VOLUNTARY REMEDIATION PROGRAM APPLICATION AND COMPLIANCE STATUS REPORT

Whitaker Oil Warehouse Property

1587 Marietta Road

Atlanta, Fulton County, Georgia

Reference Site: M&J Solvents Site, HSI #10096

Prepared on behalf of:

Whitaker Properties, Ltd.
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Prepared By:

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Atlanta, Georgia

March 15, 2018

Project No. 6121-13-0117

March 15, 2018

Mr. David Brownlee
Georgia Department of Natural Resources
Environmental Protection Division
Suite 1054, East Tower
2 Martin Luther King Jr. Drive SE
Atlanta, Georgia 30334

Subject: **Voluntary Remediation Program Application and Compliance Status Report**
Whitaker Oil Warehouse Property
1587 Marietta Road
Atlanta, Fulton County, Georgia
Reference Site: M&J Solvents Site, HSI #10096

Dear Mr. Brownlee:

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) respectfully submits this Voluntary Remediation Program (VRP) Application and Compliance Status Report (CSR) on behalf of Whitaker Properties, Ltd. ("Whitaker") for property located at 1587 Marietta Road in Atlanta, Fulton County, Georgia ("Property"), sub-listed as part of the M&J Solvents HSI Site No. 10096.

This VRP Application and CSR is submitted under the Voluntary Remediation Program and demonstrates that: the Property is in compliance with Type 1 RRS for soil, and will comply with an incomplete exposure pathway for groundwater upon execution of an Environmental Covenant restricting groundwater use at the Property. On this basis, Whitaker requests that the Property be delisted from the Hazardous Site Inventory.

Please contact us if further information or clarification is necessary.

Sincerely,

Amec Foster Wheeler Environment & Infrastructure, Inc.

Stephen R. Foley, P.G.
Senior Geologist

Charles T. Ferry, P.E.
Principal Engineer

Cc: Mr. Collie B. Whitaker
Ms. Victoria Whitaker
Ms. Andrea L. Rimer, Troutman Sanders LLP

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CERTIFICATION OF COMPLIANCE WITH RISK REDUCTION STANDARDS

I certify under penalty of law that this Compliance Status Report and all attachments were prepared under my direction in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations.

Based on my review of the findings of this report with respect to the risk reduction standards of the Rules for Hazardous Site Response, Rule 391-3-19-.07, I have determined that soil at the Property (1587 Marietta Road in Atlanta, Georgia) is in compliance with Type 1 risk reduction standards, and groundwater will comply with an incomplete exposure pathway upon execution of an Environmental Covenant that restricts groundwater use at the Property.

Colie B. Whitaker III

Mr. Colie B. Whitaker III, President
Whitaker Properties, Ltd.

3/20/18

Date

GROUNDWATER SCIENTIST STATEMENT

I certify that I am a qualified groundwater scientist or engineer who has received a baccalaureate or post-graduate degree in the natural sciences or engineering, and have sufficient training and experience in groundwater hydrology and related fields, as demonstrated by state registration and completion of accredited university courses, that enable me to make sound professional judgments regarding groundwater monitoring and contaminant fate and transport. I further certify that this report was prepared in conjunction with others working under my direction.

Mr. Charles T. Ferry, P.E.
Georgia Registration No. 10957

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LIST OF ACRONYMS

Acronym	Definition
Amec Foster Wheeler	Amec Foster Wheeler Environment & Infrastructure, Inc.
COC	Chain of Custody
CSR	Compliance Status Report
EPD	Environmental Protection Division
ESA	Environmental Site Assessment
HSRA	Hazardous Site Response Act
HSRP	Hazardous Site Response Program
HSI	Hazardous Site Inventory
MCL	Maximum Contaminant Level
NC	Notification Concentration
PAH	Polynuclear Aromatic Hydrocarbon
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RRS	Risk Reduction Standard
US EPA	United States Environmental Protection Agency
USGS	U.S. Geological Survey
VISL	Vapor Intrusion Screening Levels
VOC	Volatile Organic Compound
VRP	Voluntary Remediation Program

1.0 INTRODUCTION

The subject Whitaker Oil Warehouse Property (the “Property”) is located at 1587 Marietta Road in Atlanta, Fulton County, Georgia, and is owned by Whitaker Properties, Ltd. (Whitaker). The Property is located north of the former M&J Solvents facility at 1577 Marietta Road (the “M&J Parcel”), and is sub-listed to the M&J Solvents HSI Site #10096 (the "M&J Site") as a result of impacts originating from the M&J facility. A warehouse, supporting operations at the main Whitaker Oil facility located to the south, occupies the Property which was sub-listed in 2010 on the Hazardous Site Inventory (HSI #10096) as part of the listed M&J Site. The Property encompasses approximately 5.48 acres and is identified on the Fulton County Tax Assessor’s website as Tax Parcel ID 17 02240010011. A larger parcel owned by Whitaker, located at 1557 Marietta Road to the east and south of the M&J Parcel, was also sub-listed in 2010 based on impacts from the M&J facility, but is not the subject of this Compliance Status Report (CSR).

A site location/topographic map and aerial photograph are presented as Figures 1 and 2, respectively, in Appendix B.

1.1 PROPERTY DESCRIPTION

Historically, the subject Property has consisted primarily of vacant land with several residences located along Marietta Road near Pine Street. Portions of the subject Property have been used in the past for parking of trucks and trailers. In 2005, a warehouse was constructed in the eastern portion of the subject Property and in 2016 another warehouse was constructed in the western portion of the Property.

The Property is located in northwest Atlanta, Georgia, in an area characterized by commercial and industrial development, in close proximity to two major rail hubs, Inman Yard and Tilford Yard. The Property is bound to the east by rail lines, to the south by a portion of the Whitaker Oil facility and the former M&J Solvents facility, to the west by Marietta Road and to the north by Pine Street, beyond which is vacant property and other commercially developed land.

M&J Solvents was listed on the Hazardous Site Inventory (HSI) in June 1994 as site number 10096The EPD sub-listed both the Property and another Whitaker parcel, located at 1557 Marietta Road, to the M&J Site in April 2010based on impacts to these properties from historical M&J facility operations.

1.2 PREVIOUS ENVIRONMENTAL DOCUMENTS

The following lists the previous publicly available documents from which data and other information were utilized and on which this report is at least partially based.

- Phase I Environmental Site Assessment, 1499 Hill Street, prepared by Georgia Oilmen's Services, Inc., dated May 2002.
- Limited Environmental Site Assessment, 1499 Hill Street, prepared by Georgia Oilmen's Services, Inc., dated April 2003.
- Initial Compliance Status Report, M&J Solvents Site, prepared by Tetra Tech for Georgia EPD dated December 9, 2004.
- Corrective Action Plan Addendum, M&J Solvents Site, prepared by Environmental Resources Management (ERM) for M&J Solvents PRP Group dated October 30, 2006.
- Georgia EPD Trip Report, M&J Solvents Site, dated January 14, 2008.
- Letter by Georgia EPD to M&J Solvents PRP Group, conditional approval of Corrective Action Plan, dated January 28, 2008.
- Response to EPD Comments from January 28, 2008, M&J Solvents Site, prepared by ERM for M&J Solvents PRP Group dated February 19, 2008.
- Corrective Action Status Report, M&J Solvents Site, prepared by ERM for M&J Solvents PRP Group dated March 2009.
- Letter by Georgia EPD to Whitaker Properties LTD, Notice of sub-listing Whitaker Oil parcels 170224LL0526 (1587 Marietta Rd) and 170224LL0534 (1557 Marietta Rd) on the HSI as part of M&J Solvents Site No. 10096, dated April 30, 2010.
- First Annual Corrective Action Effectiveness Report, M&J Solvents Site, prepared by ERM for M&J Solvents PRP Group dated August 12, 2010.
- Second Annual Corrective Action Effectiveness Report, M&J Solvents Site, prepared by ERM for M&J Solvents PRP Group dated August 16, 2011.
- Third Annual Corrective Action Effectiveness Report, M&J Solvents Site, prepared by ERM for M&J Solvents PRP Group dated August 16, 2012.
- Fourth Annual Corrective Action Effectiveness Report, M&J Solvents Site, prepared by ERM for M&J Solvents PRP Group dated August 16, 2013.
- Fifth Annual Corrective Action Effectiveness Report, M&J Solvents Site, prepared by ERM for M&J Solvents PRP Group dated August 15, 2014.
- Sixth Annual Corrective Action Effectiveness Report, M&J Solvents Site, prepared by ERM for M&J Solvents PRP Group dated August 14, 2015.
- Seventh Annual Corrective Action Effectiveness Report, M&J Solvents Site, prepared by ERM for M&J Solvents PRP Group dated August 1, 2016.
- Revised Corrective Action Plan, M&J Solvents Site, prepared by ERM for M&J Solvents PRP Group dated May 2, 2017.

1.3 BACKGROUND

The Property has been the subject of a limited number of environmental assessments conducted between 2003 and 2017 in response to releases to soil and groundwater from the former M&J Solvents facility which borders the Property to the south. The former M&J Solvents facility was reportedly in operation from 1967 until operations ceased in 1994 as a requirement of an Administrative Order issued by the EPD. While in operation, M&J Solvents recycled spent solvents and was issued a solid waste handling permit in 1976 and a RCRA TSD permit in 1984. The EPD issued M&J Solvents several Consent Orders due to improper handling of solvents and various other violations during its period of operation. The EPD listed M&J Solvents on the HSI in June 1994 and identified seven regulated substances in soil and 31 regulated substances in groundwater according to EPD's posted Site summary.

Environmental assessments have been conducted on the M&J Site as well as surrounding properties, including the installation of eight soil borings which were converted to groundwater monitoring wells on the subject Property between 2003 and 2016.

In summary, soil and groundwater testing identified impacts of chlorinated VOCs along with low concentrations of non-chlorinated and petroleum VOCs, and isolated locations of metals on the Property as a result of operations from the M&J facility.

Numerous corrective action measures have been performed in the area of the M&J Site to the south of the subject Property. The initial corrective action effort was performed in 1995 and consisted of the removal of drummed waste, ASTs, USTs, an oil-water separator and some impacted soil from the M&J Parcel. Additional corrective action at the M&J Parcel was initiated in 2008 through the removal of the remaining building structures, installation of a soil liner and drainage system covering the unpaved portion of the M&J Parcel and construction of a soil and groundwater remediation system. The remediation system, which focuses primarily on treating shallow groundwater impacts under the M&J Parcel, was completed in 2009 and continues to operate. It consists of an air sparge and soil vapor extraction system, along with a vapor recovery and treatment system.

Following completion of the remediation system, a groundwater monitoring program was commenced at the M&J Site to determine the effectiveness of the remediation. The groundwater monitoring program consists of a combination of quarterly, semi-annual and annual sampling of numerous groundwater monitoring wells, including wells GOS-MW-2, GOS-MW-5 and MW-11,

located on the subject Property, with results reported to EPD on an annual basis. Other wells had previously been sampled on several occasions, including GOS-MW-1, MW-16 and MW-16D, but have not been sampled since at least 2012, and have since been abandoned.

2.0 PURPOSE

On behalf of Whitaker Properties, Ltd. ("Whitaker"), this VRP Application/Compliance Status Report (CSR) has been prepared in accordance with the Georgia VRP Act. The purpose of this this VRP Application/CSR is to document compliance with the requirements of the VRP Act and to certify compliance with applicable risk reduction standards for soil at the Property and provide appropriate property use restrictions for the purpose of delisting the site from the HSI. This CSR was compiled largely on the basis of conditions which were characterized through a series of investigations performed by others at the Property between 2003 and 2017, but includes additional sampling more recently performed on the Property by the applicant.

The Property is considered a qualifying property for the VRP under the criteria set forth in Section 12-8-105 of the Act. Whitaker qualifies as a VRP participant under criteria set forth in Section 12-8-106 of the Act.

3.0 CHARACTERIZATION OF HYDROGEOLOGY

The geology and hydrogeology of the Property discussed below are based on the information previously reported to EPD related to investigations performed at the M&J Site and from a review of published literature.

3.1 REGIONAL GEOLOGY

The property is located in the Piedmont Geologic Region of the Appalachian Province. The Piedmont parallels the eastern edge of the North American continent south of New England and east of the Blue Ridge Geologic Region. The Piedmont is the non-mountainous portion of the Appalachians, and slopes generally from the mountains toward the Coastal Plain. In general, the northwest boundary of the Piedmont is at the foot of the mountains. The southeastern boundary is located where the crystalline rocks of the Piedmont are overlain by younger marine sediments of the Coastal Plain. The Piedmont landscape typically consists of rolling terrain of gentle slope, cut or bounded by valleys of steeper slope and depth.

3.2 SITE SPECIFIC GEOLOGY

The M&J Site, including the subject Property, are mapped as being underlain by late Precambrian to early Paleozoic bedrock consisting of the Norcross Gneiss Formation which is part of the Atlanta Group (McConnell and Abrams, 1984). The Norcross Gneiss Formation is described as consisting of light-gray epidote-muscovite-plagioclase-gneiss and amphibolite. The residual soils in this geologic area have been formed by the in-place chemical and physical weathering of underlying parent rock types. The typical soil profile consists of clayey soils near the ground surface where weathering is more advanced, transitioning to sandy silts and silty sands that generally become harder with depth and proximity to parent rock. The residual soil or “saprolite” often retains some of the textural features of the bedrock. Borings on the Property identified saprolite typical of this geologic setting.

During the installation of various borings on and around the Property, a layer of fill soil overlying the saprolite was recorded ranging in thickness from about 1 foot to approximately 40 feet on the Property. According to the 2012 Third Annual Corrective Action Effectiveness Report by ERM, the fill material was thickest in the area southeast of the subject Property between the M&J Parcel and the existing CSX railroad tracks to the east.

3.3 GROUNDWATER FLOW

In the Piedmont Geologic Region, groundwater generally occurs under water table conditions and is stored in the pore spaces of the soil mantle, and in the structural features (i.e., joints, fractures, faults) present in the underlying rock. The transition zone is a primary lateral transmitter of groundwater and, potentially, of groundwater contaminants and has been observed in Georgia as the most permeable part of the groundwater system (Harned and Daniel III, 1989). Recharge to the water table occurs primarily through precipitation infiltrating the upper soils and percolating downward, under the influence of gravity, to the groundwater table. Typically, the water table is not a level surface, but a subdued reflection of the land surface. Depth to the water table is variable, being dependent on many factors which include: the amount of rainfall, the permeability of the soil, the extent of fracturing in the underlying rock, and the amount of groundwater being pumped from the local aquifer unit.

In the Piedmont, the uppermost groundwater generally flows in directions sub-parallel to the ground surface slopes and under the influence of gravity toward points of discharge such as creeks, swamps, drainage swales or pumped groundwater wells. Based on an interpretation of the data, the water table appears to form a plateau just north of the former M&J Parcel and groundwater generally flows in a radial pattern to the south, southeast and southwest. According to the 1928 topographic map, this groundwater flow pattern is consistent with the presence of a topographic knoll located on the subject Property, which positions the Property upgradient of the M&J Parcel. The groundwater flow pattern is very similar in the saprolite and bedrock as illustrated by a comparison of the March 2016 potentiometric surface maps prepared by ERM and attached in Appendix B. The saprolite and bedrock water-bearing zones appear to form a single connected aquifer unit as indicated by the similar water elevations in several shallow/deep well pairs.

Depths to groundwater on the subject Property range from approximately 20 feet to 23 feet. The monitoring wells installed prior to construction of the warehouse addition have been gauged periodically since August 2009, with the exception of GOS-MW4 which was abandoned after its initial sampling. Three wells, MW-16, MW-16D and GOS-MW-1 were abandoned at a later date. Two new wells were installed in November 2017 in the northern portion of the Property. These wells, along with MW-11 and GOS-MW-5, were gauged during Amec Foster Wheeler's November 2017 sampling event. Figure 5 illustrates the potentiometric surface across the Property which is consistent with that previously measured by ERM.

4.0 SOIL ASSESSMENT

Limited soil sampling and testing was conducted in conjunction with assessment activities by Georgia Oilmen's Services (GOS) prior to construction of the existing warehouse in April 2003, and more recently by Amec Foster Wheeler in November and December 2017. This work involved the installation of two drilled soil borings on the subject Property which were converted to groundwater monitoring wells, and three shallow hand auger borings.

Refer to Figure 3 in Appendix B for a summary of soil laboratory data.

4.1 ANALYTICAL PARAMETERS AND RATIONALE FOR SELECTION

Five soil samples (GOS-B1 through GOS-B5) collected during the 2003 assessment were tested for volatile organic compounds (VOCs, SW-846 Test Method 8260B). Two of the samples (GOS-B1 and GOS-B2) were also tested for semi-volatile organic compounds (SVOCs SW-846 Test Method 8270C) and RCRA metals (SW-846 Test Methods 6010C and 7471B). The 2017 assessment included the collection and testing of five soil samples for VOCs. Two soil samples were collected during the installation of monitoring wells MW-17 and MW-18. Shallow soil samples were also collected from HA-1, HA-2 and HA-3 along the common boundary between the Property and the adjacent M&J Parcel to check for potential impacts related to surface runoff from the M&J Parcel.

4.2 SAMPLING AND ANALYSIS PROCEDURES

Soil samples were collected by use of rotary auger drilling/split spoon sampling. As previously reported to EPD in the December 2013 CSR prepared by Amec Foster Wheeler for the Whitaker parcel located at 1557 Marietta Road, generally accepted industry procedures were followed during sample collection, sample preservation, equipment decontamination procedures, as well as, laboratory quality assurance/quality control procedures.

4.3 BACKGROUND SOIL CONCENTRATIONS

Because VOC and SVOC compounds are not characteristic of naturally occurring compounds in Piedmont soils, naturally occurring background conditions for these constituents detected on the Property were assumed to be below laboratory detection limits.

Although metals occur naturally in soils, the Type 1 risk reduction standards were used for determining background.

4.4 SUMMARY OF PERTINENT SOIL DATA

Soil testing data are summarized on the attached Table 1 in Appendix B and on Figure 3 in Appendix C. Soil results were compared to Type 1 residential RRS and Type 3 non-residential RRS.

Soil sampling and testing was conducted at the Property in April 2003, November 2017 and December 2017. During the 2003 assessment, five borings (GOS-B1 through GOS-B5) were advanced in the eastern portion of the property near the adjacent M&J Parcel boundary. One soil sample from each boring, collected from depths ranging from approximately 10 to 25 feet below grade were tested for VOCs. Samples from two of the borings (GOS-B2 and GOS-B3) were also tested for SVOCs and RCRA metals. In November 2017, two borings (MW-17 and MW-18) were installed in the area north of the warehouse at 14-15.5 feet and 9-10.5 feet, respectively. Shallow soil samples were also collected along the common boundary between the Property and the adjacent M&J Parcel boundary in December 2017. These samples were collected from a depth of 1-1.5 feet and tested for VOCs.

During the 2003 soil sampling event, 1,1,1-trichloroethane was detected in one sample (GOS-B2) at a concentration just above the laboratory reporting limit, but well below the Type 1 or 3 RRS. We note that this sample was collected from a depth consistent with the water table and may represent groundwater impact. VOCs were not detected in the remaining samples, and SVOCs were not detected in either of the two samples tested. Lead and barium were detected in both samples tested in 2003, at concentrations well below the Type 1 RRS and consistent with naturally occurring background conditions. No other metals were detected. VOCs were not detected above laboratory reporting limits in any of the five samples tested during the November and December 2017 sampling events.

5.0 GROUNDWATER ASSESSMENT

The five soil borings drilled by GOS in 2003 were converted to groundwater monitoring wells on the Property. The wells were initially designated MW-1 through MW-5, and eventually the GOS modifier was added. Tetra Tech also installed additional groundwater monitoring wells on the Property in 2003 and 2004 in connection with the investigation of the M&J Site. This work included the installation of two shallow monitoring wells (MW-11 and MW-16) and one deep bedrock monitoring well (MW-16D). Two additional monitoring wells (MW-17 and MW-18) were installed by Amec Foster Wheeler in the northern portion of the Property in November 2017 to complete the delineation of groundwater impacts in this portion of the Property.

Refer to Figure 4 in Appendix B for a plan of the monitoring well locations and Table 2 in Appendix C for a summary of the groundwater analytical data.

The groundwater data referenced in this CSR have been summarized in various submittals to the EPD which include: December 2004 Initial CSR, December 2005 CAP and CSR, October 2006 CAP Addendum, March 2009 Corrective Action Status Report, and eight Annual Corrective Action Effectiveness Reports submitted by ERM in August of each year between 2009 and 2016. The following sections summarize the general sampling methodology, analytical methods and quality assurance/quality control procedures utilized by Amec Foster Wheeler, Tetra Tech, GOS and ERM, which employed similar procedures during the assessment of groundwater on the subject Property based on a review of their documentation.

5.1 ANALYTICAL PARAMETERS SELECTED

The monitoring wells installed on the Property were intended to investigate identified impacts from the former M&J facility operations located adjacent to the Property. Groundwater samples collected from the monitoring wells have generally been analyzed for VOCs (SW-846 Test Method 8260B) with limited testing of SVOCs (SW-846 Test Method 8270C), and RCRA Metals (SW-846 Test methods 6010B and 7470A). These parameters were selected based on the impacts associated with operations conducted at the former M&J Solvents facility.

5.2 GROUNDWATER SAMPLING AND ANALYSIS PROCEDURES

As indicated, the earliest groundwater assessment performed on the Property was conducted in April 2003 and included the installation of five monitoring wells, GOS-MW-1 through GOS-MW-5. GOS-MW-4 was abandoned following the initial sampling event. The wells were installed in borings drilled to depths of 30 to 35 feet and completed as Type II groundwater monitoring wells,

consisting of a two-inch diameter PVC casing into the borehole with 15 to 20 feet of screen. A filter pack of sand was placed around and approximately 2-feet above the screened section and was followed by a hydrated bentonite seal. The remainder of the borehole annulus was filled with cement grout

In October 2003, shallow monitoring wells constructed by TetraTech consisted of a two-inch diameter PVC casing into the borehole with 15 feet of screen. A filter pack of sand was placed around and approximately 2-feet above the screened section and was followed by a hydrated bentonite seal. The remainder of the borehole annulus was filled with cement grout.

The deep monitoring well was also installed into rock by TetraTech to evaluate the vertical extent of chlorinated VOC impacts in groundwater. A 4-inch PVC solid casing was set approximately two feet into rock. An air hammer was used to advance approximately 15 feet below the rock surface. A well was then constructed in the same manner as previously described but with a short 5-foot screen to allow collection of a groundwater sample from a deeper interval within the bedrock aquifer rather than the shallow water table aquifer.

In November 2017, Amec Foster Wheeler installed two shallow monitoring wells (MW-17 and MW-18) in the area north of the warehouse to complete the delineation of groundwater impacts in this area. The wells were completed as Type II wells in the manner described above, with ten feet of screen.

5.2.1 Groundwater Elevation

As stipulated in EPD's January 28, 2008 CAP and CSR approval letter for the M&J Site, groundwater levels from wells on the Site, including the subject Property, have been gauged on a regular basis since August 2009. The water level data collected during the Site gauging events are tabulated on Table C-3 in Appendix C.

Two ERM potentiometric surface maps from the March 2016 sampling event are attached in Appendix B to illustrate the groundwater flow pattern in the shallow and bedrock aquifers. As shown on the attached figures, the subject Property appears to in an upgradient position with respect to groundwater flow in relation to the M&J Parcel.

As illustrated on Figure 5, groundwater elevation data obtained from the wells located on the Property indicate that shallow groundwater flow across the subject Property is in a southeasterly direction, generally toward the former M&J facility.

5.2.2 Well Evacuation and Groundwater Sampling

As previously reported to EPD, groundwater assessments conducted on the subject Property appear to have followed general accepted industry procedures during well evacuation, sample collection and preservation, equipment decontamination, as well as, laboratory quality assurance/quality control.

The wells located on the subject Property have been sampled on multiple occasions by ERM since August 2009 as part of the approved M&J Site groundwater monitoring program. As reported in the previous seven Corrective Action Effectiveness Reports submitted by ERM for the M&J Site, the on-Site wells were purged using low-flow/low stress techniques in accordance with EPA SESD sampling guidelines. ERM monitored the water quality parameters of temperature, pH, conductivity, dissolved oxygen, oxidation-reduction potential and turbidity during well development. Similar well purging and sampling techniques were employed by Amec Foster Wheeler during the November 2017 sampling event, which included the sampling of four wells on the Property, including two existing wells (MW-11 and GOS-MW-5) and two new wells installed by Amec Foster Wheeler (MW-17 and MW-18).

5.3 BACKGROUND GROUNDWATER QUALITY

Because the VOC and SVOC constituents are not typical of naturally occurring substances in the Piedmont, naturally occurring background conditions for these constituents at the subject property were assumed to be below laboratory detection limits.

5.4 SUMMARY OF PERTINENT GROUNDWATER DATA

During the course of various assessments conducted between 2003 and 2017, a total of eight monitoring wells were installed on the subject Site. As previously mentioned, most of the wells have been sampled on multiple occasions by ERM since August 2009 as part of the approved M&J Site groundwater monitoring program. The scope of groundwater monitoring on the subject Property has been reduced over time and currently includes one well (MW-11) sampled on an annual basis and two wells (GOS-MW2 and GOS-MW3) sampled on a biennial basis. Two additional wells were recently installed by Amec Foster Wheeler in the northern portion of the Property to complete the delineation in this area. The results of the groundwater laboratory analyses from previous sampling events are summarized on Table 2 in Appendix B and illustrated on Figure 4 in Appendix C.

In summary, groundwater testing from the Property identified impacts primarily of chlorinated, non-chlorinated and petroleum VOCs. These VOCs have been consistently detected in the wells on the subject Property since 2003, although the concentrations have fluctuated over time. The most recent sampling event, conducted in November 2017, indicated that trichloroethene exceeded its approved RRS in two wells, GOS-MW-5 and MW-11. All other VOCs detected in the wells on the subject property were below applicable RRS.

SVOCs have not historically been detected in groundwater on the subject Property. As a result, SVOCs are no longer included in the ERM testing protocol and were not included in Amec Foster Wheeler's 2017 testing.

The metals arsenic, barium, chromium, lead and selenium were detected in groundwater on the subject Property in 2003. However, only arsenic and lead are included in follow-up testing as part of the approved M&J Site groundwater monitoring program as these were the only metals detected above their respective maximum contaminant levels (MCL). Subsequent testing for arsenic and lead included testing for both total and dissolved metals. The results consistently indicated dissolved arsenic and lead concentrations below detection limits, indicating the elevated concentrations were likely related to suspended sediment. As a result, after 2012 the testing of metals in groundwater was discontinued.

6.0 DESCRIPTION OF THE RELEASE SOURCES

The results of the soil and groundwater assessments at the Property indicate a release of regulated substances to soil and groundwater. This section of the CSR provides a description of the source of the release(s).

6.1 REGULATED SUBSTANCES RELEASED FROM THE SOURCE

The following regulated substances have been identified in groundwater at the Property: 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, benzene, chloroform, cis-1,2-dichloroethene, ethylbenzene, tetrachloroethene, trichloroethene, toluene, arsenic, barium, chromium, lead and selenium. Of these, only trichloroethene is present above the RRS approved for the Site.

To date, the only regulated substance identified in soil is trichloroethene. This substance was, however, detected on the Property at very low concentrations, and from a depth that appears to be indicative of groundwater conditions.

6.2 SOURCE OF THE RELEASE

It is well documented that historical operations at M&J Solvents are the source of impacts at the M&J Site and to the Property. While in operation, M&J Solvents recycled spent solvents and was issued a solid waste handling permit in 1976 and a RCRA Treatment Storage and Disposal (TSD) permit in 1984. In 1985, several water samples were collected from a storm water retention sump located on the M&J Parcel. Due to the detection of various VOC constituents, the EPD issued M&J Solvents a Consent Order in 1986. Results of further assessment revealed the presence of regulated substances in both the soil and groundwater at the M&J Solvents facility. The facility was subsequently closed in 1994 as a requirement of an Administrative Order issued to M&J Solvents by the EPD. M&J Solvents was listed on the Hazardous Site Inventory in June 1994 as site number 10096 due to the presence of regulated constituents in soil and groundwater. Subsequent investigations and reports associated with the M&J Site have documented the source and extent of releases to soil and groundwater.

