REPORT

AIR PERMIT ASSESSMENT

City of Minneapolis – Hiawatha Yard Facility

Submitted To: City of Minneapolis
309 2ND Ave South
Room 201B
Minneapolis, MN 55401-2268

Submitted By: Golder Associates Inc.
1751 W. County Road B, Suite 105
Roseville, MN 55113 USA

Distribution: City of Minneapolis

March 2011

Project No. 103-81303

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Golder Associates

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EXECUTIVE SUMMARY

An air quality permit is not required for the existing City of Minneapolis Public Works facility (Facility) located at 26th Street and Hiawatha Avenue in Minneapolis, MN. The Facility's unlimited potential to emit is less than the State Thresholds based on the information provided by the City of Minneapolis and the assumptions presented in this report. Information was provided to Golder during a site visit that occurred on February 14, 2011 as well as through research with vendors familiar with the asphalt storage system being proposed. The addition of the proposed hot mix asphalt storage and liquid asphalt storage capabilities presented in Section 5.0 will not require an air quality construction permit or require the Facility to obtain an operating permit. A summary of the unlimited potential to emit is presented in Table ES1.

Table ES1: Unlimited Potential to Emit

Pollutant	Existing Facility (tons per year)	Proposed Hot Mix Asphalt and Liquid Asphalt Storage (tons per year)	Total Facility (tons per year)	State Threshold (tons per year)
Particulate Matter (PM)	0.55	2.14	2.70	100
Particulate Matter Less than 10 Microns (PM10)	0.43	2.14	2.58	25
Particulate Matter Less than 2.5 Microns (PM2.5)	0.39	2.14	2.54	100
Sulfur Dioxide (SO_2)	0.03	0.00	0.03	50
Nitrogen Oxides (NOx)	5.11	0.00	5.11	100
Volatile Organic Compounds (VOC)	1.24	26.99	28.23	100
Carbon Monoxide (CO)	4.29	5.10	9.40	100
Greenhouse Gases (GHG, expressed as CO_2e)	6,149	0.00	6,149	100,000
Single Hazardous Air Pollutant (HAP)	0.29	0.00	0.29	10
Total HAP	0.29	0.37	0.67	25

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1.0 INTRODUCTION

Golder Associates Inc. (Golder) presents the following air permit assessment to the City of Minneapolis (City) evaluating the air emissions at the Hiawatha Yard Facility (Facility) located at the corner of 26th Street and Hiawatha Avenue (see Figure 1). This assessment determines:

- Whether the existing Facility (as currently operated) needs an air quality permit from the Minnesota Pollution Control Agency (MPCA).; and
- Whether the Facility would need an air quality permit after the installation of a 100 ton asphalt storage silo and liquid asphalt storage tank (Proposed Modification).

City personnel escorted a Golder representative around the Facility on February 14, 2011. The City provided Golder with information to determine the potential to emit (PTE) for the Facility.

A discussion of the various emission sources and derivation of the PTE is presented in the following sections. The Facility does not currently hold an air permit from the MPCA.

2.0 AIR PERMIT THRESHOLDS

An air permit is required for any source that has the potential to exceed certain emissions thresholds. Table 1 presents the Minnesota State and Federal air permit thresholds for each pollutant.

Table 1: Minnesota State and Federal Air Permitting Thresholds

Pollutant	State Threshold (tons per year)	Federal Part 70 Threshold (tons per year)	Federal New Source Review Threshold (tons per year)
Particulate Matter (PM)	100	100	250
Particulate Matter Less than 10 Microns (PM10)	25	100	250
Particulate Matter Less than 2.5 Microns (PM2.5)	100	100	250
Nitrogen Oxides (NOx)	100	100	250
Carbon Monoxide (CO)	100	100	250
Sulfur Dioxide (SO_2)	50	100	250
Volatile Organic Compounds (VOC)	100	100	250
Greenhouse Gases (GHG, expressed as CO2e)	100,000	100,000	100,000
Single Hazardous Air Pollutant (HAP)	10	10	N/A
Total HAP	25	25	N/A

If the Facility has an unlimited PTE less than all the State Thresholds, then an air permit is generally not required. If the unlimited PTE is greater than the State Threshold for any pollutant, then an air permit is required.

3.0 EXISTING FACILITY DESCRIPTION

The Facility is divided into the following areas within the property (See Figure 2):

- Main Building
- Central Stores Building
- Bulk Material Storage
- Fuel Island
- Parking

Sections 3.1 – 3.5 describe each area in greater detail and identify activities that are performed on the property.

3.1 Main Building

The main building consists of office space, a maintenance area and a laboratory. The building is heated by the following combustion sources that emit to the atmosphere:

- Four natural gas fired boilers with a maximum heat input rating of 2.0 million btu/hr each.

The boilers also provide domestic hot water through the use of heat exchangers.

The laboratory contains equipment and an electric oven used to test concrete, asphalt, and soil samples.

The maintenance area contains the following aboveground storage tanks (AST) and degreasers that are vented to the building:

- One 120-gal AST that contains coolant
- Four 120-gal ASTs that contain used lubricating oil
- One 500-gal AST that contains new lubricating oil
- One cold cleaning degreaser with a top that circulates Stoddard solvent (approximately 30 gallons). Used solvent is serviced by Safety Kleen.

The maintenance area contains a welding station where one or more of three welders may be used. The Metal Inert Gas (MIG) Gas Metal Arc Welders (GMAW) are used to perform various maintenance activities. One Shield Metal Arc Welding (SMAW) machine is mounted in the back of a truck for use primarily offsite.

The maintenance area contains a woodshop with various saws and sanding operations that are connected to a dust collection system. The dust collection system vents inside the building. The woodshop does not routinely produce items, but is used for repairs and to construct various items needed to support other activities.

The maintenance area contains a storage room where various pieces of equipment such as snow blowers, string trimmers, and other 2-stroke and 4-stroke powered devices are stored.

The maintenance area contains several bays where vehicles or other equipment are serviced. One bay contains a hot water power washer heated by the following:

- One natural gas fired heater with a maximum heat input rating of 0.44 million btu/hr.

Two of the maintenance bays contain eye wash stations with hot water heated by:

- Two natural gas fired heaters each with a maximum heat input rating of 0.38 million btu/hr.

One bay contains equipment used for a cure-in-place process (CIPP). A CIPP consists of various mixers and equipment used to deposit a liquid resin solution into a felt lining that is inserted into sewer pipes. The solution soaks into the felt lining and cures into a rigid material which increases the service length of underground piping. The CIPP typically only occurs 5 months throughout the year (April – August). The amount of CIPP processing that is done is limited by the demand for new pipe. Last year, approximately 200 drums of resin were used.

Other activities that may occur in the maintenance area are:

- Routine maintenance on equipment (e.g. changing lubricating oil)
- Roll on painting or spray painting with aerosol cans (no paint spray booth)
- Grinding, cutting, sanding on equipment (not vented to woodshop dust collection system)

3.2 Central Stores Building

The central stores building consists mostly of storage space used to inventory supplies needed by the various City departments. Heat and hot water are provided by the following combustion units:

- One natural gas fired hot water boiler with a maximum heat input rating of 2.52 million btu/hr
- One natural gas fired hot water heater with a maximum heat input rating of 0.156 million btu/hr

No other emission units or sources of emission were observed in the central stores building.

3.3 Bulk Material Storage

The Facility has four covered areas used to store the following materials:

- Salt (for melting ice on roads during the winter)
- Sand (for traction on roads during the winter)

- Treated Salt (salt/sand mixture)
- Soil (for filling repair jobs)
- Gravel (for repair jobs)

Salt, sand, and treated salt are generally only stored on site during the winter under two covered areas that measure approximately 40 ft x 40 ft each.

Soil and gravel is generally only stored on site during the summer months under two covered areas that measure approximately15 ft x 15 ft.

Material is delivered on site via truck and moved into the storage pile with a front end loader. Material is taken from the storage pile and transferred into a truck using a front end loader as needed for use offsite.

Periodically, sandblasting equipment is set up in this area when sandblasting needs to be carried out on parts. Facility personnel estimate that sandblasting occurs approximately 2 weeks per year. Sandblasting is used to remove concrete buildup from tools and trailers, blasting tar from wagons, cleaning scaffold, and other similar uses.

There is a brine storage tank in the enclosed space next to the soil and gravel storage area. The brine solution is applied to roadways in the winter. The following space heater keeps the area from freezing:

- One natural gas fired space heater with a maximum heat input capacity of 0.03 million btu/hr

There is also an area for storing propane tanks used for fork trucks and portable heating equipment. The City does not fill propane tanks. The propane tanks are not sources of emission.

