most representative of air that will be inhaled by the staff.

38 Sutherland

- Inside office area (west side of building)
  - At breathing zone height between 3 and 5 feet

33 Sutherland

- Lunchroom (away from garage/vehicle maintenance activities)
  - This sample should be collected from the breathing zone and from as far away from the door to the garage as possible. It will be difficult to collect a representative sample from this location due to the number of potential confounders (for example, cleaning agents, vehicle exhaust, and so on). It may be necessary to collect this sample at night or over the weekend when the HVAC can be shutdown and the lunchroom door closed (for the entire duration of sampling).

37 Sutherland (Stores)

- Inside office area (west end of building, away from hazardous materials storage areas)
  - At breathing zone height between 3 and 5 feet

Ambient Outdoor Air Sample

At least one ambient outdoor (upwind) air sample should be collected during the air quality monitoring and ensure that there are no confounding factors near the sampling location, such as building exhaust fans, idling vehicles, etc. This will provide reference concentrations to which the indoor air samples can be compared.

3.0 SAMPLING EQUIPMENT

Summa Canisters (BTEX)

Integrated Sampling for indoor air samples of BTEX is to be conducted using specially prepared (cleaned and certified) 6 L Summa canisters. The air flow into the canister is regulated by a pneumatic flow control attached to an in-line particulate filter. The flow controller will be precalibrated by ALS Laboratory Group in Edmonton, Alberta for a sample collection time of 8 hours.

A vacuum gauge is used to measure and record the initial canister vacuum. The initial canister vacuum should be at least -25 inches of mercury (in HG). If the initial vacuum is less than -25 in Hg, the canister should be rejected and returned to the laboratory.

The canister vacuum will be affected if there is a significant difference between the altitude of the laboratory and the sampling site. Generally, a 1,000 ft elevation difference corresponds to 1-inch of vacuum (air pressure decreases with elevation). The laboratory must be notified when preparing the Summa canister so they can account for any elevation differences (the elevation of Winnipeg is approximately 240 masl).

Area Sampling Pumps (PAH_{16})

Indoor air samples of PAH_{16} are to be collected on polyurethane foam (PUF) tubes using an area sampling pump capable of 20 L/min flow rate. The pumps will be precalibrated by ALS Laboratory Group in Edmonton, Alberta.

4.0 BUILDING ASSESSMENT

A building assessment should be completed before sampling to obtain current information on each structure from which the sample is collected. The building review in included on the attached Indoor Air Sampling Form (Attachment 1) and includes a list of potential VOC containing products and source(s).

An effort should be made to remove all potential confounding factors from the vicinity of the sampling devices, including cleaning products, paints, cooking appliances (for example, stovetops), personal care products, and so on.

5.0 PRELIMINARY SCREENING

Preliminary screening of the sampling area may be conducted using a photoionization detector (PID) and/or a combustible gas indicator (methane). Screening will be conducted in the centre of the room away from obstructions in the breathing zone, near potential sources, basements and crawl spaces. Screening equipment is to be checked and calibrated according to manufacturers' specifications.

6.0 SAMPLING PROCEDURES

Simultaneously sampling using two separate instruments for BTEX and PAHs is not recommended as the pump used for the PAH sampling flows at 20 L/min and is likely to change the indoor air conditions. For this reason, BTEX and PAH sampling should be completed at separate times.

Summa Canisters (BTEX)

Specific instructions and/or diagrams for system assembly, if any, are obtained from the laboratory supplying the canisters. Record the local outdoor temperature, relative humidity and barometric pressure on the Indoor Air Sampling Form (Attachment 1).

In general assembly of the sampling apparatus, sample collection and documentations should be performed as follows:

- Verify the initial vacuum of the canister by confirming that the valve is closed (knob should already be tightened clockwise). Remove the brass cap. Attach the gauge and attach the brass cap to side of gauge tee fitting to ensure closed train. Open valve for a few seconds and then close. Read vacuum on gauge and record on the Indoor Air Sampling Form. Verify the canister valve is closed and remove gauge.
- Connect the flow controller, with attached in-line filter and vacuum gauge, to the canister utilizing the compression fitting.
- Connect a sampling tube (if used) to the sample inlet on the filter.
- Place the canister in the predetermined location and begin sampling by turning the canister valve counter-clockwise 1 full turn or as specified by the laboratory instructions.
- Record sample number, location, date, flow controller and canister serial numbers and start time on the identification tag attached to the canister and the Indoor Air Sampling Form.
- Monitor the integrated sampling process at regular intervals. The volume of air sampled is a linear function of the canister volume. For example, halfway (4 hours) into the sampling event, the canister should be half filled (3 L) and the gauge should read approximately 15 in Hg (note: the sampling flow rate isn't linear over time; it starts out a bit faster as there is a greater vacuum in the canister and slows down as the canister fills; therefore, it would be a rare case that the canister would actually read -15" Hg halfway through sampling, but should be close to this).

- After sampling is complete, close the canister valve by turning it clockwise 1 turn or as specified by the laboratory instructions. Record the end time and final canister vacuum on the canister identification tag and the Indoor

Air Sampling Form. Do not over tighten the valves or compression fittings.

- Package the canisters and flow controllers in the laboratory provided shipping container and transport to the laboratory under chain-of-custody protocol. Some residual vacuum, ideally approximately -2 to -5 “Hg so that this residual vacuum can be confirmed by the lab upon receipt of the canister to show that the canister didn’t leak during shipment.

Area Sampling Pumps (PAH_{16})

Specific instructions and/or diagrams for system assembly, if any, are obtained from the laboratory or the rental company supplying the pumps. The area sampling pumps should be set up in the sample locations as the Summa canisters.

In general, assembly of the sampling apparatus, sample collection and documentations should be performed as follows:

- Verify that the area sampling pump is calibrated to sample at 20 L/min.
- Connect the area sampling pump to the PUF tube and sampling tube (if used).
- Place the pump in the predetermined location and begin sampling by turning the pump on.
- Record sample number, locations, date, tube serial number and start time in field book.
- Monitoring the area sampling pump on a regular basis to insure that the pump is continuously working. Sample volume for PAHs is approximately 10,000 L, therefore pumps should run for 8.3 hours.
- After sampling time is complete, turn off the pump. Record the end time in the field book. Remove sampling tube from pump.
- Package the sample tube in the laboratory provided shipping container and transport to the laboratory under chain-of-custody protocol.

Clean Sampling Protocols

Clean sampling protocols shall apply to the air quality monitoring program, including the storage and handling of all sample containers and equipment used. Disposal gloves shall be used when handling all samples, with a new pair of gloves used for each sample. Specially prepared Summa cannisters (cleaned and certified) and PUF tubes are supplied by the laboratory. Sampling personnel should not smoke, use sharpie markers, or wear perfumes or dry cleaned clothing during sampling. The canisters should not be stored or transported with gas powered equipment.

4.0 SAMPLE ANALYSES

In general, the laboratory analytical method for analyzing BTEX collected with Summa cannisters is the USEPA Method TO-15 and the analytical method for analysing PAH_{16} collected with PUF tubes is USEPA IP-7.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-1 AS-35-EL (CANISTER#00123)							
Sampled By: CLIENT on 10-JUL-12 @ 16:56							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	1.56		0.64	ug/m3		02-AUG-12	R2412138
Benzene	0.49		0.20	ppb		02-AUG-12	R2412138
Toluene	3.65		0.75	ug/m3		02-AUG-12	R2412138
Toluene	0.97		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	0.95		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	0.22		0.20	ppb		02-AUG-12	R2412138
Xylenes	2.7		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	0.63		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	48		30	ug/m3		02-AUG-12	R2412138
F2	<30		30	ug/m3		02-AUG-12	R2412138
L1179112-2 AS-35-EE (CANISTER#213 REG#00661)							
Sampled By: CLIENT on 10-JUL-12 @ 17:30							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	2.36		0.64	ug/m3		02-AUG-12	R2412138
Benzene	0.74		0.20	ppb		02-AUG-12	R2412138
Toluene	73.1		0.75	ug/m3		02-AUG-12	R2412138
Toluene	19.4		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	11.1		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	2.55		0.20	ppb		02-AUG-12	R2412138
Xylenes	27.7		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	6.39		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	7890	DLA	120	ug/m3		02-AUG-12	R2412138
F2	20700	DLA	120	ug/m3		02-AUG-12	R2412138
L1179112-3 AS-35-02 (CANISTER#00130 REG#02507)							
Sampled By: CLIENT on 10-JUL-12 @ 17:14							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	1.50		0.64	ug/m3		02-AUG-12	R2412138
Benzene	0.47		0.20	ppb		02-AUG-12	R2412138
Toluene	8.01		0.75	ug/m3		02-AUG-12	R2412138
Toluene	2.13		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	2.04		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	0.47		0.20	ppb		02-AUG-12	R2412138
Xylenes	9.5		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	2.18		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	<30		30	ug/m3		02-AUG-12	R2412138
F2	<30		30	ug/m3		02-AUG-12	R2412138
L1179112-4 AS-35-SM (CANISTER#00113 REG#01362)							
Sampled By: CLIENT on 10-JUL-12 @ 16:40							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	1.31		0.64	ug/m3		02-AUG-12	R2412138
Benzene	0.41		0.20	ppb		02-AUG-12	R2412138
Toluene	6.58		0.75	ug/m3		02-AUG-12	R2412138
Toluene	1.75		0.20	ppb		02-AUG-12	R2412138

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-4 AS-35-SM (CANISTER#00113 REG#01362)							
Sampled By: CLIENT on 10-JUL-12 @ 16:40							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Ethylbenzene	2.43		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	0.56		0.20	ppb		02-AUG-12	R2412138
Xylenes	9.8		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	2.26		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	51		30	ug/m3		02-AUG-12	R2412138
F2	<30		30	ug/m3		02-AUG-12	R2412138
L1179112-5 AS-38-OF (CANISTER#346 REG#01362)							
Sampled By: CLIENT on 11-JUL-12 @ 16:18							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	3.19		0.64	ug/m3		02-AUG-12	R2412138
Benzene	1.00		0.20	ppb		02-AUG-12	R2412138
Toluene	14.6		0.75	ug/m3		02-AUG-12	R2412138
Toluene	3.88		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	<0.87		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	<0.20		0.20	ppb		02-AUG-12	R2412138
Xylenes	<2.6		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	<0.60		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	<30		30	ug/m3		02-AUG-12	R2412138
F2	<30		30	ug/m3		02-AUG-12	R2412138
L1179112-6 AS-33-01 (CANISTER#00134 REG#02505)							
Sampled By: CLIENT on 11-JUL-12 @ 16:18							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	4.53		0.64	ug/m3		02-AUG-12	R2412138
Benzene	1.42		0.20	ppb		02-AUG-12	R2412138
Toluene	9.37		0.75	ug/m3		02-AUG-12	R2412138
Toluene	2.49		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	4.90		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	1.13		0.20	ppb		02-AUG-12	R2412138
Xylenes	24.6		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	5.68		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	70		30	ug/m3		02-AUG-12	R2412138
F2	106		30	ug/m3		02-AUG-12	R2412138
L1179112-7 AS-38-AM (CANISTER#330, REG#02505)							
Sampled By: CLIENT on 11-JUL-12 @ 16:34							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	<0.64		0.64	ug/m3		02-AUG-12	R2412138
Benzene	<0.20		0.20	ppb		02-AUG-12	R2412138
Toluene	1.32		0.75	ug/m3		02-AUG-12	R2412138
Toluene	0.35		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	<0.87		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	<0.20		0.20	ppb		02-AUG-12	R2412138
Xylenes	<2.6		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	<0.60		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	53		30	ug/m3		02-AUG-12	R2412138