A drainage ditch is located between the Property's eastern boundary and the CSX railroad tracks. This ditch receives surface water runoff from the M&J facility but is at a lower elevation than the Property and is located off site. As such, it is not considered to represent a source for the subject Property.

During its history, there have been no documented releases in connection with operations at the subject Property. The 2002 Phase I report by GOS describes the Property as vacant, former residential land at the time. A home had recently been demolished at 1499 Hill Street, which bisected the Property at the time. The original warehouse was constructed in 2005 and Hill Street was abandoned. Since 2005, the warehouse has been used for storage of packaged goods. Whitaker subsequently acquired several residential properties located along Marietta Road and in 2016 constructed an addition to the warehouse which is located southwest of the Marietta Road and Oak Street intersection.

6.3 CHRONOLOGY OF THE RELEASES

Although detailed information regarding the chronology of releases to soil and groundwater is not available, past investigations and reports associated with the M&J Site point to a pattern of improper waste handling and poor housekeeping practices at M&J Solvents during its operation from 1967 until operations ceased in 1994.

The Property was sub-listed on the HSI in April 2010 as part of the M&J Site, apparently based on its proximity, but not based on any specific release chronology.

7.0 DESCRIPTION OF THE RESPONSIBLE PARTY FOR THE RELEASE DETECTED AT THE PROPERTY

The subject Property has been impacted by releases from the adjacent former M&J facility which borders the Property to the south. The EPD issued M&J Solvents several Consent Orders due to improper handling of solvents and various other violations. M&J Solvents was listed on the Hazardous Site Inventory in June 1994 due to the presence of regulated constituents in soil and groundwater, and subsequent investigations have indicated the presence of impacts on the Property in connection with the former M&J facility operations

8.0 SOIL COMPLIANCE

The Property is intended to remain in use as a warehouse facility.

8.1 RISK REDUCTION STANDARDS

Because the current and anticipated future use of the Property is non-residential, it will be subject to non-residential RRS.

8.2 CONCLUSION

The sampling of soils conducted on the subject Property has not identified regulated constituents in soil in excess of the non-residential RRS.

9.0 FATE AND TRANSPORT OF GROUNDWATER IMPACTS

Identified groundwater impacts on the subject Property are interpreted to represent the upgradient edge of the solvent plume associated with former operations at the M&J Solvents facility. The adjacent M&J Parcel has had a groundwater treatment system in operation since 2009. The system utilizes a combination of air sparging and vacuum extraction to remove VOCs from the soil and groundwater. The VOC plume emanating from the M&J Parcel is significant in size, extending well beyond the M&J Parcel, primarily to the southeast, away from the Property.

At this time, fate and transport modeling has not been used to evaluate the future extent and concentration of regulated constituents downgradient of the Property. In our opinion, such modeling is impractical due to the extensive nature of the existing downgradient plume and the difficulty in properly calibrating or validating a model due to the interference presented by the downgradient portion of the plume.

Groundwater remediation associated with the M&J Site is ongoing and is expected to continue into the foreseeable future, whether in the form of active remediation or monitored natural attenuation. Parties associated with the investigation of the M&J Site will continue to be allowed access to the Property, as needed to conduct any ongoing monitoring activities required by EPD.

10.0 EXPOSURE PATHWAYS

The risk to human health and the environment is directly related to the potential for receptors to be exposed to regulated constituents. Exposure pathways are the means by which regulated substances migrate from a source to a point of contact with humans and/or the environment. An examination of the following potential exposure pathways and receptors was conducted for the site.

- Potential exposure to regulated constituents in soil;
- Potential exposure to regulated constituents in groundwater;
- Potential exposure to regulated constituents in surface water;
- Potential exposure to regulated constituents due to vapor intrusion from impacted soil or groundwater.

10.1 SOIL CRITERIA

The Property is located in northwest Atlanta, Georgia, in an area characterized by commercial and industrial development (primarily railroad properties) and is located between Inman Yard to the west and CSX railroad property to the east. The former M&J Parcel and other portions of the M&J Site are located to the south. Pine Street bounds the Property to the north, beyond which is vacant and commercially developed land.

The Property is fully fenced with controlled access through gates that are locked when not in active use. Access by customers and other visitors is limited to the office building entrance and controlled by a receptionist. In order to access operating areas of the facility, members of the public must be accompanied by a Whitaker Oil employee familiar with site-specific health and safety protocols. As such, the Property is not accessible to the public.

The Property would be considered a “non-residential” property as defined under HSRA. The source of the subsurface impacts has been identified as the adjacent former M&J Solvents facility. No source materials have been identified on the subject Property and no HSRA regulated constituents have been identified in soil above applicable RRS. As such, the subject site satisfies non-residential RRS and the exposure pathway for soil is incomplete.

10.2 GROUNDWATER CRITERIA

Amec Foster Wheeler compared historical groundwater testing data from the Property from as early as 2003 to current non-residential RRS for the constituents detected. Although groundwater in several wells has historically exceeded Type 3/4 RRS, based on the most recent testing for

each well on the Property, only TCE in well GOS-MW-5 currently exceeds non-residential groundwater RRS approved for the Site. All other regulated constituents were below their non-residential RRS.

According to the information obtained, the City of Atlanta provides municipal water service to the area surrounding the Property. Water for Atlanta's system is obtained from surface intakes on the Chattahoochee River, approximately 2.2 miles northwest of the Property. As such, the risk of exposure to impacted groundwater is considered negligible for occupants of the Property and nearby properties.

Previous groundwater testing results for characterization of the M&J Site indicate that migration of the groundwater plume is generally toward the southeast. No receptors have been identified in this area which will likely be impacted.

Groundwater beneath the Property is not used for drinking water and the Property will comply with an incomplete exposure pathway upon execution of an Environmental Covenant restricting groundwater usage. As such, the Property is in compliance with appropriate groundwater criteria under the VRP.

10.3 SURFACE WATER

Based on our review of local topography on the USGS topographic maps of Northwest Atlanta, the Property is located on the southern flank of a topographic knoll which is located just north of the M&J Parcel and forms a limited upgradient watershed. No surface water bodies have been located on the Property. The nearest perennial surface water features are Proctor Creek located approximately one mile to the west/southwest and Peachtree Creek located approximately two miles north of the Property. There is no evidence to indicate that activities on the Property have contributed to groundwater conditions associated with the M&J Site plume and delineation of the plume does not indicate that impacts have occurred to these water bodies. As such, impacts to the environment associated with the Property are considered negligible.

10.4 VAPOR INTRUSION

Risk-based soil vapor screening levels protective of indoor air were calculated using OSWER's Vapor Intrusion Screening Level (VISL) calculator (Version 3.5, June 2017 RSLs, USEPA 2017). The VISLs were based on a target cancer risk of 10^{-5} and target hazard index of 1 per the Georgia Hazardous Site Response Act regulations. A default groundwater temperature for North Georgia

(19.4 degrees Celsius) was applied (USEPA 2004). In accordance with guidance issued by USEPA for the assessment and mitigation of vapor intrusion (USEPA 2017), the soil vapor to indoor air attenuation factor was set to 0.03. Based on the most recent groundwater analytical data for the Property, TCE and 1,1,-dichloroethane both exceed the vapor intrusion screening levels for commercial properties. In order to further evaluate the screening level exceedances for TCE and 1,1-dichloroethane, these constituents were further modeled using the Johnson and Ettinger model.

The space is used as a warehouse for solvents and petroleum products; thus, many confounding factors are present that would make collection of indoor air samples non-specific to the subsurface to indoor air exposure route. The space is expected to have a very high air exchange rate because of the use of bay doors that are largely left open. Per the literature, air exchange rates of 6 to 30 per hour are typical for warehouses because they are large open spaces with a lot of air movement (The Engineering Toolbox, https://www.engineeringtoolbox.com/air-change-rate-room-d_867.html, 2017). Per modeling completed with the Johnson and Ettinger Spreadsheet Tool, Version 6.0 (2017), the default air exchange rate of 1.5/hr would reduce the maximum detected concentration of TCE (59 ug/L in groundwater collected at MW-11) to an acceptable risk-based indoor air concentration, and exposures from vapor intrusion would be associated with a hazard index less than 1 and cancer risk well below 1×10^{-6}. Site-specific modeling for monitoring wells GOS-MW-2 and GOS-MW-5 also resulted in acceptable risk-based indoor air concentrations, and exposures from vapor intrusion that would be associated with a hazard index less than 1 and cancer risk well below 1×10^{-6}. Based on the site-specific modeling using the default air exchange rate for the warehouse space, the exposure risk associated with the warehouse space is expected to be in the acceptable range and no mitigation is necessary to reduce risks or hazards.

11.0 CONCLUSIONS

Based on the findings of the assessment activities and the results of corrective action, the following conclusions are presented:

- No source of soil impacts has been identified on the subject Property, and soil testing conducted to date has not identified regulated constituents in soil in excess of applicable RRS.
- Several VOCs have been identified in groundwater in the southern portion of the subject Property. The November 2017 testing results indicate, however, that TCE in well GOS-MW-5 is the only constituent which exceeds its non-residential RRS. The November 2017 assessment work also confirmed delineation of the groundwater plume within the northern, upgradient boundary of the Property. An Environmental Covenant will be implemented upon agreement with EPD so that future site use will maintain an incomplete groundwater exposure pathway.
- VISL screening conducted for the various VOCs detected in groundwater on site indicate that TCE and 1,1-dichloroethane exceed vapor intrusion screening criteria for commercial properties. Subsequent site specific modelling of potential TCE and 1,1-dichloroethene concentrations using the Johnson & Ettinger Model indicate that potential exposures are expected to be in the acceptable range and no mitigation is necessary.
- No source has been identified on the Property and no soil impacts have been identified above non-residential RRS. The concentrations of VOCs detected in groundwater do not indicate a DNAPL condition.
- The Property, located at 1587 Marietta Road, comprises a sub-listed portion of the M&J Solvents HSI site. Based on current Property conditions, a release exceeding a reportable quantity does not exist at the time of enrollment of the Property in the VRP. In summary, the Property is in compliance with Type 1 RRS for soil, and groundwater will comply with an incomplete exposure pathway upon execution of an Environmental Covenant that restricts groundwater usage. As such, the Property should be eligible for delisting from the HSI.

12.0 REFERENCES

Cressler, C.W., C.J. Thurmond and W.G. Hester, 1983, Groundwater in the Greater Atlanta Region, Georgia; Georgia Geologic Survey Information Circular 63

Fetter, C.W., Applied Hydrogeology, third edition, 1994, Macmillan Publishing Company, New York

McConnell, K.L., and C.E. Abrams, 1984, Geology of the Greater Atlanta Region, Georgia geologic Survey Bulletin 96

Harned, D.A., and C.C. Daniel III, 1986, The Transition Zone Between Bedrock and Regolith: Conduit for Contamination, Clemson University, South Carolina

Daniel III, C.C., and P.R. Dahten, 2002, Preliminary Hydrogeologic Assessment and Study Plan for a Regional Ground-Water Resource Investigation of the Blue Ridge and Piedmont Provinces of North Carolina, U.S. Geological Survey Report 02-4105, North Carolina

Nutter, L.J., and E.G. Otton, 1969, Ground-water Occurrence in the Maryland Piedmont: Maryland Geologic Survey Report of Investigations 10

The Engineering Toolbox, https://www.engineeringtoolbox.com/air-change-rate-room-d_867.html, 2017

Voluntary Investigation and Remediation Plan Application Form and Checklist

VRP APPLICANT INFORMATION

COMPANY NAME	Whitaker Oil Company				
CONTACT PERSON/TITLE	Victoria Whitaker				
ADDRESS	1587 Marietta Road 30318				
PHONE	(404) 605-8387	FAX	(404) 355-2436	E-MAIL	victoria.whitaker@whitakeroil.com

GEORGIA CERTIFIED PROFESSIONAL GEOLOGIST OR PROFESSIONAL ENGINEER OVERSEEING CLEANUP

NAME	Stephen R. Foley			GA PE/PG NUMBER	1057
COMPANY	Amec Foster Wheeler Environment & Infrastructure, Inc.				
ADDRESS	2677 Buford Highway				
PHONE	404-817-0152	FAX	404-817-0175	E-MAIL	Steve.foley@amecfw.com

APPLICANT'S CERTIFICATION

In order to be considered a qualifying property for the VRP:

(1) The property must have a release of regulated substances into the environment;
(2) The property shall not be:
- (A) Listed on the federal National Priorities List pursuant to the federal Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. Section 9601.
- (B) Currently undergoing response activities required by an order of the regional administrator of the federal Environmental Protection Agency; or
- (C) A facility required to have a permit under Code Section 12-8-66.

(3) Qualifying the property under this part would not violate the terms and conditions under which the division operates and administers remedial programs by delegation or similar authorization from the United States Environmental Protection Agency.
(4) Any lien filed under subsection (e) of Code Section 12-8-96 or subsection (b) of Code Section 12-13-12 against the property shall be satisfied or settled and released by the director pursuant to Code Section 12-8-94 or Code Section 12-13-6.

In order to be considered a participant under the VRP:
- (1) The participant must be the property owner of the voluntary remediation property or have express permission to enter another's property to perform corrective action.
- (2) The participant must not be in violation of any order, judgment, statute, rule, or regulation subject to the enforcement authority of the director.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I also certify that this property is eligible for the Voluntary Remediation Program (VRP) as defined in Code Section 12-8-105 and I am eligible as a participant as defined in Code Section 12-8-106.

APPLICANT'S SIGNATURE	Colie B. Whitaker III		
APPLICANT'S NAME/TITLE (PRINT)	Colie B. Whitaker III	DATE	3/20/18

QUALIFYING PROPERTY INFORMATION (For additional qualifying properties, please refer to the last page of application form)			
HAZARDOUS SITE INVENTORY INFORMATION (if applicable)			
HSI Number	10096	Date HSI Site listed	April 30, 2010
HSI Facility Name	M&J Solvents	NAICS CODE	
PROPERTY INFORMATION			
TAX PARCEL ID	17 02240010011	PROPERTY SIZE (ACRES)	4.15
PROPERTY ADDRESS	1587 Marietta Road		
CITY	Atlanta	COUNTY	Fulton
STATE	Georgia	ZIPCODE	30318
LATITUDE (decimal format)	33.7959	LONGITUDE (decimal format)	-84.4383
PROPERTY OWNER INFORMATION			
PROPERTY OWNER(S)	Whitaker Oil Company	PHONE #	(404) 605-8387
MAILING ADDRESS	1557 Marietta Road		
CITY	Atlanta	STATE/ZIPCODE	GA 30318

ITEM #	DESCRIPTION OF REQUIREMENT	Location in VRP (i.e. pg., Table #, Figure #, etc.)	For EPD Comment Only (Leave Blank)
1.	**$5,000 APPLICATION FEE** IN THE FORM OF A CHECK PAYABLE TO THE GEORGIA DEPARTMENT OF NATURAL RESOURCES. (PLEASE LIST CHECK DATE AND CHECK NUMBER IN COLUMN TITLED "LOCATION IN VRP." PLEASE DO NOT INCLUDE A SCANNED COPY OF CHECK IN ELECTRONIC COPY OF APPLICATION.)	**Attached**	
2.	**WARRANTY DEED(S)** FOR QUALIFYING PROPERTY.		
3.	**TAX PLAT** OR OTHER FIGURE INCLUDING QUALIFYING PROPERTY BOUNDARIES, ABUTTING PROPERTIES, AND TAX PARCEL IDENTIFICATION NUMBER(S).	**Appendix A**	
4.	**ONE (1) PAPER COPY AND TWO (2) COMPACT DISC (CD) COPIES** OF THE VOLUNTARY REMEDIATION PLAN IN A SEARCHABLE PORTABLE DOCUMENT FORMAT (PDF).	**Included**	
5.	The VRP participant's initial plan and application must include, using all reasonably available current information to the extent known at the time of application, a graphic three-dimensional preliminary conceptual site model (CSM) including a preliminary remediation plan with a table of delineation standards, brief supporting text, charts, and figures (no more than 10 pages, total) that illustrates the site's surface and subsurface setting, the known or suspected source(s) of contamination, how contamination might move within the environment, the potential human health and ecological receptors, and the complete or incomplete exposure pathways that may exist at the site; the preliminary CSM must be	**CSR Section 3.0, 4.0, 5.0, 6.0 and 7.0**	

	updated as the investigation and remediation progresses and an up-to-date CSM must be included in each semi-annual status report submitted to the director by the participant; a **PROJECTED MILESTONE SCHEDULE** for investigation and remediation of the site, and after enrollment as a participant, must update the schedule in each semi-annual status report to the director describing implementation of the plan during the preceding period. A Gantt chart format is preferred for the milestone schedule. The following four (4) generic milestones are required in all initial plans with the results reported in the participant's next applicable semi-annual reports to the director. The director may extend the time for or waive these or other milestones in the participant's plan where the director determines, based on a showing by the participant, that a longer time period is reasonably necessary:		
5.a.	Within the first 12 months after enrollment, the participant must complete horizontal delineation of the release and associated constituents of concern on property where access is available at the time of enrollment;	**Completed Section 6.0**	
5.b.	Within the first 24 months after enrollment, the participant must complete horizontal delineation of the release and associated constituents of concern extending onto property for which access was not available at the time of enrollment;	**Completed Section 6.0**	
5.c.	Within 30 months after enrollment, the participant must update the site CSM to include vertical delineation, finalize the remediation plan and provide a preliminary cost estimate for implementation of remediation and associated continuing actions; and	**Not Applicable**	
5.d.	Within 60 months after enrollment, the participant must submit the compliance status report required under the VRP, including the requisite certifications.	**Attached**	
6.	**SIGNED AND SEALED PE/PG CERTIFICATION** AND SUPPORTING DOCUMENTATION: "I certify under penalty of law that this report and all attachments were prepared by me or under my direct supervision in accordance with the Voluntary Remediation Program Act (O.C.G.A. Section 12-8-101, et seq.). I am a professional engineer/professional geologist who is registered with the Georgia State Board of Registration for Professional Engineers and Land Surveyors/Georgia State Board of Registration for Professional Geologists and I have the necessary experience and am in charge of the investigation and remediation of this release of regulated substances. Furthermore, to document my direct oversight of the Voluntary Remediation Plan development, implementation of corrective action, and long term monitoring, I have attached a monthly summary of hours invoiced and description of services provided by me to the Voluntary Remediation Program participant since the previous submittal to the Georgia Environmental Protection Division. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." Stephen R. Foley #1057 — 3/15/18 Printed Name and GA PE/PG Number — Date Signature and Stamp STEPHEN ROBERT FOLEY No. 001057 GEORGIA REGISTERED PROFESSIONAL GEOLOGIST		

APPENDIX A

LEGAL DESCRIPTION AND BOUNDARY SURVEY

ALCHEM Legal

All that tract or parcel of land and being in Land Lots 223 and 224 of the 17th District of Fulton County, Georgia and being more particularly described as follows:

Commencing at the intersection of the easterly Right-of-Way line of Marietta Road (being a 40-Foot Right-of-Way) and the southerly Right-of-Way line of Pine Street (being a 40-Foot Right-of-Way), said point being the POINT OF BEGINNING;

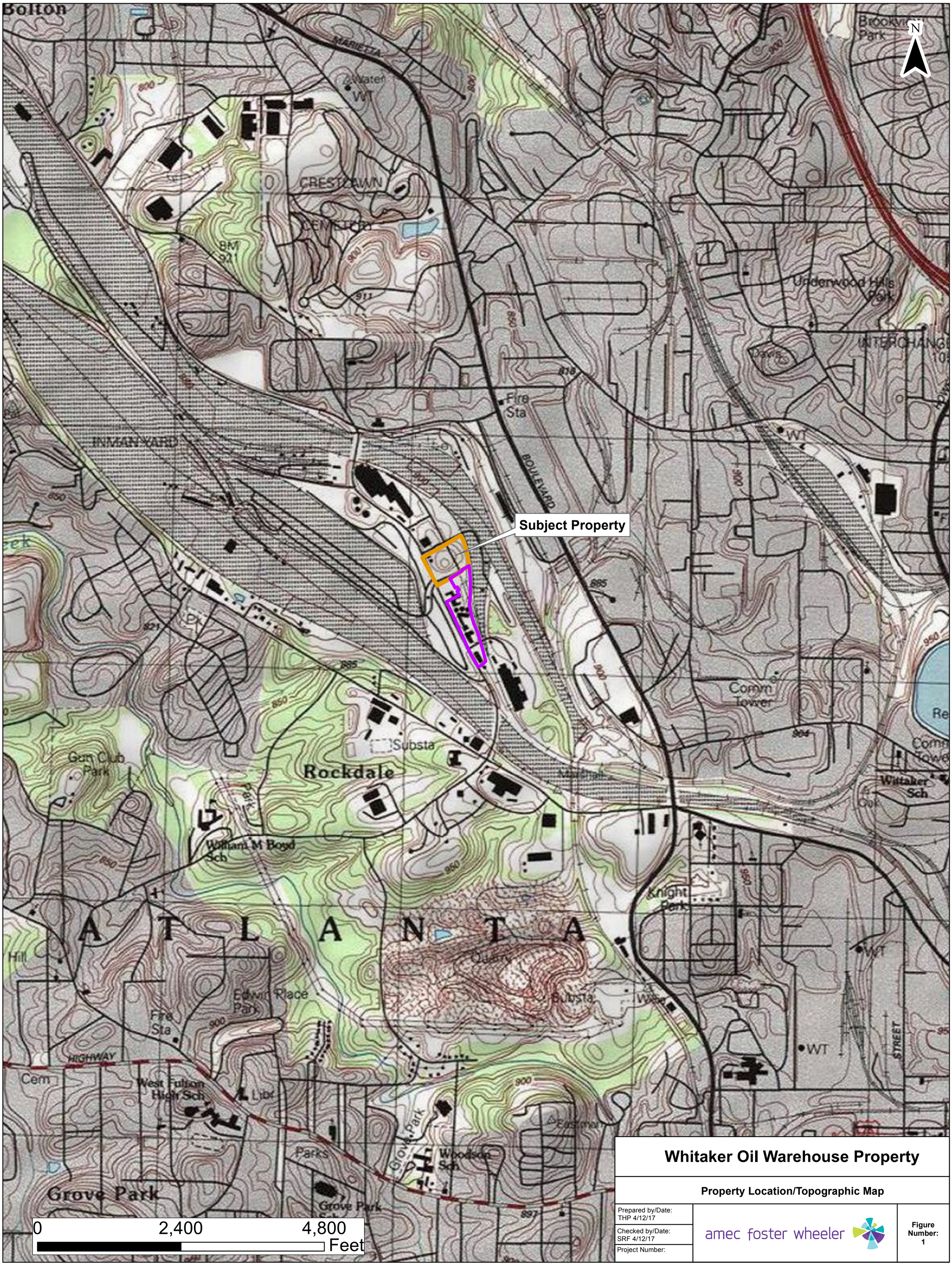
Thence running along said southerly Right-of-Way line of Pine Street North 60 Degrees 41 Minutes 21Seconds East for a distance of 161.03 feet to a point;
Thence continuing along said southerly Right-of-Way line of Pine Street North 60 Degrees 41 Minutes 21 Seconds East for a distance of 420.56 feet to a point located on the westerly Right-of-Way line of CXS Railroad;
Thence leaving said southerly Right-of-Way line of Pine Street and running along said westerly Right-of-Way line of CXS Railroad along a curve to the right for a distance of 447.23 feet, said curve having a radius of 1,187.21 feet and being subtended by a chord bearing and distance of South 14 Degrees 02 Minutes 53 Seconds East 444.60 Feet, to a point;
Thence leaving said westerly Right-of-Way line of CXS railroad and running South 60 Degrees 41 Minutes 21Seconds West for a distance of 118.67 feet to a point;
Thence running South 29 Degrees 18 Minutes 39 Seconds East for a distance of 11.50 feet to a point;
Thence running South 60 Degrees 41 Minutes 21 Seconds West for a distance of 359.33 feet to a point located on the easterly Right-of-Way line of Marietta Road;
Thence running along said easterly Right-of-Way line of Marietta Road North 28 Degrees 14 Minutes 07 Seconds West for a distance of 40.06 feet to a point;
Thence continuing along said easterly Right-of-Way line of Marietta Road North 29 Degrees 21 Minutes 42 Seconds West for a distance of 194.21 feet to a point;
Thence continuing along said easterly Right-of-Way line of Marietta Road North 25 Degrees 44 Minutes 21 Seconds West for a distance of 206.56 feet to a point, said point being the intersection of the easterly Right-of-Way line of Marietta Road (being a 40-Foot Right-of-Way) and the southerly Right-of-Way line of Pine Street (being a 40-Foot Right-of-Way) and the POINT OF BEGINNING.

Together with and subject to Covenants, Easements, and Restrictions of Record, said property contains 238,894 Square feet or 5.48 Acres more or less.