3.4 Fuel Island

The Facility has a fuel island with multiple dispensers for use in refueling vehicles and equipment. The following underground storage tanks (UST) are connected to the fuel island:

- One 15,000-gal UST that contains Unleaded E-10 Gasoline (10% ethanol/90% gasoline)
- One 15,000-gal UST that contains ultra low sulfur bio-diesel fuel
- One 10,000-gal UST that contains E-85 (85% ethanol/15% gasoline mixture)

3.5 Parking

Most of the remainder of the Facility is used for parking vehicles and trailers and storage of materials such as piping, road signs, snow plows, etc. The main routes of travel are paved and some areas used for parking are surfaced with gravel to promote storm water drainage from the Facility.

3.6 Off-Property Activities

The City performs many of its repair and maintenance activities off-property. These activities include but are not limited to:

- Sandblasting
- Operation of two and four stroke internal combustion engines that power various portable equipment such as pumps, tools, and generators (emergency and non-emergency use).
- Welding, sanding, and grinding of wood and metal
- Refueling activities with portable fuel tanks mounted in the back of trucks
- Airless spraying and rolling of latex paint
- Operation of propane and kerosene fueled portable space heaters

These activities (except those identified in Section 3.1-3.5) are not performed at the Facility and are not included in the Facility's potential to emit.

4.0 EMISSIONS TO THE ATMOSPHERE

Sections 4.1 through 4.5 discuss and quantify the potential to emit for the areas identified in Section 3.1 – 3.5.

4.1 Main Building Emissions

There are four boilers and three process heaters in operation in the main building all of which emit air pollutants. The potential to emit for these boilers/heaters is quantified in Tables A3 and A4 assuming 8,760 hours per year of operation at 100% load.

The emissions from the laboratory are negligible due to the small volume of analysis completed.

The six AST's in the maintenance area have insignificant emissions of VOC. The AST storing coolant will have no emission of a regulated air pollutant. The five lubricating oil tanks are classified as an insignificant activity by Minnesota Rule 7007.1300 Subp 2E. Emissions are not provided for these AST's.

The welding station contains both GMAW and SMAW processes. These processes emit particulate matter and hazardous air pollutants in the form of welding fume. Welding activities are classified as insignificant by Minnesota Rule 7007.1300 Subp 3H(2). Estimated emissions are not provided in this analysis.

The wood shop emits PM and PM10 in the form of wood dust which is collected by a collection system and controlled via a filter bag that exhausts inside the building. Because the use of the wood shop is devoted to maintenance and does not produce a marketable product, it is assumed that the emissions are considered to be plant upkeep and are insignificant under Minnesota Rule 7007.1300 Subp2B(1).

The cure in place process (CIPP) consists of the following steps:

- Mixing resin and initiator
- Applying the mixture to the felt pipe lining
- Loading lining into a refrigerated truck (to slow the curing process temporarily) and transported to the jobsite
- Inserting the lining into the pipe (occurs offsite)
- Allowing the resin mixture to cure in the felt lining in the pipe (occurs offsite)

The resin contains styrene and a polyester based resin that is not fully saturated, which means it has carbon-carbon double bonds that can further react in the presence of an initiator. When an initiator is mixed into the resin, the carbon-carbon double bonds react with the styrene and crosslink, which causes the material to cure and harden over a period of a few hours depending on temperature. Based on a discussion with the manufacturer of the resin (Interplastic Corporation), very little styrene is lost in this process. Interplastic estimates that much less than 1 percent of the styrene in the resin is lost to the

atmosphere during the curing process. The uncontrolled emissions assume that 1 percent of the styrene in the resin is lost to the atmosphere during this process. The Facility uses two initiators, Perakox 16, which is a solid white powder and Trigonox 42S, which is a clear liquid. The material safety data sheets are provided in Appendix B. Table A6 contains detailed information about the mixture proportions and the emissions from the process. They Facility typically uses about 100 drums of resin per year. Emissions are based on 200 drums of resin used per year.

Other activities listed do not have significant air emissions. Routine maintenance activities are classified as insignificant under Minnesota Rule 7007.1300 Subp 2B(2). Roll and spray painting is considered to be routine housekeeping and is classified as insignificant by Minnesota Rule 7007.1300 Subp 2B(1). Sawing, sanding, and grinding emissions are insignificant by Minnesota Rule 7007.1300 Subp 2D(3).

4.2 Central Stores Building Emissions

There is one boiler and one hot water heater in operation in the central stores building both of which emit air pollutants. The potential to emit for the boiler and heater is quantified in Tables A7 and A8 assuming 8,760 hours per year of operation at 100% load.

4.3 Bulk Material Storage Emissions

Moving the bulk material (salt, sand, soil, and gravel) in the bulk material storage area will create PM and PM10 emissions to the atmosphere. Wind erosion will not occur because the bulk material is fully covered and the area is protected from the wind. The bulk material is handled three times from the time it enters the site to the time it leaves the site. The bulk material handling emissions are quantified in Table A5 and assume maximum predicted annual throughputs of 175 tpy of sand, 200 tpy of salt, and 900 tpy of treated salt. The emissions from soil and gravel handling are insignificant due to the low volumes handled in comparison to the salt and sand volumes.

Sandblasting emits PM, PM10, and PM2.5 to the atmosphere. The emissions are directly proportional to the amount of abrasive used. Approximately 4,000 lb of black beauty abrasive is used per year for sandblasting. The emissions calculation assumes a maximum use of 10,000 lb/yr at the Facility and is quantified in Table A10.

The brine storage tank heater vents to the atmosphere. The potential to emit for the heater is quantified in Table A9 and assumes 8,760 hours per year of operation at 100% load.

4.4 Fuel Island Emissions

The underground storage tanks at the fuel island had the following annual throughputs based on 2010 fuel delivery records:

- 15,000 gal Bio-diesel Tank = 72,000 gal/yr
- 10,000 gal E-85 Tank = 6,000 gal/yr
- 15,000 gal Unleaded Gasoline (E-10) Tank = 120,000 gal/yr

Potential to emit is based on the throughputs stated above. The amount of fuel used is limited by the needs of the City vehicles. Emissions were estimated using US EPA's TANKS model. Emissions are summarized in Table A1. Output files from the TANKS model are in Appendix C.

4.5 Parking

Vehicles traveling on paved surfaces emit PM and PM10; however, emissions at this site are insignificant and are not provided.

5.0 PROPOSED MODIFICATION

The City proposes to install the following emission units at the Facility:

- One hot mix asphalt (HMA) storage silo with a maximum capacity of 100 tons
- One HMA receiving hopper with a slat conveyor to convey the HMA to the top of the silo. The slat conveyor will have a maximum capacity of 300 tph, and
- One liquid asphalt storage tank with a maximum capacity of 20,000 gallons.

This is not a traditional HMA production process where dry aggregate is heated and mixed with liquid asphalt as in a traditional batch or continuous HMA production facility. The proposed modification will allow the City to store pre-made HMA on site for use at their discretion rather than sending trucks to individual HMA facilities to procure product. The HMA is used to patch and repair roads throughout the City. The liquid asphalt is used as a tack coat for patch operations.

HMA Process

- The HMA will arrive on site via a dump truck that will dump the HMA into a receiving hopper
- The receiving hopper feeds the slat conveyor.
- The slat conveyor is fully enclosed and conveys the HMA to the top of the silo into what is called a batcher.
- The batcher holds approximately 4 tons of HMA and is timed to release the HMA in batches (inside the silo) which is necessary to keep the material consistent.
- The main part of the silo contains an electric heating element to keep the HMA at approximately 300°F.
- When needed, a dump truck is positioned under the bottom of the HMA silo and HMA is loaded into the truck and is taken off site.

Liquid Asphalt Process

- The liquid asphalt will arrive on site via a tanker truck which will pump the product into the liquid asphalt storage tank.
- The liquid asphalt storage tank is equipped with an electric heating element to keep the liquid asphalt at approximately 325°F
- The liquid asphalt is pumped into portable tanks as needed for road repairs

5.1 Pollution Control Devices

The HMA slat conveyer will be fully enclosed from the receiving hopper to the batcher at the top of the silo. The batcher is completely enclosed with the exception of vents at the top to allow for headspace volume changes.

The liquid asphalt tank will contain a vent condenser to condense light distillates (VOCs) with boiling points less than 325°F. The vent condenser uses cooling fins and ambient air to transfer thermal energy and condense the light distillates back into the tank.

5.2 Emissions to the Atmosphere

Emissions from the HMA process are determined from AP-42 Section 11.1 (See Table A11). The HMA is assumed to emit VOC, CO, and PM to the atmosphere in the following three transfer activities:

- Dumping HMA into receiving hopper (fugitive emission)
- Storage silo emissions (silo vent)
- Loading HMA into truck (fugitive emission)
- Liquid Asphalt storage tank emissions (tank vent)

Emissions from the liquid asphalt storage tank are estimated from AP-42 Section 11.1 using the U.S. EPA's TANKS model (See Table A11 and Appendix C). Throughput for the HMA product is limited by the speed of the slat conveyor, which is 300 tph. Annual throughput assumes 300 tph, 8760 hours per year, which equates to 2,628,000 tpy. There is no logical bottleneck for the liquid asphalt throughput, but it is limited by the demand of the City.