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-7 AS-38-AM (CANISTER#330, REG#02505)							
Sampled By: CLIENT on 11-JUL-12 @ 16:34							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
F2	<30		30	ug/m3		02-AUG-12	R2412138
L1179112-8 AS-37-01 (CANISTER#220)							
Sampled By: CLIENT on 11-JUL-12 @ 16:08							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	23.6		0.64	ug/m3		02-AUG-12	R2412138
Benzene	7.40		0.20	ppb		02-AUG-12	R2412138
Toluene	363		0.75	ug/m3		02-AUG-12	R2412138
Toluene	96.5		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	49.4		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	11.4		0.20	ppb		02-AUG-12	R2412138
Xylenes	280		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	64.7		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	1230		30	ug/m3		02-AUG-12	R2412138
F2	589		30	ug/m3		02-AUG-12	R2412138
L1179112-9 AS-35-01 (CANISTER#00136 REG#00700)							
Sampled By: CLIENT on 11-JUL-12 @ 16:49							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	2.68		0.64	ug/m3		02-AUG-12	R2412138
Benzene	0.84		0.20	ppb		02-AUG-12	R2412138
Toluene	6.21		0.75	ug/m3		02-AUG-12	R2412138
Toluene	1.65		0.20	ppb		02-AUG-12	R2412138
Ethylbenzene	1.52		0.87	ug/m3		02-AUG-12	R2412138
Ethylbenzene	0.35		0.20	ppb		02-AUG-12	R2412138
Xylenes	6.2		2.6	ug/m3		02-AUG-12	R2412138
Xylenes	1.43		0.60	ppb		02-AUG-12	R2412138
F1-BTEX	<30		30	ug/m3		02-AUG-12	R2412138
F2	<30		30	ug/m3		02-AUG-12	R2412138
L1179112-10 AS-37-01 (2768703134)							
Sampled By: CLIENT on 10-JUL-12 @ 18:12							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	9800			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	0.0000088		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	0.086		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-10 AS-37-01 (2768703134)							
Sampled By: CLIENT on 10-JUL-12 @ 18:12							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	0.0000073		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	0.072		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.00054	B>10%F	0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	3.87		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	1.44		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	0.000010		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	0.101		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000051		0.0000051	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-11 AS-38-OF (2768703142)							
Sampled By: CLIENT on 10-JUL-12 @ 18:43							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	10100			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-11 AS-38-OF (2768703142)							
Sampled By: CLIENT on 10-JUL-12 @ 18:43							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.000079	B>10%F	0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	0.602		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.192		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-12 AS-38-AM (2768703135)							
Sampled By: CLIENT on 10-JUL-12 @ 18:54							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	10000			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	0.000010		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	0.101		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-12 AS-38-AM (2768703135)							
Sampled By: CLIENT on 10-JUL-12 @ 18:54							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	0.0000059		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	0.059		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.000025	B>10%F	0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	0.178		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.074		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	0.0000095		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	0.095		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-13 AS-37-01 (2768703140)							
Sampled By: CLIENT on 11-JUL-12 @ 02:58							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	10160			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-13 AS-37-01 (2768703140)							
Sampled By: CLIENT on 11-JUL-12 @ 02:58							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.00017	B>10%F	0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	1.29		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.444		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-14 AS-35-SM (2768703137)							
Sampled By: CLIENT on 11-JUL-12 @ 17:21							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	9600			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	0.000014		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	0.136		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-14 AS-35-SM (2768703137)							
Sampled By: CLIENT on 11-JUL-12 @ 17:21							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.00030	B>10%F	0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	2.15		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.706		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000052		0.0000052	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-15 AS-35-E2 (2768703139)							
Sampled By: CLIENT on 11-JUL-12 @ 17:33							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	10000			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-15 AS-35-E2 (2768703139)							
Sampled By: CLIENT on 11-JUL-12 @ 17:33							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.000059	B>10%F	0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	0.455		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.134		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-16 AS-35-02 (2768703138)							
Sampled By: CLIENT on 11-JUL-12 @ 17:57							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	10000			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-16 AS-35-02 (2768703138)							
Sampled By: CLIENT on 11-JUL-12 @ 17:57							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.00018	B>10%F	0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	1.45		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.342		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-17 AS-35-01 (2768703136)							
Sampled By: CLIENT on 12-JUL-12 @ 15:25							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	10000			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-17 AS-35-01 (2768703136)							
Sampled By: CLIENT on 12-JUL-12 @ 15:25							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.00013	B>10%F	0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	0.909		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.376		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000050		0.0000050	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
L1179112-19 AS-35-EE (2768703141)							
Sampled By: CLIENT on 12-JUL-12 @ 15:56							
Matrix: AIR							
Miscellaneous Parameters							
Air volume	10200			L		24-JUL-12	R2403939
PAHs							
Acenaphthene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Acenaphthylene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Acenaphthylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Anthracene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)anthracene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(a)pyrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1179112-19 AS-35-EE (2768703141)							
Sampled By: CLIENT on 12-JUL-12 @ 15:56							
Matrix: AIR							
PAHs							
FRONT Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(a)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(b/k)fluoranthene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(b/k)fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Benzo(g,h,i)perylene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Benzo(g,h,i)perylene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Chrysene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Chrysene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Dibenzo(a,h)anthracene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Dibenzo(a,h)anthracene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluoranthene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluoranthene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Fluorene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Fluorene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Indeno(1,2,3-cd)pyrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Naphthalene	>0.000057	B>10%F	0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Naphthalene	0.434		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Naphthalene	0.149		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Phenanthrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Phenanthrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
Pyrene	<0.0000049		0.0000049	mg/m3	24-JUL-12	28-JUL-12	R2407460
FRONT Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460
BACK Pyrene	<0.050		0.050	ug	24-JUL-12	28-JUL-12	R2407460

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1219965-1 AS-37-OF (CANISTER #241) (FLOW CONTROLLER #00532)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	14.2		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	4.40		0.64	ug/m3		09-OCT-12	R2454333
Benzene	1.38		0.20	ppb		09-OCT-12	R2454333
Toluene	112		0.75	ug/m3		09-OCT-12	R2454333
Toluene	29.8		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	7.24		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	1.67		0.20	ppb		09-OCT-12	R2454333
Xylenes	39.9		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	9.21		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	165		30	ug/m3		09-OCT-12	R2454333
F2	174		30	ug/m3		09-OCT-12	R2454333
L1219965-2 AS-38-OF (CANISTER #326) (FLOW CONTROLLER #01381)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	14.2		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	<0.64		0.64	ug/m3		09-OCT-12	R2454333
Benzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Toluene	28.9		0.75	ug/m3		09-OCT-12	R2454333
Toluene	7.68		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	<0.87		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Xylenes	<2.6		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	<0.60		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	<30		30	ug/m3		09-OCT-12	R2454333
F2	<30		30	ug/m3		09-OCT-12	R2454333
L1219965-3 AS-38-AM (CANISTER #238) (FLOW CONTROLLER #00536)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	9.2		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	<0.64		0.64	ug/m3		09-OCT-12	R2454333
Benzene	0.20		0.20	ppb		09-OCT-12	R2454333
Toluene	26.8		0.75	ug/m3		09-OCT-12	R2454333
Toluene	7.12		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	<0.87		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Xylenes	<2.6		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	<0.60		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	<30		30	ug/m3		09-OCT-12	R2454333
F2	<30		30	ug/m3		09-OCT-12	R2454333
L1219965-4 AS-37-LR (CANISTER #ED01545) (FLOW CONTROLLER #01369)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	12.4		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1219965-4 AS-37-LR (CANISTER #ED01545) (FLOW CONTROLLER #01369)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	<0.64		0.64	ug/m3		09-OCT-12	R2454333
Benzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Toluene	107		0.75	ug/m3		09-OCT-12	R2454333
Toluene	28.4		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	<0.87		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Xylenes	<2.6		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	<0.60		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	<30		30	ug/m3		09-OCT-12	R2454333
F2	<30		30	ug/m3		09-OCT-12	R2454333
L1219965-5 AS-35-EL (CANISTER #325) (FLOW CONTROLLER #00536)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	2.6		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	<0.64		0.64	ug/m3		09-OCT-12	R2454333
Benzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Toluene	1.24		0.75	ug/m3		09-OCT-12	R2454333
Toluene	0.33		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	<0.87		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Xylenes	<2.6		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	<0.60		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	<30		30	ug/m3		09-OCT-12	R2454333
F2	<30		30	ug/m3		09-OCT-12	R2454333
L1219965-6 AS-35-SM (CANISTER #00107) (FLOW CONTROLLER #01369)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	12.6		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	1.88		0.64	ug/m3		09-OCT-12	R2454333
Benzene	0.59		0.20	ppb		09-OCT-12	R2454333
Toluene	85.8		0.75	ug/m3		09-OCT-12	R2454333
Toluene	22.8		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	1.43		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	0.33		0.20	ppb		09-OCT-12	R2454333
Xylenes	5.5		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	1.27		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	<30		30	ug/m3		09-OCT-12	R2454333
F2	<30		30	ug/m3		09-OCT-12	R2454333
L1219965-7 AS-35-02 (CANISTER #220) (FLOW CONTROLLER #00340)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	14.5		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	3.45		0.64	ug/m3		09-OCT-12	R2454333
Benzene	1.08		0.20	ppb		09-OCT-12	R2454333

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1219965-7 AS-35-02 (CANISTER #220) (FLOW CONTROLLER #00340)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Toluene	160		0.75	ug/m3		09-OCT-12	R2454333
Toluene	42.4		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	2.08		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	0.48		0.20	ppb		09-OCT-12	R2454333
Xylenes	8.5		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	1.97		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	45		30	ug/m3		09-OCT-12	R2454333
F2	<30		30	ug/m3		09-OCT-12	R2454333
L1219965-8 AS-35-EE (CANISTER #1187) (FLOW CONTROLLER #02500)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	15		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	1.02		0.64	ug/m3		09-OCT-12	R2454333
Benzene	0.32		0.20	ppb		09-OCT-12	R2454333
Toluene	97.2		0.75	ug/m3		09-OCT-12	R2454333
Toluene	25.8		0.20	ppb		09-OCT-12	R2454333
Ethylbenzene	<0.87		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	<0.20		0.20	ppb		09-OCT-12	R2454333
Xylenes	<2.6		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	<0.60		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	<30		30	ug/m3		09-OCT-12	R2454333
F2	<30		30	ug/m3		09-OCT-12	R2454333
L1219965-9 AS-35-01 (CANISTER #205) (FLOW CONTROLLER #00550)							
Sampled By: NRH on 02-OCT-12 @ 17:49							
Matrix: AIR							
Miscellaneous Parameters							
Canister Pressure	14.5		0	psia		09-OCT-12	R2454333
BTEX, F1 (C6-C10), F2 (C>10-C16)							
Benzene	3.92		0.64	ug/m3		09-OCT-12	R2454333
Benzene	1.23		0.20	ppb		09-OCT-12	R2454333
Toluene	1900	DLA	6.0	ug/m3		09-OCT-12	R2454333
Toluene	504	DLA	1.6	ppb		09-OCT-12	R2454333
Ethylbenzene	3.08		0.87	ug/m3		09-OCT-12	R2454333
Ethylbenzene	0.71		0.20	ppb		09-OCT-12	R2454333
Xylenes	13.0		2.6	ug/m3		09-OCT-12	R2454333
Xylenes	3.00		0.60	ppb		09-OCT-12	R2454333
F1-BTEX	349	DLA	60	ug/m3		09-OCT-12	R2454333
F2	<60	DLA	60	ug/m3		09-OCT-12	R2454333