1587 Marietta Road			
Parcel: 17 022400010011 Acres: 5.48			
Name:	WHITAKER PROPERTIES LTD	Land Value:	1479600
Site:	1585 MARIETTA RD	Building Value:	746700
Sale:		Misc Value:	
Mail:	1557 MARIETTA RD NW ATLANTA, GA 30318	Total Value:	2226300

Date printed: 01/11/18 : 12:09:29

APPENDIX B
FIGURES

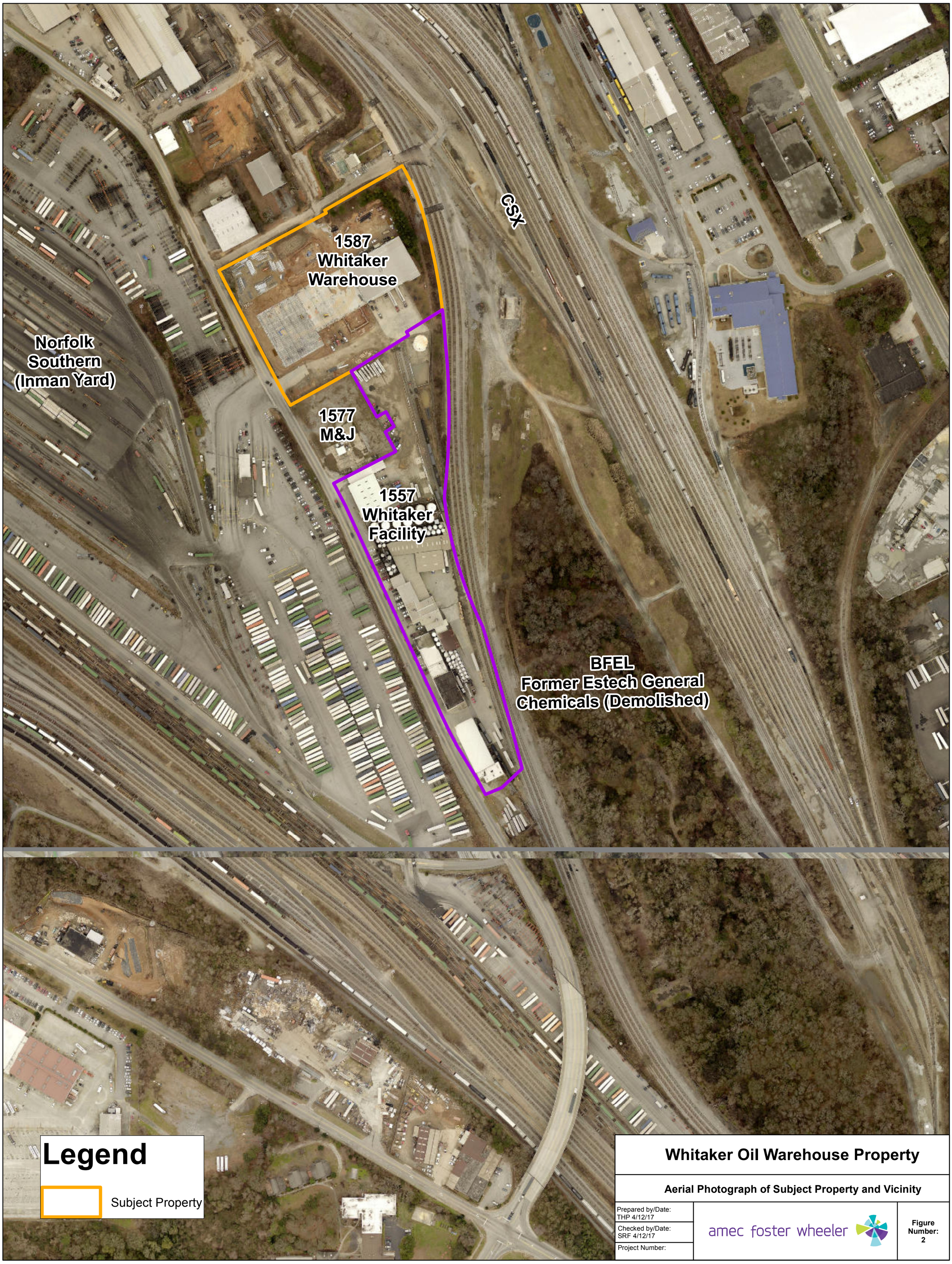


Path: G:\Phase_1\Whitaker\Topo.mxd

Whitaker Oil Warehouse Property

Property Location/Topographic Map

Prepared by/Date: THP 4/12/17	
Checked by/Date: SRF 4/12/17	amec foster wheeler
Project Number:	Figure Number: 1

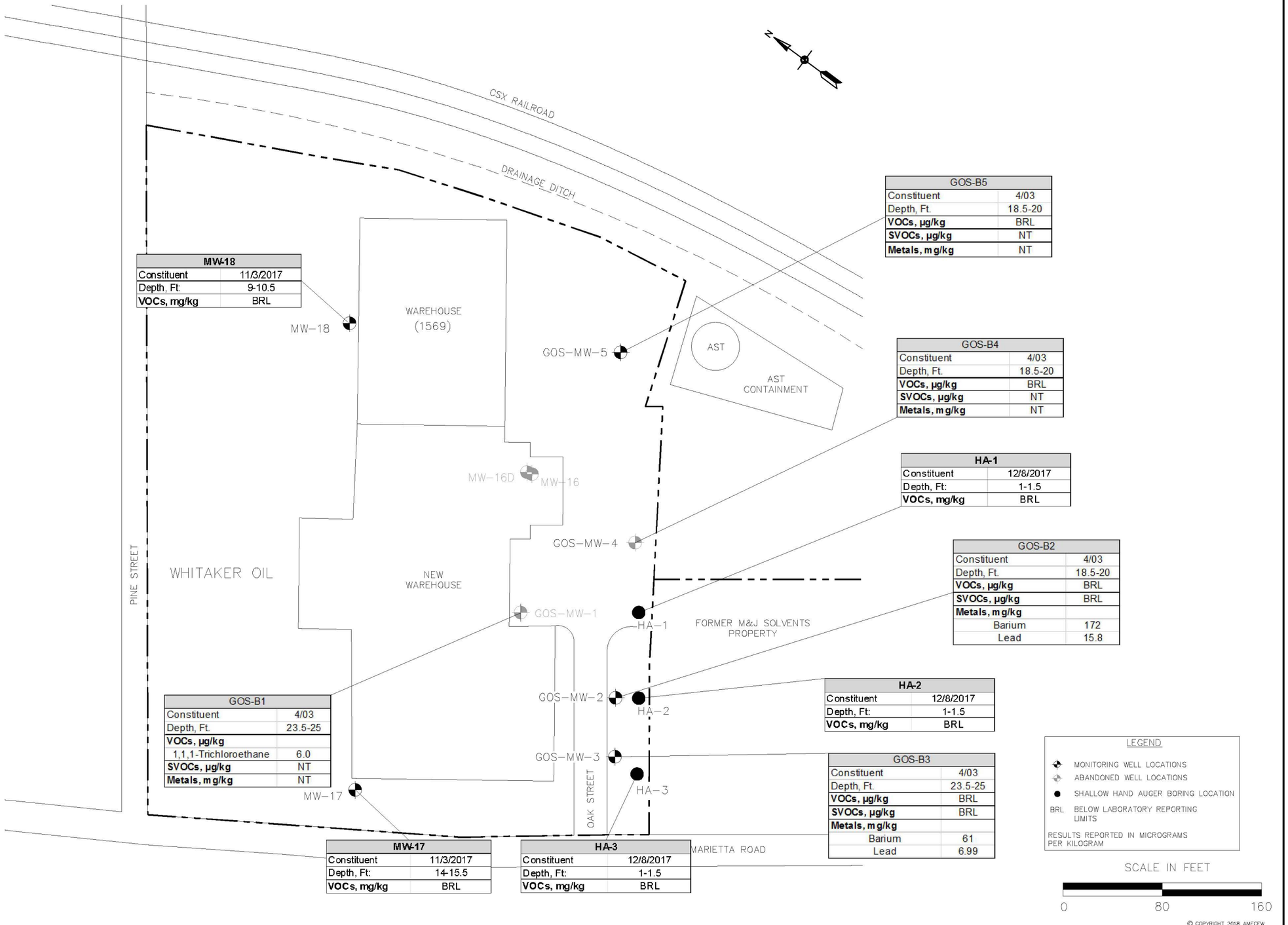


Whitaker Oil Warehouse Property

Aerial Photograph of Subject Property and Vicinity

Prepared by/Date: THP 4/12/17	amec foster wheeler	Figure Number: 2
Checked by/Date: SRF 4/12/17		
Project Number:		

Path: G:\Phase_1\Whitaker\Aerial_sizeC.mxd



MW-18	
Constituent	11/3/2017
Depth, Ft:	9-10.5
VOCs, mg/kg	BRL

GOS-B5	
Constituent	4/03
Depth, Ft.	18.5-20
VOCs, µg/kg	BRL
SVOCs, µg/kg	NT
Metals, mg/kg	NT

GOS-B4	
Constituent	4/03
Depth, Ft.	18.5-20
VOCs, µg/kg	BRL
SVOCs, µg/kg	NT
Metals, mg/kg	NT

HA-1	
Constituent	12/8/2017
Depth, Ft:	1-1.5
VOCs, mg/kg	BRL

GOS-B2	
Constituent	4/03
Depth, Ft.	18.5-20
VOCs, µg/kg	BRL
SVOCs, µg/kg	BRL
Metals, mg/kg	
Barium	172
Lead	15.8

GOS-B1	
Constituent	4/03
Depth, Ft.	23.5-25
VOCs, µg/kg	
1,1,1-Trichloroethane	6.0
SVOCs, µg/kg	NT
Metals, mg/kg	NT

HA-2	
Constituent	12/8/2017
Depth, Ft:	1-1.5
VOCs, mg/kg	BRL

GOS-B3	
Constituent	4/03
Depth, Ft.	23.5-25
VOCs, µg/kg	BRL
SVOCs, µg/kg	BRL
Metals, mg/kg	
Barium	61
Lead	6.99

MW-17	
Constituent	11/3/2017
Depth, Ft:	14-15.5
VOCs, mg/kg	BRL

HA-3	
Constituent	12/8/2017
Depth, Ft:	1-1.5
VOCs, mg/kg	BRL

REV	DATE	BY	SUB	APP	DESCRIPTION

DESIGNED
DRAWN TG
CHECKED SF
IN CHARGE CTF
DATE DEC 2017

WHITAKER OIL WAREHOUSE
ATLANTA, GEORGIA 30318

amec foster wheeler
Environment & Infrastructure, Inc.
2677 BUFORD HIGHWAY NE
ATLANTA, GEORGIA 30324
(404) 873-4761

SUMMARY OF SOIL TESTING DATA

SCALE AS SHOWN
CONTRACT 6121-13-0117
DWG. NO. 3
REV
PAGE NO

T:\Plasters Ave\Environmental\6121-J\612113017_Whitaker Properties_Whitaker Oil_2013\CAD Figures\GW & SOIL RESULTS SVOCs 12062017.dwg 01/10/2018 2:50pm tonya.gladstone

MW-16D					
Constituent	1/04	12/11/09	12/22/10	12/8/11	12/4/12
VOCs, µg/L					
Toluene	1.6	2.2	<2.0	<2.0	<2.0
trans-1,2-Dichloroethene	1.9	<2.0	<2.0	<2.0	<2.0
SVOCs, µg/L	BRL	BRL	BRL	BRL	BRL
Metals, mg/L					
Arsenic	<0.005	<0.005/<0.005	<0.005/<0.005	<0.005/<0.005	<0.005/<0.005
Barium	0.63	NT	NT	NT	NT
Chromium	0.0058	NT	NT	NT	NT
Lead	<0.005	0.0018/<0.001	0.0018/<0.001	0.002/<0.001	<0.001/<0.001
Selenium	<0.005	NT	NT	NT	NT

GOS-MW-5								
Constituent	4/03	12/17/09	12/22/10	12/8/11	12/6/12	4/3/14	3/8/16	11/6/17
VOCs, µg/L								
1,1,1-Trichloroethane	7	<2.0	2.5	<2.0	<2.0	2.8	<2.0	3.5
1,1-Dichloroethane	<5.0	5.8	<2.0	6.2	13	300	180	72
1,1-Dichloroethene	<5.0	<2.0	<2.0	<2.0	<2.0	8.4	4.1	2.5
Benzene	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.3	<2
Chloroform	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	9.6
Cis-1,2-Dichloroethene	<5.0	<2.0	<2.0	<2.0	<2.0	50	41	17
Tetrachloroethene	107	51	47	28	23	22	7.2	19
Trichloroethene	12	23	11	21	81	38	41	13
SVOCs, µg/L	BRL	BRL	BRL	BRL	BRL	NT	NT	NT
Metals, mg/L								
Arsenic	<0.01	<0.005/<0.005	<0.005/<0.005	<0.005/<0.005	<0.005/<0.005	NT	NT	NT
Barium	0.494	NT	NT	NT	NT	NT	NT	NT
Lead	0.013	<0.001/<0.001	<0.001/<0.001	<0.001/<0.001	0.0024/<0.001	NT	NT	NT

MW-18	
Constituent	11/8/2017
VOCs, µg/L	BRL

MW-16				
Constituent	10/03	10/04	12/22/10	12/8/11
VOCs, µg/L				
1,1,1-Trichloroethane	NT	<1.0	2.3	<2.0
Tetrachloroethene	NT	12	<2.0	<2.0
Toluene	NT	<1.0	6.1	<2.0
Trichloroethene	NT	17	2.5	2.4
SVOCs, µg/L	BRL	NT	BRL	NT
Metals, mg/L				
Arsenic	0.0056	NT	<0.005/<0.005	NT
Barium	0.059	NT	NT	NT
Chromium	<0.002	NT	NT	NT
Lead	<0.005	NT	<0.0404/<0.001	NT
Selenium	<0.005	NT	NT	NT

GOS-MW-2										
Constituent	4/03	8/26/09	12/14/09	3/24/10	6/4/10	12/22/10	12/9/11	12/6/12	4/3/14	3/8/16
VOCs, µg/L										
1,1,1-Trichloroethane	574	270	180	100	200	110	60	19	150	24
1,1,2-Trichloroethane	<5.0	<2.0	<2.0	6.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloroethane	17	36	27	20	35	25	16	7.6	48	17
1,1-Dichloroethene	137	160	150	96	190	100	56	25	120	15
1,2-Dichloroethane	<5.0	2.8	<2.0	3.1	2.4	<2.0	<2.0	<2.0	<2.0	<2.0
cis-1,2-Dichloroethene	<5.0	2.8	2.1	3.1	2.4	<2.0	<2.0	<2.0	6.4	5.8
Tetrachloroethene	15	11	12	8.3	13	9.7	5.9	3.1	17	7.5
Toluene	<5.0	<2.0	<2.0	<2.0	49	<2.0	<2.0	<2.0	<2.0	<2.0
Trichloroethene	11	13	12	8.2	13	8.9	6.5	3.9	18	6.4
SVOCs, µg/L	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	NT	NT
Metals, mg/L										
Arsenic	<0.010	<0.005/<0.005	<0.005/<0.005	<0.005/<0.005	<0.005/<0.005	<0.005/<0.005	<0.005/<0.005	<0.005/<0.005	NT	NT
Barium	0.679	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chromium	<0.010	NT	NT	NT	NT	NT	NT	NT	NT	NT
Lead	0.019	0.0012/<0.001	0.0011/<0.001	<0.001/<0.001	0.0037/<0.001	<0.001/<0.001	0.0029/<0.001	<0.001/<0.001	NT	NT

GOS-MW-4	
Constituent	4/03
VOCs, µg/L	
1,1-Dichloroethane	6
Trichloroethene	370
SVOCs, µg/L	BRL
Metals, mg/L	
Arsenic	<0.010
Barium	0.705
Lead	0.02

MW-11										
Constituent	10/03	10/04	12/10/09	12/21/10	12/8/11	12/5/12	4/2/14	3/17/15	3/8/2016	11/6/2017
VOCs, µg/L										
1,1,1-Trichloroethane	NT	5.6	<2.0	2.5	<2.0	<2.0	5.1	<2.0	<2.0	<2.0
1,1,2-Trichloroethane	NT	<1.0	<2.0	<2.0	<2.0	<2.0	3.8	<2.0	<2.0	<2.0
1,1-Dichloroethane	NT	2.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane	NT	<1.0	<2.0	<2.0	<2.0	<2.0	22	<2.0	<2.0	<2.0
4-methyl-2-Pentanone	NT	10	<10	<10	<10	<10	<10	<10	<10	<10
cis-1,2-Dichloroethene	NT	3.4	<2.0	<2.0	<2.0	<2.0	6.9	<2.0	<2.0	<2.0
Ethylbenzene	NT	1.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene	NT	<1.0	<2.0	<2.0	<2.0	<2.0	6	<2.0	<2.0	<2.0
Toluene	NT	37	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Trichloroethene	NT	3.7	<2.0	<2.0	<2.0	<2.0	<2.0	45	36	59
SVOCs, µg/L	BRL	NT	BRL	BRL	BRL	NT	NT	NT	NT	NT
Metals, mg/L										
Arsenic	0.0088	NT	<0.005/<0.005	<0.005/<0.005	<0.005/<0.005	<0.005/<0.005	NT	NT	NT	NT
Barium	<0.005	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chromium	0.078	NT	NT	NT	NT	NT	NT	NT	NT	NT
Lead	0.0026	NT	<0.001/<0.001	<0.001/<0.001	<0.001/<0.001	0.0093/<0.001	NT	NT	NT	NT
Selenium	0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT

GOS-MW-1					
Constituent	4/03	12/10/09	12/21/10	12/7/11	12/5/12
VOCs, µg/L					
1,1,1-Trichloroethane	<5.0	2.7	<2.0	<2.0	<2.0
SVOCs, µg/L	NT	BRL	BRL	BRL	BRL
Metals, mg/L					
Arsenic	NT	<0.005/<0.005	<0.005/<0.005	<0.025/<0.005	<0.005/<0.005
Lead	NT	0.001/<0.001	<0.001/<0.001	0.0166/<0.001	<0.001/<0.001

GOS-MW-3					
Constituent	4/03	12/14/09	12/22/10	12/8/11	41249
VOCs, µg/L					
1,1,1-Trichloroethane	213	22	19	7.9	<2.0
1,1-Dichloroethane	<5.0	5	4	2.3	<2.0
1,1-Dichloroethene	44	15	24	9.7	<2.0
Tetrachloroethene	5	<2.0	<2.0	<2.0	<2.0
Trichloroethene	5	2.2	<2.0	<2.0	<2.0
SVOCs, µg/L	BRL	BRL	BRL	BRL	BRL
Metals, mg/L					
Arsenic	<0.01	<0.005/<0.005	<0.005/<0.005	<0.005/<0.005	<0.005/<0.005
Barium	0.155	NT	NT	NT	NT
Chromium	<0.01	NT	NT	NT	NT
Lead	0.012	0.0023/<0.001	0.0028/<0.001	0.0277/<0.001	<0.0046/<0.001

MW-17	
Constituent	11/8/2017
VOCs, µg/L	BRL

WAREHOUSE (1569)
NEW WAREHOUSE
AST
AST CONTAINMENT
DRAINAGE DITCH
OAK STREET
MARIETTA ROAD
FORMER M&J S PROPERTY
MW-18
MW-17
MW-16D
MW-16
MW-11
GOS-MW-5
GOS-MW-4
GOS-MW-1
GOS-MW-2
GOS-MW-3

LEGEND

- MONITORING WELL LOCATIONS
- ABANDONED WELL LOCATIONS
- BRL BELOW LABORATORY REPORTING LIMITS
- SHADED VALUES EXCEED THE HIGHER OF THE TYPE 3 OR TYPE 4 RRS
- RESULTS REPORTED IN MICROGRAMS PER KILOGRAM

SCALE IN FEET
0 80 160

REV	DATE	BY	SUB	APP	DESCRIPTION

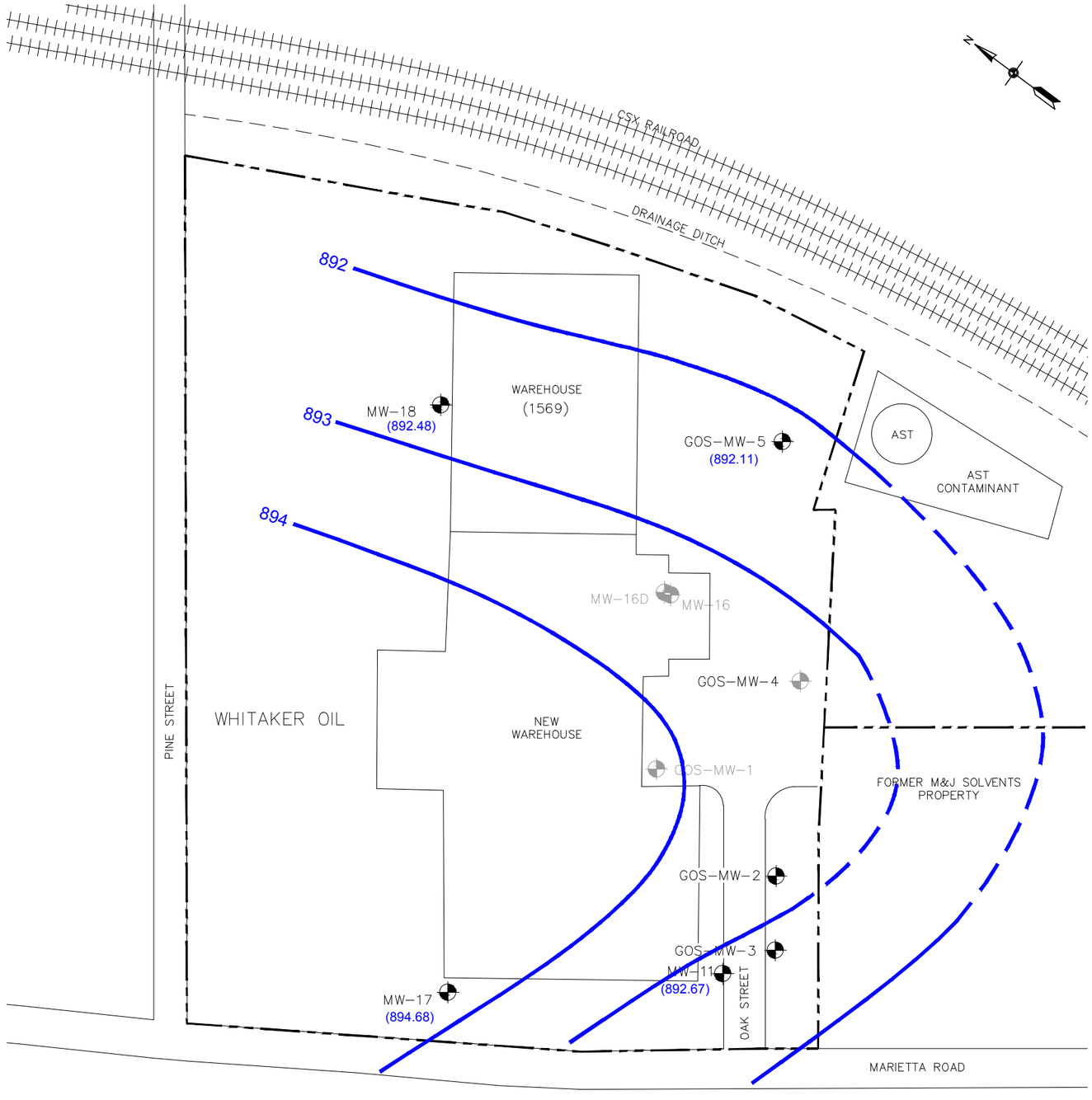
DESIGNED
DRAWN TG
CHECKED SF
IN CHARGE CTF
DATE DEC 2017

WHITAKER OIL WAREHOUSE
ATLANTA, GEORGIA 30318

amec foster wheeler
Environment & Infrastructure, Inc.
2677 BUFORD HIGHWAY NE
ATLANTA, GEORGIA 30324
(404) 873-4761

CUMMULATIVE SUMMARY OF GROUNDWATER TESTING DATA

SCALE AS SHOWN
CONTRACT 6121-13-0117
DWG. NO. 4 | REV | PAGE NO



LEGEND

- MONITORING WELL LOCATIONS
- ABANDONED WELL LOCATIONS
- 894 GROUNDWATER CONTOUR
- (894.68) GROUNDWATER ELEVATION MEASURED ON 11/6/2017

SCALE IN FEET

0 80 160

REV	DATE	BY	SUB	APP	DESCRIPTION	REV	DATE	BY	SUB	APP	DESCRIPTION

DESIGNED
DRAWN TG
CHECKED SF
IN CHARGE CTF
DATE DEC 2017

WHITAKER OIL WAREHOUSE
ATLANTA, GEORGIA 30318

amec foster wheeler

Environment & Infrastructure, Inc.
2677 BUFORD HIGHWAY NE
ATLANTA, GEORGIA 30324
(404) 873-4761

POTENTIOMETRIC SURFACE MAP
NOVEMBER 6, 2017

SCALE AS SHOWN
CONTRACT 6121-13-0117
DWG. NO. 5 REV PAGE NO

LEGEND

- MW-04 — MONITORING WELL LOCATION
- MW-06 — ABANDONED MONITORING WELL LOCATION
- M&J PROPERTY LINE (SOURCE: RILEY, PARK, HAYDEN & ASSOC. AUG. 2008)
- ADJACENT PROPERTY LINE (SOURCE: FULTON COUNTY GIS)
- STORM DRAIN
- FENCE
- 890 — GROUNDWATER CONTOUR (APPROXIMATE WHERE DASHED)
- GROUNDWATER FLOW DIRECTION
- (893.58) — GROUNDWATER ELEVATION MARCH 2016

NOTES

* GOS-MW-3, MW-13 AND TMW-1 WERE NOT USED FOR CONTOURING.

N

(893.58) GOS-MW-5
MW-16D
MW-16
GOS-MW-1
GOS-MW-4
(895.03) GOS-MW-2
(894.61)* GOS-MW-3
(895.49) MW-10
MW-06
MW-11 (894.97)
(895.18) MW-05
MW-02 (895.66)
(894.84) MW-04
MW-13 (892.84)*
(890.87) MW-CSX 2
MW-CSX-02D
MW-17 (894.28)
MW-17D
MW-3 (893.92)
MW-07 (893.78)
MW-2 (893.36)
MW-01 (894.12)
MW-03 (893.76)
MW-12 (893.90)
TMW-4
MW-WO-02 (893.99)
TMW-1 (890.87)*
(891.02) MW-NS-01
MW-NS-01D
MW-08 (892.53)
(892.20) MW-15
MW-14D
MW-14 (892.62)
(890.64) MW-CSX 1
MW-CSX-01D
MW-09 (891.29)
MW-09D
(890.98) MW-NS-02
MW-NS-02D
MW-WO-01 (889.73)
MW-NS-03 (887.56)
MW-NS-03D

895 894 893 892 891 890 889 888

0 80 160
SCALE FEET

Environmental Resources Management

FIGURE 6
SAPROLITE POTENTIOMETRIC SURFACE
MAP - MARCH 2016
SEVENTH ANNUAL CORRECTIVE ACTION
EFFECTIVENESS REPORT - AUGUST 2016
M & J SOLVENTS - HSI SITE 10096 ATLANTA, GEORGIA

DESIGN:	DRAWN: S Vizuete	CHKD.: A Reimer
DATE: 7/15/2016	SCALE: AS SHOWN	REV.:

W.O.NO.: D:\M&J\Figures\121000\121035 M&J\2016\07 2016 7th CAER\121035Site(2).dwg

ERM

LEGEND

- MW-04 — MONITORING WELL LOCATION
- MW-06 — ABANDONED MONITORING WELL LOCATION
- M&J PROPERTY LINE (SOURCE: RILEY, PARK, HAYDEN & ASSOC. AUG. 2008)
- ADJACENT PROPERTY LINE (SOURCE: FULTON COUNTY GIS)
- STORM DRAIN
- FENCE
- 890 — GROUNDWATER CONTOUR (APPROXIMATE WHERE DASHED)
- GROUNDWATER FLOW DIRECTION
- (892.02) — GROUNDWATER ELEVATION MARCH 2016

NOTES

* MW-18D, MW-CSX-01D AND MW-CSX-02D WERE NOT USED FOR CONTOURING BECAUSE THEY ARE SCREENED IN A DEEPER AQUIFER.