The liquid asphalt throughput is assumed to be 40,000 gal per day for 365 days/year which equates to 14,600,000 gallons per year. Actual throughputs are expected to be much less than used in the calculations. No emissions controls were assumed in the calculations. Please see Table A2 for a summary of the unlimited potential to emit.

6.0 SUMMARY

6.1 Existing Facility

Sections 4.1 through 4.5 discuss how the unlimited potential to emit (PTE) is derived for the areas identified in Section 3.1 – 3.5. Please see Table A1 for a summary of the unlimited PTE for each activity. Because the Facility has an unlimited PTE below the State permitting thresholds, an air permit is not required at this time.

6.2 Proposed Modification

Section 5 discusses the proposed hot mix asphalt and liquid asphalt storage areas. Please see Table A2 for a summary of the unlimited PTE for each activity. Because the Facility unlimited PTE is below the State permitting thresholds, an air permit is not required at this time for the proposed project.

7.0 CLOSING

This report is intended to quantify the unlimited potential to emit for the Facility for the purpose of submitting a permit applicability determination to the Minnesota Pollution Control Agency. If you have questions regarding assumptions or calculations, please contact Ryan Birkenholz at 651-697-9737.

GOLDER ASSOCIATES INC.

Ryan Birkenholz, PE
Project Engineer

Bruce A. Labno, MS
Senior Consultant

At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

Africa	+ 27 11 254 4800
Asia	+ 852 2562 3658
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 55 21 3095 9500

solutions@golder.com
www.golder.com

Golder Associates Inc.
1751 W. County Road B, Suite 105
Roseville, MN 55113 USA
Tel: (651) 697-9737
Fax: (651) 697-9735

Golder Associates

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Hazardous Building Materials Inspection Report

Commercial Building – Roof Depot Site
1860 28th Street
Minneapolis, Minnesota

Prepared for

City of Minneapolis

Project B1500394
April 7, 2015

Braun Intertec Corporation

BRAUN INTERTEC
The Science You Build On.

Braun Intertec Corporation
11001 Hampshire Avenue S
Minneapolis, MN 55438

Phone: 952.995.2000
Fax: 952.995.2020
Web: braunintertec.com

April 7, 2015

Project B1500394

Mr. Chris Backes
City of Minneapolis
309 2nd Avenue South, Suite 300
Minneapolis, MN 55401

Re: Hazardous Building Materials Inspection Report
Commercial Building – Roof Depot Site
1860 28th Street
Minneapolis, Minnesota

Dear Mr. Backes:

The enclosed report provides the results of the hazardous building materials inspection conducted on March 25-26, 2015 at the commercial building located 1860 28th Street in Minneapolis, Minnesota (site). Braun Intertec Corporation was authorized to provide a hazardous building material inspection in accordance with our Proposal QTB013985 dated December 11, 2014.

The following outline provides the structure of the report.

- Scope of Services
- Site Description
- Results
- Discussion
- Limitations

If you have any questions or need further assistance, please call Jerry Wallerius at 952.995.2478 or Robert Nordby at 952.995.2424.

Sincerely,

BRAUN INTERTEC CORPORATION

for Gerald J. Wallerius, CHMM
Project Scientist

Robert E. Nordby
Associate Principal – Senior Scientist

Attachment:
Hazardous Building Materials Inspection Report

AA/EOE

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F: Asbestos Bulk Sample Location Maps and XRF Lead Paint Sample Location Maps

A. Scope of Services

The scope of our services was limited to:

- Visually examine accessible areas and identify the locations of suspect asbestos-containing materials (ACM), lead, poly-chlorinated biphenyls (PCBs), mercury, and other miscellaneous hazardous materials.

- Collect and analyze representative bulk samples of materials suspected of containing asbestos.

- Conduct limited lead-based paint testing of painted surfaces suspected of containing lead. Testing will be accomplished using a Niton X-ray fluorescence (XRF) spectrum analyzer.

- Assign a hazard rating based on asbestos content with respect to the materials condition, friability, accessibility, and hazard potential.

- Document the various materials current conditions and quantities of ACM.

- Generate a final report, documenting the sample locations, analysis results, conditions, and ACM quantities.

B. Site Description

The subject Site included the commercial building (Roof Depot Site) located at 1860 28th Street in Minneapolis, Minnesota. The building is a one story with a basement boiler room has an approximate footprint of 201,000 square feet and was built in 1947. The typical interior finishes included sheetrock/joint compound, plaster, lay-in ceiling panels, floor tile, and carpeting. The typical exterior finish was brick with metal fascia and soffits and newer metal framed windows. The roofing material was rubber membrane with stone. The property was occupied at the time of this inspection.

C. Results

C.1. Asbestos

A total of 66 bulk samples were collected on March 25-26, 2015 and submitted to Pace Analytical, Inc. for Polarized Light Microscopy (PLM) analysis.

C.1.a. Asbestos-Containing Materials

The following is a summary of materials found or assumed to contain greater than one percent asbestos (ACMs by regulatory definition).

- Exterior boiler insulation contains 60 percent chrysotile (asbestos).
- Boiler breeching insulation contains 60 percent chrysotile and 10 percent amosite (asbestos).
- Silver exterior boiler brick insulation contains 5 percent chrysotile.
- 1” – 6” felt with tar paper and fibrous layer pipe insulation contains 40 percent chrysotile in the tar paper layer and 60 percent chrysotile in the fibrous layer.
- 1” – 6” pipe fitting insulation on felt with tar paper and fibrous layer insulated piping contains 15 percent chrysotile and 10 percent amosite.
- 1” – 6” air cell pipe insulation contains 60 percent chrysotile.
- 1” – 6” pipe fitting insulation on air cell insulated piping contains 5 percent chrysotile and 10 percent amosite.
- 7” – 12” air cell pipe insulation contains 70 percent chrysotile.
- 7” – 12” pipe fitting insulation on air cell insulated piping contains 20 percent chrysotile and 10 percent amosite.
- 13” – 20” air cell pipe insulation (including header and main steam lines) contains 70 percent chrysotile.
- 13” – 20” pipe fitting insulation on air cell insulated piping (including header and main steam lines) contains 20 percent chrysotile and 10 percent amosite.
- 13” – 20” boiler header pipe insulation contains 5 percent chrysotile and 10 percent amosite.
- 24” heat exchanger tank insulation contains 70 percent chrysotile.
- 9” x 9” brown floor tile contains 7 percent chrysotile.
- 12” x 12” red floor tile cross-contaminated by the associated black mastic contains 7 percent chrysotile.
- Transite panels/pieces contain 12 percent chrysotile.
- Interior boiler lining – assumed due to sampling constraints.
- Boiler gasket material – assumed due to sampling constraints.
- Roofing materials - assumed due to sampling constraints.

C.1.b. Non-Asbestos-Containing Materials

The following is a summary of building materials found to contain no asbestos or materials that contain one percent or less asbestos (non-ACMs by regulatory definition).

- Interior boiler refractory
- Boiler brick
- Sheetrock/joint compound
- Plaster
- Tan ceramic floor tile with grout
- White ceramic wall tile with grout
- Gray ceramic floor tile with grout
- 2’ x 4’ ceiling panels pitted
- 12” x 12” tan floor tile with adhesive
- 12” x 12” gray floor tile with adhesive
- 12” x 12” gray with white floor tile with adhesive
- Tan vinyl base with adhesive
- Gray vinyl base with adhesive
- Gray duct seam sealer
- Tan brown carpet adhesive
- White sink undercoating
- Interior and exterior gray and brown rubbery window frame caulking
- Exterior gray door frame caulking

Refer to Table I in Appendix A, which lists individual functional spaces of the building, the suspect materials identified in that functional space, whether the suspect material was identified by analysis to be an ACM, an estimated amount of each suspect material for the functional space, and includes condition, assessment categories and hazard ratings based on subjective observations made by our representatives.

Bulk asbestos analysis was conducted in accordance with the Environmental Protection Agency's (EPA) Method 40 CFR, Chapter 1, Part 763, Subpart F, and Appendix A (7/1/87 Edition). Refer to Appendix B for Table II, which lists the homogenous material sample numbers, sample locations, suspect material descriptions, and the analysis results for each sample. This table summarizes the results from the Bulk Asbestos Laboratory Report, which is attached in Appendix D.

Bulk asbestos analysis was conducted in accordance with the EPA Method 40 CFR, Chapter 1, Part 763, Subpart F, and Appendix A (7/1/87 Edition). Bulk samples are retained at the laboratory for 60 days and then disposed of, unless instructed otherwise. Detailed quality-control information is available upon request.

C.2. Lead-Based Paint

Braun Intertec Corporation performed limited lead-based paint testing on March 25, 2015. A total of 50 XRF tests were performed on painted surfaces. The EPA and Minnesota Department of Health (MDH) define "lead-based paint" as equal to or greater than 1.0 milligram per square centimeter (mg/cm^2) via XRF analysis. The following painted surface had lead-based paint.