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-1 AS-35-EL (PUMP#308012E)							
Sampled By: CLIENT on 02-OCT-12 @ 08:20							
Matrix: PUF/XAD							
Miscellaneous Parameters							
Air volume	2.850887			m3		30-OCT-12	R2465326
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0803		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene	229		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	0.152		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	432		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	0.0379		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	108		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene	0.0212		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene	61		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene	0.262		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene	746		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene UJ - SUR<LCL	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	0.0350		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	100		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10	70.9		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8	58.5		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10	80.5		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12	33.4	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12	54.4		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12	60.4		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12	46.0	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12	60.9	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12	33.3	G	50-150	%	17-OCT-12	27-OCT-12	R2465122

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-1 AS-35-EL (PUMP#308012E)							
Sampled By: CLIENT on 02-OCT-12 @ 08:20							
Matrix: PUF/XAD							
CARB 429 PAH LR							
Surrogate: Dibenz(a,h)anthracene-D14	43.8	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10	61.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12	46.8	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8	71.1		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12	48.0	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10	85.3		50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-2 AS-35-01 (PUMP#308013)							
Sampled By: CLIENT on 02-OCT-12 @ 08:38							
Matrix: PUF/XAD							
Miscellaneous Parameters							
Air volume	3.72864			m3		30-OCT-12	R2465326
CARB 429 PAH LR							
1-Methyl Naphthalene	0.140		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene	522		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	0.276		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	1030		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	0.0300		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	112		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene UJ - SUR<LCL	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<0.0027		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<10		10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene	0.0189		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene	70		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene	0.421		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene	1570		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	0.0260		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	97		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-2 AS-35-01 (PUMP#308013)							
Sampled By: CLIENT on 02-OCT-12 @ 08:38							
Matrix: PUF/XAD							
CARB 429 PAH LR							
Pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10	80.2		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8	76.9		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10	98.2		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12	45.4	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12	66.1		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12	71.1		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12	51.2		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12	81.0	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12	44.4	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14	51.9	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10	77.2		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12	60.5	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8	76.8		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12	55.3		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10	104.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-3 AS-35-02 (PUMP#308011)							
Sampled By: CLIENT on 02-OCT-12 @ 08:49							
Matrix: PUF/XAD							
Miscellaneous Parameters							
Air volume	2.19072			m3		30-OCT-12	R2465326
CARB 429 PAH LR							
1-Methyl Naphthalene	0.134		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene	293		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	0.267		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	586		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	0.0444		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	97		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene	0.0289		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-3 AS-35-02 (PUMP#308011)							
Sampled By: CLIENT on 02-OCT-12 @ 08:49							
Matrix: PUF/XAD							
CARB 429 PAH LR							
Fluorene	63		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene	0.444		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene	972		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene UJ - SUR<LCL	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	0.0421		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	92		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10	74.9		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8	67.7		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10	84.3		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12	38.7	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12	50.0		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12	61.2		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12	50.4	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12	60.4	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12	38.8	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14	49.1	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10	70.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12	53.3	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8	70.6		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12	36.9	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10	92.8		50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-4 AS-35-SM (PUMP#308014)							
Sampled By: CLIENT on 02-OCT-12 @ 09:01							
Matrix: PUF/XAD							
Miscellaneous Parameters							
Air volume	2.666517			m3		30-OCT-12	R2465326
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0900		0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene	240		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	0.181		0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	482		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	0.0280	M	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	75	M	10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene UJ - SUR<LCL	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-4 AS-35-SM (PUMP#308014)								
Sampled By: CLIENT on 02-OCT-12 @ 09:01								
Matrix: PUF/XAD								
CARB 429 PAH LR								
Benzo(ghi)perylene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene		<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene	UJ - SUR<LCL	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene	UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene		<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene		<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene		0.0230	M	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene		61	M	10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene		<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene		0.322		0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene		858		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene	UJ - SUR<LCL	<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene	UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene		0.0289		0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene		77		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene		<0.0038	[U]	0.0038	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10		73.9		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8		64.8		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10		90.1		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12		41.5	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12		58.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12		67.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12		48.7	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12		60.2		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12		44.8	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14		51.8	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10		77.9		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12		51.3	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8		75.3		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12		46.4	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10		92.4		50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-5 AS-35-EE (PUMP#308002E)								
Sampled By: CLIENT on 02-OCT-12 @ 09:20								
Matrix: PUF/XAD								
Miscellaneous Parameters								
Air volume		2.41274			m3		30-OCT-12	R2465326
CARB 429 PAH LR								
1-Methyl Naphthalene		0.0111		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene		27		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene		0.0221		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene		53		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene		0.0311		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene		75		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-5 AS-35-EE (PUMP#308002E)							
Sampled By: CLIENT on 02-OCT-12 @ 09:20							
Matrix: PUF/XAD							
CARB 429 PAH LR							
Anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene	0.0185		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene	45		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene	0.0423		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene	102		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	0.0330		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	80		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10	92.8		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8	82.3		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10	109.1		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12	47.2	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12	51.2		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12	62.3		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12	43.0	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12	54.4	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12	49.2	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14	42.2	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10	89.9		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12	47.9	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8	88.7		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12	40.2	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10	118.0		50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-6 AS-37-OF (PUMP#308013)							
Sampled By: CLIENT on 03-OCT-12 @ 08:05							
Matrix: PUF/XAD							
Miscellaneous Parameters							
Air volume	3.72864			m3		30-OCT-12	R2465326

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-6 AS-37-OF (PUMP#308013)								
Sampled By: CLIENT on 03-OCT-12 @ 08:05								
Matrix: PUF/XAD								
CARB 429 PAH LR								
1-Methyl Naphthalene		0.319		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene		1190		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene		0.646		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene		2410		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene		0.0496		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene		185		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene		0.0040		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene		15		10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene		<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	UJ - SUR<LCL	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene		<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene		<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene		<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	UJ - SUR<LCL	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene		<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene	UJ - SUR<LCL	<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene		<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene		0.0033		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene		12		10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene		0.0325		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene		121		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene		<0.0027	[U]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene	J - LR	1.32	[E]	0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene	J - LR	4910	[E]	10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene		0.0034		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene		13		10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene		0.0547		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene		204		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene		0.0031		0.0027	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene		11		10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10		74.6		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8		60.1		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10		94.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12		47.5	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12		57.0		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12		74.5		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12		48.7	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12		62.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12		48.3	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14		46.5	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10		78.5		50-150	%	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-6 AS-37-OF (PUMP#308013)							
Sampled By: CLIENT on 03-OCT-12 @ 08:05							
Matrix: PUF/XAD							
CARB 429 PAH LR							
Surrogate: Indeno(1,2,3,cd)pyrene-D12	55.4	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8	75.2		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12	51.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10	101.9		50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-7 AS-38-OF (PUMP#308012E)							
Sampled By: CLIENT on 03-OCT-12 @ 08:15							
Matrix: PUF/XAD							
Miscellaneous Parameters							
Air volume	2.84496			m3		30-OCT-12	R2465326
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0311		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene	88		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	0.0622		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	177		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	0.0335		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	95		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene UJ - SUR<LCL	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	0.0046		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	13		10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene	0.0289		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene	82		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene	0.668		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene	1900		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	0.0552		0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	157		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene	<0.0035	[U]	0.0035	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10	92.6		30-150	%	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-7 AS-38-OF (PUMP#308012E)							
Sampled By: CLIENT on 03-OCT-12 @ 08:15							
Matrix: PUF/XAD							
CARB 429 PAH LR							
Surrogate: Acenaphthylene d8	88.5		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10	125.7	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12	44.8	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12	71.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12	84.5		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12	57.0		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12	66.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12	45.8	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14	50.5		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10	95.0		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12	63.6	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8	89.2		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12	62.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10	138.8	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-8 AS-38-AM (PUMP#308011)							
Sampled By: CLIENT on 03-OCT-12 @ 08:25							
Matrix: PUF/XAD							
Miscellaneous Parameters							
Air volume	2.19072			m3		30-OCT-12	R2465326
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0163		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene	36		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	0.0342		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene	75		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	0.0293		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene	64		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	0.0090		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene	20		10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene	0.0200		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene	44		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-8	AS-38-AM (PUMP#308011)							
Sampled By:	CLIENT on 03-OCT-12 @ 08:25							
Matrix:	PUF/XAD							
CARB 429 PAH LR								
Indeno(1,2,3 cd)pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene		0.781		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene		1710		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene		0.0056		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene		12		10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene		0.0350		0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene		77		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene		<0.0046	[U]	0.0046	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10		100.1		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8		91.5		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10		146.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12		67.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12		82.7		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12		100.3		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12		72.2		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12		90.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12		67.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14		72.5		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10		100.0		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12		84.1	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8		97.1		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12		91.6		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10		145.3		50-150	%	17-OCT-12	27-OCT-12	R2465122
L1220198-9	AS-33-LR (PUMP#308002E)							
Sampled By:	CLIENT on 03-OCT-12 @ 20:58							
Matrix:	PUF/XAD							
Miscellaneous Parameters								
Air volume		2.45262			m3		30-OCT-12	R2465326
CARB 429 PAH LR								
1-Methyl Naphthalene		0.0384		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
1-Methyl Naphthalene		94		10	ng	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene		0.0779		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
2-Methyl Naphthalene		191		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthene		0.0285		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthene		70		10	ng	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Acenaphthylene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Anthracene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Anthracene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benz(a)anthracene	UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(a)pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(b)fluoranthene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(e)pyrene		<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Benzo(ghi)perylene	UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Benzo(k)fluoranthene		<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1220198-9 AS-33-LR (PUMP#308002E)							
Sampled By: CLIENT on 03-OCT-12 @ 20:58							
Matrix: PUF/XAD							
CARB 429 PAH LR							
Benzo(k)fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Chrysene UJ - SUR<LCL	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluoranthene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Fluorene	0.0218		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Fluorene	53		10	ng	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Naphthalene	0.162		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Naphthalene	398		10	ng	17-OCT-12	27-OCT-12	R2465122
Perylene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Perylene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	0.0403		0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Phenanthrene	99		10	ng	17-OCT-12	27-OCT-12	R2465122
Pyrene	<0.0041	[U]	0.0041	ug/m3	17-OCT-12	27-OCT-12	R2465122
Pyrene	<10	[U]	10	ng	17-OCT-12	27-OCT-12	R2465122
Surrogate: 2-Methylnaphthalene-D10	83.4		30-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Acenaphthylene d8	76.3		40-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Anthracene-D10	126.8		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benz(a)anthracene-D12	39.5	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(a)pyrene d12	66.8		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(b)fluoranthene-D12	70.1		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(g,h,i)perylene d12	48.1	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Benzo(k)fluoranthene-D12	60.1		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Chrysene d12	44.2	G	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Dibenz(a,h)anthracene-D14	45.9	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Fluoranthene d10	81.4		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Indeno(1,2,3,cd)pyrene-D12	58.9	M	50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Naphthalene d8	79.1		20-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Perylene d12	55.3		50-150	%	17-OCT-12	27-OCT-12	R2465122
Surrogate: Phenanthrene d10	128.5		50-150	%	17-OCT-12	27-OCT-12	R2465122