N

MW-16D
MW-16
GOS-MW-5
GOS-MW-1
GOS-MW-4
894
MW-11
GOS-MW-2
MW-10
MW-06
GOS-MW-3
MW-05
MW-02
MW-13
MW-CSX 2
MW-CSX-02D
(887.45)*
MW-04
MW-17
(894.48)
MW-17D
MW-3
MW-07
TMW-2
MW-18D
(891.08)*
892
MW-01
MW-03
MW-12
TMW-4
MW-WO-02
890
TMW-1
894
MW-NS-01
MW-NS-01D
(891.83)
MW-08
MW-14D
(892.47)
MW-15
MW-14
MW-CSX 1
MW-CSX-01D
(847.19)*
MW-09
MW-09D
(890.77)
MW-NS-02
MW-NS-02D
(889.83)
892
888
MW-WO-01
890
0
80
160
SCALE
FEET
MW-NS-03
MW-NS-03D
(887.35)
888

Environmental Resources Management

FIGURE 7
BEDROCK POTENTIOMETRIC SURFACE
MAP - MARCH 2016
SEVENTH ANNUAL CORRECTIVE ACTION
EFFECTIVENESS REPORT - AUGUST 2016
M & J SOLVENTS - HSI SITE 10096 ATLANTA, GEORGIA

DESIGN:	DRAWN: S Vizuete	CHKD.: A Reimer
DATE: 7/15/2016	SCALE: AS SHOWN	REV.:

W.O.NO.: D:\M&J\Figures\121000\121035 M&J\2016\07 2016 7th CAER\121035Site(2).dwg

ERM

APPENDIX C
TABLES

TABLE 1 - DATA SUMMARY - SOIL SAMPLE RESULTS
WHITAKER OIL - 1587 MARIETTA ST.
ATLANTA, GEORGIA

PARAMETER	Sample ID:	Type 1 RRS	Type 3 RRS	GOS-B1	GOS-B2	GOS-B3	GOS-B4	GOS-B5	MW-17	MW-18	HA-1	HA-2	HA-3
	Sample Depth:			23.5-25	18.5-20	23.5-25	18.5-20	15.8-20	14-15.5	9-10.5	1-1.5	1-1.5	1-1.5
	Sample Date:			Apr-03	Apr-03	Apr-03	Apr-03	Apr-03	Nov-17	Nov-17	Dec-17	Dec-17	Dec-17
Volatile Organic Compounds (VOCs), mg/kg													
1,1,1-Trichloroethane		20	20	<0.005	**0.006**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Semi-Volatile Organic Compounds (SVOCs), mg/kg		NA	NA	NT	BRL	BRL	NT	NT	NT	NT	NT	NT	NT
Metals, mg/kg													
Barium		1,000	1,000	--	172	61	--	--	NT	NT	NT	NT	NT
Lead		75	400	--	15.8	6.99	--	--	NT	NT	NT	NT	NT

Notes:
NT = Not Tested
-- = Not Reported
NA = Not Applicable as no constituents detected

Prepared By: Tyler Boyles
Checked By: Chuck Ferry

TABLE 2 - CUMULATIVE GROUNDWATER DATA SUMMARY
WHITAKER OIL
1587 MARIETTA STREET
ATLANTA, GEORGIA

PARAMETER	Higher of Type 3/4 RRS	MW-11 10/2003	MW-11 10/2004	MW-11 12/10/2009	MW-11 12/21/2010	MW-11 12/6/2011	MW-11 6/5/2012	MW-11 12/5/2012	MW-11 4/2/2014	MW-11 3/17/2015	MW-11 3/8/2016	MW-11 11/6/2017
Volatile Organic Compounds (VOCs), ug/L												
1,1,1-Trichloroethane	1,300	NT	**5.6**	< 2.0	**2.5**	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1,2-Trichloroethane	5.0	NT	< 1.0	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethane	4,000	NT	**2.3**	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethene	520	NT	< 1.0	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,2-Dichloroethane	5.0	NT	<1.0	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Methyl-2-pentanone	4,200	NT	**10**	< 10	< 10	< 10	NT	< 10	< 10	< 10	< 10	< 10
Benzene	9	NT	<1.0	<2.0	<2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Chloroform	80	NT	<1.0	<2.0	<2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
cis-1,2-Dichloroethene	200	NT	**3.4**	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	700	NT	**1.6**	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Tetrachloroethene	98	NT	< 1.0	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Toluene	1,000	NT	**37**	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	6	NT	**3.7**	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	**45**	**36**	**59**
Xylenes, mixture	10,000	NT	< 1.0	< 5.0	< 5.0	< 5.0	NT	< 5.0	< 5.0	< 5.0	<5.0	<5.0
Semi-Volatile Organic Compounds (SVOCs), ug/L	NA	BRL	NT	BRL	BRL	BRL	NT	NT	NT	NT	NT	NT
Metals, Total, mg/L												
Arsenic	0.01	**0.0088**	NT	< 0.0050	< 0.0050	< 0.0050	NT	< 0.0050	NT	NT	NT	NT
Lead	0.015	<0.005	NT	< 0.0010	< 0.0010	< 0.0010	NT	< 0.0093	NT	NT	NT	NT
Barium	2	**0.078**	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chromium	0.1	**0.0026**	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Selenium	0.51	**0.01**	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Metals, Dissolved, mg/L												
Arsenic	0.01	NT	NT	< 0.0050	< 0.0050	< 0.0050	NT	< 0.0050	NT	NT	NT	NT
Lead	0.015	NT	NT	< 0.0010	< 0.0010	< 0.0010	NT	< 0.0010	NT	NT	NT	NT

Notes:
-- = Not Reported
NT - Not Tested
Shaded values indicate exceedance of the higher of the Type 3/4 RRS

TABLE 2 - CUMULATIVE GROUNDWATER DATA SUM
WHITAKER OIL
1587 MARIETTA STREET
ATLANTA, GEORGIA

PARAMETER	Higher of Type 3/4 RRS	MW-16 10/2003	MW-16 10/2004	MW-16 12/22/2010	MW-16 12/8/2011	MW-16D 1/2004	MW-16D 12/11/2009	MW-16D 12/22/2010	MW-16D 12/8/2011	MW-16D 12/4/2012	MW-17 11/6/2017	MW-18 11/6/2017
Volatile Organic Compounds (VOCs), ug/L												
1,1,1-Trichloroethane	1,300	NT	< 1.0	**2.3**	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1,2-Trichloroethane	5.0	NT	< 1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethane	4,000	NT	< 1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethene	520	NT	< 1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,2-Dichloroethane	5.0	NT	< 1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Methyl-2-pentanone	4,200	NT	<5.0	< 10	< 10	<5.0	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	9	NT	<1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Chloroform	80	NT	<1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
cis-1,2-Dichloroethene	200	NT	< 1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	700	NT	< 1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Tetrachloroethene	98	NT	**12**	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Toluene	1,000	NT	< 1.0	**6.1**	< 2.0	**1.6**	**2.2**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	6	NT	**17**	**2.5**	**2.4**	**1.9**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Xylenes, mixture	10,000	NT	< 1.0	< 5.0	< 5.0	<2.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Semi-Volatile Organic Compounds (SVOCs), ug/L	NA	BRL	NT	BRL	NT	BRL	BRL	BRL	BRL	BRL	NT	NT
Metals, Total, mg/L												
Arsenic	0.01	**0.0056**	NT	< 0.0050	NT	<0.005	<0.005	<0.005	< 0.0050	< 0.0050	NT	NT
Lead	0.015	<0.005	NT	**0.0404**	NT	<0.005	**0.0018**	**0.0018**	**0.002**	<0.0010	NT	NT
Barium	2	**0.059**	NT	NT	NT	**0.63**	NT	NT	NT	NT	NT	NT
Chromium	0.1	<0.002	NT	NT	NT	**0.0058**	NT	NT	NT	NT	NT	NT
Selenium	0.51	<0.005	NT	NT	NT	<0.005	NT	NT	NT	NT	NT	NT
Metals, Dissolved, mg/L												
Arsenic	0.01	NT	NT	< 0.0050	NT	NT	<0.005	<0.005	< 0.0050	< 0.0050	NT	NT
Lead	0.015	NT	NT	< 0.0010	NT	NT	<0.001	<0.001	< 0.0010	< 0.0010	NT	NT

Notes:
-- = Not Reported
NT - Not Tested
Shaded values indicate exceedance of the higher of the Ty

TABLE 2 - CUMULATIVE GROUNDWATER DATA SUM
WHITAKER OIL
1587 MARIETTA STREET
ATLANTA, GEORGIA

PARAMETER	Higher of Type 3/4 RRS	GOS-MW-1 4/2003	GOS-MW-1 12/10/2009	GOS-MW-1 12/21/2010	GOS-MW-1 12/7/2011	GOS-MW-1 12/5/2012	GOS-MW-2 4/2003	GOS-MW-2 8/26/2009	GOS-MW-2 12/14/2009
Volatile Organic Compounds (VOCs), ug/L									
1,1,1-Trichloroethane	1,300	<5.0	**2.7**	< 2.0	< 2.0	< 2.0	**574**	**270**	**180**
1,1,2-Trichloroethane	5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0
1,1-Dichloroethane	4,000	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	**17**	**36**	**27**
1,1-Dichloroethene	520	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	**137**	**160**	**150**
1,2-Dichloroethane	5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	**2.8**	< 2.0
4-Methyl-2-pentanone	4,200	<50	< 10	< 10	< 10	< 10	<50	< 10	< 10
Benzene	9	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0
Chloroform	80	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0
cis-1,2-Dichloroethene	200	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	**2.8**	**2.1**
Ethylbenzene	700	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0
Tetrachloroethene	98	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	**15**	**11**	**12**
Toluene	1,000	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0
Trichloroethene	6	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	**11**	**13**	**12**
Xylenes, mixture	10,000	<5.0	< 5.0	< 5.0	< 5.0	< 5.0	<5.0	< 5.0	< 5.0
Semi-Volatile Organic Compounds (SVOCs), ug/L	NA		BRL	BRL	BRL	BRL	BRL	BRL	BRL
Metals, Total, mg/L									
Arsenic	0.01	NT	< 0.0050	< 0.0050	< 0.0250	< 0.0050	<0.010	< 0.0050	< 0.0050
Lead	0.015	NT	**0.001**	< 0.0010	**0.0166**	< 0.0010	**0.019**	**0.0012**	**0.0011**
Barium	2	NT	NT	NT	NT	NT	**0.679**	NT	NT
Chromium	0.1	NT	NT	NT	NT	NT	<0.010	NT	NT
Selenium	0.51	NT	NT	NT	NT	NT	<0.040	NT	NT
Metals, Dissolved, mg/L									
Arsenic	0.01	NT	< 0.0050	< 0.0050	< 0.0050	< 0.0050	NT	< 0.0050	< 0.0050
Lead	0.015	NT	< 0.0010	< 0.0010	< 0.0010	< 0.0010	NT	< 0.0010	< 0.0010

Notes:
-- = Not Reported
NT - Not Tested
Shaded values indicate exceedance of the higher of the Ty

TABLE 2 - CUMULATIVE GROUNDWATER DATA SUM
WHITAKER OIL
1587 MARIETTA STREET
ATLANTA, GEORGIA

PARAMETER	Higher of Type 3/4 RRS	GOS-MW-2 3/24/2010	GOS-MW-2 6/4/2010	GOS-MW-2 12/22/2010	GOS-MW-2 12/9/2011	GOS-MW-2 12/6/2012	GOS-MW-2 4/3/2014	GOS-MW-2 3/8/2016	GOS-MW-3 4/2003	GOS-MW-3 12/14/2009	GOS-MW-3 12/22/2010	GOS-MW-3 12/8/2011	GOS-MW-3 12/6/2012
Volatile Organic Compounds (VOCs), ug/L													
1,1,1-Trichloroethane	1,300	**100**	**200**	**110**	**60**	**19**	**150**	**24**	**213**	**22**	**19**	**7.9**	< 2.0
1,1,2-Trichloroethane	5.0	**6.3**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethane	4,000	**20**	**35**	**25**	**16**	**7.6**	**48**	**17**	<5.0	**5**	**4**	**2.3**	< 2.0
1,1-Dichloroethene	520	**96**	**190**	**100**	**56**	**25**	**120**	**15**	**44**	**15**	**24**	**9.7**	< 2.0
1,2-Dichloroethane	5.0	**3.1**	**2.4**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Methyl-2-pentanone	4,200	< 10	< 10	< 10	< 10	< 10	< 10	< 10	<50	< 10	< 10	< 10	< 10
Benzene	9	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0
Chloroform	80	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0
cis-1,2-Dichloroethene	200	**3.1**	**2.4**	< 2.0	< 2.0	< 2.0	**6.4**	**5.8**	<5.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	700	< 2.0	2.7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0
Tetrachloroethene	98	**8.3**	**13**	**9.7**	**5.9**	**3.1**	**17**	**7.5**	**5**	< 2.0	< 2.0	< 2.0	< 2.0
Toluene	1,000	< 2.0	**49**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	6	**8.2**	**13**	**8.9**	**6.5**	**3.9**	**18**	**6.4**	**5**	**2.2**	< 2.0	< 2.0	< 2.0
Xylenes, mixture	10,000	< 5.0	**7.9**	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	<5.0	< 5.0	< 5.0	< 5.0	< 5.0
Semi-Volatile Organic Compounds (SVOCs), ug/L	NA	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL
Metals, Total, mg/L													
Arsenic	0.01	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	NT	NT	<0.010	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Lead	0.015	< 0.0010	**0.0037**	< 0.0010	**0.029**	< 0.0010	NT	NT	**0.012**	**0.0023**	**0.0028**	**0.0277**	**0.0046**
Barium	2	NT	NT	NT	NT	NT	NT	NT	**0.155**	NT	NT	NT	NT
Chromium	0.1	NT	NT	NT	NT	NT	NT	NT	<0.010	NT	NT	NT	NT
Selenium	0.51	NT	NT	NT	NT	NT	NT	NT	<0.040	NT	NT	NT	NT
Metals, Dissolved, mg/L													
Arsenic	0.01	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	NT	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Lead	0.015	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	NT	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Notes:
-- = Not Reported
NT - Not Tested
Shaded values indicate exceedance of the higher of the Ty

TABLE 2 - CUMULATIVE GROUNDWATER DATA SUM
WHITAKER OIL
1587 MARIETTA STREET
ATLANTA, GEORGIA

PARAMETER	Higher of Type 3/4 RRS	GOS-MW-4 4/2003	GOS-MW-5 4/2003	GOS-MW-5 12/17/2009	GOS-MW-5 12/22/2010	GOS-MW-5 12/8/2011	GOS-MW-5 12/6/2012	GOS-MW-5 4/3/2014	GOS-MW-5 3/8/2016	GOS-MW-5 11/6/2017
Volatile Organic Compounds (VOCs), ug/L										
1,1,1-Trichloroethane	1,300	<5.0	**7**	< 2.0	**2.5**	< 2.0	< 2.0	**2.8**	<2.0	<2.0
1,1,2-Trichloroethane	5.0	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethane	4,000	**6**	<5.0	**5.8**	< 2.0	**6.2**	**13**	**300**	**180**	**72**
1,1-Dichloroethene	520	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	**8.4**	**4.1**	**2.5**
1,2-Dichloroethane	5.0	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Methyl-2-pentanone	4,200	<50	<50	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	9	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.3	<2
Chloroform	80	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<2	9.6
cis-1,2-Dichloroethene	200	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	**50**	**41**	**17**
Ethylbenzene	700	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Tetrachloroethene	98	<5.0	**107**	**51**	**47**	**28**	**28**	**22**	**7.2**	**19**
Toluene	1,000	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	6	**370**	**12**	**23**	**11**	**21**	**21**	**38**	**41**	**13**
Xylenes, mixture	10,000	<5.0	<5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Semi-Volatile Organic Compounds (SVOCs), ug/L	NA	BRL	BRL	BRL	BRL	BRL	BRL	NT	NT	NT
Metals, Total, mg/L										
Arsenic	0.01	<0.010	<0.010	< 0.0050	< 0.0050	< 0.0050	< 0.0050	NT	NT	NT
Lead	0.015	**0.02**	**0.013**	< 0.0010	< 0.0010	< 0.0010	**0.0024**	NT	NT	NT
Barium	2	**0.705**	**0.494**	NT	NT	NT	NT	NT	NT	NT
Chromium	0.1	<0.010	<0.010	NT	NT	NT	NT	NT	NT	NT
Selenium	0.51	<0.040	<0.040	NT	NT	NT	NT	NT	NT	NT
Metals, Dissolved, mg/L										
Arsenic	0.01	NT	NT	< 0.0050	< 0.0050	< 0.0050	< 0.0050	NT	NT	NT
Lead	0.015	NT	NT	< 0.0010	< 0.0010	< 0.0010	< 0.0010	NT	NT	NT

Notes:
-- = Not Reported
NT - Not Tested
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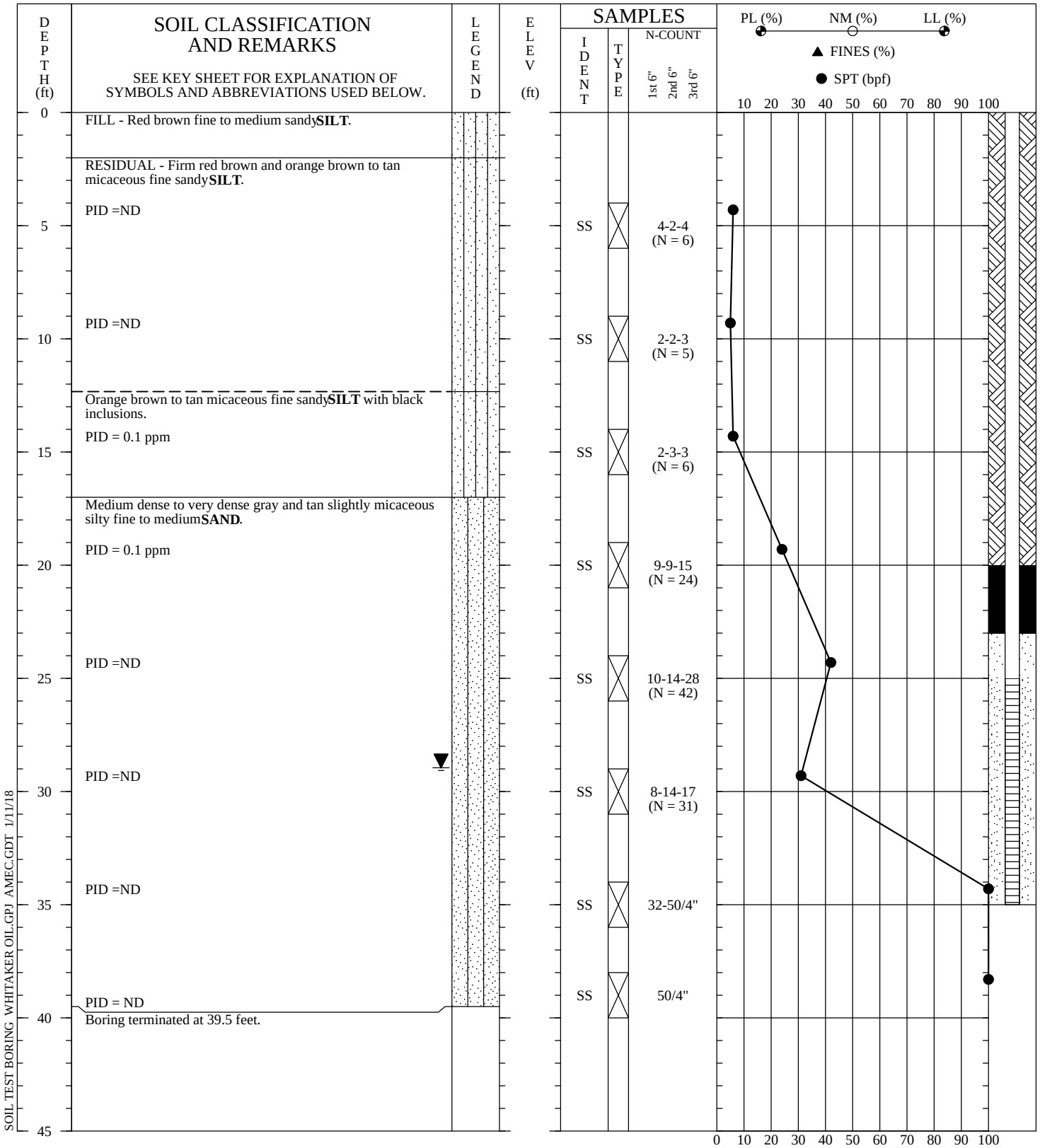
APPENDIX D

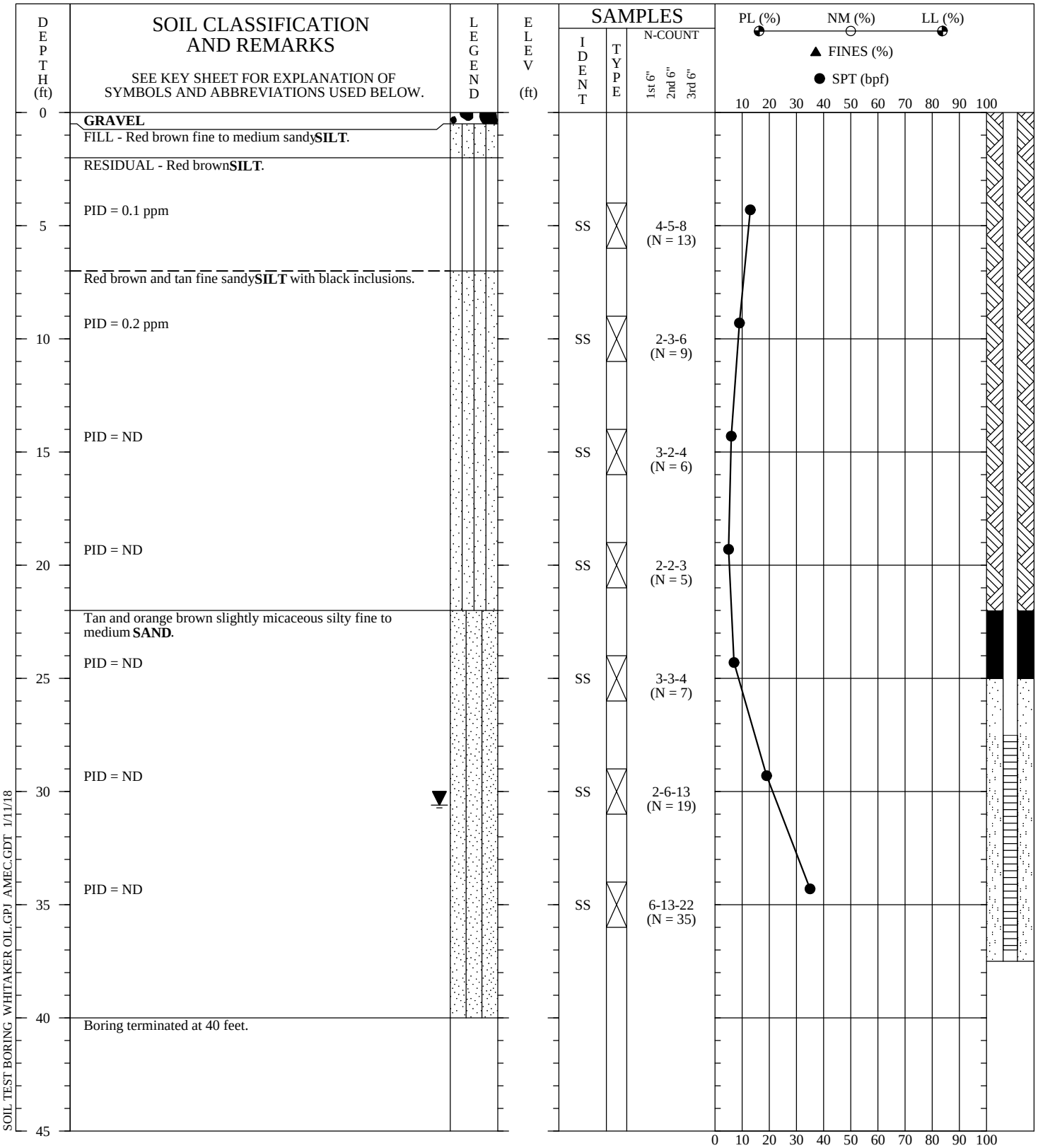
SOIL BORING LOGS AND WELL CONSTRUCTION DIAGRAMS



DRILLER:	Premier Drilling
EQUIPMENT:	CME 55
METHOD:	Hollow Stem Auger
HOLE DIA.:	8 inches
REMARKS:	Type II monitoring well installed. Stabilized groundwater depth 28.95 feet.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING NO.: MW-17
PROJECT: Whitaker Oil
LOCATION: Atlanta, Georgia
DRILLED: November 3, 2017
PROJECT NO.: 6121-13-0117



DRILLER:
EQUIPMENT:
METHOD:
HOLE DIA.:
REMARKS: Type II monitoring well installed. Stabilized groundwater depth 30.60 feet.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING NO.: MW-18
PROJECT: Whitaker Oil
LOCATION: Atlanta, Georgia
DRILLED:
PROJECT NO.: 6121-13-0117

APPENDIX E
LABORATORY REPORTS

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

Laboratory Report

Prepared For:

AMEC - Atlanta
2677 Buford Highway
Atlanta, GA 30324

Attention: Mr. Stephen Foley

Report Number: AAK0177
November 10, 2017
Project: Whitaker Oil
Project #:6121-13-0117

We appreciate the opportunity to provide the analytical support for your project. The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Approved:

Signature

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-18	AAK0177-01	Ground Water	11/06/17 11:00	11/07/17 12:25
MW-17	AAK0177-02	Ground Water	11/06/17 12:10	11/07/17 12:25
GOS-MW-5	AAK0177-03	Ground Water	11/06/17 13:20	11/07/17 12:25
MW-11	AAK0177-04	Ground Water	11/06/17 14:05	11/07/17 12:25
Trip Blank	AAK0177-05	Water	11/06/17 00:00	11/07/17 12:25

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177
Client ID: MW-18
Date/Time Sampled: 11/06/2017 11:00:00AM
Matrix: Ground Water

Project: Whitaker Oil
Lab Number ID: AAK0177-01
Date/Time Received: 11/07/2017 12:25:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Acrolein	ND	50	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Benzene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Bromobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Bromoform	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Bromomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Chloroform	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Chloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Dibromomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
cis-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH

PACE ANALYTICAL SERVICES, LLC.

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AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177
Client ID: MW-18
Date/Time Sampled: 11/06/2017 11:00:00AM
Matrix: Ground Water

Project: Whitaker Oil
Lab Number ID: AAK0177-01
Date/Time Received: 11/07/2017 12:25:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Iodomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Naphthalene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Styrene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Tetrachloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Toluene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Trichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177
Project: Whitaker Oil
Client ID: MW-18
Lab Number ID: AAK0177-01
Date/Time Sampled: 11/06/2017 11:00:00AM
Date/Time Received: 11/07/2017 12:25:00PM
Matrix: Ground Water

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:07	7110202	LIH
Surrogate: Dibromofluoromethane	*95 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 18:07*	*7110202*	
Surrogate: 1,2-Dichloroethane-d4	*103 %*	*78-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 18:07*	*7110202*	
Surrogate: Toluene-d8	*91 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 18:07*	*7110202*	
Surrogate: 4-Bromofluorobenzene	*101 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 18:07*	*7110202*	

PACE ANALYTICAL SERVICES, LLC.

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Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177
Client ID: MW-17
Date/Time Sampled: 11/06/2017 12:10:00PM
Matrix: Ground Water

Project: Whitaker Oil
Lab Number ID: AAK0177-02
Date/Time Received: 11/07/2017 12:25:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Acrolein	ND	50	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Benzene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Bromobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Bromoform	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Bromomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Chloroform	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Chloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Dibromomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
cis-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH

PACE ANALYTICAL SERVICES, LLC.

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AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177
Client ID: MW-17
Date/Time Sampled: 11/06/2017 12:10:00PM
Matrix: Ground Water

Project: Whitaker Oil
Lab Number ID: AAK0177-02
Date/Time Received: 11/07/2017 12:25:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Iodomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Naphthalene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Styrene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Tetrachloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Toluene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Trichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH

PACE ANALYTICAL SERVICES, LLC.

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AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177
Project: Whitaker Oil
Client ID: MW-17
Lab Number ID: AAK0177-02
Date/Time Sampled: 11/06/2017 12:10:00PM
Date/Time Received: 11/07/2017 12:25:00PM
Matrix: Ground Water

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:32	7110202	LIH
Surrogate: Dibromofluoromethane	*98 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 18:32*	*7110202*	
Surrogate: 1,2-Dichloroethane-d4	*103 %*	*78-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 18:32*	*7110202*	
Surrogate: Toluene-d8	*91 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 18:32*	*7110202*	
Surrogate: 4-Bromofluorobenzene	*100 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 18:32*	*7110202*	

PACE ANALYTICAL SERVICES, LLC.