- Red water tower metal framing
- Gray metal fire door
- Gray metal fire door frame
- Blue metal stair railing
- Gray wood door frame
- Tan steel beams
- Red steel beams
- Tan metal ceiling decking
- Blue steel columns
- White steel columns
- Yellow steel columns
- Red steel columns
- White large metal garage door
- Red exterior metal corner guard
- Red exterior steel beam

The U.S. Occupational Safety and Health Administration (OSHA) Lead in Construction Standard 29 CFR 1926.62 applies to all situations where employees are engaged in the disturbance of lead-containing coatings, regardless of the quantity of lead involved. Therefore, any XRF result above 0.0 mg/cm^2 is considered "lead-containing coatings" in order to be in compliance with the OSHA standard. The following painted surfaces had lead-containing paint.

- Red concrete floor
- Green concrete block wall
- White concrete block wall

- Silver boiler insulation
- Silver steel ladder
- Blue concrete wall
- Gray concrete floor
- Gray wood door
- White brick wall
- Yellow striped concrete floor
- Gray wall plaster
- Tan wall plaster
- Red exterior steel overhang

Refer to Table III. Lead-Based Paint Testing Results in Appendix C, which lists the sample numbers (1 through 53), sample locations, component descriptions, XRF field results, and the paint condition for each sample.

Field screening for lead-based paint was accomplished utilizing a XRF field portable analyzer, Model No. XLP703 (Serial No. 26139) equipped with a 40-milocurie CD-109 Source Model #XFB-3 installed on November 1, 2014.

C.3. Miscellaneous Regulated Waste

A visual inspection for miscellaneous regulated waste materials that require separate handling and disposal prior to disturbance during building renovation/demolition was also performed as part of this assessment. The following is a list of items documented at the Site:

- Emergency lighting systems
- Exit signs
- Security systems and alarms
- Fluorescent lights
- High intensity discharge lamps
- Boilers with controls
- Firestats
- Manometers
- Gauges
- Space heater controls
- Mercury thermostats
- Microwave oven
- Television sets
- Water heater
- Door closers
- Fuel oil tanks
- Grease
- Motors
- Motor oil
- Lubricating oil
- Gasket remover
- Chain lube
- Air compressor

- Lead acid batteries
- Exit signs
- Security Systems
- Fire extinguishers
- Roof top air conditioners
- In wall air conditioner units
- Water fountains
- Refrigerator/freezers
- Vending machines
- Food display cases
- Light ballasts
- Transformers
- Electrical panels
- Fuses
- Switch gear
- Pumps and motors
- Used oil
- Bio hazard storage container
- Automotive parts/chemicals
- Computer equipment
- Gasoline containers
- Meters
- Miscellaneous cleaning supplies
- Overhead garage door openers
- Paint
- Paint thinner
- Polyurethane
- Solvents
- Spray paint
- Stains
- Tires
- Boiler chemicals
- Propane tanks
- Diesel fuel container
- Snow blower
- Parts degreaser

D. Discussion

D.1. Asbestos-Containing Materials

D.1.a. Friable ACM

The following ACMs are classified as friable materials according to EPA 40 CFR Part 61 National Emission Standard for Hazardous Air Pollutants (NESHAPs):

- Exterior boiler insulation
- Boiler breeching insulation
- Silver exterior boiler brick insulation
- 1” – 6” felt with tar paper and fibrous layer pipe insulation
- 1” – 6” pipe fitting insulation on felt with tar paper and fibrous layer insulated piping
- 1” – 6” air cell pipe insulation
- 1” – 6” pipe fitting insulation on air cell insulated piping

- 7” – 12” air cell pipe insulation
- 7” – 12” pipe fitting insulation on air cell insulated piping
- 13” – 20” air cell pipe insulation (including header and main steam lines)
- 13” – 20” pipe fitting insulation on air cell insulated piping (including header and main steam lines)
- 13” – 20” boiler header pipe insulation
- 24” heat exchanger tank insulation
- Interior boiler lining – assumed due to sampling constraints.

Approximately 8-feet of damaged 1” – 6” felt with tar paper and fibrous layer pipe insulation was observed on the boiler room floor at the time of our assessment. In addition, approximately 10-feet of damaged 13” – 20” air cell pipe insulation was observed north warehouse area. These materials should be repaired and maintained in good condition to prevent potential exposure to asbestos. The remaining friable ACM’s were observed to be in good condition at the time of our assessment. Friable ACMs are to be removed prior to disturbance by renovation/demolition in accordance with applicable state and federal regulations.

D.1.b. Category I Non-Friable ACM

The following ACMs are classified as Category I non-friable materials according to EPA 40 CFR Part 61 National Emission Standard for Hazardous Air Pollutants (NESHAPs):

- 9” x 9” brown floor tile
- 12” x 12” red floor tile cross-contaminated by the associated black mastic
- Boiler gasket material – assumed due to sampling constraints.
- Roofing materials – assumed due to sampling constraints.

The above Category I non-friable ACMs were observed to be in good condition at the time of our assessment. These materials should be maintained in good condition to prevent potential exposure to asbestos. Category I non-friable ACMs are not considered a hazard unless cut, drilled, sanded, or otherwise abraded. However, any Category I material that may become friable during demolition must be removed prior to that activity. Category I materials in good condition may be left in place for demolition. However, if left in place, the crushing or recycling of demolition debris is strictly prohibited. In addition, all demolition debris containing Category I materials must be disposed of at a landfill specifically permitted to accept this type of waste.

D.1.c. Category II Non-Friable ACM

The following ACM is classified as a Category II non-friable material according to EPA NESHAPs:

- Transite panels and pieces

The above Category II non-friable ACM was observed to be in fair condition at the time of our assessment. These materials should be maintained in good condition to prevent potential exposure to asbestos. Category II non-friable ACMs are not considered a hazard unless cut, drilled, sanded, or otherwise abraded. However, Category II non-friable ACMs are to be removed prior to disturbance by demolition in accordance with applicable state and federal regulations.

D.2. Lead-Based Paint

The U.S. Occupational Safety and Health Administration (OSHA) Lead in Construction Standard 29 CFR 1926.62 applies to all situations where employees are engaged in the disturbance of lead-containing coatings, regardless of the quantity of lead involved. Therefore, any XRF result above 0.0 mg/cm^2 is considered "lead-containing coatings" in order to be in compliance with the OSHA standard. Renovation/demolition of the building may involve disturbing lead-containing coatings. Contractors should be informed of the presence of lead coatings and that they will be required to comply with the OSHA lead standard.

D.3. Miscellaneous Regulated Waste

In the case of building renovation/demolition, any of the miscellaneous regulated waste items listed in Section C.3 that will be disturbed, must be removed prior to disturbance and must be recycled or disposed of in accordance with state and federal guidelines. In addition, all solid waste must be disposed of accordingly.

E. Limitations

In any building, the potential exists for hazardous building materials to be located inside walls, above ceilings, under floors, and other inaccessible areas. This inspection was limited to areas available for observation via non-destructive means. Therefore, Braun Intertec cannot be held responsible for the presence of any such hidden materials. In the case of building renovation or demolition, a more thorough destructive investigation should be completed prior to any disturbance.

Note: The rubber membrane roofing materials and associated sub layers were not sampled for asbestos content as part of this evaluation in order to maintain the integrity of the roof seal. The assumed ACM roofing materials should be sampled for asbestos content prior to building renovation/demolition.

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

F. Asbestos Building Inspector Certification

I, the undersigned, do hereby certify that I am an accredited Asbestos Building Inspector in the State of Minnesota. A photocopy of my current asbestos building inspector certificate is attached in Appendix E.