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/17/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-1 AS-38-OF (PUMP# 194999)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.244			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0232		0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	52		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.0455		0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	102		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0375		0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	84		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0291		0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	65		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.0949		0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	213		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0557		0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	125		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0045	[U]	0.0045	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	86.2		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	93.7		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	100.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	84.1		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	98.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	108.1		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	58.7	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	114.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	76.1		50-150	%	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-1 AS-38-OF (PUMP# 194999)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Surrogate: Dibenz(a,h)anthracene-D14	61.8	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	99.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	54.9	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	86.9		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	94.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	96.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
L1235449-2 AS-37-OF (PUMP# 194725)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.428			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.361		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	876		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.750		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	1820		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0548		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	133		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	0.0046		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	11		10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0041		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10		10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0353		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	86		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	1.00		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	2430		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0523		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	127		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-2 AS-37-OF (PUMP# 194725)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	98.9		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	108.3		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	118.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	87.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	108.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	120.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	68.4	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	122.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	78.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	64.1	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	113.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	63.9	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	100.2		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	107.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	113.0		50-150	%	09-NOV-12	24-NOV-12	R2479079
L1235449-3 AS-38-AM (PUMP# 194950)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.464			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0125		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	31		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.0225		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	56		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0229		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	56		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0149		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-3 AS-38-AM (PUMP# 194950)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Fluorene	37		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.0556		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	137		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0250		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	62		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	102.3		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	109.3		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	119.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	88.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	111.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	121.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	55.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	126.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	81.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	54.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	114.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	66.1	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	102.7		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	114.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	115.0		50-150	%	09-NOV-12	24-NOV-12	R2479079
L1235449-4 AS-33-LR (PUMP# 194950)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.453			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0477		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	117		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.0958		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	235		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0264		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	65		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-4 AS-33-LR (PUMP# 194950)							
Sampled By: CLIENT on 05-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Benzo(ghi)perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0181		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	45		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.146		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	358		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0407		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	100		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	85.4		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	92.1		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	99.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	76.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	98.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	102.3		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	57.5	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	109.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	68.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	57.3	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	97.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	52.7	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	87.4		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	95.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	95.1		50-150	%	09-NOV-12	24-NOV-12	R2479079
L1235449-5 AS-35-EL (PUMP# 194999)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.267			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0913		0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	207		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.178		0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	404		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0320		0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	73		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-5 AS-35-EL (PUMP# 194999)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0195		0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	44		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.265		0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	601		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0359		0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	81		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0044	[U]	0.0044	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	93.7		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	102.2		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	114.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	77.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	106.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	111.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	53.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	118.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	70.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	57.6	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	108.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	62.6	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	93.8		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	104.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	110.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
L1235449-6 AS-35-SM (PUMP# 194725)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.454			m3		28-NOV-12	R2486948

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-6 AS-35-SM (PUMP# 194725)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
1-Methyl Naphthalene	0.114		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	279		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.231		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	566		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0334		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	82		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0192		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	47		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.351		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	862		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0306		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	75		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	92.5		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	101.2		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	109.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	79.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	106.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	112.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	51.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	119.0		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	73.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	56.2	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	105.9		50-150	%	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-6 AS-35-SM (PUMP# 194725)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Surrogate: Indeno(1,2,3,cd)pyrene-D12	56.3	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	91.9		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	104.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	104.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
L1235449-7 AS-35-01 (PUMP# 194720)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.471			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.145		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	359		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.297		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	733		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0350		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	87		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	0.0510		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	126		10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene UJ - SUR<LCL	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene UJ - SUR<LCL	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene UJ - SUR<LCL	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene UJ - SUR<LCL	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0230		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	57		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.389		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	961		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0510		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	126		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	84.3		30-150	%	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-7 AS-35-01 (PUMP# 194720)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Surrogate: Acenaphthylene d8	89.9		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	99.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	68.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	95.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	92.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	43.4	G	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	111.3		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	62.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	41.0	G	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	96.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	43.6	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	84.5		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	89.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	95.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Note: The recovery of selected surrogates are below method control. The associated targets are not detected in the sample therefore no negative impact to data quality.							
L1235449-8 AS-35-02 (PUMP# 194952)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.414			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.109		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	262		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.221		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	533		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0286		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	69		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	0.0447		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	108		10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene UJ - SUR<LCL	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene UJ - SUR<LCL	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene UJ - SUR<LCL	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-8 AS-35-02 (PUMP# 194952)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Fluorene	0.0195		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	47		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.298		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	719		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0439		0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	106		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0041	[U]	0.0041	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	92.3		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	98.7		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	107.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	76.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	104.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	107.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	48.8	G	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	114.4		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	70.3		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	46.2	G	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	104.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	52.5	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	94.2		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	100.6		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	103.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Note: The recovery of selected surrogates are below method control. The associated targets are not detected in the sample therefore no negative impact to data quality.							
L1235449-9 AS-35-EE (PUMP# 194950)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.474			m3		28-NOV-12	R2486948
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0060		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
1-Methyl Naphthalene	15		10	ng	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	0.0108		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
2-Methyl Naphthalene	27		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	0.0249		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthene	62		10	ng	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Acenaphthylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Anthracene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benz(a)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(a)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(b)fluoranthene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1235449-9 AS-35-EE (PUMP# 194950)							
Sampled By: CLIENT on 06-NOV-12							
Matrix: PUF							
CARB 429 PAH LR							
Benzo(b)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(e)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(ghi)perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Benzo(k)fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Chrysene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Chrysene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Dibenzo(ah)anthracene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluoranthene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Fluorene	0.0172		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Fluorene	43		10	ng	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Naphthalene	0.0151		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Naphthalene	37		10	ng	09-NOV-12	24-NOV-12	R2479079
Perylene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Perylene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	0.0428		0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Phenanthrene	106		10	ng	09-NOV-12	24-NOV-12	R2479079
Pyrene	<0.0040	[U]	0.0040	ug/m3	09-NOV-12	24-NOV-12	R2479079
Pyrene	<10	[U]	10	ng	09-NOV-12	24-NOV-12	R2479079
Surrogate: 2-Methylnaphthalene-D10	99.6		30-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Acenaphthylene d8	106.6		40-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Anthracene-D10	118.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benz(a)anthracene-D12	82.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(a)pyrene d12	111.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(b)fluoranthene-D12	112.2		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(g,h,i)perylene d12	57.9		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Benzo(k)fluoranthene-D12	134.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Chrysene d12	75.0		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Dibenz(a,h)anthracene-D14	52.5		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Fluoranthene d10	114.7		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Indeno(1,2,3,cd)pyrene-D12	62.4	M	50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Naphthalene d8	101.2		20-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Perylene d12	110.8		50-150	%	09-NOV-12	24-NOV-12	R2479079
Surrogate: Phenanthrene d10	113.2		50-150	%	09-NOV-12	24-NOV-12	R2479079

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1236456-1 AS-35-EL (CANISTER#00956)(REGULATOR#02507)							
Sampled By: NRH/KEM on 05-NOV-12 @ 15:17							
Matrix: air							
Miscellaneous Parameters							
Canister Pressure	14.3		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	1.89		0.64	ug/m3		26-NOV-12	R2488588
Benzene	0.59		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	1.34		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	0.31		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	8.13		0.75	ug/m3		26-NOV-12	R2488588
Toluene	2.16		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	5.0		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	1.16		0.60	ppb		26-NOV-12	R2488588
L1236456-2 AS-35-01 (CANISTER#0243)(REGULATOR#01365)							
Sampled By: NRH/KEM on 05-NOV-12 @ 15:41							
Matrix: air							
Miscellaneous Parameters							
Canister Pressure	14.2		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	3.95		0.64	ug/m3		26-NOV-12	R2488588
Benzene	1.24		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	1.86		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	0.43		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	10.9		0.75	ug/m3		26-NOV-12	R2488588
Toluene	2.89		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	7.4		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	1.71		0.60	ppb		26-NOV-12	R2488588
L1236456-3 AS-35-02 (CANISTER #00113)(REGULATOR#00534)							
Sampled By: NRH/KEM on 06-NOV-12 @ 15:52							
Matrix: air							
Miscellaneous Parameters							
Canister Pressure	14.2		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	1.85		0.64	ug/m3		26-NOV-12	R2488588
Benzene	0.58		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	1.40		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	0.32		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	8.63		0.75	ug/m3		26-NOV-12	R2488588
Toluene	2.29		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	5.7		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	1.31		0.60	ppb		26-NOV-12	R2488588
L1236456-4 AS-38-OF (CANISTER #211)(REGULATOR#01372)							
Sampled By: NRH/KEM on 06-NOV-12 @ 15:59							
Matrix: air							
Miscellaneous Parameters							

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1236456-4 AS-38-OF (CANISTER #211)(REGULATOR#01372)							
Sampled By: NRH/KEM on 06-NOV-12 @ 15:59							
Matrix: air							
Canister Pressure	14.4		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	<0.64		0.64	ug/m3		26-NOV-12	R2488588
Benzene	<0.20		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	<0.87		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	<0.20		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	8.16		0.75	ug/m3		26-NOV-12	R2488588
Toluene	2.17		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	<2.6		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	<0.60		0.60	ppb		26-NOV-12	R2488588
L1236456-5 AS-38-AM (CANISTER #352)(REGULATOR#00666)							
Sampled By: NRH/KEM on 06-NOV-12 @ 16:05							
Matrix: air							
Miscellaneous Parameters							
Canister Pressure	13.6		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	<0.64		0.64	ug/m3		26-NOV-12	R2488588
Benzene	<0.20		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	<0.87		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	<0.20		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	1.04		0.75	ug/m3		26-NOV-12	R2488588
Toluene	0.28		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	<2.6		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	<0.60		0.60	ppb		26-NOV-12	R2488588
L1236456-6 AS-37-OF (CANISTER #1192)(REGULATOR#02502)							
Sampled By: NRH/KEM on 06-NOV-12 @ 16:16							
Matrix: air							
Miscellaneous Parameters							
Canister Pressure	14.5		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	10.5		0.64	ug/m3		26-NOV-12	R2488588
Benzene	3.30		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	12.8		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	2.96		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	118		0.75	ug/m3		26-NOV-12	R2488588
Toluene	31.3		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	63.3		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	14.6		0.60	ppb		26-NOV-12	R2488588
L1236456-7 AS-33-LR (CANISTER #268)(REGULATOR#01385)							
Sampled By: NRH/KEM on 07-NOV-12 @ 06:53							
Matrix: air							
Miscellaneous Parameters							

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1236456-7 AS-33-LR (CANISTER #268)(REGULATOR#01385)							
Sampled By: NRH/KEM on 07-NOV-12 @ 06:53							
Matrix: air							
Canister Pressure	14.6		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	0.99		0.64	ug/m3		26-NOV-12	R2488588
Benzene	0.31		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	<0.87		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	<0.20		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	2.96		0.75	ug/m3		26-NOV-12	R2488588
Toluene	0.79		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	<2.6		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	<0.60		0.60	ppb		26-NOV-12	R2488588
L1236456-8 AS-35-SM2 (CANISTER #00123)(REGULATOR#01304)							
Sampled By: NRH/KEM on 07-NOV-12 @ 06:58							
Matrix: air							
Miscellaneous Parameters							
Canister Pressure	14.4		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	1.90		0.64	ug/m3		26-NOV-12	R2488588
Benzene	0.59		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	1.20		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	0.28		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	8.14		0.75	ug/m3		26-NOV-12	R2488588
Toluene	2.16		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	4.7		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	1.09		0.60	ppb		26-NOV-12	R2488588
L1236456-9 AS-35-EE2 (CANISTER #00107)(REGULATOR#00447)							
Sampled By: NRH/KEM on 08-NOV-12 @ 17:26							
Matrix: air							
Miscellaneous Parameters							
Canister Pressure	15.6		0	psia		26-NOV-12	R2488588
Benzene - air							
Benzene	<0.64		0.64	ug/m3		26-NOV-12	R2488588
Benzene	<0.20		0.20	ppb		26-NOV-12	R2488588
Ethyl Benzene							
Ethylbenzene	1.24		0.87	ug/m3		26-NOV-12	R2488588
Ethylbenzene	0.29		0.20	ppb		26-NOV-12	R2488588
Toluene							
Toluene	4.04		0.75	ug/m3		26-NOV-12	R2488588
Toluene	1.08		0.20	ppb		26-NOV-12	R2488588
Total xylenes							
Xylenes (Total)	<2.6		2.6	ug/m3		26-NOV-12	R2488588
Xylenes (Total)	<0.60		0.60	ppb		26-NOV-12	R2488588