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AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177 **Project: Whitaker Oil**

Client ID: GOS-MW-5 **Lab Number ID: AAK0177-03**

Date/Time Sampled: 11/06/2017 1:20:00PM **Date/Time Received: 11/07/2017 12:25:00PM**

Matrix: Ground Water

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Acrolein	ND	50	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Benzene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Bromobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Bromoform	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Bromomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Chloroform	9.6	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Chloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Dibromomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,1-Dichloroethane	72	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,1-Dichloroethene	2.5	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
cis-1,2-Dichloroethene	17	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
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AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177 **Project: Whitaker Oil**

Client ID: GOS-MW-5 **Lab Number ID: AAK0177-03**

Date/Time Sampled: 11/06/2017 1:20:00PM **Date/Time Received: 11/07/2017 12:25:00PM**

Matrix: Ground Water

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Iodomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Naphthalene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Styrene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Tetrachloroethene	19	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Toluene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,1,1-Trichloroethane	3.5	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Trichloroethene	13	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH

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AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177 **Project: Whitaker Oil**

Client ID: GOS-MW-5 **Lab Number ID: AAK0177-03**

Date/Time Sampled: 11/06/2017 1:20:00PM **Date/Time Received: 11/07/2017 12:25:00PM**

Matrix: Ground Water

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 18:58	7110202	LIH
Surrogate: Dibromofluoromethane	*99 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 18:58*	*7110202*	
Surrogate: 1,2-Dichloroethane-d4	*104 %*	*78-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 18:58*	*7110202*	
Surrogate: Toluene-d8	*89 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 18:58*	*7110202*	
Surrogate: 4-Bromofluorobenzene	*101 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 18:58*	*7110202*	

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Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177
Client ID: MW-11
Date/Time Sampled: 11/06/2017 2:05:00PM
Matrix: Ground Water

Project: Whitaker Oil
Lab Number ID: AAK0177-04
Date/Time Received: 11/07/2017 12:25:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Acrolein	ND	50	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Benzene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Bromobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Bromoform	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Bromomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Chloroform	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Chloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Dibromomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
cis-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH

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Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177
Client ID: MW-11
Date/Time Sampled: 11/06/2017 2:05:00PM
Matrix: Ground Water

Project: Whitaker Oil
Lab Number ID: AAK0177-04
Date/Time Received: 11/07/2017 12:25:00PM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Iodomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Naphthalene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Styrene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Tetrachloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Toluene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Trichloroethene	59	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
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AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177
Project: Whitaker Oil
Client ID: MW-11
Lab Number ID: AAK0177-04
Date/Time Sampled: 11/06/2017 2:05:00PM
Date/Time Received: 11/07/2017 12:25:00PM
Matrix: Ground Water

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:23	7110202	LIH
Surrogate: Dibromofluoromethane	*97 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 19:23*	*7110202*	
Surrogate: 1,2-Dichloroethane-d4	*101 %*	*78-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 19:23*	*7110202*	
Surrogate: Toluene-d8	*93 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 19:23*	*7110202*	
Surrogate: 4-Bromofluorobenzene	*101 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 19:23*	*7110202*	

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Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177 **Project: Whitaker Oil**

Client ID: Trip Blank **Lab Number ID: AAK0177-05**

Date/Time Sampled: 11/06/2017 12:00:00AM **Date/Time Received: 11/07/2017 12:25:00PM**

Matrix: Water

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Acrolein	ND	50	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Benzene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Bromobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Bromoform	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Bromomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Chloroform	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Chloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Dibromomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
cis-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH

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AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177 **Project: Whitaker Oil**

Client ID: Trip Blank **Lab Number ID: AAK0177-05**

Date/Time Sampled: 11/06/2017 12:00:00AM **Date/Time Received: 11/07/2017 12:25:00PM**

Matrix: Water

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Iodomethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Naphthalene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Styrene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Tetrachloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Toluene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Trichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH

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AMEC - Atlanta
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Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177
Project: Whitaker Oil
Client ID: Trip Blank
Lab Number ID: AAK0177-05
Date/Time Sampled: 11/06/2017 12:00:00AM
Date/Time Received: 11/07/2017 12:25:00PM
Matrix: Water

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	11/07/17 9:00	11/07/17 19:48	7110202	LIH
Surrogate: Dibromofluoromethane	*99 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 19:48*	*7110202*	
Surrogate: 1,2-Dichloroethane-d4	*105 %*	*78-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 19:48*	*7110202*	
Surrogate: Toluene-d8	*92 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 19:48*	*7110202*	
Surrogate: 4-Bromofluorobenzene	*99 %*	*80-120*		*EPA 8260B*			*11/07/17 9:00*	*11/7/17 19:48*	*7110202*	

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November 10, 2017

Report No.: AAK0177

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7110202 - EPA 5030B										
Blank (7110202-BLK1)				Prepared & Analyzed: 11/07/17						
Acetone	ND	100	ug/L							
Acrolein	ND	50	ug/L							
Acrylonitrile	ND	50	ug/L							
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L							
Benzene	ND	2.0	ug/L							
Bromobenzene	ND	10	ug/L							
Bromochloromethane	ND	10	ug/L							
Bromodichloromethane	ND	10	ug/L							
Bromoform	ND	10	ug/L							
Bromomethane	ND	10	ug/L							
n-Butylbenzene	ND	10	ug/L							
sec-Butylbenzene	ND	10	ug/L							
tert-Butylbenzene	ND	10	ug/L							
Carbon Disulfide	ND	10	ug/L							
Carbon Tetrachloride	ND	2.0	ug/L							
Chlorobenzene	ND	10	ug/L							
1-Chlorobutane	ND	10	ug/L							
Chloroethane	ND	5.0	ug/L							
Chloroform	ND	2.0	ug/L							
Chloromethane	ND	10	ug/L							
2-Chlorotoluene	ND	10	ug/L							
4-Chlorotoluene	ND	10	ug/L							
Dibromochloromethane	ND	10	ug/L							
1,2-Dibromo-3-chloropropane	ND	10	ug/L							
1,2-Dibromoethane	ND	10	ug/L							
Dibromomethane	ND	10	ug/L							
1,2-Dichlorobenzene	ND	10	ug/L							
1,3-Dichlorobenzene	ND	10	ug/L							
1,4-Dichlorobenzene	ND	10	ug/L							
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L							
Dichlorodifluoromethane	ND	10	ug/L							
1,1-Dichloroethane	ND	2.0	ug/L							
1,2-Dichloroethane	ND	2.0	ug/L							
1,1-Dichloroethene	ND	2.0	ug/L							
cis-1,2-Dichloroethene	ND	2.0	ug/L							
trans-1,2-Dichloroethene	ND	2.0	ug/L							
1,2-Dichloropropane	ND	2.0	ug/L							
1,3-Dichloropropane	ND	2.0	ug/L							
2,2-Dichloropropane	ND	10	ug/L							
1,1-Dichloropropene	ND	10	ug/L							
cis-1,3-Dichloropropene	ND	2.0	ug/L							

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November 10, 2017

Report No.: AAK0177

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7110202 - EPA 5030B										
Blank (7110202-BLK1)					Prepared & Analyzed: 11/07/17					
trans-1,3-Dichloropropene	ND	2.0	ug/L							
Ethylbenzene	ND	2.0	ug/L							
Ethyl Methacrylate	ND	10	ug/L							
Hexachlorobutadiene	ND	10	ug/L							
p-Isopropyltoluene	ND	10	ug/L							
Hexachloroethane	ND	10	ug/L							
Iodomethane	ND	10	ug/L							
Isopropylbenzene	ND	10	ug/L							
Methacrylonitrile	ND	10	ug/L							
Methyl Acrylate	ND	10	ug/L							
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L							
Methylene Chloride	ND	5.0	ug/L							
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L							
Methyl Methacrylate	ND	10	ug/L							
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L							
Methyl-tert-Butyl Ether	ND	10	ug/L							
Naphthalene	ND	10	ug/L							
2-Nitropropane	ND	10	ug/L							
Propionitrile (Ethyl Cyanide)	ND	20	ug/L							
n-Propylbenzene	ND	10	ug/L							
Styrene	ND	5.0	ug/L							
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L							
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L							
Tetrachloroethene	ND	2.0	ug/L							
Tetrahydrofuran	ND	10	ug/L							
Toluene	ND	2.0	ug/L							
1,2,3-Trichlorobenzene	ND	10	ug/L							
1,2,4-Trichlorobenzene	ND	10	ug/L							
1,1,1-Trichloroethane	ND	2.0	ug/L							
1,1,2-Trichloroethane	ND	2.0	ug/L							
Trichloroethene	ND	2.0	ug/L							
Trichlorofluoromethane	ND	10	ug/L							
1,2,3-Trichloropropane	ND	10	ug/L							
1,2,4-Trimethylbenzene	ND	10	ug/L							
1,3,5-Trimethylbenzene	ND	10	ug/L							
Vinyl Acetate	ND	10	ug/L							
Vinyl Chloride	ND	2.0	ug/L							
m+p-Xylene	ND	5.0	ug/L							
o-Xylene	ND	5.0	ug/L							
Xylenes, total	ND	5.0	ug/L							
Surrogate: Dibromofluoromethane	*49*		*ug/L*	*50.000*		*98*	*80-120*			

PACE ANALYTICAL SERVICES, LLC.

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AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

Report No.: AAK0177

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7110202 - EPA 5030B										
Blank (7110202-BLK1)				Prepared & Analyzed: 11/07/17						
Surrogate: 1,2-Dichloroethane-d4	*51*		*ug/L*	*50.000*		*102*	*78-120*			
Surrogate: Toluene-d8	*46*		*ug/L*	*50.000*		*93*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*50*		*ug/L*	*50.000*		*100*	*80-120*			
LCS (7110202-BS1)				Prepared & Analyzed: 11/07/17						
Benzene	57		ug/L	50.000		114	67-134			
Chlorobenzene	48		ug/L	50.000		96	69-122			
1,1-Dichloroethene	66		ug/L	50.000		132	58-142			
Toluene	52		ug/L	50.000		104	68-127			
Trichloroethene	53		ug/L	50.000		106	72-132			
Surrogate: Dibromofluoromethane	*49*		*ug/L*	*50.000*		*98*	*80-120*			
Surrogate: 1,2-Dichloroethane-d4	*51*		*ug/L*	*50.000*		*102*	*78-120*			
Surrogate: Toluene-d8	*46*		*ug/L*	*50.000*		*91*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*49*		*ug/L*	*50.000*		*98*	*80-120*			
Matrix Spike (7110202-MS1)	**Source: AAJ1010-70**			Prepared & Analyzed: 11/07/17						
Benzene	63		ug/L	50.000	0.0	126	67-134			
Chlorobenzene	50		ug/L	50.000	0.0	99	69-122			
1,1-Dichloroethene	80		ug/L	50.000	0.0	159	58-142			QM-05
Toluene	56		ug/L	50.000	0.0	112	68-127			
Trichloroethene	56		ug/L	50.000	0.0	111	72-132			
Surrogate: Dibromofluoromethane	*47*		*ug/L*	*50.000*		*94*	*80-120*			
Surrogate: 1,2-Dichloroethane-d4	*52*		*ug/L*	*50.000*		*104*	*78-120*			
Surrogate: Toluene-d8	*45*		*ug/L*	*50.000*		*91*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*52*		*ug/L*	*50.000*		*103*	*80-120*			
Matrix Spike Dup (7110202-MSD1)	**Source: AAJ1010-70**			Prepared & Analyzed: 11/07/17						
Benzene	63		ug/L	50.000	0.0	126	67-134	0.4	9	
Chlorobenzene	51		ug/L	50.000	0.0	102	69-122	3	13	
1,1-Dichloroethene	77		ug/L	50.000	0.0	154	58-142	4	9	QM-05
Toluene	58		ug/L	50.000	0.0	115	68-127	3	9	
Trichloroethene	57		ug/L	50.000	0.0	115	72-132	3	11	
Surrogate: Dibromofluoromethane	*48*		*ug/L*	*50.000*		*96*	*80-120*			
Surrogate: 1,2-Dichloroethane-d4	*53*		*ug/L*	*50.000*		*106*	*78-120*			
Surrogate: Toluene-d8	*46*		*ug/L*	*50.000*		*91*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*51*		*ug/L*	*50.000*		*102*	*80-120*			

PACE ANALYTICAL SERVICES, LLC.

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Atlanta GA, 30324
Attention: Mr. Stephen Foley

November 10, 2017

Laboratory Certifications

Code	Description	Number	Expires
GADW	Georgia DW Inorganics Eff: 07/01/2016	812	06/30/2018
GADWM	Georgia DW Microbiology Eff: 07/01/2015	812	12/09/2019
NC	North Carolina	381	12/31/2017
NELAC	FL DOH (Non-Pot. Water, Solids) Eff:: 07/01/2016	E87315	06/30/2018
NELDW	FL DOH NELAC (Drinking Water) Eff: 07/01/2016	E87315	06/30/2018
SC	South Carolina	98011001	11/30/2017
TX	Texas	T104704397-08-TX	03/31/2018
VA	Virginia	460204	12/14/2017

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November 10, 2017

Legend

Definition of Laboratory Terms

ND - None Detected at the Reporting Limit
TIC - Tentatively Identified Compound
CFU - Colony Forming Units
SOP - Method run per Pace Standard Operating Procedure
RL - Reporting Limit
DF - Dilution Factor
***** - Analyte not included in the NELAC list of certified analytes.

Sample Information

N-Nitrosodiphenylamine breaks down to diphenylamine in the GCMS; both analytes are reported as N-Nitrososdiphenylamine. Pace is not NELAC certified for diphenylamine.

Phthalic acid and phthalic anhydride are reported as dimethyl phthalate

Maleic acid and maleic anhydride are reported as dimethyl malate

1,2-Diphenylhydrazine breaks down to azobenzene in the GCMS; both analytes are reported as azobenzene

Drinking Water Records will be available for at least 5 years and are subject to disposal after the 5 years have elapsed.

Definition of Qualifiers

QM-05 The spike recovery was outside acceptance limits for the MS and/or MSD and/or PDS due to suspected matrix interference. Sample results for the QC batch were accepted based on acceptable LCS recoveries.

Note: Unless otherwise noted, all results are reported on an as received basis.

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November 10, 2017

Report Notes

The sample type was not listed on the COC. MMR

CHAIN OF CUSTODY RECORD

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, LLC - Atlanta GA
110 TECHNOLOGY PARKWAY, PEACHTREE CORNERS, GA 30092
(770) 734-4200 : FAX (770) 734-4201

PAGE: 1 OF 1

CLIENT NAME: Amec Foster Wheeler
CLIENT ADDRESS/PHONE NUMBER/FAX NUMBER: 2677 Buford Hwy Atlanta, GA
REPORT TO: Steve Foley
CC:
REQUESTED COMPLETION DATE: 1 week TAT
PO #:
PROJECT NAME/STATE: Whitaker Oil Co.
PROJECT #: 6121-13-0117

Collection DATE	Collection TIME	MATRIX CODE*	COMP	GRAB	SAMPLE IDENTIFICATION	# of CONTAINERS	VOCs (8260B)									LAB ID NUMBER
11/6/17	1100	GW			MW-18	3	X									1
	1210				MW-17	3	X									2
	1320				GOS-MW-5	3	X									3
	1405				MW-11	3	X									4
		W			TRIP BLANK	3	X									5

ANALYSIS REQUESTED

CONTAINER TYPE:
PRESERVATION:

CONTAINER TYPE	PRESERVATION
P - PLASTIC	1 - HCl, ≤6°C
A - AMBER GLASS	2 - H_2SO_4, ≤6°C
G - CLEAR GLASS	3 - HNO_3
V - VOA VIAL	4 - NaOH, ≤6°C
S - STERILE	5 - NaOH/ZnAc, ≤6°C
O - OTHER	6 - $Na_2S_2O_3$, ≤6°C
	7 - ≤6°C not frozen

*MATRIX CODES:

DW - DRINKING WATER	S - SOIL
WW - WASTEWATER	SL - SLUDGE
GW - GROUNDWATER	SD - SOLID
SW - SURFACE WATER	A - AIR
ST - STORM WATER	L - LIQUID
W - WATER	P - PRODUCT

REMARKS/ADDITIONAL INFORMATION

SAMPLED BY AND TITLE: Stephen R. Foley
DATE/TIME:
RELINQUISHED BY:
DATE/TIME: 11/7/17 0900

RECEIVED BY: Mike Nguyen
DATE/TIME: 11/7/17 1056
RELINQUISHED BY:
DATE/TIME:

RECEIVED BY/LAB: [signature]
DATE/TIME: 11/07/17 1225
SAMPLE SHIPPED VIA: UPS FED-EX USPS COURIER CLIENT OTHER FS

Ice checked: Yes No NA
Ice: Yes No NA
Temperature: Min: 5.8 Max:
Custody Seal: Intact Broken Not Present N/A
# of Coolers
Cooler ID:

FOR LAB USE ONLY
LAB #: AAK0177
Entered into LIMS:
Tracking #:

Rev. 12/15/2016

Sample Condition Upon Receipt

Pace Analytical

Client Name: Amec - Atlanta Project # AAK0177

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

Tracking #: _____

Optional
Proj. Due Date:
Proj. Name:

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other _____

Thermometer Used IR-4 Type of Ice: (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 5.8 Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: 11/7/17 MP

Temp should be above freezing to 6°C

				Comments:
Chain of Custody Present:	☑Yes	☐No	☐N/A	1.
Chain of Custody Filled Out:	☐Yes	☑No	☐N/A	2. Sample type missing
Chain of Custody Relinquished:	☑Yes	☐No	☐N/A	3.
Sampler Name & Signature on COC:	☑Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time:	☑Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes	☑No	☐N/A	6.
Rush Turn Around Time Requested:	☐Yes	☑No	☐N/A	7.
Sufficient Volume:	☑Yes	☐No	☐N/A	8.
Correct Containers Used:	☑Yes	☐No	☐N/A	9.
-Pace Containers Used:	☑Yes	☐No	☐N/A	
Containers Intact:	☑Yes	☐No	☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☑N/A	11.
Sample Labels match COC:	☑Yes	☐No	☐N/A	12.
-Includes date/time/ID/Analysis Matrix: GW				
All containers needing preservation have been checked.	☐Yes	☐No	☑N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes	☐No	☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☑Yes	☐No		Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes	☐No	☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes	☑No	☐N/A	15.
Trip Blank Present:	☑Yes	☐No	☐N/A	16.
Trip Blank Custody Seals Present	☑Yes	☐No	☐N/A	
Pace Trip Blank Lot # (if purchased): _____				

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** _____

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

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

LOG-IN CHECKLIST **Printed: 11/08/2017 6:43:26PM**

Attn: Mr. Stephen Foley

Client: AMEC - Atlanta
Project: Whitaker Oil
Date Received: 11/07/17 12:25

Work Order: AAK0177
Logged In By: Mohammad M. Rahman

OBSERVATIONS

#Samples: 5 **#Containers:** 15

Minimum Temp(C): 5.8 **Maximum Temp(C):** 5.8 **Custody Seal(s) Used:** Yes

CHECKLIST ITEMS

COC included with Samples	YES
Sample Container(s) Intact	YES
Chain of Custody Complete	NO
Sample Container(s) Match COC	YES
Custody seal Intact	YES
Temperature in Compliance	YES
Sufficient Sample Volume for Analysis	YES
Zero Headspace Maintained for VOA Analyses	YES
Samples labeled preserved (If Applicable)	YES
Samples received within Allowable Hold Times	YES
Samples Received on Ice	YES
Preservation Confirmed	YES

Comments:

The sample type was not listed on the COC. MMR

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

Laboratory Report

Prepared For:

AMEC - Atlanta
2677 Buford Highway
Atlanta, GA 30324

Attention: Mr. Stephen Foley

Report Number: AAL0379
December 18, 2017
Project: Whitaker Oil
Project #:6121-13-0117

We appreciate the opportunity to provide the analytical support for your project. The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Approved:

Signature

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
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(770) 734-4200 FAX (770) 734-4201

AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

December 18, 2017

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HA-1	AAL0379-01	Soil	12/08/17 11:25	12/12/17 11:15
HA-2	AAL0379-02	Soil	12/08/17 11:38	12/12/17 11:15
HA-3	AAL0379-03	Soil	12/08/17 11:53	12/12/17 11:15

PACE ANALYTICAL SERVICES, LLC.

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AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

December 18, 2017

Report No.: AAL0379
Client ID: HA-1
Date/Time Sampled: 12/08/2017 11:25:00AM
Matrix: Soil

Project: Whitaker Oil
Lab Number ID: AAL0379-01
Date/Time Received: 12/12/2017 11:15:00AM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
General Chemistry										
% Solids	78.8	0.04	% by Weight	SOP Moisture		1	12/13/17 10:35	12/13/17 10:35	7120301	JPT
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Acrolein	ND	51	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Acrylonitrile	ND	51	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Benzene	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Bromobenzene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Bromochloromethane	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Bromodichloromethane	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Bromoform	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Bromomethane	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
n-Butylbenzene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
sec-Butylbenzene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
tert-Butylbenzene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Carbon Disulfide	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Carbon Tetrachloride	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Chlorobenzene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Chloroethane	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Chloroform	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Chloromethane	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
2-Chlorotoluene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
4-Chlorotoluene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Dibromochloromethane	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,2-Dibromo-3-chloropropane	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,2-Dibromoethane	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Dibromomethane	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,2-Dichlorobenzene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,3-Dichlorobenzene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,4-Dichlorobenzene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Dichlorodifluoromethane	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,1-Dichloroethane	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,2-Dichloroethane	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,1-Dichloroethene	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
cis-1,2-Dichloroethene	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
trans-1,2-Dichloroethene	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG

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AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

December 18, 2017

Report No.: AAL0379
Client ID: HA-1
Date/Time Sampled: 12/08/2017 11:25:00AM
Matrix: Soil

Project: Whitaker Oil
Lab Number ID: AAL0379-01
Date/Time Received: 12/12/2017 11:15:00AM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,3-Dichloropropane	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
2,2-Dichloropropane	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,1-Dichloropropene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
cis-1,3-Dichloropropene	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
trans-1,3-Dichloropropene	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Ethylbenzene	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Isopropylbenzene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
p-Isopropyltoluene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Methyl Butyl Ketone (2-Hexanone)	ND	51	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Methylene Chloride	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
4-Methyl-2-pentanone (MIBK)	ND	51	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Naphthalene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
n-Propylbenzene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Styrene	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,1,1,2-Tetrachloroethane	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,1,2,2-Tetrachloroethane	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Tetrachloroethene	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Toluene	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,2,3-Trichlorobenzene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,2,4-Trichlorobenzene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,1,1-Trichloroethane	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,1,2-Trichloroethane	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Trichloroethene	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Trichlorofluoromethane	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,2,3-Trichloropropane	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,2,4-Trimethylbenzene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
1,3,5-Trimethylbenzene	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Vinyl Acetate	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Vinyl Chloride	ND	10	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
m+p-Xylene	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
o-Xylene	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Xylenes, total	ND	5.1	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 14:54	7120323	JG
Surrogate: Dibromofluoromethane	*95 %*	*80-121*		*EPA 8260B*			*12/13/17 11:00*	*12/13/17 14:54*	*7120323*	
Surrogate: 1,2-Dichloroethane-d4	*104 %*	*70-131*		*EPA 8260B*			*12/13/17 11:00*	*12/13/17 14:54*	*7120323*	

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

December 18, 2017

Report No.: AAL0379
Client ID: HA-1
Date/Time Sampled: 12/08/2017 11:25:00AM
Matrix: Soil

Project: Whitaker Oil
Lab Number ID: AAL0379-01
Date/Time Received: 12/12/2017 11:15:00AM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Surrogate: Toluene-d8	*101 %*	*79-120*		*EPA 8260B*			*12/13/17 11:00*	*12/13/17 14:54*	*7120323*	
Surrogate: 4-Bromofluorobenzene	*111 %*	*80-121*		*EPA 8260B*			*12/13/17 11:00*	*12/13/17 14:54*	*7120323*	

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Attention: Mr. Stephen Foley

December 18, 2017

Report No.: AAL0379
Client ID: HA-2
Date/Time Sampled: 12/08/2017 11:38:00AM
Matrix: Soil

Project: Whitaker Oil
Lab Number ID: AAL0379-02
Date/Time Received: 12/12/2017 11:15:00AM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
General Chemistry										
% Solids	83.6	0.05	% by Weight	SOP Moisture		1	12/13/17 10:35	12/13/17 10:35	7120301	JPT
Volatile Organic Compounds by EPA 8260										
Acetone	ND	150	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Acrolein	ND	77	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Acrylonitrile	ND	77	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Benzene	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Bromobenzene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Bromochloromethane	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Bromodichloromethane	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Bromoform	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Bromomethane	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
n-Butylbenzene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
sec-Butylbenzene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
tert-Butylbenzene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Carbon Disulfide	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Carbon Tetrachloride	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Chlorobenzene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Chloroethane	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Chloroform	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Chloromethane	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
2-Chlorotoluene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
4-Chlorotoluene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Dibromochloromethane	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,2-Dibromo-3-chloropropane	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,2-Dibromoethane	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Dibromomethane	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,2-Dichlorobenzene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,3-Dichlorobenzene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,4-Dichlorobenzene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Dichlorodifluoromethane	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,1-Dichloroethane	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,2-Dichloroethane	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,1-Dichloroethene	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
cis-1,2-Dichloroethene	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
trans-1,2-Dichloroethene	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG

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Attention: Mr. Stephen Foley

December 18, 2017

Report No.: AAL0379
Client ID: HA-2
Date/Time Sampled: 12/08/2017 11:38:00AM
Matrix: Soil

Project: Whitaker Oil
Lab Number ID: AAL0379-02
Date/Time Received: 12/12/2017 11:15:00AM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,3-Dichloropropane	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
2,2-Dichloropropane	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,1-Dichloropropene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
cis-1,3-Dichloropropene	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
trans-1,3-Dichloropropene	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Ethylbenzene	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Isopropylbenzene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
p-Isopropyltoluene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Methyl Butyl Ketone (2-Hexanone)	ND	77	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Methylene Chloride	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Methyl Ethyl Ketone (2-Butanone)	ND	150	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
4-Methyl-2-pentanone (MIBK)	ND	77	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Naphthalene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
n-Propylbenzene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Styrene	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,1,1,2-Tetrachloroethane	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,1,2,2-Tetrachloroethane	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Tetrachloroethene	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Toluene	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,2,3-Trichlorobenzene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,2,4-Trichlorobenzene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,1,1-Trichloroethane	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,1,2-Trichloroethane	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Trichloroethene	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Trichlorofluoromethane	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,2,3-Trichloropropane	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,2,4-Trimethylbenzene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
1,3,5-Trimethylbenzene	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Vinyl Acetate	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Vinyl Chloride	ND	15	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
m+p-Xylene	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
o-Xylene	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Xylenes, total	ND	7.7	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:24	7120323	JG
Surrogate: Dibromofluoromethane	*92 %*	*80-121*		*EPA 8260B*			*12/13/17 11:00*	*12/13/17 15:24*	*7120323*	
Surrogate: 1,2-Dichloroethane-d4	*104 %*	*70-131*		*EPA 8260B*			*12/13/17 11:00*	*12/13/17 15:24*	*7120323*	

PACE ANALYTICAL SERVICES, LLC.