Signature: _____ Date: 4/8/15

for Gerald J. Wallerius, CHMM
Project Scientist
Minnesota Department of Health Asbestos Inspector No: AI2305

Appendix A

Table I. Asbestos Building Inspection Results

Table I. Asbestos Building Inspection Results

Client: City of Minneapolis
Location: 1860 28th Street; Minneapolis, Minnesota
Date of Inspection: March 25-26, 2015
Project: B1500394

Functional Space	Homogeneous Material Description	Contains Asbestos (Yes/No)	Ref. Client Sample No. (See Table II)	Estimated Quantity Units	Material Condition[1]	Hazard Category[2]
Boiler Room (3 Boilers)	**Exterior boiler insulation**	**Yes**	**1A-C**	**5,200 ft.²**	**ND**	**2**
Boiler Room (3 Boilers)	**Boiler breeching insulation**	**Yes**	**2A-C**	**2,200 ft.²**	**ND**	**2**
Boiler Room (3 Boilers)	Interior boiler refractory	No	3A-C	1,200 ft.²	ND	0
Boiler Room (3 Boilers) Under Refractory	**Interior boiler lining**	**Assume**	**No Sample Taken**	**1,200 ft.²**	**ND**	**2**
Boiler Room (3 Boilers)	**Boiler gasket material**	**Assume**	**No Sample Taken**	**120 lin. ft.**	**ND**	**2**
Boiler Room (3 Boilers)	Boiler brick	No	4	1,500 ft.²	ND	0
Boiler Room (3 Boilers)	**Exterior boiler brick insulation (silver)**	**Yes**	**5A-C**	**1,500 ft.²**	**ND**	**2**
Boiler Room	**1"-6" pipe insulation - felt with tar paper & fibrous layer**	**Yes**	**6A-C**	**200 lin. ft.**	**ND**	**2**
Boiler Room	**1"-6" pipe-fitting insulation on felt with tar paper pipe insulation**	**Yes**	**7A-C**	**30 fittings**	**ND**	**2**
Boiler Room - On Floor	**1"-6" pipe insulation - felt with tar paper & fibrous layer**	**Yes**	**6A-C**	**8 lin. ft.**	**D**	**4**
Boiler Room	**1"-6" pipe insulation - air cell**	**Yes**	**8A-C**	**500 lin. ft.**	**ND**	**2**
Boiler Room	**1"-6" pipe-fitting insulation on air cell pipe insulation**	**Yes**	**9A-C**	**180 fittings**	**ND**	**2**
Boiler Room	**7"-12" Pipe insulation - air cell**	**Yes**	**10A-C**	**200 lin. ft.**	**ND**	**2**
Boiler Room	**7"-12" pipe-fitting insulation on air cell pipe insulation**	**Yes**	**11A-C**	**40 fittings**	**ND**	**2**
Boiler Room - Including Header and Main Steam Line	**13"-20" Pipe insulation - air cell**	**Yes**	**12A-C**	**120 lin. ft.**	**ND**	**2**

Functional Space	Homogeneous Material Description	Contains Asbestos (Yes/No)	Ref. Client Sample No. (See Table II)	Estimated Quantity Units	Material Condition[1]	Hazard Category[2]
Boiler Room - Including Header and Main Steam Line	**13"-20" pipe-fitting insulation on air cell pipe insulation**	**Yes**	**13A-C**	**20 fittings**	**ND**	**2**
Fuel Oil Tank Room	**7"-12" Pipe insulation - air cell**	**Yes**	**10A-C**	**230 lin. ft.**	**ND**	**2**
Fuel Oil Tank Room	**7"-12" pipe-fitting insulation on air cell pipe insulation**	**Yes**	**11A-C**	**50 fittings**	**ND**	**2**
Boiler Room & Fuel Tank Room	Metal/wood core fire doors	No	---	3 doors	ND	0
Hazardous Materials Office/Storage Area	Sheetrock/Joint compound	No	14	800 ft.^{2}	ND	0
Hazardous Materials Storage Restroom	Ceramic floor tile (tan) with grout	No	15	75 ft.^{2}	ND	0
Hazardous Materials Storage Restroom	Ceramic (white) wall tile with grout	No	16	200 ft.^{2}	ND	0
Hazardous Materials Storage Area	Metal/wood core fire doors	No	---	100 lin. ft.	ND	0
Hazardous Materials Storage Area	**1"-6" pipe insulation - air cell**	**Yes**	**8A-C**	**100 lin. ft.**	**ND**	**2**
Hazardous Materials Storage Area	**1"-6" pipe-fitting insulation on air cell pipe insulation**	**Yes**	**9A-C**	**4 fittings**	**ND**	**2**
South Warehouse Area, Offices & Showroom (Plus Above Ceilings)	**1"-6" pipe insulation - felt with tar paper & fibrous layer**	**Yes**	**6A-C**	**850 lin. ft.**	**ND**	**2**
South Warehouse Area, Offices & Showroom (Plus Above Ceilings)	**1"-6" pipe-fitting insulation on felt with tar paper pipe insulation**	**Yes**	**7A-C**	**120 fittings**	**ND**	**2**
South Warehouse Area, Offices & Showroom (Plus Above Ceilings)	**1"-6" pipe insulation - air cell**	**Yes**	**8A-C**	**2,110 lin. ft.**	**ND**	**2**
South Warehouse Area, Offices & Showroom (Plus Above Ceilings)	**1"-6" pipe-fitting insulation on air cell pipe insulation**	**Yes**	**9A-C**	**300 fittings**	**ND**	**2**
South Warehouse Area, Offices & Showroom (Plus Above Ceilings)	**13"-20" Pipe insulation - air cell**	**Yes**	**12A-C**	**400 lin. ft.**	**ND**	**2**

Functional Space	Homogeneous Material Description	Contains Asbestos (Yes/No)	Ref. Client Sample No. (See Table II)	Estimated Quantity Units	Material Condition[1]	Hazard Category[2]
South Warehouse Area, Offices & Showroom (Plus Above Ceilings)	**13"-20" pipe-fitting insulation on air cell pipe insulation**	**Yes**	**13A-C**	**12 fittings**	**ND**	**2**
South Warehouse Area, Offices	**13"-20" Pipe insulation - air cell**	**Yes**	**12A-C**	**200 ft.²**	**ND**	**2**
South Warehouse Area, Offices	**9"x 9" floor tile (brown) with black mastic**	**Yes (Floor Tile)**	**18**	**500 ft.²**	**ND**	**1**
South Warehouse Area, Offices & Storage	Sheetrock/joint compound	No	14	2,000 ft.²	ND	0
South Warehouse Area Northwest Locker Room	2' x 4' ceiling panels - pitted	No	17	144 ft.²	ND	0
South Warehouse Area Northwest Locker Room	Sheetrock/joint compound	No	14	300 ft.²	ND	0
South Warehouse Area - Above and Below Beams & Transformer Area	**Transite panels & pieces**	**Yes**	**19**	**1,200 scattered**	**ND**	**2**
North Warehouse Area and Offices (Plus Above Ceilings)	**1"-6" pipe insulation - felt with tar paper & fibrous layer**	**Yes**	**6A-C**	**1,150 lin. ft.**	**ND**	**2**
North Warehouse Area and Offices (Plus Above Ceilings)	**1"-6" pipe-fitting insulation on felt with tar paper pipe insulation**	**Yes**	**7A-C**	**160 fittings**	**ND**	**2**
North Warehouse Area and Offices (Plus Above Ceilings)	**1"-6" pipe insulation - air cell**	**Yes**	**8A-C**	**2,600 lin. ft.**	**ND**	**2**
North Warehouse Area and Offices (Plus Above Ceilings)	**1"-6" pipe-fitting insulation on air cell pipe insulation**	**Yes**	**9A-C**	**340 fittings**	**ND**	**2**
North Warehouse Area and Offices (Plus Above Ceilings)	**13"-20" Pipe insulation - air cell**	**Yes**	**12A-C**	**500 lin. ft.**	**D (limited)**	**4**
North Warehouse Area and Offices (Plus Above Ceilings)	**13"-20" pipe-fitting insulation on air cell pipe insulation**	**Yes**	**13A-C**	**15 fittings**	**ND**	**2**
North Warehouse Area and Offices (Above and Below Beams/ Transformer Area)	**Transite panels & pieces**	**Yes**	**19**	**2,000 ft.²**	**ND**	**2**
North Warehouse Shipping/Receiving Restroom	12" x 12" tan floor tile with adhesive	No	20	100 ft.²	ND	0

Functional Space	Homogeneous Material Description	Contains Asbestos (Yes/No)	Ref. Client Sample No. (See Table II)	Estimated Quantity Units	Material Condition[1]	Hazard Category[2]
North Warehouse Shipping/Receiving Restroom	Vinyl base (tan) with adhesive	No	21	40 lin. ft.	ND	0
North Warehouse Shipping/Receiving Restroom	Sheetrock/joint compound	No	22	300 $ft.^2$	ND	0
Shipping/Receiving Office and Storage	Sheetrock/joint compound	No	22	1,600 $ft.^2$	ND	0
Shipping/Receiving Office and Storage	12"x 12" floor tile (gray) with adhesive	No	23	400 $ft.^2$	ND	0
Shipping/Receiving Office and Storage	Vinyl base (gray) with adhesive	No	24	50 lin. ft.	ND	0
North Office Warehouse and Office Windows	Interior gray silicon caulking	No	25	2,680 lin. ft.	ND	0
North Warehouse Southwest Office Area	2' x 4' ceiling panels - pitted	No	26	2,000 $ft.^2$	ND	0
North Warehouse Southwest Office Area	12"x 12" floor tile (gray) with adhesive	No	23	2,000 $ft.^2$	ND	0
North Warehouse Southwest Office Area	Vinyl case (gray) with adhesive	No	24	240 lin. ft.	ND	0
North Warehouse Southwest Office Area	Sheetrock/joint compound	No	22	4,000 $ft.^2$	ND	0
North Warehouse Southwest Office Area	Plaster	No	27A	4,000 $ft.^2$	ND	0
North Warehouse South Training Rooms/Restrooms/ Janitor's Closet	2'x4' ceiling panels - pitted	No	26	160 $ft.^2$	ND	0
North Warehouse South Training Rooms/Restrooms/ Janitor's Closet	Vinyl base (gray) with adhesive	No	24	100 lin. ft.	ND	0
North Warehouse South Training Rooms/Restrooms/ Janitor's Closet	Plaster	No	27B-C	8,000 $ft.^2$	ND	0
North Warehouse South Training Rooms/Restrooms/ Janitor's Closet	Metal/wood core fire doors	No	---	No Quantity	---	0
North Warehouse - South Restrooms	Ceramic floor tile (gray) with grout	No	28	160 $ft.^2$	ND	0