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-1 AS-35-01 (PUMP #194999, ID # L1242937-7)							
Sampled By: CLIENT on 10-DEC-12 @ 09:00							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.391			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.321		0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
1-Methyl Naphthalene	768		10	ng	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	0.657		0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	1570		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	0.0506		0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	121		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Anthracene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(ghi)perylene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Chrysene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluorene	0.0291		0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Fluorene	70		10	ng	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Naphthalene	0.908		0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Naphthalene	2170		10	ng	17-DEC-12	31-DEC-12	R2504965
Perylene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	0.0510		0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	122		10	ng	17-DEC-12	31-DEC-12	R2504965
Pyrene	<0.0042	[U]	0.0042	ug/m3	17-DEC-12	31-DEC-12	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Surrogate: 2-Methylnaphthalene-D10	98.4		30-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Acenaphthylene d8	103.2		40-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Anthracene-D10	123.7		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benz(a)anthracene-D12	88.3		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(a)pyrene d12	121.3		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(b)fluoranthene-D12	121.7		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(g,h,i)perylene d12	94.4		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(k)fluoranthene-D12	107.0		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Chrysene d12	78.4		50-150	%	17-DEC-12	31-DEC-12	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-1 AS-35-01 (PUMP #194999, ID # L1242937-7)							
Sampled By: CLIENT on 10-DEC-12 @ 09:00							
Matrix: PUF							
CARB 429 PAH LR							
Surrogate: Dibenz(a,h)anthracene-D14	115.1	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Fluoranthene d10	111.2		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	117.9	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Naphthalene d8	93.4		20-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Perylene d12	125.6	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Phenanthrene d10	119.2		50-150	%	17-DEC-12	31-DEC-12	R2504965
L1249458-2 AS-35-02 (PUMP #194950, ID # L1242937-8)							
Sampled By: CLIENT on 10-DEC-12 @ 09:06							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.328			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.233		0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
1-Methyl Naphthalene	542		10	ng	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	0.468		0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	1090		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	0.0382		0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	89		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Anthracene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(ghi)perylene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Chrysene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluorene	0.0265		0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Fluorene	62		10	ng	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Naphthalene	0.717		0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Naphthalene	1670		10	ng	17-DEC-12	31-DEC-12	R2504965
Perylene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	0.0507		0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	118		10	ng	17-DEC-12	31-DEC-12	R2504965
Pyrene	<0.0043	[U]	0.0043	ug/m3	17-DEC-12	31-DEC-12	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-2 AS-35-02 (PUMP #194950, ID # L1242937-8)							
Sampled By: CLIENT on 10-DEC-12 @ 09:06							
Matrix: PUF							
CARB 429 PAH LR							
Pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Surrogate: 2-Methylnaphthalene-D10	97.0		30-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Acenaphthylene d8	98.1		40-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Anthracene-D10	112.3		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benz(a)anthracene-D12	83.8		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(a)pyrene d12	114.0		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(b)fluoranthene-D12	107.7		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(g,h,i)perylene d12	86.3		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(k)fluoranthene-D12	100.3		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Chrysene d12	76.6		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	98.9	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Fluoranthene d10	102.2		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	113.8	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Naphthalene d8	92.9		20-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Perylene d12	116.6	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Phenanthrene d10	110.0		50-150	%	17-DEC-12	31-DEC-12	R2504965
L1249458-3 AS-35-SM (PUMP #194952, ID # L1242937-9)							
Sampled By: CLIENT on 10-DEC-12 @ 09:22							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.471			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.182		0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
1-Methyl Naphthalene	449		10	ng	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	0.361		0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	893		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	0.0425		0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	105		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Anthracene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(ghi)perylene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Chrysene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluorene	0.0244		0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-3 AS-35-SM (PUMP #194952, ID # L1242937-9)							
Sampled By: CLIENT on 10-DEC-12 @ 09:22							
Matrix: PUF							
CARB 429 PAH LR							
Fluorene	60		10	ng	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Naphthalene	0.595		0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Naphthalene	1470		10	ng	17-DEC-12	31-DEC-12	R2504965
Perylene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	0.0421		0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	104		10	ng	17-DEC-12	31-DEC-12	R2504965
Pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	31-DEC-12	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Surrogate: 2-Methylnaphthalene-D10	100.9		30-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Acenaphthylene d8	104.0		40-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Anthracene-D10	118.6		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benz(a)anthracene-D12	86.0		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(a)pyrene d12	108.6	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(b)fluoranthene-D12	113.9		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(g,h,i)perylene d12	89.0		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(k)fluoranthene-D12	103.4		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Chrysene d12	78.8		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	95.4	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Fluoranthene d10	108.7		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	102.7	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Naphthalene d8	99.4		20-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Perylene d12	119.6	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Phenanthrene d10	115.0	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
L1249458-4 AS-37-OF (PUMP #194720, ID # L1242937-1)							
Sampled By: CLIENT on 10-DEC-12 @ 09:38							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.43			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.302		0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
1-Methyl Naphthalene	735		10	ng	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	0.609		0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
2-Methyl Naphthalene	1480		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	0.0626		0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthene	152		10	ng	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(ghi)perylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-4 AS-37-OF (PUMP #194720, ID # L1242937-1)							
Sampled By: CLIENT on 10-DEC-12 @ 09:38							
Matrix: PUF							
CARB 429 PAH LR							
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Chrysene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Fluorene	0.0412		0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Fluorene	100		10	ng	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Naphthalene	0.901		0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Naphthalene	2190		10	ng	17-DEC-12	31-DEC-12	R2504965
Perylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	0.0959		0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Phenanthrene	233		10	ng	17-DEC-12	31-DEC-12	R2504965
Pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	31-DEC-12	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	31-DEC-12	R2504965
Surrogate: 2-Methylnaphthalene-D10	100.0		30-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Acenaphthylene d8	104.4		40-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Anthracene-D10	120.7		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benz(a)anthracene-D12	92.1		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(a)pyrene d12	117.7		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(b)fluoranthene-D12	115.3		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(g,h,i)perylene d12	93.5		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Benzo(k)fluoranthene-D12	106.1		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Chrysene d12	84.9		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	91.9	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Fluoranthene d10	110.3		50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	107.3	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Naphthalene d8	98.7		20-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Perylene d12	118.6	M	50-150	%	17-DEC-12	31-DEC-12	R2504965
Surrogate: Phenanthrene d10	117.2		50-150	%	17-DEC-12	31-DEC-12	R2504965
L1249458-5 AS-38-OF (PUMP #194725, ID # L1242937-3)							
Sampled By: CLIENT on 10-DEC-12 @ 09:47							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.457			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0229		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
1-Methyl Naphthalene	56		10	ng	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	0.0427		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	105		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	0.0329		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	81		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-5 AS-38-OF (PUMP #194725, ID # L1242937-3)							
Sampled By: CLIENT on 10-DEC-12 @ 09:47							
Matrix: PUF							
CARB 429 PAH LR							
Anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Chrysene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluorene	0.0328		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluorene	81		10	ng	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Naphthalene	0.121		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Naphthalene	297		10	ng	17-DEC-12	01-JAN-13	R2504965
Perylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	0.0993		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	244		10	ng	17-DEC-12	01-JAN-13	R2504965
Pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Surrogate: 2-Methylnaphthalene-D10	114.6		30-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Acenaphthylene d8	113.7		40-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Anthracene-D10	126.1	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benz(a)anthracene-D12	98.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(a)pyrene d12	129.1		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(b)fluoranthene-D12	126.9		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(g,h,i)perylene d12	98.3		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(k)fluoranthene-D12	118.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Chrysene d12	89.9		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	106.6	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Fluoranthene d10	122.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	121.9	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Naphthalene d8	108.0		20-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Perylene d12	128.2	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Phenanthrene d10	125.5	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
L1249458-6 AS-35-EL (PUMP #194952, ID # L1242937-2)							
Sampled By: CLIENT on 11-DEC-12 @ 07:21							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.471			m3		03-JAN-13	R2504954