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AMEC - Atlanta
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Attention: Mr. Stephen Foley

December 18, 2017

Report No.: AAL0379
Client ID: HA-2
Date/Time Sampled: 12/08/2017 11:38:00AM
Matrix: Soil

Project: Whitaker Oil
Lab Number ID: AAL0379-02
Date/Time Received: 12/12/2017 11:15:00AM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Surrogate: Toluene-d8	*102 %*	*79-120*		*EPA 8260B*			*12/13/17 11:00*	*12/13/17 15:24*	*7120323*	
Surrogate: 4-Bromofluorobenzene	*112 %*	*80-121*		*EPA 8260B*			*12/13/17 11:00*	*12/13/17 15:24*	*7120323*	

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December 18, 2017

Report No.: AAL0379 **Project: Whitaker Oil**

Client ID: HA-3 **Lab Number ID: AAL0379-03**

Date/Time Sampled: 12/08/2017 11:53:00AM **Date/Time Received: 12/12/2017 11:15:00AM**

Matrix: Soil

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
General Chemistry										
% Solids	85.1	0.05	% by Weight	SOP Moisture		1	12/13/17 10:35	12/13/17 10:35	7120301	JPT
Volatile Organic Compounds by EPA 8260										
Acetone	ND	110	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Acrolein	ND	54	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Acrylonitrile	ND	54	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Benzene	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Bromobenzene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Bromochloromethane	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Bromodichloromethane	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Bromoform	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Bromomethane	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
n-Butylbenzene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
sec-Butylbenzene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
tert-Butylbenzene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Carbon Disulfide	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Carbon Tetrachloride	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Chlorobenzene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Chloroethane	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Chloroform	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Chloromethane	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
2-Chlorotoluene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
4-Chlorotoluene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Dibromochloromethane	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,2-Dibromo-3-chloropropane	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,2-Dibromoethane	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Dibromomethane	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,2-Dichlorobenzene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,3-Dichlorobenzene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,4-Dichlorobenzene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Dichlorodifluoromethane	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,1-Dichloroethane	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,2-Dichloroethane	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,1-Dichloroethene	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
cis-1,2-Dichloroethene	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
trans-1,2-Dichloroethene	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG

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Attention: Mr. Stephen Foley

December 18, 2017

Report No.: AAL0379
Client ID: HA-3
Date/Time Sampled: 12/08/2017 11:53:00AM
Matrix: Soil

Project: Whitaker Oil
Lab Number ID: AAL0379-03
Date/Time Received: 12/12/2017 11:15:00AM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,3-Dichloropropane	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
2,2-Dichloropropane	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,1-Dichloropropene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
cis-1,3-Dichloropropene	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
trans-1,3-Dichloropropene	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Ethylbenzene	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Isopropylbenzene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
p-Isopropyltoluene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Methyl Butyl Ketone (2-Hexanone)	ND	54	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Methylene Chloride	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Methyl Ethyl Ketone (2-Butanone)	ND	110	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
4-Methyl-2-pentanone (MIBK)	ND	54	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Naphthalene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
n-Propylbenzene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Styrene	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,1,1,2-Tetrachloroethane	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,1,2,2-Tetrachloroethane	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Tetrachloroethene	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Toluene	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,2,3-Trichlorobenzene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,2,4-Trichlorobenzene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,1,1-Trichloroethane	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,1,2-Trichloroethane	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Trichloroethene	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Trichlorofluoromethane	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,2,3-Trichloropropane	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,2,4-Trimethylbenzene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
1,3,5-Trimethylbenzene	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Vinyl Acetate	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Vinyl Chloride	ND	11	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
m+p-Xylene	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
o-Xylene	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Xylenes, total	ND	5.4	ug/kg dry	EPA 8260B		1	12/13/17 11:00	12/13/17 15:54	7120323	JG
Surrogate: Dibromofluoromethane	*94 %*	*80-121*		*EPA 8260B*			*12/13/17 11:00*	*12/13/17 15:54*	*7120323*	
Surrogate: 1,2-Dichloroethane-d4	*108 %*	*70-131*		*EPA 8260B*			*12/13/17 11:00*	*12/13/17 15:54*	*7120323*	

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2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

December 18, 2017

Report No.: AAL0379
Client ID: HA-3
Date/Time Sampled: 12/08/2017 11:53:00AM
Matrix: Soil

Project: Whitaker Oil
Lab Number ID: AAL0379-03
Date/Time Received: 12/12/2017 11:15:00AM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Surrogate: Toluene-d8	*99 %*	*79-120*		*EPA 8260B*			*12/13/17 11:00*	*12/13/17 15:54*	*7120323*	
Surrogate: 4-Bromofluorobenzene	*108 %*	*80-121*		*EPA 8260B*			*12/13/17 11:00*	*12/13/17 15:54*	*7120323*	

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December 18, 2017

Report No.: AAL0379

General Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7120301 - % Solids										
Duplicate (7120301-DUP1)		**Source: AAL0378-01**			Prepared & Analyzed: 12/13/17					
% Solids	85.8	0.04	% by Weight		85.5			0.3	10	

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Report No.: AAL0379

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7120323 - EPA 5035										
Blank (7120323-BLK1)					Prepared & Analyzed: 12/13/17					
Acetone	ND	5000	ug/kg wet							
Acrolein	ND	2500	ug/kg wet							
Acrylonitrile	ND	2500	ug/kg wet							
Benzene	ND	250	ug/kg wet							
Bromobenzene	ND	500	ug/kg wet							
Bromochloromethane	ND	500	ug/kg wet							
Bromodichloromethane	ND	500	ug/kg wet							
Bromoform	ND	500	ug/kg wet							
Bromomethane	ND	500	ug/kg wet							
n-Butylbenzene	ND	500	ug/kg wet							
sec-Butylbenzene	ND	500	ug/kg wet							
tert-Butylbenzene	ND	500	ug/kg wet							
Carbon Disulfide	ND	500	ug/kg wet							
Carbon Tetrachloride	ND	250	ug/kg wet							
Chlorobenzene	ND	500	ug/kg wet							
Chloroethane	ND	250	ug/kg wet							
Chloroform	ND	250	ug/kg wet							
Chloromethane	ND	500	ug/kg wet							
2-Chlorotoluene	ND	500	ug/kg wet							
4-Chlorotoluene	ND	500	ug/kg wet							
Dibromochloromethane	ND	250	ug/kg wet							
1,2-Dibromo-3-chloropropane	ND	500	ug/kg wet							
1,2-Dibromoethane	ND	500	ug/kg wet							
Dibromomethane	ND	500	ug/kg wet							
1,2-Dichlorobenzene	ND	500	ug/kg wet							
1,3-Dichlorobenzene	ND	500	ug/kg wet							
1,4-Dichlorobenzene	ND	500	ug/kg wet							
Dichlorodifluoromethane	ND	500	ug/kg wet							
1,1-Dichloroethane	ND	250	ug/kg wet							
1,2-Dichloroethane	ND	250	ug/kg wet							
1,1-Dichloroethene	ND	250	ug/kg wet							
cis-1,2-Dichloroethene	ND	250	ug/kg wet							
trans-1,2-Dichloroethene	ND	250	ug/kg wet							
1,2-Dichloropropane	ND	250	ug/kg wet							
1,3-Dichloropropane	ND	250	ug/kg wet							
2,2-Dichloropropane	ND	500	ug/kg wet							
1,1-Dichloropropene	ND	500	ug/kg wet							
cis-1,3-Dichloropropene	ND	250	ug/kg wet							
trans-1,3-Dichloropropene	ND	250	ug/kg wet							
Ethylbenzene	ND	250	ug/kg wet							
Isopropylbenzene	ND	500	ug/kg wet							

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Report No.: AAL0379

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7120323 - EPA 5035										
Blank (7120323-BLK1)					Prepared & Analyzed: 12/13/17					
p-Isopropyltoluene	ND	500	ug/kg wet							
Methyl Butyl Ketone (2-Hexanone)	ND	2500	ug/kg wet							
Methylene Chloride	ND	500	ug/kg wet							
Methyl Ethyl Ketone (2-Butanone)	ND	5000	ug/kg wet							
4-Methyl-2-pentanone (MIBK)	ND	2500	ug/kg wet							
Naphthalene	ND	500	ug/kg wet							
n-Propylbenzene	ND	500	ug/kg wet							
Styrene	ND	250	ug/kg wet							
1,1,1,2-Tetrachloroethane	ND	500	ug/kg wet							
1,1,2,2-Tetrachloroethane	ND	250	ug/kg wet							
Tetrachloroethene	ND	250	ug/kg wet							
Toluene	ND	250	ug/kg wet							
1,2,3-Trichlorobenzene	ND	500	ug/kg wet							
1,2,4-Trichlorobenzene	ND	500	ug/kg wet							
1,1,1-Trichloroethane	ND	250	ug/kg wet							
1,1,2-Trichloroethane	ND	250	ug/kg wet							
Trichloroethene	ND	250	ug/kg wet							
Trichlorofluoromethane	ND	500	ug/kg wet							
1,2,3-Trichloropropane	ND	500	ug/kg wet							
1,2,4-Trimethylbenzene	ND	500	ug/kg wet							
1,3,5-Trimethylbenzene	ND	500	ug/kg wet							
Vinyl Acetate	ND	500	ug/kg wet							
Vinyl Chloride	ND	500	ug/kg wet							
m+p-Xylene	ND	250	ug/kg wet							
o-Xylene	ND	250	ug/kg wet							
Xylenes, total	ND	250	ug/kg wet							
Surrogate: Dibromofluoromethane	*47*		*ug/kg*	*50.000*		*94*	*80-121*			
Surrogate: 1,2-Dichloroethane-d4	*50*		*ug/kg*	*50.000*		*101*	*70-131*			
Surrogate: Toluene-d8	*50*		*ug/kg*	*50.000*		*100*	*79-120*			
Surrogate: 4-Bromofluorobenzene	*56*		*ug/kg*	*50.000*		*112*	*80-121*			

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Report No.: AAL0379

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7120323 - EPA 5035										
Blank (7120323-BLK2)					Prepared & Analyzed: 12/13/17					
Acetone	ND	100	ug/kg wet							
Acrolein	ND	50	ug/kg wet							
Acrylonitrile	ND	50	ug/kg wet							
Benzene	ND	5.0	ug/kg wet							
Bromobenzene	ND	10	ug/kg wet							
Bromochloromethane	ND	10	ug/kg wet							
Bromodichloromethane	ND	10	ug/kg wet							
Bromoform	ND	10	ug/kg wet							
Bromomethane	ND	10	ug/kg wet							
n-Butylbenzene	ND	10	ug/kg wet							
sec-Butylbenzene	ND	10	ug/kg wet							
tert-Butylbenzene	ND	10	ug/kg wet							
Carbon Disulfide	ND	10	ug/kg wet							
Carbon Tetrachloride	ND	5.0	ug/kg wet							
Chlorobenzene	ND	10	ug/kg wet							
Chloroethane	ND	5.0	ug/kg wet							
Chloroform	ND	5.0	ug/kg wet							
Chloromethane	ND	10	ug/kg wet							
2-Chlorotoluene	ND	10	ug/kg wet							
4-Chlorotoluene	ND	10	ug/kg wet							
Dibromochloromethane	ND	5.0	ug/kg wet							
1,2-Dibromo-3-chloropropane	ND	10	ug/kg wet							
1,2-Dibromoethane	ND	10	ug/kg wet							
Dibromomethane	ND	10	ug/kg wet							
1,2-Dichlorobenzene	ND	10	ug/kg wet							
1,3-Dichlorobenzene	ND	10	ug/kg wet							
1,4-Dichlorobenzene	ND	10	ug/kg wet							
Dichlorodifluoromethane	ND	10	ug/kg wet							
1,1-Dichloroethane	ND	5.0	ug/kg wet							
1,2-Dichloroethane	ND	5.0	ug/kg wet							
1,1-Dichloroethene	ND	5.0	ug/kg wet							
cis-1,2-Dichloroethene	ND	5.0	ug/kg wet							
trans-1,2-Dichloroethene	ND	5.0	ug/kg wet							
1,2-Dichloropropane	ND	5.0	ug/kg wet							
1,3-Dichloropropane	ND	5.0	ug/kg wet							
2,2-Dichloropropane	ND	10	ug/kg wet							
1,1-Dichloropropene	ND	10	ug/kg wet							
cis-1,3-Dichloropropene	ND	5.0	ug/kg wet							
trans-1,3-Dichloropropene	ND	5.0	ug/kg wet							
Ethylbenzene	ND	5.0	ug/kg wet							
Isopropylbenzene	ND	10	ug/kg wet							

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December 18, 2017

Report No.: AAL0379

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7120323 - EPA 5035										
Blank (7120323-BLK2)					Prepared & Analyzed: 12/13/17					
p-Isopropyltoluene	ND	10	ug/kg wet							
Methyl Butyl Ketone (2-Hexanone)	ND	50	ug/kg wet							
Methylene Chloride	ND	10	ug/kg wet							
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/kg wet							
4-Methyl-2-pentanone (MIBK)	ND	50	ug/kg wet							
Naphthalene	ND	10	ug/kg wet							
n-Propylbenzene	ND	10	ug/kg wet							
Styrene	ND	5.0	ug/kg wet							
1,1,1,2-Tetrachloroethane	ND	10	ug/kg wet							
1,1,2,2-Tetrachloroethane	ND	5.0	ug/kg wet							
Tetrachloroethene	ND	5.0	ug/kg wet							
Toluene	ND	5.0	ug/kg wet							
1,2,3-Trichlorobenzene	ND	10	ug/kg wet							
1,2,4-Trichlorobenzene	ND	10	ug/kg wet							
1,1,1-Trichloroethane	ND	5.0	ug/kg wet							
1,1,2-Trichloroethane	ND	5.0	ug/kg wet							
Trichloroethene	ND	5.0	ug/kg wet							
Trichlorofluoromethane	ND	10	ug/kg wet							
1,2,3-Trichloropropane	ND	10	ug/kg wet							
1,2,4-Trimethylbenzene	ND	10	ug/kg wet							
1,3,5-Trimethylbenzene	ND	10	ug/kg wet							
Vinyl Acetate	ND	10	ug/kg wet							
Vinyl Chloride	ND	10	ug/kg wet							
m+p-Xylene	ND	5.0	ug/kg wet							
o-Xylene	ND	5.0	ug/kg wet							
Xylenes, total	ND	5.0	ug/kg wet							
Surrogate: Dibromofluoromethane	*47*		*ug/kg*	*50.000*		*94*	*80-121*			
Surrogate: 1,2-Dichloroethane-d4	*51*		*ug/kg*	*50.000*		*102*	*70-131*			
Surrogate: Toluene-d8	*49*		*ug/kg*	*50.000*		*98*	*79-120*			
Surrogate: 4-Bromofluorobenzene	*55*		*ug/kg*	*50.000*		*111*	*80-121*			

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Report No.: AAL0379

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7120323 - EPA 5035										
LCS (7120323-BS1)					Prepared & Analyzed: 12/13/17					
Benzene	50	5.0	ug/kg wet	50.000		100	71-125			
Chlorobenzene	48	10	ug/kg wet	50.000		96	70-120			
1,1-Dichloroethene	55	5.0	ug/kg wet	50.000		111	71-139			
Toluene	51	5.0	ug/kg wet	50.000		101	69-120			
Trichloroethene	52	5.0	ug/kg wet	50.000		104	75-124			
Surrogate: Dibromofluoromethane	*51*		*ug/kg*	*50.000*		*101*	*80-121*			
Surrogate: 1,2-Dichloroethane-d4	*51*		*ug/kg*	*50.000*		*101*	*70-131*			
Surrogate: Toluene-d8	*50*		*ug/kg*	*50.000*		*100*	*79-120*			
Surrogate: 4-Bromofluorobenzene	*51*		*ug/kg*	*50.000*		*102*	*80-121*			
Matrix Spike (7120323-MS1)	**Source: AAL0379-01**				Prepared & Analyzed: 12/13/17					
Benzene	2500	250	ug/kg dry	2511.9	ND	100	70-137			
Chlorobenzene	2400	500	ug/kg dry	2511.9	ND	95	33-131			
1,1-Dichloroethene	2700	250	ug/kg dry	2511.9	ND	106	48-146			
Toluene	2700	250	ug/kg dry	2511.9	ND	106	41-133			
Trichloroethene	2500	250	ug/kg dry	2511.9	ND	101	43-138			
Surrogate: Dibromofluoromethane	*50*		*ug/kg*	*50.000*		*100*	*80-121*			
Surrogate: 1,2-Dichloroethane-d4	*51*		*ug/kg*	*50.000*		*102*	*70-131*			
Surrogate: Toluene-d8	*50*		*ug/kg*	*50.000*		*101*	*79-120*			
Surrogate: 4-Bromofluorobenzene	*52*		*ug/kg*	*50.000*		*104*	*80-121*			
Matrix Spike Dup (7120323-MSD1)	**Source: AAL0379-01**				Prepared & Analyzed: 12/13/17					
Benzene	2500	250	ug/kg dry	2511.9	ND	100	70-137	0.4	41	
Chlorobenzene	2400	500	ug/kg dry	2511.9	ND	96	33-131	0.3	46	
1,1-Dichloroethene	2700	250	ug/kg dry	2511.9	ND	106	48-146	0.3	57	
Toluene	2500	250	ug/kg dry	2511.9	ND	99	41-133	7	61	
Trichloroethene	2600	250	ug/kg dry	2511.9	ND	102	43-138	1	49	
Surrogate: Dibromofluoromethane	*55*		*ug/kg*	*50.000*		*110*	*80-121*			
Surrogate: 1,2-Dichloroethane-d4	*59*		*ug/kg*	*50.000*		*119*	*70-131*			
Surrogate: Toluene-d8	*50*		*ug/kg*	*50.000*		*101*	*79-120*			
Surrogate: 4-Bromofluorobenzene	*52*		*ug/kg*	*50.000*		*103*	*80-121*			

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December 18, 2017

Laboratory Certifications

Code	Description	Number	Expires
GADW	Georgia DW Inorganics Eff: 07/01/2016	812	06/30/2018
GADWM	Georgia DW Microbiology Eff: 07/01/2015	812	12/09/2019
NC	North Carolina	381	12/31/2017
NELAC	FL DOH (Non-Pot. Water, Solids) Eff:: 07/01/2016	E87315	06/30/2018
NELDW	FL DOH NELAC (Drinking Water) Eff: 07/01/2016	E87315	06/30/2018
SC	South Carolina	98011001	06/30/2018
TX	Texas	T104704397-08-TX	03/31/2018
VA	Virginia	460204	12/14/2018

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December 18, 2017

Legend

Definition of Laboratory Terms

ND - None Detected at the Reporting Limit
TIC - Tentatively Identified Compound
CFU - Colony Forming Units
SOP - Method run per Pace Standard Operating Procedure
RL - Reporting Limit
DF - Dilution Factor
***** - Analyte not included in the NELAC list of certified analytes.

Sample Information

N-Nitrosodiphenylamine breaks down to diphenylamine in the GCMS; both analytes are reported as N-Nitrososdiphenylamine. Pace is not NELAC certified for diphenylamine.

Phthalic acid and phthalic anhydride are reported as dimethyl phthalate

Maleic acid and maleic anhydride are reported as dimethyl malate

1,2-Diphenylhydrazine breaks down to azobenzene in the GCMS; both analytes are reported as azobenzene

Drinking Water Records will be available for at least 5 years and are subject to disposal after the 5 years have elapsed.

Definition of Qualifiers

Note: Unless otherwise noted, all results are reported on an as received basis.

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

AMEC - Atlanta
2677 Buford Highway
Atlanta GA, 30324
Attention: Mr. Stephen Foley

December 18, 2017

Report Notes

The samples arrived frozen for TerraCore preservation. CFH

CHAIN OF CUSTODY RECORD

Pace Analytical® www.pacelabs.com

Pace Analytical Services, LLC - Atlanta GA
110 TECHNOLOGY PARKWAY, PEACHTREE CORNERS, GA 30092
(770) 734-4200 : FAX (770) 734-4201

CLIENT NAME: Amec Foster Wheeler

CLIENT ADDRESS/PHONE NUMBER/FAX NUMBER: 2677 Buford Hwy Atlanta, GA

REPORT TO: Steve Foley

CC:

REQUESTED COMPLETION DATE: 1 WK TAT

PO #:

PROJECT NAME/STATE: WHITAKER OIL

PROJECT #: 6121-13-0117

ANALYSIS REQUESTED: VOCs 8260B

Collection DATE	Collection TIME	MATRIX CODE*	COMP	GRAB	SAMPLE IDENTIFICATION	# of CONTAINERS	VOCs 8260B	LAB ID NUMBER	REMARKS/ADDITIONAL INFORMATION
12/8/17	1125	SO		X	HA-1	4	X	1	SAMPLES FROZEN
↓	1138	SO		X	HA-2	4	X	2	12/8/17 @ 15:00
	1153	SO		X	HA-3	4	X	3	

CONTAINER TYPE: P - PLASTIC; A - AMBER GLASS; G - CLEAR GLASS; V - VOA VIAL; S - STERILE; O - OTHER

PRESERVATION: 1 - HCl, ≤6°C; 2 - H_2SO_4, ≤6°C; 3 - HNO_3; 4 - NaOH, ≤6°C; 5 - NaOH/ZnAc, ≤6°C; 6 - $Na_2S_2O_3$, ≤6°C; 7 - ≤6°C not frozen

*MATRIX CODES: DW - DRINKING WATER; WW - WASTEWATER; GW - GROUNDWATER; SW - SURFACE WATER; ST - STORM WATER; W - WATER; S - SOIL; SL - SLUDGE; SD - SOLID; A - AIR; L - LIQUID; P - PRODUCT

SAMPLED BY AND TITLE: Stephen R Foley | DATE/TIME:

RELINQUISHED BY: [signature] | DATE/TIME: 12/12/17 10:39

RECEIVED BY: S. Austin | DATE/TIME: 12/12/17 10:39

RELINQUISHED BY: S. Austin 12-12-17 11:15 | DATE/TIME:

RECEIVED BY LAB: [signature] | DATE/TIME: 12/12/17 1115

Checked: No NA | Ice: Yes No NA | Temperature: Min: 0.0°C Max:

SAMPLE SHIPPED VIA: UPS FED-EX USPS COURIER CLIENT OTHER FS

Custody Seal: Intact Broken Not Present N/A | # of Coolers | Cooler ID:

FOR LAB USE ONLY

LAB #: AAL0374

Entered into LIMS: CHH

Tracking #:

Rev. 12/15/2016

Sample Condition Upon Receipt

Pace Analytical

Client Name: Amec Foster Wheeler Project # AAL0379

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

Optional
Proj. Due Date:
Proj. Name:

Tracking #: _____

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☑ Other _____

Thermometer Used IR082 Type of Ice: (Wet) Blue None Frozen ☐ Samples on ice, cooling process has begun

Cooler Temperature 0.0°C Biological Tissue is Frozen: Yes (No)

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 12/12/17 cdg

Comments:

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.	
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.	
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.	
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.	
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.	
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6.	
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.	
Sufficient Volume:	☑Yes ☐No ☐N/A	8.	
Correct Containers Used:	☑Yes ☐No ☐N/A	9.	
-Pace Containers Used:	☑Yes ☐No ☐N/A		
Containers Intact:	☑Yes ☐No ☐N/A	10.	
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.	
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.	
-Includes date/time/ID/Analysis Matrix: SD			
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	13.	
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A		
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	Initial when completed	Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.	
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.	
Trip Blank Present:	☐Yes ☐No ☑N/A	16.	
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A		
Pace Trip Blank Lot # (if purchased):			

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: The samples arrived frozen for TerraCore preservation (24, 12/12/17

Project Manager Review: _____ **Date:** _____

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

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

LOG-IN CHECKLIST **Printed: 12/12/2017 4:50:25PM**

Attn: Mr. Stephen Foley

Client: AMEC - Atlanta
Project: Whitaker Oil
Date Received: 12/12/17 11:15

Work Order: AAL0379
Logged In By: Charles Hawks

OBSERVATIONS

#Samples: 3 **#Containers:** 12

Minimum Temp(C): 0.0 **Maximum Temp(C):** 0.0 **Custody Seal(s) Used:** Yes

CHECKLIST ITEMS

COC included with Samples	YES
Sample Container(s) Intact	YES
Chain of Custody Complete	YES
Sample Container(s) Match COC	YES
Custody seal Intact	YES
Temperature in Compliance	YES
Sufficient Sample Volume for Analysis	YES
Zero Headspace Maintained for VOA Analyses	YES
Samples labeled preserved (If Applicable)	YES
Samples received within Allowable Hold Times	YES
Samples Received on Ice	YES
Preservation Confirmed	YES

Comments:

The samples arrived frozen for TerraCore preservation. CFH

APPENDIX F
RISK REDUCTION STANDARDS

TABLE 1 - CUMULATIVE GROUNDWATER DATA SUMMARY
WHITAKER OIL
1587 MARIETTA STREET
ATLANTA, GEORGIA

PARAMETER	Higher of Type 3/4 RRS	Type 3 RRS[1]	Type 4 RRS[2]	MW-11 10/2003	MW-11 10/2004	MW-11 12/10/2009	MW-11 12/21/2010	MW-11 12/6/2011	MW-11 6/5/2012	MW-11 12/5/2012	MW-11 4/2/2014	MW-11 3/17/2015	MW-11 3/8/2016	MW-11 11/6/2017
Volatile Organic Compounds (VOCs), ug/L														
1,1,1-Trichloroethane	16,000	200	16,000	NT	**5.6**	< 2.0	**2.5**	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1,2-Trichloroethane	5.0	5.0	0.67	NT	< 1.0	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethane	4,000	4,000	53	NT	**2.3**	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethene	600	7.0	600	NT	< 1.0	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,2-Dichloroethane	5.0	5.0	3.3	NT	<1.0	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Methyl-2-pentanone	10,000	2,000	10,000	NT	**10**	< 10	< 10	< 10	NT	< 10	< 10	< 10	< 10	< 10
Benzene	10	5.0	10	NT	<1.0	<2.0	<2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Chloroform	80	80	3.9	NT	<1.0	<2.0	<2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
cis-1,2-Dichloroethene	230	70	230	NT	**3.4**	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	700	700	33	NT	**1.6**	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Tetrachloroethene	110	5.0	110	NT	< 1.0	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Toluene	6,000	1,000	6,000	NT	**37**	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	6.0	5.0	6.0	NT	**3.7**	< 2.0	< 2.0	< 2.0	NT	< 2.0	< 2.0	**45**	**36**	**59**
Xylenes, mixture	10,000	10,000	330	NT	< 1.0	< 5.0	< 5.0	< 5.0	NT	< 5.0	< 5.0	< 5.0	<5.0	<5.0
Semi-Volatile Organic Compounds (SVOCs), ug/L				BRL	NT	BRL	BRL	BRL	NT	NT	NT	NT	NT	NT
Metals, Total, mg/L														
Arsenic	0.010	0.010	0.0022	**0.0088**	NT	< 0.0050	< 0.0050	< 0.0050	NT	< 0.0050	NT	NT	NT	NT
Lead	0.015	0.015	0.015	<0.005	NT	< 0.0010	< 0.0010	< 0.0010	NT	< 0.0093	NT	NT	NT	NT
Barium	23	2.0	23	**0.078**	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chromium	0.10	0.10	0.0065	**0.0026**	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Selenium	0.58	0.050	0.58	**0.01**	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Metals, Dissolved, mg/L														
Arsenic	0.010	0.010	0.0022	NT	NT	< 0.0050	< 0.0050	< 0.0050	NT	< 0.0050	NT	NT	NT	NT
Lead	0.015	0.015	0.015	NT	NT	< 0.0010	< 0.0010	< 0.0010	NT	< 0.0010	NT	NT	NT	NT

Notes:
-- = Not Reported
NT - Not Tested
Shaded values indicate exceedance of the higher of the Type 3/4 RRS

References:
1. Taken from Georgia Administrative Code Appendix (391-3-19) III. Media Target Concentrations and Standard Default Exposure Assumptions
2. Values calculated in Table 2 using the methodology outlined in Georgia Administrative Code Appendix (391-3-19) III. Media Target Concentrations and Standard Default Exposure Assumptions

TABLE 1 - CUMULATIVE GROUNDWATER DATA SUMMARY
WHITAKER OIL
1587 MARIETTA STREET
ATLANTA, GEORGIA

PARAMETER	Higher of Type 3/4 RRS	Type 3 RRS[1]	Type 4 RRS[2]	MW-16 10/2003	MW-16 10/2004	MW-16 12/22/2010	MW-16 12/8/2011	MW-16D 1/2004	MW-16D 12/11/2009	MW-16D 12/22/2010	MW-16D 12/8/2011	MW-16D 12/4/2012	MW-17 11/6/2017	MW-18 11/6/2017
Volatile Organic Compounds (VOCs), ug/L														
1,1,1-Trichloroethane	16,000	200	16,000	NT	< 1.0	**2.3**	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1,2-Trichloroethane	5.0	5.0	0.67	NT	< 1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethane	4,000	4,000	53	NT	< 1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethene	600	7.0	600	NT	< 1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,2-Dichloroethane	5.0	5.0	3.3	NT	< 1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Methyl-2-pentanone	10,000	2,000	10,000	NT	<5.0	< 10	< 10	<5.0	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	10	5.0	10	NT	<1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Chloroform	80	80	3.9	NT	<1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
cis-1,2-Dichloroethene	230	70	230	NT	< 1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	700	700	33	NT	< 1.0	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Tetrachloroethene	110	5.0	110	NT	**12**	< 2.0	< 2.0	<1.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Toluene	6,000	1,000	6,000	NT	< 1.0	**6.1**	< 2.0	**1.6**	**2.2**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	6.0	5.0	6.0	NT	**17**	**2.5**	**2.4**	**1.9**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Xylenes, mixture	10,000	10,000	330	NT	< 1.0	< 5.0	< 5.0	<2.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Semi-Volatile Organic Compounds (SVOCs), ug/L				BRL	NT	BRL	NT	BRL	BRL	BRL	BRL	BRL	NT	NT
Metals, Total, mg/L														
Arsenic	0.010	0.010	0.0022	**0.0056**	NT	< 0.0050	NT	<0.005	<0.005	<0.005	< 0.0050	< 0.0050	NT	NT
Lead	0.015	0.015	0.015	<0.005	NT	**0.0404**	NT	<0.005	**0.0018**	**0.0018**	**0.002**	<0.0010	NT	NT
Barium	23	2.0	23	**0.059**	NT	NT	NT	**0.63**	NT	NT	NT	NT	NT	NT
Chromium	0.10	0.10	0.0065	<0.002	NT	NT	NT	**0.0058**	NT	NT	NT	NT	NT	NT
Selenium	0.58	0.050	0.58	<0.005	NT	NT	NT	<0.005	NT	NT	NT	NT	NT	NT
Metals, Dissolved, mg/L														
Arsenic	0.010	0.010	0.0022	NT	NT	< 0.0050	NT	NT	<0.005	<0.005	< 0.0050	< 0.0050	NT	NT
Lead	0.015	0.015	0.015	NT	NT	< 0.0010	NT	NT	<0.001	<0.001	< 0.0010	< 0.0010	NT	NT