Functional Space	Homogeneous Material Description	Contains Asbestos (Yes/No)	Ref. Client Sample No. (See Table II)	Estimated Quantity Units	Material Condition[1]	Hazard Category[2]
North Warehouse - South Restrooms	Ceramic wall tile (white) with grout	No	29	300 ft.²	ND	0
North Warehouse - South Restrooms	Sheetrock/joint compound	No	22	400 ft.²	ND	0
South Warehouse and Office Windows	Interior silicon caulking (gray)	No	30	2,000 lin. ft.	ND	0
South Warehouse Southwest Storage	Sheetrock/joint compound	No	31	2,500 lin. ft.	ND	0
Southwest Main Offices & Showroom Area	2' x 4' ceiling panels pitted	No	32	18,750 lin. ft.	ND	0
Southwest Main Offices & Showroom Area	Sheetrock/joint compound	No	31	22,000 ft.²	ND	0
Southwest Main Offices & Showroom Area	Plaster	No	27A-C	8,000 ft.²	ND	0
Southwest Main Offices & Showroom Area	Duct seam sealer (gray)	No	33	200 lin. ft.	ND	0
Southwest Main Offices & Showroom Area	Carpet adhesive (tan, brown)	No	34	14,000 ft.²	ND	0
Southwest Main Offices & Showroom Area	12" x 12" floor tile (gray) with adhesive	No	35	3,600 ft.²	ND	0
Southwest Main Offices & Showroom Area	**12" x 12" floor tile (red) with adhesive & black mastic**	**Yes**	**36**	**400 ft.²**	**ND**	**1**
Southwest Main Offices & Showroom Area - Break Room	12" x 12" floor tile (gray with white) with adhesive	No	37	400 ft.²	ND	0
Southwest Main Offices & Showroom Area - Break Room	Sink undercoating (white)	No	38	1 sink	ND	0
Exterior - Roof at Ladder Access	**Transite panels**	**Yes**	**19**	**120 ft.²**	**ND**	**2**
Exterior - Roof	**Rubber membrane with stone & sublayers**	**Assume**	**No Sample Taken**	**201,000 ft.²**	**ND**	**1**
Exterior - West at Windows	Silicon caulking (brown)	No	39	No Quantity	ND	0
Exterior - South at Door Frame	Door frame caulking (gray)	No	40	2 doors 50 lin. ft.	ND	0
Exterior - South at Windows	Silicon caulking (brown)	No	39	No Quantity	ND	0

Functional Space	Homogeneous Material Description	Contains Asbestos (Yes/No)	Ref. Client Sample No. (See Table II)	Estimated Quantity Units	Material Condition[1]	Hazard Category[2]
Exterior at East Windows	Silicon caulking (brown)	No	39	No Quantity	ND	0
Exterior at East Lower	Door frame caulking (gray)	No	40	32 lin. ft.	ND	0
Exterior at North Windows	Silicon caulking (brown)	No	39	No Quantity	ND	0

1. Condition of ACM:
   ND = Not Damaged
   D = Damaged
   SD = Significantly Damaged

2. Hazard Category:
   0 = No hazard - material does not contain asbestos
   1 = ACM with potential for damage
   2 = ACM with potential for significant damage
   3 = Damaged or significantly damaged asbestos-containing miscellaneous material
   4 = Damaged or significantly damaged friable asbestos-containing thermal system insulation
   5 = Damaged or significantly damaged friable asbestos-containing surfacing material

Appendix B

Table II. Bulk Asbestos Analytical Results

Table II. Bulk Asbestos Analytical Results

Client: City of Minneapolis
Location: 1860 28th Street; Minneapolis, Minnesota
Date of Inspection: March 25-26, 2015
Project: B1500394

Sample No.	Sample Location		Material	Asbestos Content (%)[1]
1A	**Basement**	**Boiler Room**	**Exterior boiler insulation**	**Chrysotile 60**
1B	Basement	Boiler Room	Exterior boiler insulation	N.A.[2]
1C	Basement	Boiler Room	Exterior boiler insulation	N.A.
2A	**Basement**	**Boiler Room**	**Boiler breeching insulation**	**Chrysotile 60** **Amosite 10**
2B	Basement	Boiler Room	Boiler breeching insulation	N.A.
2C	Basement	Boiler Room	Boiler breeching insulation	N.A.
3A	Basement	Boiler Room	Interior boiler refractory	N.D.[3]
3B	Basement	Boiler Room	Interior boiler refractory	N.D.
3C	Basement	Boiler Room	Interior boiler refractory	N.D.
4	Basement	Boiler Room	Boiler brick	N.D.
5A	**Basement**	**Boiler Room**	**Exterior boiler brick insulation (silver)**	**Chrysotile 5**
5B	Basement	Boiler Room	Exterior boiler brick insulation (silver)	N.A.
5C	Basement	Boiler Room	Exterior boiler brick insulation (silver)	N.A.
6A	**Basement**	**Boiler Room**	**1"-6" pipe insulation - felt with tar paper & fibrous layer**	**Tan Fibrous: Chrysotile 60** **Tar Paper: Chrysotile 40**
6B	Basement	Boiler Room	1"-6" pipe insulation - felt with tar paper & fibrous layer	N.A.
6C	Basement	Boiler Room	1"-6" pipe insulation - felt with tar paper & fibrous layer	N.A.
7A	**Basement**	**Boiler Room**	**1"-6" pipe-fitting insulation on felt with tar paper pipe insulation**	**Chrysotile 15** **Amosite 10**
7B	Basement	Boiler Room	1"-6" pipe-fitting insulation on felt with tar paper pipe insulation	N.A.
7C	Basement	Boiler Room	1"-6" pipe-fitting insulation on felt with tar paper pipe insulation	N.A.
8A	**Basement**	**Boiler Room**	**1"-6" pipe insulation - air cell**	**Chrysotile 60**
8B	Basement	Boiler Room	1"-6" pipe insulation - air cell	N.A.

Sample No.	Sample Location		Material	Asbestos Content (%)[1]
8C	Basement	Boiler Room	1"-6" pipe insulation - air cell	N.A.
9A	**Basement**	**Boiler Room**	**1"-6" pipe-fitting insulation on air cell pipe insulation**	**Chrysotile 5** **Amosite 10**
9B	Basement	Boiler Room	1"-6" pipe-fitting insulation on air cell pipe insulation	N.A.
9C	Basement	Boiler Room	1"-6" pipe-fitting insulation on air cell pipe insulation	N.A.
10A	**Basement**	**Boiler Room**	**7"-12" Pipe insulation - air cell**	**Chrysotile 70**
10B	Basement	Boiler Room	7"-12" Pipe insulation - air cell	N.A.
10C	Basement	Boiler Room	7"-12" Pipe insulation - air cell	N.A.
11A	**Basement**	**Boiler Room**	**7"-12" pipe-fitting insulation on air cell pipe insulation**	**Chrysotile 20** **Amosite 10**
11B	Basement	Boiler Room	7"-12" pipe-fitting insulation on air cell pipe insulation	N.A.
11C	Basement	Boiler Room	7"-12" pipe-fitting insulation on air cell pipe insulation	N.A.
12A	Basement	Boiler Room	13"-20" Pipe insulation - air cell	Chrysotile 70
12B	Basement	Boiler Room	13"-20" Pipe insulation - air cell	N.A.
12C	Basement	Boiler Room	13"-20" Pipe insulation - air cell	N.A.
13A	**Basement**	**Boiler Room**	**13"-20" pipe-fitting insulation on air cell pipe insulation**	**Chrysotile 20** **Amosite 10**
13B	Basement	Boiler Room	13"-20" pipe-fitting insulation on air cell pipe insulation	N.A.
13C	Basement	Boiler Room	13"-20" pipe-fitting insulation on air cell pipe insulation	N.A.
14	Main Level	Hazardous Materials Office	Sheetrock/joint compound	N.D.
15	Main Level	Hazardous Materials Restroom	Ceramic floor tile (tan) with grout	N.D.
16	Main Level	Hazardous Materials Restroom	Ceramic (white) wall tile with grout	N.D.
17	Main Level	South Warehouse Northwest Locker Room	2'x 4' ceiling panels pitted	N.D.
18	**Main Level**	**South Warehouse by North Wall**	**9"x 9" floor tile (brown) with black mastic**	**Floor Tile: Chrysotile 7** **Black Mastic: N.D.**
19	**Main Level**	**South Warehouse Beams & Transformer Area**	**Transite panels**	**Chrysotile 12**
20	Main Level	North Warehouse Shipping/Receiving Restroom	12" x 12" tan floor tile with adhesive	N.D.
21	Main Level	North Warehouse Shipping/Receiving Restroom	Vinyl base (tan) with adhesive	N.D.