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-6 AS-35-EL (PUMP #194952, ID # L1242937-2)							
Sampled By: CLIENT on 11-DEC-12 @ 07:21							
Matrix: PUF							
CARB 429 PAH LR							
1-Methyl Naphthalene	0.146		0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
1-Methyl Naphthalene	361		10	ng	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	0.284		0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	702		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	0.0341		0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	84		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Anthracene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Chrysene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluorene	0.0296		0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluorene	73		10	ng	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Naphthalene	0.530		0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Naphthalene	1310		10	ng	17-DEC-12	01-JAN-13	R2504965
Perylene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	0.0992		0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	245		10	ng	17-DEC-12	01-JAN-13	R2504965
Pyrene	<0.0040	[U]	0.0040	ug/m3	17-DEC-12	01-JAN-13	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Surrogate: 2-Methylnaphthalene-D10	114.7		30-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Acenaphthylene d8	111.7		40-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Anthracene-D10	127.2		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benz(a)anthracene-D12	92.7		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(a)pyrene d12	126.7		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(b)fluoranthene-D12	123.9		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(g,h,i)perylene d12	96.0		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(k)fluoranthene-D12	114.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Chrysene d12	86.5		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	113.3	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Fluoranthene d10	117.1		50-150	%	17-DEC-12	01-JAN-13	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-6 AS-35-EL (PUMP #194952, ID # L1242937-2)							
Sampled By: CLIENT on 11-DEC-12 @ 07:21							
Matrix: PUF							
CARB 429 PAH LR							
Surrogate: Indeno(1,2,3,cd)pyrene-D12	110.9	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Naphthalene d8	109.3		20-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Perylene d12	128.9	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Phenanthrene d10	120.5	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
L1249458-7 AS-38-AM (PUMP #194720, ID # L1242937-10)							
Sampled By: CLIENT on 11-DEC-12 @ 08:13							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.415			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0222		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
1-Methyl Naphthalene	54		10	ng	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	0.0431		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	104		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	0.0299		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	72		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Chrysene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluorene	0.0200		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluorene	48		10	ng	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Naphthalene	0.0952		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Naphthalene	230		10	ng	17-DEC-12	01-JAN-13	R2504965
Perylene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	0.0359		0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	87		10	ng	17-DEC-12	01-JAN-13	R2504965
Pyrene	<0.0041	[U]	0.0041	ug/m3	17-DEC-12	01-JAN-13	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Surrogate: 2-Methylnaphthalene-D10	102.8		30-150	%	17-DEC-12	01-JAN-13	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-7 AS-38-AM (PUMP #194720, ID # L1242937-10)							
Sampled By: CLIENT on 11-DEC-12 @ 08:13							
Matrix: PUF							
CARB 429 PAH LR							
Surrogate: Acenaphthylene d8	104.7		40-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Anthracene-D10	116.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benz(a)anthracene-D12	85.8		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(a)pyrene d12	119.2		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(b)fluoranthene-D12	120.8		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(g,h,i)perylene d12	86.6		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(k)fluoranthene-D12	105.8		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Chrysene d12	78.8		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	93.4	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Fluoranthene d10	110.9		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	101.8	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Naphthalene d8	97.5		20-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Perylene d12	94.5		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Phenanthrene d10	116.6		50-150	%	17-DEC-12	01-JAN-13	R2504965
L1249458-8 AS-35-EE (PUMP #194725, ID # L1242937-4)							
Sampled By: CLIENT on 11-DEC-12 @ 08:57							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.288			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0208		0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
1-Methyl Naphthalene	48		10	ng	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	0.0420		0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	96		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	0.0279		0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	64		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Anthracene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Chrysene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluorene	0.0205		0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluorene	47		10	ng	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-8 AS-35-EE (PUMP #194725, ID # L1242937-4)							
Sampled By: CLIENT on 11-DEC-12 @ 08:57							
Matrix: PUF							
CARB 429 PAH LR							
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Naphthalene	0.0813		0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Naphthalene	186		10	ng	17-DEC-12	01-JAN-13	R2504965
Perylene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	0.0503		0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	115		10	ng	17-DEC-12	01-JAN-13	R2504965
Pyrene	<0.0044	[U]	0.0044	ug/m3	17-DEC-12	01-JAN-13	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Surrogate: 2-Methylnaphthalene-D10	104.5		30-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Acenaphthylene d8	103.1		40-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Anthracene-D10	115.5		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benz(a)anthracene-D12	86.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(a)pyrene d12	123.3		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(b)fluoranthene-D12	114.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(g,h,i)perylene d12	76.8		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(k)fluoranthene-D12	103.7		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Chrysene d12	81.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	101.2	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Fluoranthene d10	106.9		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	108.3	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Naphthalene d8	104.2		20-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Perylene d12	100.4		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Phenanthrene d10	115.9		50-150	%	17-DEC-12	01-JAN-13	R2504965
L1249458-9 AS-33-LR (PUMP #194952, ID # L1242937-5)							
Sampled By: CLIENT on 11-DEC-12 @ 22:50							
Matrix: PUF							
Miscellaneous Parameters							
Air volume	2.677			m3		03-JAN-13	R2504954
CARB 429 PAH LR							
1-Methyl Naphthalene	0.0930		0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
1-Methyl Naphthalene	249		10	ng	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	0.189		0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
2-Methyl Naphthalene	507		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	0.0264		0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthene	71		10	ng	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Acenaphthylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Anthracene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benz(a)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(a)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(b)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(e)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Benzo(ghi)perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Benzo(k)fluoranthene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1249458-9 AS-33-LR (PUMP #194952, ID # L1242937-5)							
Sampled By: CLIENT on 11-DEC-12 @ 22:50							
Matrix: PUF							
CARB 429 PAH LR							
Benzo(k)fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Chrysene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Chrysene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Dibenzo(ah)anthracene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluoranthene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Fluorene	0.0230		0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Fluorene	62		10	ng	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Indeno(1,2,3 cd)pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Naphthalene	0.437		0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Naphthalene	1170		10	ng	17-DEC-12	01-JAN-13	R2504965
Perylene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Perylene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	0.0549		0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Phenanthrene	147		10	ng	17-DEC-12	01-JAN-13	R2504965
Pyrene	<0.0037	[U]	0.0037	ug/m3	17-DEC-12	01-JAN-13	R2504965
Pyrene	<10	[U]	10	ng	17-DEC-12	01-JAN-13	R2504965
Surrogate: 2-Methylnaphthalene-D10	108.8		30-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Acenaphthylene d8	108.4		40-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Anthracene-D10	119.8		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benz(a)anthracene-D12	86.1		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(a)pyrene d12	123.1		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(b)fluoranthene-D12	121.3		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(g,h,i)perylene d12	86.8		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Benzo(k)fluoranthene-D12	108.5		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Chrysene d12	76.5		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Dibenz(a,h)anthracene-D14	109.7	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Fluoranthene d10	112.9		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Indeno(1,2,3,cd)pyrene-D12	105.0	M	50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Naphthalene d8	107.3		20-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Perylene d12	98.5		50-150	%	17-DEC-12	01-JAN-13	R2504965
Surrogate: Phenanthrene d10	123.3		50-150	%	17-DEC-12	01-JAN-13	R2504965

* Refer to Referenced Information for Qualifiers (if any) and Methodology. HK 4/16/2013

KGS Group Consultants (Winnipeg)
865 Waverly Street - 3rd Floor
Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-35-EL(CANISTER#264,REGULATOR#02644)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-1
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	16.0		ppb			04-JAN-13
Xylenes (Total)	69.4		ug/m3			04-JAN-13
Note: Canister Pressure= 11.4psia						
Toluene						
Toluene	17.4		ppb			04-JAN-13
Toluene	65.4		ug/m3			04-JAN-13
Note: Canister Pressure= 11.4psia						
Ethyl Benzene						
Ethylbenzene	3.07		ppb			04-JAN-13
Ethylbenzene	13.3		ug/m3			04-JAN-13
Note: Canister Pressure= 11.4psia						
Benzene - air						
Benzene	18.0		ug/m3			04-JAN-13
Benzene	5.64		ppb			04-JAN-13
Note: Canister Pressure= 11.4psia						

CDWQG = Health Canada Guideline Limits updated

* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit.
* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

Approved by

Jessica Spira
Account Manager

KGS Group Consultants (Winnipeg)
865 Waverly Street - 3rd Floor
Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-38-AM(CANISTER#245,REGULATOR#02504)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-2
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	<2.6		ug/m3			04-JAN-13
Xylenes (Total)	<0.60		ppb			04-JAN-13
Note: Canister Pressure= 15.8psia						
Toluene						
Toluene	0.43		ppb			04-JAN-13
Toluene	1.62		ug/m3			04-JAN-13
Note: Canister Pressure= 15.8psia						
Ethyl Benzene						
Ethylbenzene	<0.87		ug/m3			04-JAN-13
Ethylbenzene	<0.20		ppb			04-JAN-13
Note: Canister Pressure= 15.8psia						
Benzene - air						
Benzene	0.65		ug/m3			04-JAN-13
Benzene	0.21		ppb			04-JAN-13
Note: Canister Pressure= 15.8psia						

CDWQG = Health Canada Guideline Limits updated

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* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

Approved by

Jessica Spira
Account Manager

KGS Group Consultants (Winnipeg)
865 Waverly Street - 3rd Floor

Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-35-EE(CANISTER#1187,REGULATOR#01380)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-3
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	<2.6		ug/m3			04-JAN-13
Xylenes (Total)	<0.60		ppb			04-JAN-13
Note: Canister Pressure= 15.9psia						
Toluene						
Toluene	0.50		ppb			04-JAN-13
Toluene	1.89		ug/m3			04-JAN-13
Note: Canister Pressure= 15.9psia						
Ethyl Benzene						
Ethylbenzene	<0.20		ppb			04-JAN-13
Ethylbenzene	<0.87		ug/m3			04-JAN-13
Note: Canister Pressure= 15.9psia						
Benzene - air						
Benzene	0.26		ppb			04-JAN-13
Benzene	0.81		ug/m3			04-JAN-13
Note: Canister Pressure= 15.9psia						

CDWQG = Health Canada Guideline Limits updated

* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit.
* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

Approved by

Jessica Spira
Account Manager

KGS Group Consultants (Winnipeg)
865 Waverly Street - 3rd Floor

Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-38-OF2(CANISTER#204,REGULATOR#02503)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-4
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	4.5		ug/m3			04-JAN-13
Xylenes (Total)	1.03		ppb			04-JAN-13
Note: Canister Pressure= 13.9psia						
Toluene						
Toluene	3.11		ppb			04-JAN-13
Toluene	11.7		ug/m3			04-JAN-13
Note: Canister Pressure= 13.9psia						
Ethyl Benzene						
Ethylbenzene	0.99		ug/m3			04-JAN-13
Ethylbenzene	0.23		ppb			04-JAN-13
Note: Canister Pressure= 13.9psia						
Benzene - air						
Benzene	0.58		ppb			04-JAN-13
Benzene	1.85		ug/m3			04-JAN-13
Note: Canister Pressure= 13.9psia						

CDWQG = Health Canada Guideline Limits updated

* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit.
* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

Approved by

Jessica Spira
Account Manager

KGS Group Consultants (Winnipeg)
865 Waverly Street - 3rd Floor
Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-33-LR(CANISTER#242,REGULATOR#01363)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-5
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	9.2		ug/m3			04-JAN-13
Xylenes (Total)	2.12		ppb			04-JAN-13
Note: Canister Pressure= 14.0psia						
Toluene						
Toluene	7.06		ug/m3			04-JAN-13
Toluene	1.88		ppb			04-JAN-13
Note: Canister Pressure= 14.0psia						
Ethyl Benzene						
Ethylbenzene	1.78		ug/m3			04-JAN-13
Ethylbenzene	0.41		ppb			04-JAN-13
Note: Canister Pressure= 14.0psia						
Benzene - air						
Benzene	0.42		ppb			04-JAN-13
Benzene	1.35		ug/m3			04-JAN-13
Note: Canister Pressure= 14.0psia						

CDWQG = Health Canada Guideline Limits updated

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* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

Approved by

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Account Manager

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Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-35-01(CANISTER#320,REGULATOR#02643)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-6
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	1.72		ppb			04-JAN-13
Xylenes (Total)	7.4		ug/m3			04-JAN-13
Note: Canister Pressure= 13.9psia						
Toluene						
Toluene	6.75		ug/m3			04-JAN-13
Toluene	1.80		ppb			04-JAN-13
Note: Canister Pressure= 13.9psia						
Ethyl Benzene						
Ethylbenzene	0.33		ppb			04-JAN-13
Ethylbenzene	1.42		ug/m3			04-JAN-13
Note: Canister Pressure= 13.9psia						
Benzene - air						
Benzene	2.12		ug/m3			04-JAN-13
Benzene	0.66		ppb			04-JAN-13
Note: Canister Pressure= 13.9psia						

CDWQG = Health Canada Guideline Limits updated

* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit.
* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

Approved by

Jessica Spira
Account Manager

KGS Group Consultants (Winnipeg)
865 Waverly Street - 3rd Floor
Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-35-02(CANISTER#326,REGUALTOR#02504)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-7
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	18.4		ug/m3			04-JAN-13
Xylenes (Total)	4.25		ppb			04-JAN-13
Note: Canister Pressure= 13.9psia						
Toluene						
Toluene	4.63		ppb			04-JAN-13
Toluene	17.4		ug/m3			04-JAN-13
Note: Canister Pressure= 13.9psia						
Ethyl Benzene						
Ethylbenzene	0.76		ppb			04-JAN-13
Ethylbenzene	3.30		ug/m3			04-JAN-13
Note: Canister Pressure= 13.9psia						
Benzene - air						
Benzene	3.43		ug/m3			04-JAN-13
Benzene	1.07		ppb			04-JAN-13
Note: Canister Pressure= 13.9psia						

CDWQG = Health Canada Guideline Limits updated

* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit.
* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

Approved by

Jessica Spira
Account Manager

KGS Group Consultants (Winnipeg)
865 Waverly Street - 3rd Floor

Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-35-SM(CANISTER#00131,REGULATOR#00447)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-8
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	20.5		ug/m3			04-JAN-13
Xylenes (Total)	4.73		ppb			04-JAN-13
Note: Canister Pressure= 14.3psia						
Toluene						
Toluene	14.5		ug/m3			04-JAN-13
Toluene	3.85		ppb			04-JAN-13
Note: Canister Pressure= 14.3psia						
Ethyl Benzene						
Ethylbenzene	3.56		ug/m3			04-JAN-13
Ethylbenzene	0.82		ppb			04-JAN-13
Note: Canister Pressure= 14.3psia						
Benzene - air						
Benzene	1.62		ppb			04-JAN-13
Benzene	5.16		ug/m3			04-JAN-13
Note: Canister Pressure= 14.3psia						

CDWQG = Health Canada Guideline Limits updated

* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit.
* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

Approved by

Jessica Spira
Account Manager

KGS Group Consultants (Winnipeg)
865 Waverly Street - 3rd Floor
Winnipeg MB R3T 5P4
ATTN: Marci Friedman Hamm

Date: 10-JAN-13
PO No.:
WO No.: L1249498
Project Ref: 12-0038-003-1000.06
Sample ID: AS-37-OF(CANISTER#325,REGUALTOR#01383)
Sampled By: NRH/KEM
Date Collected:
Lab Sample ID: L1249498-9
Matrix: AIR

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Total xylenes						
Xylenes (Total)	16.3		ug/m3			04-JAN-13
Xylenes (Total)	3.75		ppb			04-JAN-13
Note: Canister Pressure= 13.6psia						
Toluene						
Toluene	34.0		ug/m3			04-JAN-13
Toluene	9.02		ppb			04-JAN-13
Note: Canister Pressure= 13.6psia						
Ethyl Benzene						
Ethylbenzene	3.27		ug/m3			04-JAN-13
Ethylbenzene	0.76		ppb			04-JAN-13
Note: Canister Pressure= 13.6psia						
Benzene - air						
Benzene	0.86		ppb			04-JAN-13
Benzene	2.75		ug/m3			04-JAN-13
Note: Canister Pressure= 13.6psia						

CDWQG = Health Canada Guideline Limits updated

* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit.
* Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality
- A blank entry designates no known limit.
- A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.