Notes:
-- = Not Reported
NT - Not Tested
Shaded values indicate exceedance of the higher of the Type 3/4 RRS

References:
1. Taken from Georgia Administrative Code Appendix (391-3-19) III. Media Target Concent
2. Values calculated in Table 2 using the methodology outlined in Georgia Administrative C

TABLE 1 - CUMULATIVE GROUNDWATER DATA SUMMARY
WHITAKER OIL
1587 MARIETTA STREET
ATLANTA, GEORGIA

PARAMETER	Higher of Type 3/4 RRS	Type 3 RRS[1]	Type 4 RRS[2]	GOS-MW-1 4/2003	GOS-MW-1 12/10/2009	GOS-MW-1 12/21/2010	GOS-MW-1 12/7/2011	GOS-MW-1 12/5/2012	GOS-MW-2 4/2003	GOS-MW-2 8/26/2009	GOS-MW-2 12/14/2009
Volatile Organic Compounds (VOCs), ug/L											
1,1,1-Trichloroethane	16,000	200	16,000	<5.0	**2.7**	< 2.0	< 2.0	< 2.0	**574**	**270**	**180**
1,1,2-Trichloroethane	5.0	5.0	0.67	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0
1,1-Dichloroethane	4,000	4,000	53	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	**17**	**36**	**27**
1,1-Dichloroethene	600	7.0	600	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	**137**	**160**	**150**
1,2-Dichloroethane	5.0	5.0	3.3	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	**2.8**	< 2.0
4-Methyl-2-pentanone	10,000	2,000	10,000	<50	< 10	< 10	< 10	< 10	<50	< 10	< 10
Benzene	10	5.0	10	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0
Chloroform	80	80	3.9	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0
cis-1,2-Dichloroethene	230	70	230	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	**2.8**	**2.1**
Ethylbenzene	700	700	33	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0
Tetrachloroethene	110	5.0	110	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	**15**	**11**	**12**
Toluene	6,000	1,000	6,000	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0
Trichloroethene	6.0	5.0	6.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	**11**	**13**	**12**
Xylenes, mixture	10,000	10,000	330	<5.0	< 5.0	< 5.0	< 5.0	< 5.0	<5.0	< 5.0	< 5.0
Semi-Volatile Organic Compounds (SVOCs), ug/L					BRL	BRL	BRL	BRL	BRL	BRL	BRL
Metals, Total, mg/L											
Arsenic	0.010	0.010	0.0022	NT	< 0.0050	< 0.0050	< 0.0250	< 0.0050	<0.010	< 0.0050	< 0.0050
Lead	0.015	0.015	0.015	NT	**0.001**	< 0.0010	**0.0166**	< 0.0010	**0.019**	**0.0012**	**0.0011**
Barium	23	2.0	23	NT	NT	NT	NT	NT	**0.679**	NT	NT
Chromium	0.10	0.10	0.0065	NT	NT	NT	NT	NT	<0.010	NT	NT
Selenium	0.58	0.050	0.58	NT	NT	NT	NT	NT	<0.040	NT	NT
Metals, Dissolved, mg/L											
Arsenic	0.010	0.010	0.0022	NT	< 0.0050	< 0.0050	< 0.0050	< 0.0050	NT	< 0.0050	< 0.0050
Lead	0.015	0.015	0.015	NT	< 0.0010	< 0.0010	< 0.0010	< 0.0010	NT	< 0.0010	< 0.0010

Notes:
-- = Not Reported
NT - Not Tested
Shaded values indicate exceedance of the higher of the Type 3/4 RRS

References:
1. Taken from Georgia Administrative Code Appendix (391-3-19) III. Media Target Concent
2. Values calculated in Table 2 using the methodology outlined in Georgia Administrative C

TABLE 1 - CUMULATIVE GROUNDWATER DATA SUMMARY
WHITAKER OIL
1587 MARIETTA STREET
ATLANTA, GEORGIA

PARAMETER	Higher of Type 3/4 RRS	Type 3 RRS[1]	Type 4 RRS[2]	GOS-MW-2 3/24/2010	GOS-MW-2 6/4/2010	GOS-MW-2 12/22/2010	GOS-MW-2 12/9/2011	GOS-MW-2 12/6/2012	GOS-MW-2 4/3/2014	GOS-MW-2 3/8/2016	GOS-MW-3 4/2003	GOS-MW-3 12/14/2009	GOS-MW-3 12/22/2010	GOS-MW-3 12/8/2011	GOS-MW-3 12/6/2012
Volatile Organic Compounds (VOCs), ug/L															
1,1,1-Trichloroethane	16,000	200	16,000	**100**	**200**	**110**	**60**	**19**	**150**	**24**	**213**	**22**	**19**	**7.9**	< 2.0
1,1,2-Trichloroethane	5.0	5.0	0.67	**6.3**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethane	4,000	4,000	53	**20**	**35**	**25**	**16**	**7.6**	**48**	**17**	<5.0	**5**	**4**	**2.3**	< 2.0
1,1-Dichloroethene	600	7.0	600	**96**	**190**	**100**	**56**	**25**	**120**	**15**	**44**	**15**	**24**	**9.7**	< 2.0
1,2-Dichloroethane	5.0	5.0	3.3	**3.1**	**2.4**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Methyl-2-pentanone	10,000	2,000	10,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	<50	< 10	< 10	< 10	< 10
Benzene	10	5.0	10	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0
Chloroform	80	80	3.9	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0
cis-1,2-Dichloroethene	230	70	230	**3.1**	**2.4**	< 2.0	< 2.0	< 2.0	**6.4**	**5.8**	<5.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	700	700	33	< 2.0	2.7	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0
Tetrachloroethene	110	5.0	110	**8.3**	**13**	**9.7**	**5.9**	**3.1**	**17**	**7.5**	**5**	< 2.0	< 2.0	< 2.0	< 2.0
Toluene	6,000	1,000	6,000	< 2.0	**49**	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	6.0	5.0	6.0	**8.2**	**13**	**8.9**	**6.5**	**3.9**	**18**	**6.4**	**5**	**2.2**	< 2.0	< 2.0	< 2.0
Xylenes, mixture	10,000	10,000	330	< 5.0	**7.9**	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	<5.0	< 5.0	< 5.0	< 5.0	< 5.0
Semi-Volatile Organic Compounds (SVOCs), ug/L				BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL
Metals, Total, mg/L															
Arsenic	0.010	0.010	0.0022	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	NT	NT	<0.010	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Lead	0.015	0.015	0.015	< 0.0010	**0.0037**	< 0.0010	**0.029**	< 0.0010	NT	NT	**0.012**	**0.0023**	**0.0028**	**0.0277**	**0.0046**
Barium	23	2.0	23	NT	NT	NT	NT	NT	NT	NT	**0.155**	NT	NT	NT	NT
Chromium	0.10	0.10	0.0065	NT	NT	NT	NT	NT	NT	NT	<0.010	NT	NT	NT	NT
Selenium	0.58	0.050	0.58	NT	NT	NT	NT	NT	NT	NT	<0.040	NT	NT	NT	NT
Metals, Dissolved, mg/L															
Arsenic	0.010	0.010	0.0022	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	NT	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Lead	0.015	0.015	0.015	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	NT	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Notes:
-- = Not Reported
NT - Not Tested
Shaded values indicate exceedance of the higher of the Type 3/4 RRS

References:
1. Taken from Georgia Administrative Code Appendix (391-3-19) III. Media Target Concent
2. Values calculated in Table 2 using the methodology outlined in Georgia Administrative C

TABLE 1 - CUMULATIVE GROUNDWATER DATA SUMMARY
WHITAKER OIL
1587 MARIETTA STREET
ATLANTA, GEORGIA

PARAMETER	Higher of Type 3/4 RRS	Type 3 RRS[1]	Type 4 RRS[2]
Volatile Organic Compounds (VOCs), ug/L			
1,1,1-Trichloroethane	16,000	200	16,000
1,1,2-Trichloroethane	5.0	5.0	0.67
1,1-Dichloroethane	4,000	4,000	53
1,1-Dichloroethene	600	7.0	600
1,2-Dichloroethane	5.0	5.0	3.3
4-Methyl-2-pentanone	10,000	2,000	10,000
Benzene	10	5.0	10
Chloroform	80	80	3.9
cis-1,2-Dichloroethene	230	70	230
Ethylbenzene	700	700	33
Tetrachloroethene	110	5.0	110
Toluene	6,000	1,000	6,000
Trichloroethene	6.0	5.0	6.0
Xylenes, mixture	10,000	10,000	330
Semi-Volatile Organic Compounds (SVOCs), ug/L			
Metals, Total, mg/L			
Arsenic	0.010	0.010	0.0022
Lead	0.015	0.015	0.015
Barium	23	2.0	23
Chromium	0.10	0.10	0.0065
Selenium	0.58	0.050	0.58
Metals, Dissolved, mg/L			
Arsenic	0.010	0.010	0.0022
Lead	0.015	0.015	0.015

Notes:
-- = Not Reported
NT - Not Tested
Shaded values indicate exceedance of the higher of the Type 3/4 RRS

References:
1. Taken from Georgia Administrative Code Appendix (391-3-19) III. Media Target Concent
2. Values calculated in Table 2 using the methodology outlined in Georgia Administrative C

TABLE 1 - CUMULATIVE GROUNDWATER DATA SUMMARY
WHITAKER OIL
1587 MARIETTA STREET
ATLANTA, GEORGIA

PARAMETER	Higher of Type 3/4 RRS	Type 3 RRS[1]	Type 4 RRS[2]	GOS-MW-4 4/2003	GOS-MW-5 4/2003	GOS-MW-5 12/17/2009	GOS-MW-5 12/22/2010	GOS-MW-5 12/8/2011	GOS-MW-5 12/6/2012	GOS-MW-5 4/3/2014	GOS-MW-5 3/8/2016	GOS-MW-5 11/6/2017
Volatile Organic Compounds (VOCs), ug/L												
1,1,1-Trichloroethane	16,000	200	16,000	<5.0	**7**	< 2.0	**2.5**	< 2.0	< 2.0	**2.8**	<2.0	<2.0
1,1,2-Trichloroethane	5.0	5.0	0.67	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethane	4,000	4,000	53	**6**	<5.0	**5.8**	< 2.0	**6.2**	**13**	**300**	**180**	**72**
1,1-Dichloroethene	600	7.0	600	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	**8.4**	**4.1**	**2.5**
1,2-Dichloroethane	5.0	5.0	3.3	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Methyl-2-pentanone	10,000	2,000	10,000	<50	<50	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	10	5.0	10	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.3	<2
Chloroform	80	80	3.9	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<2	9.6
cis-1,2-Dichloroethene	230	70	230	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	**50**	**41**	**17**
Ethylbenzene	700	700	33	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Tetrachloroethene	110	5.0	110	<5.0	**107**	**51**	**47**	**28**	**28**	**22**	**7.2**	**19**
Toluene	6,000	1,000	6,000	<5.0	<5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	6.0	5.0	6.0	**370**	**12**	**23**	**11**	**21**	**21**	**38**	**41**	**13**
Xylenes, mixture	10,000	10,000	330	<5.0	<5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Semi-Volatile Organic Compounds (SVOCs), ug/L				BRL	BRL	BRL	BRL	BRL	BRL	NT	NT	NT
Metals, Total, mg/L												
Arsenic	0.010	0.010	0.0022	<0.010	<0.010	< 0.0050	< 0.0050	< 0.0050	< 0.0050	NT	NT	NT
Lead	0.015	0.015	0.015	**0.02**	**0.013**	< 0.0010	< 0.0010	< 0.0010	**0.0024**	NT	NT	NT
Barium	23	2.0	23	**0.705**	**0.494**	NT	NT	NT	NT	NT	NT	NT
Chromium	0.10	0.10	0.0065	<0.010	<0.010	NT	NT	NT	NT	NT	NT	NT
Selenium	0.58	0.050	0.58	<0.040	<0.040	NT	NT	NT	NT	NT	NT	NT
Metals, Dissolved, mg/L												
Arsenic	0.010	0.010	0.0022	NT	NT	< 0.0050	< 0.0050	< 0.0050	< 0.0050	NT	NT	NT
Lead	0.015	0.015	0.015	NT	NT	< 0.0010	< 0.0010	< 0.0010	< 0.0010	NT	NT	NT

Notes:
-- = Not Reported
NT - Not Tested
Shaded values indicate exceedance of the higher of the Type 3/4 RRS

References:
1. Taken from Georgia Administrative Code Appendix (391-3-19) III. Media Target Concent
2. Values calculated in Table 2 using the methodology outlined in Georgia Administrative C

TABLE 2 - Type 4 Risk Reduction Standard Calculation
WHITAKER OIL
1587 MARIETTA STREET
ATLANTA, GEORGIA

Exposure Parameters

Component	Symbol	Value	Unit	Reference
Averaging Time - carcinogenic	AT_c	70	years	GAC, 2018
Averaging Time - noncarcinogenic	AT_{nc}	25	years	GAC, 2018
Body Weight	BW	80	kg	U.S.EPA, 2014
Exposure Duration	ED	25	years	GAC, 2018
Exposure Frequency	EF	250	days/year	GAC, 2018
Ingestion rate of air	IR_a	20	m^3/day	GAC, 2018
Ingestion rate of water	IR_w	1	L/day	GAC, 2018
Water -to-air volatilization factor	K	0.5	L/m^3	GAC, 2018
Target Hazard Index	THI	1	unitless	GAC, 2018
Target Excess Risk	TR	1.00E-05	unitless	GAC, 2018

References

GAC, 2018. Georgia Administrative Code Rule 391-3-19-.07. Risk Reduction Standards> Current through January 4, 2018
U.S.EPA, 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors. OSWER Directive 9200.1-120. Febraury, 2014

Type 4 Risk Reduction Standards Calculation

		Toxicity Factors[2]										Risk Reduction Standards[3]	
PARAMETER	**Volatile[1]**	**Oral Reference Dose – RfD_o (mg/kg-day)**	**Reference**	**Oral Cancer Slope Factor – SF_o $(mg/kg\text{-}day)^{-1}$**	**Reference**	**Inhalation Reference Concentration – RfC (mg/m^3)**	**Inhalation Reference Dose –RfD_i (mg/kg-day)**	**Reference**	**Inhalation Unit Risk – IUR $(\mu g/m^3)^{-1}$**	**Inhalation Cancer Slope Factor – SF_i $(mg/kg\text{-}day)^{-1}$**	**Reference**	**Carcinogenic Type 4 Groundwater RRS (mg/L)**	**Noncarcinogenic Type 4 Groundwater RRS (mg/L)**
Volatile Organic Compounds (VOCs)													
1,1,1-Trichloroethane	Yes	2.0	IRIS	--	--	5.0	1.4	IRIS	--	--	--	--	16
1,1,2-Trichloroethane	Yes	0.0040	IRIS	0.057	IRIS	0.00020	0.000057	PPRTV - Appendix	0.000016	0.056	IRIS	0.0053	0.00067
1,1-Dichloroethane	Yes	0.20	PPRTV	0.0057	CALEPA	--	--	--	0.0000016	0.0056	CALEPA	0.053	23
1,1-Dichloroethene	Yes	0.050	IRIS	--	--	0.20	0.057	IRIS	--	--	--	--	0.60
1,2-Dichloroethane	Yes	0.0060	PPRTV - Appendix	0.091	IRIS	0.0070	0.0020	PPRTV	0.000026	0.091	IRIS	0.0033	0.023
4-Methyl-2-pentanone	Yes	--	--	--	--	3.0	0.86	IRIS	--	--	--	--	10
Benzene	Yes	0.0040	IRIS	0.055	IRIS	0.030	0.0086	IRIS	0.0000078	0.027	IRIS	0.010	0.082
Chloroform	Yes	0.010	IRIS	0.031	CALEPA	0.098	0.028	ASTDR	0.000023	0.081	IRIS	0.0039	0.26
cis-1,2-Dichloroethene	Yes	0.0020	IRIS	--	--	--	--	--	--	--	--	--	0.23
Ethylbenzene	Yes	0.10	IRIS	0.011	CALEPA	1.0	0.29	IRIS	0.0000025	0.0088	CALEPA	0.033	2.6
Tetrachloroethene	Yes	0.0060	IRIS	0.0021	IRIS	0.040	0.011	IRIS	0.00000026	0.00091	IRIS	0.29	0.112
Toluene	Yes	0.080	IRIS	--	--	5.0	1.4	IRIS	--	--	--	--	6.0
Trichloroethene	Yes	0.00050	IRIS	0.046	IRIS	0.0020	0.00057	IRIS	0.0000041	0.014	IRIS	0.017	0.0060
Xylenes, mixture	Yes	0.20	IRIS	--	--	0.10	0.029	IRIS	--	--	--	--	0.33
Metals, Total													
Arsenic	No	0.00030	IRIS	1.5	IRIS	0.000015	0.0000043	CALEPA	0.0043	15.1	IRIS	0.0022	0.035
Lead	No	--	--	--		--	--	--	--	--	--	--	0.015
Barium	No	0.20	IRIS	--		0.00050	0.00014	HEAST	--	--	--	--	23
Chromium[4]	No	0.0030	IRIS	0.50	CALEPA	0.00010	0.000029	IRIS	0.084	294	RSL	0.0065	0.35
Selenium	No	0.0050	IRIS	--	--	0.020	0.0057	CALEPA	--	--	--	--	0.58

Notes:
1. Volatile compounds are those defined as volatile in the USEPA Regional Screening level tables (November, 2017)
2. Toxicity factors taken from the November, 2017 U.S.EPA Regional Screening Level Tables.
3. Non-residential risk reduction standards were calculated using the following equations:
- For carcinogens

$$C\ (mg/L) = \frac{(TR)(BW)(AT)(365\ days/year)}{(EF)(ED)[(SFi)(K)(IRa) + (SFo)(IRw)]}$$

- For noncarcinogens

$$C\ (mg/L) = \frac{(THI)(BW)(AT)(365\ days/year)}{(EF)(ED)[(SFi)(K)(IRa) + (SFo)(IRw)]}$$

Prepared by: IMR 1/15/18
Checked by: LMS 1/15/18

4. Toxicity factors for chromium were based on the carcinogenic hexavalent form of chromium due to lack of information on Site-specific chromium speciation

Acronyms
IRIS - Integrated Risk Information System
PPRTV- Provisional Peer Reviewed Toxicity Factors
ATSDR - Agency for Toxic Substances and Disease Registry
CALEPA - California Environmental Protection Agency
PPRTV Appendix- Provisional Peer Reviewed Toxicity Factors (Appendix)
RSL - Regional Screening Level Tables

APPENDIX G
VAPOR INTRUSION EVALUATION

OSWER VAPOR INTRUSION ASSESSMENT

Vapor Intrusion Screening Level (VISL) Calculator Version 3.5, June 2017 RSLs

The primary objective of risk-based screening is to identify sites or buildings unlikely to pose a health concern through the vapor intrusion pathway. Generally, at properties where subsurface concentrations of vapor-forming chemicals (e.g., groundwater or "near source" soil gas concentrations) fall below screening levels (i.e., VISLs), no further action or study is warranted, so long as the exposure assumptions match those taken into account by the calculations and the site fulfills the conditions and assumptions of the generic conceptual model underlying the screening levels. In a similar fashion, the results of risk-based screening can help the data review team identify areas, buildings, and/or chemicals that can be eliminated from further assessment. The generic conceptual model underlying these screening levels is described in OSWER Publication 9200.2-154 (OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway From Subsurface Vapor Sources to Indoor Air) (EPA 2015; Section 6.5)

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens
Average Groundwater Temperature (°C)	Tgw	20.2	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Does the chemical meet the definition for volatility? (HLC>1E-5 or VP>1) Yes/No	Does chemical have inhalation toxicity data? (IUR and/or RfC) Yes/No	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Soil Source? Cvp > Cia,target? Yes/No	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Groundwater Source? Chc > Cia,target? Yes/No	Target Indoor Air Conc. @ TCR = 1E-06 or THQ = 1 MIN(Cia,c,Cia,nc) (ug/m^3)	Toxicity Basis C/NC	Target Sub-Slab and Exterior Soil Gas Conc. @ TCR = 1E-06 or THQ = 1 Csg (ug/m^3)	Target Ground Water Conc. @ TCR = 1E-06 or THQ = 1 Cgw (ug/L)	Is Target Ground Water Conc. < MCL? Cgw<MCL? Yes/No (MCL ug/L)	Pure Phase Vapor Conc. @ 25°C Cvp (ug/m^3)	Maximum Groundwater Vapor Conc. Chc (ug/m^3)	Temperature for Max. Groundwater Vapor Conc. Tgw or 25 C	Lower Explosive Limit** LEL (% by vol)	LEL Source	Inhalation Unit Risk IUR (ug/m^3)$^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator i	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06 Cia,c (ug/m^3)	Target Indoor Air Conc. for Non-Carcinogens @ THQ = 1 Cia,nc (ug/m^3)
71-43-2	Benzene	Yes	Yes	Yes	Yes	1.6E+00	C	5.2E+01	8.6E+00	No (5)	3.98E+08	3.25E+08	20.2	1.2	N	7.80E-06	I	3.00E-02	I		1.6E+00	1.3E+02
67-66-3	Chloroform	Yes	Yes	Yes	Yes	5.3E-01	C	1.8E+01	4.4E+00	Yes (8.0E+01(F))	1.27E+09	9.71E+08	20.2			2.30E-05	I	9.80E-02	A		5.3E-01	4.3E+02
75-34-3	Dichloroethane, 1,1-	Yes	No	Yes	Yes	7.7E+00	C	2.6E+02	4.1E+01	--	1.21E+09	9.45E+08	20.2	5.4	N	1.60E-06	CA				7.7E+00	
107-06-2	Dichloroethane, 1,2-	Yes	No	Yes	Yes	4.7E-01	C	1.6E+01	1.2E+01	No (5)	4.20E+08	3.29E+08	20.2	6.2	N	2.60E-05	I	7.00E-03	P		4.7E-01	3.1E+01
75-35-4	Dichloroethylene, 1,1-	Yes	No	Yes	Yes	8.8E+02	NC	2.9E+04	9.8E+02	No (7)	3.13E+09	2.17E+09	20.2	6.5	N			2.00E-01	I			8.8E+02
156-59-2	Dichloroethylene, 1,2-cis-	Yes	No	No Inhal. Tox. Info	No Inhal. Tox. Info	--	--	--	--	No (70)	1.04E+09	8.68E+08	20.2	9.7	M							
100-41-4	Ethylbenzene	Yes	Yes	Yes	Yes	4.9E+00	C	1.6E+02	2.0E+01	Yes (700)	5.48E+07	4.13E+07	20.2	0.8	N	2.50E-06	CA	1.00E+00	I		4.9E+00	4.4E+03
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)	Yes	No	Yes	Yes	1.3E+04	NC	4.4E+05	3.0E+06	--	1.07E+08	8.19E+07	20.2	1.2	N			3.00E+00	I			1.3E+04
127-18-4	Tetrachloroethylene	Yes	No	Yes	Yes	4.7E+01	C	1.6E+03	8.5E+01	No (5)	1.65E+08	1.15E+08	20.2			2.60E-07	I	4.00E-02	I		4.7E+01	1.8E+02
108-88-3	Toluene	Yes	No	Yes	Yes	2.2E+04	NC	7.3E+05	1.0E+05	No (1000)	1.41E+08	1.11E+08	20.2	1.1	N			5.00E+00	I			2.2E+04
71-55-6	Trichloroethane, 1,1,1-	Yes	No	Yes	Yes	2.2E+04	NC	7.3E+05	3.9E+04	No (200)	8.90E+08	7.32E+08	20.2	7.5	N			5.00E+00	I			2.2E+04
79-00-5	Trichloroethane, 1,1,2-	Yes	Yes	Yes	Yes	7.7E-01	C	2.6E+01	3.0E+01	No (5)	1.65E+08	1.19E+08	20.2	6	N	1.60E-05	I	2.00E-04	X		7.7E-01	8.8E-01
79-01-6	Trichloroethylene	Yes	Yes	Yes	Yes	3.0E+00	C	1.0E+02	9.4E+00	No (5)	4.88E+08	4.08E+08	20.2	8	N	see note	I	2.00E-03	I	TCE	3.0E+00	8.8E+00
1330-20-7	Xylenes	Yes	No	Yes	Yes	4.4E+02	NC	1.5E+04	2.1E+03	Yes (10000)	4.56E+07	2.17E+07	20.2					1.00E-01	I			4.4E+02

Notes:

(1) **Inhalation Pathway Exposure Parameters (RME):**

Exposure Scenario	Units	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario in cell G10) Symbol	Selected Value
Averaging time for carcinogens	(yrs)	ATc_R	70	ATc_C	70	ATc	70
Averaging time for non-carcinogens	(yrs)	ATnc_R	26	ATnc_C	25	ATnc	25
Exposure duration	(yrs)	ED_R	26	ED_C	25	ED	25
Exposure frequency	(days/yr)	EF_R	350	EF_C	250	EF	250
Exposure time	(hr/day)	ET_R	24	ET_C	8	ET	8

(2) **Generic Attenuation Factors:**

Source Medium of Vapors		Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario in cell G10) Symbol	Selected Value
Groundwater	(-)	AFgw_R	0.001	AFgw_C	0.001	AFgw	0.001
Sub-Slab and Exterior Soil Gas	(-)	AFss_R	0.03	AFss_C	0.03	AFss	0.03

(3) **Formulas**

Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) **Special Case Chemicals**

Trichloroethylene

	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario in cell G10) Symbol	Selected Value
mIURTCE	mIURTCE_R	1.00E-06	mIURTCE_C	0.00E+00	mIURTCE	0.00E+00
IURTCE	IURTCE_R	3.10E-06	IURTCE_C	4.10E-06	IURTCE	4.10E-06

Mutagenic Chemicals

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.

The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Age Cohort	Exposure Duration (years)	Age-dependent adjustment factor
0 - 2 years	2	10
2 - 6 years	4	3
6 - 16 years	10	3
16 - 26 years	10	1

Mutagenic-mode-of-action (MMOA) adjustment factor 25 This factor is used in the equations for mutagenic chemicals.

See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:

NVT = Not sufficiently volatile and/or toxic to pose inhalation risk in selected exposure scenario for the indicated medium
C = Carcinogenic
NC = Non-carcinogenic
I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at: http://www.epa.gov/iris/subst/index.html
P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at: http://hhpprtv.ornl.gov/pprtv.shtml
A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at: http://www.atsdr.cdc.gov/mrls/index.html
CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at: http://epa-heast.ornl.gov/heast.shtml
S = See RSL User Guide, Section 5
X = PPRTV Appendix
E = The Engineering ToolBox. Available online at http://www.engineeringtoolbox.com/explosive-concentration-limits-d_423.html
N = Centers for Disease Control and Prevention (CDC) National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. Available online at: http://www.cdc.gov/niosh/npg/default.html http://www.cdc.gov/niosh/npg/default.html
M = Chemical-specific MSDS
Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).
VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).
TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).
Yellow highlighting indicates site-specific parameters that may be edited by the user.
Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.
**Lower explosive limit is the minimum concentration of the compound in air (% by volume) that is needed for the gas to ignite and explode.