Sample No.	Sample Location			Material	Asbestos Content (%)[1]
22	Main Level	North Warehouse Shipping/Receiving Restroom		Sheetrock/joint compound	N.D.
23	Main Level	North Warehouse Shipping/Receiving Office		12"x 12" floor tile (gray) with adhesive	N.D.
24	Main Level	North Warehouse Shipping/Receiving Office		Vinyl case (gray) with adhesive	N.D.
25	Main Level	North Warehouse & Office Windows		Interior silicon caulking (gray)	N.D.
26	Main Level	North Warehouse Southwest Office Area		2'x 4' ceiling panels - pitted	N.D.
27A	Main Level	North Warehouse Southwest Office Area		Plaster	N.D.
27B	Main Level	North Warehouse Southwest Office Area		Plaster	N.D.
27C	Main Level	North Warehouse Southwest Office Area		Plaster	N.D.
28	Main Level	North Warehouse Southwest Office Area Restrooms		Ceramic floor tile (gray) with grout	N.D.
29	Main Level	North Warehouse Southwest Office Area Restrooms		Ceramic wall tile (white) with grout	N.D.
30	Main Level	South Warehouse & Office Windows		Interior silicon caulking (gray)	N.D.
31	Main Level	South Warehouse Southwest Storage Rooms		Sheetrock/joint compound	N.D.
32	Main Level	Southwest Main Offices & Showroom Area		2' x 4' ceiling panels pitted	N.D.
33	Main Level	Southwest Main Offices & Showroom Area		Duct seam sealer (gray)	N.D.
34	Main Level	Southwest Main Offices & Showroom Area		Carpet adhesive (tan, brown)	N.D.
35	Main Level	Southwest Main Offices & Showroom Area		12" x 12" floor tile (gray) with adhesive	N.D.
36	Main Level	Southwest Main Offices & Showroom Area		12" x 12" floor tile (red) with adhesive	**Floor Tile:** **N.D.** **Black Mastic:** **Chrysotile** **7**
37	Main Level	Southwest Main Offices & Showroom Area	Break Rooms	12" x 12" floor tile (gray with white) with adhesive	N.D.
38	Main Level	Southwest Main Offices & Showroom Area	Break Rooms	Sink undercoating (white)	N.D.

Sample No.	Sample Location		Material	Asbestos Content (%)[1]
39	Exterior	West Office Window	Silicon caulking (brown)	N.D.
40	Exterior	South at Door Frame	Door frame caulking (gray)	N.D.

* Materials containing 1 percent of asbestos or less are not considered to be asbestos-containing materials by the U.S.EPA.

1. Asbestos content is indicated as an approximate percent by area.
2. NA = Not Analyzed
3. ND = None Detected

Appendix C

Table III. Lead-Based Paint Testing

Table III. Lead-Based Paint Testing

Client: City of Minneapolis
Location: 1860 28th Street; Minneapolis, Minnesota
Date of Inspection: March 25-26, 2015
Project: B1500394

Sample I.D. No.	Room/Area	Component Description			Results	Paint Condition G = Good P = Peeling
1	---	Calibration			1.00	---
2	---	Calibration			1.10	---
3	---	Calibration			1.00	---
Roof						
4	Water Tower	Framing	Metal	Red	15.90	G
Basement						
5	Boiler Room	Floor	Concrete	Red	0.08	G
6	Boiler Room	Wall	Concrete Block	Green	0.24	G
7	Boiler Room	Wall	Concrete Block	White	0.05	G
8	Boiler Room	Boiler	Insulation	Silver	0.03	G
9	Boiler Room	Column	Steel	Silver	0.00	G
10	Boiler Room	Ladder	Steel	Silver	0.02	G
11	Boiler Room	Wall	Concrete	Blue	0.23	G
12	Boiler Room	Fire Door	Metal	Gray	4.30	G
13	Boiler Room	Door Frame	Metal	Gray	1.60	G
14	Stairwell to Main Level	Railing	Metal	Blue	2.20	G
Main Level						
15	Hazardous Materials Storage	Floor	Concrete	Gray	0.01	G
16	Hazardous Materials Storage	Wall	Sheetrock	White	0.00	G
17	Hazardous Materials Storage	Door	Wood	Grey	0.07	G

Sample I.D. No.	Room/Area	Component Description			Results	Paint Condition G = Good P = Peeling
18	Hazardous Materials Storage	Door Frame	Wood	Grey	3.00	G
19	Hazardous Materials Storage	Wall	Concrete Block	White	0.22	G
20	Hazardous Materials Storage	Beam	Steel	Tan	3.30	G
21	Hazardous Materials Storage	Ceiling Deck	Metal	Tan	3.20	G
22	South Warehouse	Wall	Brick	White	0.06	G
23	South Warehouse	Column	Steel	Blue	4.60	G
24	South Warehouse	Column	Steel	White	4.20	G
25	South Warehouse	Wall	Concrete Block	White	0.28	G
26	South Warehouse	Large Garage Door	Metal	White	1.50	G
27	South Warehouse	Floor	Concrete	Yellow Stripe	0.50	G
28	South Warehouse	Window Frame	Metal	Brown	0.00	G
29	South Warehouse	Wall	Sheetrock	White	0.00	G
30	Southwest Showroom Office	Wall	Sheetrock	White	0.00	G
31	Southwest Showroom Office	Door	Wood	Tan	0.00	G
32	Southwest Showroom Office	Door Frame	Metal	White	0.00	G
33	Southwest Showroom Office	Wall	Plaster	Gray	0.03	G
34	Southwest Showroom Office	Wall	Plaster	Tan	0.05	G
35	Southwest Showroom Office	Window Frame	Metal	Gray	0.00	G
36	Southwest Showroom Office	Door	Metal	Black	0.00	G
37	Southwest Showroom Office	Door Frame	Metal	Black	0.00	G
38	North Warehouse	Wall	Concrete Block	White	0.23	G

Sample I.D. No.	Room/Area	Component Description			Results	Paint Condition G = Good P = Peeling
39	North Warehouse	Wall	Brick	White	0.06	G
40	North Warehouse	Wall	Sheetrock	White	0.00	G
41	North Warehouse	Door	Wood	Tan	0.00	G
42	North Warehouse	Door Frame	Metal	Gray	0.00	G
43	North Warehouse	Door	Wood	Gray	0.03	G
44	North Warehouse	Door Frame	Wood	Gray	3.30	G
45	North Warehouse	Column	Steel	Yellow	3.40	G
46	North Warehouse	Column	Steel	White	4.90	G
47	North Warehouse	Column	Steel	Red	4.00	G
Exterior West						
48	Loading Dock	Overhang	Steel	Red	0.50	P
49	Loading Dock	Beam	Steel	Red	1.70	P
50	Loading Dock	New Soffit	Metal	Red	0.00	G
51	Loading Dock	New Fascia	Metal	Red	0.00	G
52	Loading Dock	Corner Guard	Metal	Red	4.10	G
53	Loading Dock	Window Frame	Metal	Brown	0.00	G

mg/cm^2 = milligrams of lead per square centimeter of paint

Appendix D

Bulk Asbestos Analysis Report

Pace Analytical Services, Inc.
1800 Elm St. SE - Suite 1830
Minneapolis, MN 55414
(612) 607-6457

Mr. Jerry Wallerius
Braun Intertec-Bloomington
11001 Hampshire Ave. South
Bloomington, MN 55438

April 03, 2015

Work Order #: 1500620

RE: 1860 28th Street, MPLS

B15-00394

Dear Jerry Wallerius:

Bulk Asbestos Analysis Report

The microscopy department of Pace Analytical Services, Inc. received your analytical request on March 30, 2015. The sample(s) were analyzed in the Pace Industrial Hygiene laboratory unless otherwise noted. The objective of this analysis was to determine the presence of asbestos using polarized light microscopy (PLM) and to determine the percent of asbestos and non-asbestos fibrous components by calibrated visual area estimation. Analytical results are summarized on the following laboratory report.

Discussion

None-detected floor tile results obtained by PLM analysis may contain thin asbestos fibers below the limits of resolution of the polarized light microscope. The EPA Method EPA/600/R-93/116 recommends the use of transmission electron microscopy to confirm the absence of asbestos.