Approved by

Jessica Spira
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Appendix D
HHRA Sample Calculations

APPENDIX D

Sample Calculation

The exposure parameters for the inhalation route calculations presented in this appendix were obtained from Table 8 and 9 of the main report.

Inhalation of Volatiles

The receptor's average uptake of COCs through inhalation of volatiles in air is estimated using the following equation (based on USEPA, 2009):

$$EC = \frac{(C_{air} * EF1 * EF2 * EF3 * ED)}{AT}$$

where: EC = Exposure concentration (mg/m^3)
C_{air} = volatile contaminant concentration in indoor or outdoor air (mg/m^3); this concentration is obtained through environmental sampling or modeling
EF1 = Exposure frequency to indoor or outdoor air (hours/day)
EF2 = Exposure frequency to indoor or outdoor air (days/week)
EF3 = Exposure frequency to indoor or outdoor air (weeks/year)
ED = Exposure duration (years)
AT = Averaging time (hours)

Exposure assumptions related to Indoor Workers exposed to volatiles in indoor air (37 Sutherland Avenue, Stores Building) are applied to demonstrate this calculation. The COC selected for demonstration is naphthalene. As naphthalene is not a carcinogen, an averaging time representative of non-carcinogenic exposure is applied. The exposure parameters are as follows:

C_{air} = 1.32E-03 mg/m^3
EF1 = 10 hours/day
EF2 = 5 days/week
EF3 = 48 weeks/year
ED = 35 years
AT = 35 x 365 = 12,775 days or 306,600 hours

Therefore:

$$EC = \frac{1.32E-03 * 10 * 5 * 48 * 35}{306600}$$

$$EC = 3.6E-04\ mg/m^3$$

References

United States Environmental Protection Agency (USEPA). 2009. *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment).* Final. EPA-540-R-070-002, OSWER 9285.7-82. January.

Appendix E
Toxicological Profiles

1.0 POLYCYCLIC AROMATIC HYDROCARBONS

Polycyclic aromatic hydrocarbons (PAHs) comprise a group of chemicals that are formed from the incomplete burning of organic substances (ATSDR, 1995; WHO, 1998). Sources of PAHs in the environment include forest fires, and petroleum or coal tar distillation and fractionation.

There is no information available from studies on humans to determine what effects can result from being exposed to individual PAHs at certain levels. However, breathing PAHs and skin contact have been linked with cancer in humans. A number of PAHs have been shown to cause tumours in laboratory animals that were exposed to PAHs through their food, from breathing contaminated air, and when it was applied to their skin. When pregnant mice ate high doses of benzo(a)pyrene they experienced reproductive problems. In addition, the offspring of the pregnant mice showed birth defects and a decrease in their body weight. Other effects include damage to the skin, body fluids, and the immune system. However, these effects have not been seen in humans.

1.1 Chemical and Physical Properties

Table 1: Chemical and Physical Properties of PAHs

Compound	Molecular Weight (g/mol)	log K_{ow}	Water Solubility (mg/L)	Specific Gravity	Vapour Pressure (atm)
Acenaphthene	154.21[a]	4.33[a]	3.42[a]	1.19[b]	1.50×10^{-5} [b]
Acenaphthylene	152.2[b]	4.00[b]	16.1[b]	0.89[b]	4.09×10^{-5} [b]
Anthracene	178.24[a]	4.5[a]	0.045[a]	1.283[b]	7.68×10^{-7} [b]
Benzo(a)anthracene	228[a]	5.6[a]	0.0057[a]	1.2544[b]	5.98×10^{-9} [b]
Benzo(a)pyrene	252.3[b]	6.04[b]	0.0038[b]	NA	2.10×10^{-10} [b]
Benzo(b)fluoranthene	252.32[a]	6.06[a]	0.014[a]	NA	6.67×10^{-8} [b]
Benzo(e)pyrene	252.3[b]	6.44[b]	0.004[b]	NA	2.38×10^{-10} [b]
Benzo(ghi)perylene	268.36[b]	6.50[b]	0.0003[b]	NA	2.22×10^{-10} [b]
Benzo(k)fluoranthene	252.32[a]	6.06[a]	0.0043[a]	NA	4.07×10^{-11} [b]
Chrysene	228.3[b]	5.79[b]	0.0015[b]	1.274[b]	1.06×10^{-9} [b]
Dibenzo(a,h)anthracene	278.4[b]	6.75[b]	0.0005[b]	1.28[b]	1.33×10^{-8} [b]
Fluoranthene	202.26[a]	5.1[a]	0.26[a]	1.252[b]	8.61×10^{-8} [b]
Fluorene	166[a]	4.18[a]	1.98[a]	1.202[b]	7.06×10^{-6} [b]
Indeno(1,2,3-cd)pyrene	276[a]	6.4[a]	0.00053[a]	NA	1.00×10^{-9} [b]
1-Methylnaphthalene	142.2[b]	3.87[b]	28[b]	1.022[b]	8.72×10^{-5} [b]
2-Methylnaphthalene	142.2[b]	3.86[b]	25[b]	1.0058[b]	1.11×10^{-4} [b]
Naphthalene	128.16[b]	3.37[b]	31[b]	1.03[b]	3.63×10^{-4} [b]
Perylene	252.32[b]	6.25[b]	0.0004[b]	1.35[b]	NA
Phenanthrene	178.24[a]	4.5[a]	1.29[a]	1.03[b]	1.12×10^{-6} [b]
Pyrene	202.26[a]	4.9[a]	0.135[a]	1.271[b]	1.17×10^{-7} [b]

Notes:

NA, not available.

[a], CEPA (Canadian Environmental Protection Act). 1994. Priority Substances List Assessment Report, Polycyclic Aromatic Hydrocarbons. Government of Canada.

[b], TPHCWG (Total Petroleum Hydrocarbons Criteria Working Group). 1997a. Volume 3: Selection of Representative TPH Fractions Based on Fate and Transport Concentrations. July 1997.

1.2 Assessment of Carcinogenicity

The US EPA considers benzo(a)pyrene, benz(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-c,d)pyrene, and dibenz(a,h)anthracene to be Group B2 compounds; probable human carcinogens. Health Canada (1996) classifies benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene as Group II compounds; probably carcinogenic to humans.

The US EPA (1998) classifies naphthalene as a Group C compound; possible human carcinogen. Naphthalene is classified as a Group 2B compound by the International Agency for Research on Cancer (IARC), possibly carcinogenic to humans.

The US EPA classifies acenaphthylene, anthracene, fluorene, phenanthrene, pyrene and benzo(ghi)perylene as Group D compounds; not classifiable as to human carcinogenicity.

1.3 Susceptible Populations

People with various conditions such as aryl hydrocarbon hydroxylase (AHH) are at increased risk to the toxic effects of benzo(a)pyrene (ATDSR, 1995). Furthermore, people who smoke, persons with a history of excessive sun exposure, people with liver and skin diseases and women, especially of childbearing age, are all at risk (ATDSR, 1995). Data also indicates that the general population may be at increased risk of developing lung cancer following prolonged inhalation of PAH-contaminated air and skin cancer following skin exposure to PAH's and sunlight (ATDSR, 1995). Also, individuals who undergo a rapid reduction in weight may be at risk because of the systemic release and activation of PAH's that had been stored in body fat. People exposed to PAH's in conjunction with particles from tobacco smoke, fossil fuel combustion, coal fly ash, and asbestos fibres are again at an elevated risk of developing toxic effects, primarily cancer. Women may also be at high risk of reproductive dysfunction and fertility may be reduced by causing ovarian dysfunction (ATSDR 1995).

1.4 Selection of Toxicity Reference Values

1.4.1 Carcinogenic PAHs

1.4.1.1 Benz(a)anthracene

Health Canada (2010) presents a UR of 8.8E-02 $(mg/m^3)^{-1}$ for benz(a)anthracene, and the UR was obtained from the Risk Assessment Information System (RAIS) on-line database in 2004. Currently, the RAIS database presents an inhalation unit risk of 1.1E-01 $(mg/m^3)^{-1}$ for benz(a)anthracene. Therefore, the toxicological basis of the Health Canada (2010) UR cannot be determined.

1.4.1.2 Benzo(a)pyrene

Health Canada (1996) derived a TD_{05} for inhaled benzo(a)pyrene based on multi-stage modeling of the respiratory tract tumors in Syrian golden hamsters in the study reported by Thyssen et al. (1981). The TD_{05} for benzo(a)pyrene estimated in this manner was 1.6 mg/m^3. This is equivalent to an inhalation slope factor of 1.4E-01 $(mg/kg/day)^{-1}$. The inhalation slope factor can be converted to an inhalation unit risk (3.1E-02 $[mg/m^3]^{-1}$) by multiplying by an adult inhalation rate of 16.6 m^3/day and then dividing by an adult body weight of 70.7 kg. This inhalation unit risk of 3.1E-02 $[mg/m^3]^{-1}$ is used in the current risk assessment.

1.4.1.3 Benzo(b)fluoranthene

Health Canada (2004) presents a UR of 1.9E-03 $(mg/m^3)^{-1}$ for benzo(b)fluoranthene. Carcinogenic potencies relative to benzo(a)pyrene were estimated for a number of PAHs on the basis of multistage modeling of tumour incidence (epidermoid carcinomas) in Osborne-Mendel rats. PAHs were implanted into the left lung of rats (Deutsch-Wenzel et al., 1983). The potencies for each PAH relative to that of benzo(a)pyrene were calculated by dividing the dose calculated to be associated with a 5% increase in tumours for benzo(a)pyrene by those for each compound. On this basis, a relative carcinogenic potency factor of 0.06 was derived for benzo(b)fluoranthene. By applying the relative carcinogenic potency factor of 0.06 to the UR for benzo(a)pyrene (3.1E-02 $[mg/m^3]^{-1}$) we arrive at the Health Canada (2004) UR for benzo(b)fluoranthene of 1.9E-03 $(mg/m^3)^{-1}$. This inhalation unit risk of 1.9E-03 $[mg/m^3]^{-1}$ is used in the current risk assessment.

1.4.1.4 Benzo(k)fluoranthene

Health Canada (2004) presents a UR of 1.3E-03 $(mg/m^3)^{-1}$ for benzo(k)fluoranthene. Carcinogenic potencies relative to benzo(a)pyrene were estimated for a number of PAHs on the basis of multistage modeling of tumour incidence (epidermoid carcinomas) in Osborne-Mendel rats. PAHs were implanted into the left lung of rats (Deutsch-Wenzel et al., 1983). The potencies for each PAH relative to that of benzo(a)pyrene were calculated by dividing the dose calculated to be associated with a 5% increase in tumours for benzo(a)pyrene by those for each compound. On this basis, a relative carcinogenic potency factor of 0.04 was derived for benzo(k)fluoranthene. By applying the relative carcinogenic potency factor of 0.04 to the UR for benzo(a)pyrene (3.1E-02 $[mg/m^3]^{-1}$) we arrive at the Health Canada (2004) UR for benzo(k)fluoranthene of 1.3E-03 $(mg/m^3)^{-1}$. This inhalation unit risk of 1.3E-03 $[mg/m^3]^{-1}$ is used in the current risk assessment.