TABLE 1 - CUMULATIVE GROUNDWATER DATA SUMMARY
WHITAKER OIL
1587 MARIETTA STREET
ATLANTA, GEORGIA

PARAMETER	Type 1/3 RRS	MW-11 4/2/2014	MW-11 3/17/2015	MW-11 3/8/2016	MW-11 11/6/2017	GOS-MW-2 4/3/2014	GOS-MW-2 3/8/2016	GOS-MW-5 4/3/2014	GOS-MW-5 3/8/2016	GOS-MW-5 11/6/2017
Volatile Organic Compounds (VOCs), ug/L										
1,1,1-Trichloroethane	200	< 2.0	< 2.0	< 2.0	< 2.0	**150**	**24**	**2.8**	<2.0	**3.5**
1,1,2-Trichloroethane	5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
1,1-Dichloroethane	4,000	< 2.0	< 2.0	< 2.0	< 2.0	**48**	**17**	**300**	**180**	**72**
1,1-Dichloroethene	7.0	< 2.0	< 2.0	< 2.0	< 2.0	**120**	**15**	**8.4**	**4.1**	**2.5**
1,2-Dichloroethane	7.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Methyl-2-pentanone	2,000	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.3	2.3
Chloroform	80	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<2.0	**9.6**
cis-1,2-Dichloroethene	70	< 2.0	< 2.0	< 2.0	< 2.0	**6.4**	**5.8**	**50**	**50**	**17**
Ethylbenzene	700	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Tetrachloroethene	5	< 2.0	< 2.0	< 2.0	< 2.0	**17**	**7.5**	**22**	**22**	**19**
Toluene	1,000	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	5	< 2.0	**45**	**36**	**59**	**18**	**6.4**	**38**	**41**	**13**
Xylenes, mixture	10,000	< 5.0	< 5.0	<5.0	<5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Semi-Volatile Organic Compounds (SVOCs), ug/L	NA	NT	NT	NT	NT	BRL	BRL	NT	NT	NT
Metals, Total, mg/L										
Arsenic	0.01	NT	NT	NT	NT	NT	NT	NT	NT	NT
Lead	0.015	NT	NT	NT	NT	NT	NT	NT	NT	NT
Barium	2	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chromium	0.1	NT	NT	NT	NT	NT	NT	NT	NT	NT
Selenium	0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT
Metals, Dissolved, mg/L										
Arsenic	0.01	NT	NT	NT	NT	< 0.0050	< 0.0050	NT	NT	NT
Lead	0.015	NT	NT	NT	NT	< 0.0010	< 0.0010	NT	NT	NT

Notes:
-- = Not Reported
NT - Not Tested
Shaded values indicate exceedance of Type 1/3 RRS

Table 2
Comparison of Groundwater Concentrations to Groundwater VISLs

Parameter	Maximum Detected Groundwater Concentration (2014-2017, ug/L)	Residential GW VISL, ug/L	Commercial GW VISL, ug/L
1,1,1-Trichloroethane	150	9,200	39,000
1,1,2-Trichloroethane	<2.0	6.8	30
1,1-Dichloroethane	300	**9.4**	**41**
1,1-Dichloroethene	120	230	980
1,2-Dichloroethane	<2.0	2.8	12
4-Methyl-2-pentanone	<10	730,000	3,000,000
Benzene	2.3	**2.0**	8.6
Chloroform	9.6	**1.0**	**4.4**
cis-1,2-Dichloroethene	50	--	--
Ethylbenzene	<2.0	4.6	20
Tetrachloroethene	22	**19**	85
Toluene	<2.0	25,000	100,000
Trichloroethene	59	**1.5**	**9.4**
Xylenes, mixture	<5	510	2,100

June 2017 Groundwater Vapor Intrusion Screening Levels (VISLs), Target Risk of 10^{-6}, Target Hazard Index of 1, and groundwater temperature of 20.2 degree Celsius.
Bolded concentrations are greater than the VISL.

Prepared by: IMR 01/03/2018
Checked by: LMS 01/03/2018

Table 3
Occupational Assumptions Used in Johnson & Ettinger Model
Whitaker Oil Site
Atlanta, Georgia

Parameter	Value	Justification
Average Groundwater Temp.	20.2 ^{o}C	Site-Specific
Depth Below Grade to Base of Foundation	0.2 m	Slab on grade foundation – Model default
Groundwater Depth	8.84 m	Site-specific data
Stratum A Soil Vapor Permeability	L	Loam – site-specific data
SCS Soil Type	L	Loam – site-specific data
Soil Dry Bulk Density	1.59 g/cm^3	Loam – Model Value for Loam
Soil Total Porosity	0.399 unitless	Loam – Model Value for Loam
Soil Water-filled Porosity	0.148 cm^3/cm^3	Loam – Model Value for Loam
Foundation Thickness	0.2 m	Model default
Building Footprint Length	145 m	Site-specific
Building Footprint Width	42.67 m	Site-specific
Building Mixing Height	6.1 m	20 foot ceiling – site-specific
Fraction of Foundation Area with Cracks	0.001	Model default
Indoor Air Exchange Rate	1.5/hr	Warehouse with six loading bay doors that typically remain open during the day
Average Vapor Flow Rate into Building	Model generated, L/m	Model option
Averaging Time, Carcinogens	70 years	HSRA Rule, Appendix III, Table 3
Averaging Time, Noncarcinogens	25 years	Reasonable Maximum Exposure Duration for Commercial Scenario (HSRA Rule, Appendix III, Table 3; USEPA 2014)
Exposure Duration	25 years	Reasonable Maximum Exposure Duration for Commercial Scenario (HSRA Rule, Appendix III, Table 3; USEPA 2014)
Exposure Frequency	250 days/year	Commercial exposure frequency (HSRA Rule, Appendix III, Table 3)

Prepared by: SF 1/2/2018
Checked by: LMS 1/3/2018

TABLE 4
SUMMARY OF RESULTS - JOHNSON AND ETTINGER MODELING

With Site-Specific Building Parameters

	GOS-MW-2			MW-11			GOS-MW-5		
Parameter	**Maximum Detected Groundwater Concentration (2014-2017, ug/L)**	**Cancer Risk**	**HQ**	**Maximum Detected Groundwater Concentration (2014-2017, ug/L)**	**Cancer Risk**	**HQ**	**Maximum Detected Groundwater Concentration (2014-2017, ug/L)**	**Cancer Risk**	**HQ**
Chloroform	ND	--	--	ND	--	--	9.6	1E-08	0.00002
1,1-Dichloroethane	48	7E-09	--	ND	--	--	300	4E-08	--
Trichloroethene	18	4E-08	0.003	59	1E-07	0.01	41	8E-08	0.007
	Cumulative Value	4E-08	0.003	Cumulative Value	1E-07	0.01	Cumulative Value	1E-07	0.007

Bolded values indicate an exceedance of the USEPA target cancer risk of 1E-05 or target HQ of 1
ND = Non-detect

Revised by: IMR 01/16/2018
Checked by: LMS 1/16/18

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

			Dichloroethane, 1,1-	Trichloroethylene
Source Characteristics:	**Units**	**Symbol**	**Value**	**Value**
Source medium		Source	Groundwater	Groundwater
Groundwater concentration	(ug/L)	Cmedium	48	18
Depth below grade to water table	(m)	Ls	8.84	8.84
Average groundwater temperature	(^{o}C)	Ts	20.2	20.2
Calc: Source vapor concentration	(ug/m3)	Cs	9154	5838
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.001%	0.001%
Chemical:	**Units**	**Symbol**	**Value**	**Value**
Chemical Name		Chem	Dichloroethane, 1,1-	Trichloroethylene
CAS No.		CAS	75-34-3	79-01-6
Toxicity Factors				
Unit risk factor	$(ug/m^3)^{-1}$	IUR	1.60E-06	see note
Mutagenic compound		Mut	No	Yes
Reference concentration	(ug/m^3)	RfC	Not Available	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**	**Value**
Pure component water solubility	(mg/L)	S	5.04E+03	1.28E+03
Henry's Law Constant @ 25^{o}C	($atm\text{-}m^3/mol$)	Hc	5.62E-03	9.85E-03
Calc: Henry's Law Constant @ 25^{o}C	(dimensionless)	Hr	2.30E-01	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.91E-01	3.24E-01
Diffusivity in air	(cm2/s)	Dair	8.36E-02	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.06E-05	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**	**Value**
Building setting		Bldg_Setting	Commercial	Commercial
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15	0.15
Foundation thickness	(m)	Lf	0.13	0.13
Fraction of foundation area with cracks	(-)	eta	0.001	0.001
Enclosed space floor area	(m2)	Ab	6187.15	6187.15
Enclosed space mixing height	(m)	Hb	6.10	6.10
Indoor air exchange rate	(1/hr)	ach	1.50	1.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	56612.42	56612.42
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	169.84	169.84

Vadose zone characteristics:	**Units**	**Symbol**	**Value**	**Value**
Stratum A (Top of soil profile):				
Stratum A SCS soil type		SCS_A	Loam	Loam
Stratum A thickness (from surface)	(m)	hSA	8.84	8.84
Stratum A total porosity	(-)	nSA	0.399	0.399
Stratum A water-filled porosity	(-)	nwSA	0.148	0.148
Stratum A bulk density	(g/cm^3)	rhoSA	1.590	1.590
Stratum B (Soil layer below Stratum A):				
Stratum B SCS soil type		SCS_B	Not Present	Not Present
Stratum B thickness	(m)	hSB		
Stratum B total porosity	(-)	nSB		
Stratum B water-filled porosity	(-)	nwSB		
Stratum B bulk density	(g/cm^3)	rhoSB		
Stratum C (Soil layer below Stratum B):				
Stratum C SCS soil type		SCS_C	Not Present	Not Present
Stratum C thickness	(m)	hSC		
Stratum C total porosity	(-)	nSC		
Stratum C water-filled porosity	(-)	nwSC		
Stratum C bulk density	(g/cm^3)	rhoSC		

J&E Model for GOS-MW-2

Stratum directly above the water table

Stratum A, B, or C		src_soil	Stratum A	Stratum A
Height of capillary fringe	(m)	hcz	0.375	0.375
Capillary zone total porosity	(-)	ncz	0.399	0.399
Capillary zone water filled porosity	(-)	nwcz	0.332	0.332
Exposure Parameters:	**Units**	**Symbol**	**Value**	**Value**
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1
Exposure Scenario		Scenario	Commercial	Commercial
Averaging time for carcinogens	(yrs)	ATc	70	70
Averaging time for non-carcinogens	(yrs)	ATnc	25	25
Exposure duration	(yrs)	ED	25	25
Exposure frequency	(days/yr)	EF	250	250
Exposure time	(hrs/24 hrs)	ET	8	8
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72

Source to Indoor Air Attenuation Factor	**Units**	**Symbol**	**Value**	**Value**
Groundwater to indoor air attenuation coefficient	**(-)**	**alpha**	**6.0E-06**	**4.8E-06**
		Range	5.7E-06 - 6.0E-06	4.6E-06 - 4.8E-06
Predicted Indoor Air Concentration			**Value**	**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**5.5E-02**	**2.8E-02**
		Range	5.2E-02 - 5.5E-02	2.7E-02 - 2.8E-02
	(ppbv)	**Cia**	**1.4E-02**	**5.2E-03**
		Range	1.3E-02 - 1.4E-02	5.0E-03 - 5.2E-03
Predicted Vapor Concentration Beneath the Foundation			**Value**	**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**1.8E+01**	**9.3E+00**
		Range	1.1E+00 - 5.2E+02	5.6E-01 - 2.7E+02
	(ppbv)	**Css**	**4.5E+00**	**1.7E+00**
		Range	2.7E-01 - 1.3E+02	1.0E-01 - 5.0E+01
Diffusive Transport Upward Through Vadose Zone			**Value**	**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	5.3E-03	4.3E-03
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB		
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC		
Effective diffusion coefficient through capillary zone	(cm2/sec)	DeffCZ	7.5E-05	5.9E-05
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	1.3E-03	1.1E-03
Critical Parameters			**Value**	**Value**
α for diffusive transport from source to building with	(-)	A_Param	6.0E-06	4.8E-06
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	1.8E+03	2.2E+03
α for convective transport from subslab to building	(-)	C_Param	3.0E-03	3.0E-03
			1.8E+03	2.2E+03
Interpretation				
			Advection is the domina	Advection is the domi
			Diffusion through soil is th	Diffusion through soil is
Critical Parameters				
			Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach
Non-Critical Parameters				
			Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, et

Risk Calculations	**Units**	**Symbol**	**Value**	**Value**
Risk-Based Target Screening Levels				
Target risk for carcinogens	(-)	Target_CR	1E-06	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**7.67E+00**	**2.05E+00**
	(ppbv)	**Target_IA**	**1.89E+00**	**3.82E-01**
Target groundwater concentration	**(ug/L)**	**Target_GW**	**6.70E+03**	**1.32E+03**
Incremental Risk Estimates				
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**7.17E-09**	**3.63E-08**
		Range	6.8E-09 - 7.2E-09	3.5E-08 - 3.6E-08
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**No RfC Available**	**0.003191932**
		Range	C Available - No RfC Ava	3.1E-03 - 3.2E-03
			No RfC Available - No RfC Avai	3.1E-03 - 3.2E-03

J&E Model for GOS-MW-5

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

			Chloroform	Dichloroethane, 1,1-	Trichloroethylene
Source Characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Source medium		Source	Groundwater	Groundwater	Groundwater
Groundwater concentration	(ug/L)	Cmedium	9.6	300	41
Depth below grade to water table	(m)	Ls	8.84	8.84	8.84
Average groundwater temperature	(^{o}C)	Ts	20.2	20.2	20.2
Calc: Source vapor concentration	(ug/m3)	Cs	1192	57213	13297
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.000%	0.005%	0.003%
Chemical:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Chemical Name		Chem	Chloroform	Dichloroethane, 1,1-	Trichloroethylene
CAS No.		CAS	67-66-3	75-34-3	79-01-6
Toxicity Factors					
Unit risk factor	$(ug/m^3)^{-1}$	IUR	2.30E-05	1.60E-06	see note
Mutagenic compound		Mut	No	No	Yes
Reference concentration	(ug/m^3)	RfC	9.80E-02	Not Available	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Pure component water solubility	(mg/L)	S	7.95E+03	5.04E+03	1.28E+03
Henry's Law Constant @ 25^{o}C	(atm-m^3/mol)	Hc	3.67E-03	5.62E-03	9.85E-03
Calc: Henry's Law Constant @ 25^{o}C	(dimensionless)	Hr	1.50E-01	2.30E-01	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	1.24E-01	1.91E-01	3.24E-01
Diffusivity in air	(cm2/s)	Dair	7.69E-02	8.36E-02	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.09E-05	1.06E-05	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Building setting		Bldg_Setting	Commercial	Commercial	Commercial
Foundation type		Found_Type	Slab-on-grade	Slab-on-grade	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15	0.15	0.15
Foundation thickness	(m)	Lf	0.13	0.13	0.13
Fraction of foundation area with cracks	(-)	eta	0.001	0.001	0.001
Enclosed space floor area	(m2)	Ab	6187.15	6187.15	6187.15
Enclosed space mixing height	(m)	Hb	6.10	6.10	6.10
Indoor air exchange rate	(1/hr)	ach	1.50	1.50	1.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030	0.0030	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	56612.42	56612.42	56612.42
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	169.84	169.84	169.84

Vadose zone characteristics:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Stratum A (Top of soil profile):					
Stratum A SCS soil type		SCS_A	Loam	Loam	Loam
Stratum A thickness (from surface)	(m)	hSA	8.84	8.84	8.84
Stratum A total porosity	(-)	nSA	0.399	0.399	0.399
Stratum A water-filled porosity	(-)	nwSA	0.148	0.148	0.148
Stratum A bulk density	(g/cm^3)	rhoSA	1.590	1.590	1.590
Stratum B (Soil layer below Stratum A):					
Stratum B SCS soil type		SCS_B	Not Present	Not Present	Not Present
Stratum B thickness	(m)	hSB			
Stratum B total porosity	(-)	nSB			
Stratum B water-filled porosity	(-)	nwSB			
Stratum B bulk density	(g/cm^3)	rhoSB			
Stratum C (Soil layer below Stratum B):					
Stratum C SCS soil type		SCS_C	Not Present	Not Present	Not Present
Stratum C thickness	(m)	hSC			
Stratum C total porosity	(-)	nSC			
Stratum C water-filled porosity	(-)	nwSC			
Stratum C bulk density	(g/cm^3)	rhoSC			

J&E Model for GOS-MW-5

Stratum directly above the water table

Stratum A, B, or C		src_soil	Stratum A	Stratum A	Stratum A
Height of capillary fringe	(m)	hcz	0.375	0.375	0.375
Capillary zone total porosity	(-)	ncz	0.399	0.399	0.399
Capillary zone water filled porosity	(-)	nwcz	0.332	0.332	0.332
Exposure Parameters:	**Units**	**Symbol**	**Value**	**Value**	**Value**
Target risk for carcinogens	(-)	Target_CR	1.00E-06	1.00E-06	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1	1	1
Exposure Scenario		Scenario	Commercial	Commercial	Commercial
Averaging time for carcinogens	(yrs)	ATc	70	70	70
Averaging time for non-carcinogens	(yrs)	ATnc	25	25	25
Exposure duration	(yrs)	ED	25	25	25
Exposure frequency	(days/yr)	EF	250	250	250
Exposure time	(hrs/24 hrs)	ET	8	8	8
Mutagenic mode-of-action factor	(yrs)	MMOAF	72	72	72

Source to Indoor Air Attenuation Factor	**Units**	**Symbol**	**Value**	**Value**	**Value**
Groundwater to indoor air attenuation coefficient	**(-)**	**alpha**	**5.9E-06**	**6.0E-06**	**4.8E-06**
		Range	5.6E-06 - 5.9E-06	5.7E-06 - 6.0E-06	4.6E-06 - 4.8E-06
Predicted Indoor Air Concentration			**Value**	**Value**	**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**7.0E-03**	**3.4E-01**	**6.4E-02**
		Range	6.6E-03 - 7.0E-03	3.2E-01 - 3.4E-01	6.1E-02 - 6.4E-02
	(ppbv)	**Cia**	**1.4E-03**	**8.5E-02**	**1.2E-02**
		Range	1.4E-03 - 1.4E-03	8.0E-02 - 8.5E-02	1.1E-02 - 1.2E-02
Predicted Vapor Concentration Beneath the Foundation			**Value**	**Value**	**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**2.3E+00**	**1.1E+02**	**2.1E+01**
		Range	1.4E-01 - 6.6E+01	6.9E+00 - 3.2E+03	1.3E+00 - 6.1E+02
	(ppbv)	**Css**	**4.8E-01**	**2.8E+01**	**4.0E+00**
		Range	2.9E-02 - 1.4E+01	1.7E+00 - 8.0E+02	2.4E-01 - 1.1E+02
Diffusive Transport Upward Through Vadose Zone			**Value**	**Value**	**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	4.8E-03	5.3E-03	4.3E-03
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB			
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC			
Effective diffusion coefficient through capillary zone	(cm2/sec)	DeffCZ	7.5E-05	7.5E-05	5.9E-05
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	1.3E-03	1.3E-03	1.1E-03
Critical Parameters			**Value**	**Value**	**Value**
α for diffusive transport from source to building with	(-)	A_Param	5.9E-06	6.0E-06	4.8E-06
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	2.0E+03	1.8E+03	2.2E+03
α for convective transport from subslab to building	(-)	C_Param	3.0E-03	3.0E-03	3.0E-03
Interpretation					
			Advection is the domina	Advection is the domi	Advection is the domi
			Diffusion through soil is th	Diffusion through soil is	Diffusion through soil is
Critical Parameters					
			Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach	Hb, Ls, DeffT, ach
Non-Critical Parameters					
			Qsoil_Qb, Lf, DeffA, eta	Qsoil_Qb, Lf, DeffA, et	Qsoil_Qb, Lf, DeffA, et

Risk Calculations	**Units**	**Symbol**	**Value**	**Value**	**Value**
Risk-Based Target Screening Levels					
Target risk for carcinogens	(-)	Target_CR	1E-06	1E-06	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1	1	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**5.33E-01**	**7.67E+00**	**2.05E+00**
	(ppbv)	**Target_IA**	**1.09E-01**	**1.89E+00**	**3.82E-01**
Target groundwater concentration	**(ug/L)**	**Target_GW**	**7.32E+02**	**6.70E+03**	**1.32E+03**
Incremental Risk Estimates					
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**1.31E-08**	**4.48E-08**	**8.26E-08**
		Range	1.2E-08 - 1.3E-08	4.2E-08 - 4.5E-08	7.9E-08 - 8.3E-08
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**1.62971E-05**	**No RfC Available**	**0.007270512**
		Range	1.5E-05 - 1.6E-05	C Available - No RfC Ava	6.9E-03 - 7.3E-03

Table of Inputs and Outputs for Multiple Chemicals

Note: Parameters other than the chemical concentration must be entered in the MODEL sheet and must be the same for all chemicals. Warnings and errors are displayed in only on the MODEL sheet.

			Trichloroethylene
Source Characteristics:	**Units**	**Symbol**	**Value**
Source medium		Source	Groundwater
Groundwater concentration	(ug/L)	Cmedium	59
Depth below grade to water table	(m)	Ls	8.84
Average groundwater temperature	(^{o}C)	Ts	20.2
Calc: Source vapor concentration	(ug/m3)	Cs	19134
Calc: % of pure component saturated vapor concentration	(%)	%Sat	0.004%
Chemical:	**Units**	**Symbol**	**Value**
Chemical Name		Chem	Trichloroethylene
CAS No.		CAS	79-01-6
Toxicity Factors			
Unit risk factor	$(ug/m^3)^{-1}$	IUR	see note
Mutagenic compound		Mut	Yes
Reference concentration	(ug/m^3)	RfC	2.00E-03
Chemical Properties:	**Units**	**Symbol**	**Value**
Pure component water solubility	(mg/L)	S	1.28E+03
Henry's Law Constant @ 25^{o}C	($atm\text{-}m^3/mol$)	Hc	9.85E-03
Calc: Henry's Law Constant @ 25^{o}C	(dimensionless)	Hr	4.03E-01
Calc: Henry's Law Constant @ system temperature	(dimensionless)	Hs	3.24E-01
Diffusivity in air	(cm2/s)	Dair	6.87E-02
Diffusivity in water	(cm2/s)	Dwater	1.02E-05
Building Characteristics:	**Units**	**Symbol**	**Value**
Building setting		Bldg_Setting	Commercial
Foundation type		Found_Type	Slab-on-grade
Depth below grade to base of foundation	(m)	Lb	0.15
Foundation thickness	(m)	Lf	0.13
Fraction of foundation area with cracks	(-)	eta	0.001
Enclosed space floor area	(m2)	Ab	6187.15
Enclosed space mixing height	(m)	Hb	6.10
Indoor air exchange rate	(1/hr)	ach	1.50
Qsoil/Qbuilding	(-)	Qsoil_Qb	0.0030
Calc: Building ventilation rate	(m3/hr)	Qb	56612.42
Calc: Average vapor flow rate into building	(m3/hr)	Qsoil	169.84

Vadose zone characteristics:	**Units**	**Symbol**	**Value**
Stratum A (Top of soil profile):			
Stratum A SCS soil type		SCS_A	Loam
Stratum A thickness (from surface)	(m)	hSA	8.84
Stratum A total porosity	(-)	nSA	0.399
Stratum A water-filled porosity	(-)	nwSA	0.148
Stratum A bulk density	(g/cm^3)	rhoSA	1.590
Stratum B (Soil layer below Stratum A):			
Stratum B SCS soil type		SCS_B	Not Present
Stratum B thickness	(m)	hSB	
Stratum B total porosity	(-)	nSB	
Stratum B water-filled porosity	(-)	nwSB	
Stratum B bulk density	(g/cm^3)	rhoSB	
Stratum C (Soil layer below Stratum B):			
Stratum C SCS soil type		SCS_C	Not Present
Stratum C thickness	(m)	hSC	
Stratum C total porosity	(-)	nSC	
Stratum C water-filled porosity	(-)	nwSC	
Stratum C bulk density	(g/cm^3)	rhoSC	

J&E Model for MW-11

Stratum directly above the water table

Stratum A, B, or C		src_soil	Stratum A
Height of capillary fringe	(m)	hcz	0.375
Capillary zone total porosity	(-)	ncz	0.399
Capillary zone water filled porosity	(-)	nwcz	0.332

Exposure Parameters:	**Units**	**Symbol**	**Value**
Target risk for carcinogens	(-)	Target_CR	1.00E-06
Target hazard quotient for non-carcinogens	(-)	Target_HQ	1
Exposure Scenario		Scenario	Commercial
Averaging time for carcinogens	(yrs)	ATc	70
Averaging time for non-carcinogens	(yrs)	ATnc	25
Exposure duration	(yrs)	ED	25
Exposure frequency	(days/yr)	EF	250
Exposure time	(hrs/24 hrs)	ET	8
Mutagenic mode-of-action factor	(yrs)	MMOAF	72

Source to Indoor Air Attenuation Factor	**Units**	**Symbol**	**Value**
Groundwater to indoor air attenuation coefficient	**(-)**	**alpha**	**4.8E-06**
		Range	4.6E-06 - 4.8E-06

Predicted Indoor Air Concentration			**Value**
Indoor air concentration due to vapor intrusion	**(ug/m3)**	**Cia**	**9.2E-02**
		Range	8.8E-02 - 9.2E-02
	(ppbv)	**Cia**	**1.7E-02**
		Range	1.6E-02 - 1.7E-02

Predicted Vapor Concentration Beneath the Foundation			**Value**
Subslab vapor concentration	**(ug/m3)**	**Css**	**3.1E+01**
		Range	1.8E+00 - 8.8E+02
	(ppbv)	**Css**	**5.7E+00**
		Range	3.4E-01 - 1.6E+02

Diffusive Transport Upward Through Vadose Zone			**Value**
Effective diffusion coefficient through Stratum A	(cm2/sec)	DeffA	4.3E-03
Effective diffusion coefficient through Stratum B	(cm2/sec)	DeffB	
Effective diffusion coefficient through Stratum C	(cm2/sec)	DeffC	
Effective diffusion coefficient through capillary zone	(cm2/sec)	DeffCZ	5.9E-05
Effective diffusion coefficient through unsaturated zone	(cm2/sec)	DeffT	1.1E-03

Critical Parameters			**Value**
α for diffusive transport from source to building with	(-)	A_Param	4.8E-06
Pe (Peclet Number) for transport through the foundation	(-)	B_Param	2.2E+03
α for convective transport from subslab to building	(-)	C_Param	3.0E-03

Interpretation

Advection is the domina
Diffusion through soil is th

Critical Parameters

Hb, Ls, DeffT, ach

Non-Critical Parameters

Qsoil_Qb, Lf, DeffA, eta

Risk Calculations	**Units**	**Symbol**	**Value**
Risk-Based Target Screening Levels			
Target risk for carcinogens	(-)	Target_CR	1E-06
Target hazard quotient for noncarcinogens	(-)	Target_HQ	1
Target indoor air concentration	**(ug/m3)**	**Target_IA**	**2.05E+00**
	(ppbv)	**Target_IA**	**3.82E-01**
Target groundwater concentration	**(ug/L)**	**Target_GW**	**1.32E+03**
Incremental Risk Estimates			
Incremental cancer risk from vapor intrusion	**(-)**	**Cancer_Risk**	**1.19E-07**
		Range	1.1E-07 - 1.2E-07
Hazard quotient from vapor intrusion	**(-)**	**HQ**	**0.010462443**
		Range	1.0E-02 - 1.0E-02