1.4.1.5 Chrysene

Health Canada (2010) presents a UR of 8.8E-04 $(mg/m^3)^{-1}$ for chrysene, and the UR was obtained from the Risk Assessment Information System (RAIS) on-line database in 2004. Currently, the RAIS database presents an inhalation unit risk of 1.1E-02 $(mg/m^3)^{-1}$ for chrysene. Therefore, the toxicological basis of the Health Canada (2010) UR cannot be determined.

1.4.1.6 Dibenz(a,h)anthracene

Health Canada (2010) presents a UR of 8.8E-01 $(mg/m^3)^{-1}$ for dibenz(a,h)anthracene, and the UR was obtained from the Risk Assessment Information System (RAIS) on-line database in 2004. Currently, the RAIS database presents an inhalation unit risk of 1.2 $(mg/m^3)^{-1}$ for dibenz(a,h)anthracene. Therefore, the toxicological basis of the Health Canada (2010) UR cannot be determined.

1.4.1.7 Indeno(1,2,3-c,d)pyrene

Health Canada (2010) presents a UR of 8.8E-03 $(mg/m^3)^{-1}$ for indeno(1,2,3-c,d)pyrene, and the UR was obtained from the Risk Assessment Information System (RAIS) on-line database in 2004. Currently, the RAIS database presents an inhalation unit risk of 1.1E-01 $(mg/m^3)^{-1}$ for indeno(1,2,3-c,d)pyrene. Therefore, the toxicological basis of the Health Canada (2010) UR cannot be determined.

1.4.2.1 Acenaphthene

The US EPA (1994) Integrated Risk Information System (IRIS) database provides an oral reference dose (RfD) for acenaphthene of 6.0E-02 mg/kg-day. A sub-chronic study of oral exposure to mice was used to develop a NOAEL of 175 mg/kg-day and a LOAEL of 350 mg/kg-day for hepatotoxicity. An uncertainty factor of 3000 was applied (10 for interspecies variability, 10 for intraspecies variability, 10 for use of a sub-chronic study, and 3 for data inadequacies). Confidence in the study, the database, and the RfD are low. Health Canada (2010) used the US EPA (1994) RfD to calculate a tolerable concentration (TC) by multiplying the RfD by the body weight of a toddler (16.5 kg) and dividing the resultant value by the inhalation rate of a toddler (8.3 m^3 per day). This TC (1.19E-01 mg/m^3) is used in the current risk assessment.

1.4.2.2 Naphthalene

The US EPA (1998) IRIS provides an inhalation reference concentration (RfC) of 3.0E-03 mg/m^3 for naphthalene. This value has been adopted by Health Canada (2010) and is used in the current assessment. The value is based on a human equivalent LOAEL of 9.3 mg/m^3 in a chronic mouse inhalation study. No NOAEL was established. Effects at the LOAEL included metaplasia in the nasal olfactory epithelium and hyperplasia in the nasal respiratory epithelium. An uncertainty factor of 3000 was applied (10 for interspecies extrapolation, 10 for intraspecies extrapolation, 10 for the use of a LOAEL, and 3 for database deficiencies including reproductive and chronic study deficiencies).

1.4.2.3 Anthracene

The US EPA (1993a) IRIS database provides an oral RfD for anthracene of 0.3 mg/kg-day. A sub-chronic study of oral exposure to mice was used to develop a NOAEL of 1000 mg/kg-day. No LOAEL was established. An uncertainty factor of 3000 was applied (10 for interspecies variability, 10 for intraspecies variability, 30 for use of a subchronic study, and data inadequacies). Confidence in the study, the database, and the RfD are low. Health Canada (2010) used the US EPA (1993a) RfD to calculate a TC by multiplying the RfD by the body weight of a toddler (16.5 kg) and dividing the resultant value by the inhalation rate of a toddler (8.3 m^3 per day). This TC (5.96E-01 mg/m^3) is used in the current assessment.

1.4.2.4 Chrysene

Health Canada (2010) presents a TC of 8.8E-04 mg/m^3 [and a UR of 8.8E-04 $(mg/m^3)^{-1}$] for chrysene, and the TC was obtained from the Risk Assessment Information System (RAIS) on-line database in 2004. Currently, the RAIS database presents an inhalation unit risk of 1.1E-02 $(mg/m^3)^{-1}$ for chrysene but no TC or RfC. Therefore, the toxicological basis of the Health Canada (2010) TC cannot be determined.

1.4.2.5 Fluoranthene

The US EPA (1993b) IRIS database provides an oral RfD for fluoranthene of 4.0E-02 mg/kg-day. A sub-chronic study of oral exposure to mice was used to establish a NOAEL of 125 mg/kg-day and a LOAEL of 250 mg/kg-day for nephropathy, increased liver weights, hematological alterations, and clinical effects. An uncertainty factor of 3000 was applied to the NOAEL (10 each for inter- and intraspecies variability, and 30 for use of a sub-chronic study and data

inadequacies). Confidence in the study is medium. Confidence in the database and the RfD are low. Health Canada (2010) used the US EPA (1993b) RfD to calculate a TC by multiplying the RfD by the body weight of a toddler (16.5 kg) and dividing the resultant value by the inhalation rate of a toddler (8.3 m^3 per day). This TC (7.95E-02 mg/m^3) is used in the current assessment.

1.4.2.6 Fluorene

The US EPA (1990) IRIS database provides an oral RfD for fluorene of 4.0E-02 mg/kg-day. A sub-chronic study of oral exposure to mice was used to establish a NOAEL of 125 mg/kg-day and a LOAEL of 250 mg/kg-day for decreased red blood cells, packed cell volume, and hemoglobin. An uncertainty factor of 3000 was applied to the NOAEL (10 each for inter- and intraspecies variability, 10 for use of a sub-chronic study, and 3 for data inadequacies). Confidence in the study is medium while confidence in the database and the RfD are low. Health Canada (2010) used the US EPA (1990) RfD to calculate a TC by multiplying the RfD by the body weight of a toddler (16.5 kg) and dividing the resultant value by the inhalation rate of a toddler (8.3 m^3 per day). This TC (7.95E-02 mg/m^3) is used in the current assessment.

1.4.2.7 2-Methylnaphthalene

No relevant information is available regarding the chronic, sub-chronic, reproductive, or developmental toxicity of inhaled 2-methylnaphthalene in humans or animals (ATSDR, 2005). Based on a mixture study wherein rats were exposed to high flash aromatic naphtha by inhalation (Clark et al., 1989), the Massachusetts Department of Environmental Protection (MDEP) derived a RfC value of 5.0E-02 mg/m^3 as a surrogate toxicity value for constituents of the C_9 to C_{18} aromatic TPH fraction (which includes 2-methylnaphthalene). The parameters used to assess toxicity included body and organ weight, clinical observations, and hematology and serum chemistry. The NOAEL was identified by MDEP as 900 mg/m^3 (adjusted to 160 mg/m^3 for continuous exposure) based on hepatic and CNS effects. An uncertainty factor of 3000 was applied to the NOAEL (10 for use of a sub-chronic study for chronic RfC derivation, 10 each for inter- and intra-species variability, and 3 for database deficiencies). It should be noted that TPHCWG (1997b) recommended a RfC of 2.0E-01 mg/m^3 for the C_9 to C_{16} aromatic TPH fraction based on mixture studies with rodents and therefore the selected inhalation chronic non-cancer TRV may represent a conservative value.

1.4.2.8 1-Methylnaphthalene

No relevant information is available regarding the chronic, sub-chronic, reproductive, or developmental toxicity of inhaled 1-methylnaphthalene in humans or animals (ATSDR, 2005). Based on a mixture study wherein rats were exposed to high flash aromatic naphtha by inhalation (Clark et al., 1989), the MDEP derived a RfC value of 5.0E-02 mg/m^3 as a surrogate toxicity value for constituents of the C_9 to C_{18} aromatic TPH fraction (which includes 1-methylnaphthalene). The derivation of this RfC value is described in detail above for 2-methylnaphthalene.

1.4.2.9 Phenanthrene

Information on the acute, sub-chronic, chronic, developmental, or reproductive toxicity of phenanthrene in humans or animals following inhalation exposure is not available (ORNL, 1993). Based on a mixture study wherein rats were exposed to high flash aromatic naphtha by inhalation (Clark et al., 1989), the MDEP derived a RfC value of 5.0E-02 mg/m^3 as a surrogate toxicity value for constituents of the C_9 to C_{18} aromatic TPH fraction (which includes

phenanthrene). The derivation of this RfC value is described in detail above for 2-methylnaphthalene.

1.4.2.10 Pyrene

The US EPA (1993c) IRIS database provides an oral RfD for pyrene of 3.0E-02 mg/kg-day. A sub-chronic study wherein mice were orally exposed to pyrene was used to establish a NOAEL of 75 mg/kg-day and a LOAEL of 125 mg/kg-day for kidney effects. An uncertainty factor of 3000 was applied to the NOAEL to generate the RfD (10 each for inter- and intraspecies variability, and 30 for use of a sub-chronic study and data inadequacies). Confidence in the study is medium, while confidence in the database and the RfD are low. Health Canada (2010) used the US EPA (1993c) RfD to calculate a TC by multiplying the RfD by the body weight of a toddler (16.5 kg) and dividing the resultant value by the inhalation rate of a toddler (8.3 m^3 per day). This TC (6.0E-02 mg/m^3) is used in the current assessment.

1.5 Bioavailability

Information on the bioavailability of individual PAH congeners is lacking. Therefore, the discussion that follows relates to the bioavailability of benzo(a)pyrene and naphthalene (two congeners for which bioavailability information is available).

The absorption of benzo(a)pyrene in humans may be inferred to occur from studies of PAHs as a group (ATSDR, 1995). Animal studies on inhalation absorption of benzo(a)pyrene indicate rapid absorption of benzo(a)pyrene by the lungs; however, the studies also indicate that the absorption may be affected by the size of the carrier particles to which the benzo(a)pyrene is absorbed, and the solubility of the vehicle used in the administration.

There is evidence to suggest that most orally ingested benzo(a)pyrene is absorbed in humans. Oral absorption of benzo(a)pyrene in rats is incomplete, and may be influenced by the presence of oils and fat in the gastrointestinal tract. Studies have estimated the oral absorption of benzo(a)pyrene from animal studies as 23% to 58% (ATSDR, 1995). The oral absorption factor reported by the Oak Ridge National Laboratory (ORNL, 2003) was 0.31.

A dermal absorption factor of 0.01 was provided by ORNL (2003) for benzo(a)pyrene. A study using human cadaver skin showed than 23.7±9.7% of applied benzo(a)pyrene penetrated into the skin (ATSDR, 1995) while an in vitro study using human skin demonstrated that 3% of the applied benzo(a)pyrene penetrated the skin (ATSDR, 1995). These results suggest that substantial metabolism and/or binding of benzo(a)pyrene takes place in viable human skin which limits the amount of PAH available to penetrate the skin (ATSDR, 1995). A dermal bioavailability factor of 0.1 is recommended by the US EPA Region III (1995), while a factor of 0.13 is recommended by the US EPA (2001).

Naphthalene is readily absorbed through the intestinal tract and is known to also be absorbed through the skin with a half-time of 2.1 hours (US EPA, 1998). In this study, 100% oral bioavailability of naphthalene and other non-carcinogenic PAHs was assumed.

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