Methodology

Bulk asbestos analysis is conducted in accordance with the Environmental Protection Agency's (EPA) methods 40 CFR, Part 763, Ch. 1, Subpart F, Appendix A (7-1-87 Edition) and EPA/600/R-93/116. All analyses are in compliance with the quality control procedures specified by the methods. All samples are examined for homogeneity. If a sample contains more than one layer, each layer is analyzed individually. Total fibrous content is calculated for joint compound/wallboard systems by combining layer results according to their percentages of the total sample. All routine quality assurance procedures were followed, unless otherwise noted.

Pace Analytical Services, Inc.
1800 Elm St. SE - Suite 1830
Minneapolis, MN 55414
(612) 607-6457

April 03, 2015

Work Order #: 1500620

Remarks

This test report relates only to the items submitted for analysis.

Samples are retained at our laboratory for a period of 30 days and will be disposed of unless otherwise instructed by the client.

This report can not be copied, except in its entirety, without prior written permission from Pace Analytical Services, Inc.

We appreciate your decision to use Pace Analytical Services, Inc. for this project. We are committed to being your vendor of choice to meet your analytical needs.

If you have any questions please contact me at 612-607-6457.

Sincerely,

Kevin R. Osborn

Project Manager

Sample No: 1500620-01 Client ID: 1A

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Insulation	2	100	-	-		-		03/30/15
Tan woven fibers	(A)	15	3,11	Cellulose 90		None Detected		
Gray fibrous	(B)	85	1,2,3	None Detected		Chrysotile 60		

Sample No: 1500620-02 Client ID: 1B

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-03 Client ID: 1C

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-04 Client ID: 2A

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Insulation	2	100	-	-		-		03/30/15
Tan woven fibers	(A)	50	3,11	Cellulose 90		None Detected		
White/gray fibrous	(B)	50	1,2,3	None Detected		Chrysotile 10 Amosite 10		

Sample No: 1500620-05 Client ID: 2B

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-06 Client ID: 2C

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-07 Client ID: 3A

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Tan/gray granular	1	100	1,3	None Detected		None Detected		03/30/15

Sample No: 1500620-08 Client ID: 3B

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Tan/gray granular	1	100	1,3	None Detected		None Detected		03/30/15

Sample No: 1500620-09 Client ID: 3C

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Tan/gray granular	1	100	1,3	None Detected		None Detected		03/30/15

Sample No: 1500620-10 Client ID: 4

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Tan cementitious	1	100	1,3	None Detected		None Detected		03/31/15

Sample No: 1500620-11 Client ID: 5A

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Silver/gray fibrous	1	100	1,3,11	Cellulose <1 Glass Fibers 30		Chrysotile 5		03/31/15

Sample No: 1500620-12 Client ID: 5B

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-13 Client ID: 5C

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-14 Client ID: 6A

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Insulation	4	100	-	-		-		03/31/15
Tan woven fibers	(A)	15	3,11	Cellulose 85		Chrysotile 1		
Tan fibrous	(B)	25	3,4	Cellulose 80		Chrysotile <1		
Tan fibrous	(C)	25	3,4	Cellulose <1		Chrysotile 60		
Black tar paper	(D)	35	1,8	Cellulose <1 Hair <1		Chrysotile 40		

Sample No: 1500620-15 Client ID: 6B

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-16 Client ID: 6C

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-17 Client ID: 7A

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Insulation	2	100	-	-		-		03/31/15
Brown fibrous	(A)	70	None Detected	Hair 100		None Detected		
White fribrous micaceous	(B)	30	1,2,3	None Detected		Chrysotile 15 Amosite 10		

Sample No: 1500620-18 Client ID: 7B

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-19 Client ID: 7C

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-20 Client ID: 8A

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Insulation	2	100	-	-		-		03/31/15
Tan woven fibers	(A)	20	3	Cellulose 90		None Detected		
White fibrous	(B)	80	3,4	None Detected		Chrysotile 60		

Sample No: 1500620-21 Client ID: 8B

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-22 Client ID: 8C

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-23 Client ID: 9A

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
White fibrous	1	100	1,3	Cellulose 5		Chrysotile 5 Amosite 10		03/31/15

Sample No: 1500620-24 Client ID: 9B

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-25 Client ID: 9C

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-26 Client ID: 10A

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Insulation	2	100	-	-		-		03/31/15
Tan woven fibers	(A)	10	3,11	Cellulose 80		None Detected		
White fibrous	(B)	90	3,4	Cellulose <1		Chrysotile 70		

Sample No: 1500620-27 Client ID: 10B

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-28 Client ID: 10C

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-29 Client ID: 11A

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
White/gray fibrous	1	100	3,4,11	Cellulose 2		Chrysotile 20 Amosite 10		03/31/15

Sample No: 1500620-30 Client ID: 11B

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-31 Client ID: 11C

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-32 Client ID: 12A

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Insulation	2	100	-	-		-		03/31/15
Tan woven fibers	(A)	10	3,11	Cellulose 80		None Detected		
White fibrous	(B)	90	3,4	None Detected		Chrysotile 70		

Sample No: 1500620-33 Client ID: 12B

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-34 Client ID: 12C

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-35 Client ID: 13A

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Insulation	2	100	-	-		-		03/31/15
White woven fibers	(A)	15	3,11	Cellulose 80		None Detected		
White/gray fibrous	(B)	85	1,2,3	None Detected		Chrysotile 20 Amosite 10		

Sample No: 1500620-36 Client ID: 13B

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-37 Client ID: 13C

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date

NO ANALYSIS PERFORMED ON THIS SAMPLE

Sample No: 1500620-38 Client ID: 14

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Sheetrock	3	100	1,3,6,11	Cellulose 9 Glass Fibers <1		None Detected		03/31/15
White powdery compound with paint	(A)	2	1,3,6,11	None Detected		None Detected		
Brown paper	(B)	10	3,11	Cellulose 90		None Detected		
White chalky	(C)	88	1,3	Glass Fibers <1		None Detected		

Sample No: 1500620-39 Client ID: 15

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Tile with grout	2	100	-	-		-		03/31/15
Tan cementitious tile	(A)	80	1,3	None Detected		None Detected		
Tan granular	(B)	20	1,3	Cellulose <1		None Detected		

Sample No: 1500620-40 Client ID: 16

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
White cementitious	1	100	1,3	None Detected		None Detected		03/31/15

Sample No: 1500620-41 Client ID: 17

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Gray fibrous ceiling tile with paint	1	100	3,6,11	Cellulose 40 Glass Fibers 25		None Detected		03/31/15

Sample No: 1500620-42 Client ID: 18

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Floor tile with mastic	2	100	-	-		-		03/31/15
Brown floor tile	(A)	99	1,3,9	None Detected		Chrysotile 7		
Black mastic	(B)	1	1,7	None Detected		None Detected		

Sample No: 1500620-43 Client ID: 19

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Gray fibrous cementitious	1	100	1,3,11	None Detected		Chrysotile 12		03/31/15

Sample No: 1500620-44 Client ID: 20

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Floor tile with adhesive	2	100	-	-		-		03/31/15
Tan floor tile	(A)	99	1,3,9	None Detected		None Detected		
Yellow adhesive	(B)	1	1,7	None Detected		None Detected		

Sample No: 1500620-45 Client ID: 21

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Baseboard with adhesive	2	100	-	-		-		03/31/15
Tan vinyl	(A)	95	1,3,9	None Detected		None Detected		
Yellow adhesive	(B)	5	1,7	None Detected		None Detected		

Sample No: 1500620-46 Client ID: 22

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Sheetrock	3	100	1,2,3,11	Cellulose 10 Glass Fibers <1		None Detected		03/31/15
White powdery compound with paint	(A)	10	1,2,3,11	None Detected		None Detected		
Brown/white paper	(B)	10	3	Cellulose 95		None Detected		
White chalky	(C)	80	1,3	Cellulose <1 Glass Fibers <1		None Detected		

Sample No: 1500620-47 Client ID: 23

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Floor tile with adhesive	2	100	-	-		-		03/31/15
Gray floor tile	(A)	99	1,3,9	None Detected		None Detected		
Yellow adhesive	(B)	1	1,7	None Detected		None Detected		

Sample No: 1500620-48 Client ID: 24

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Baseboard with adhesive	2	100	-	-		-		03/31/15
Gray vinyl	(A)	>99	1,3,9	None Detected		None Detected		
Yellow adhesive	(B)	<1	1,3,7	None Detected		None Detected		

Sample No: 1500620-49 Client ID: 25

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Brown rubbery	1	100	1,3	None Detected		None Detected		03/31/15

Sample No: 1500620-50 Client ID: 26

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Gray fibrous ceiling tile with paint	1	100	3,6,11	Cellulose 50 Glass Fibers 20		None Detected		03/31/15

Sample No: 1500620-51 Client ID: 27A

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
White/gray granular	1	100	1,3,11	Cellulose <1		None Detected		03/31/15

Sample No: 1500620-52 Client ID: 27B

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
White/gray granular	1	100	1,3,11	None Detected		None Detected		03/31/15

Sample No: 1500620-53 Client ID: 27C

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
White/gray granular	1	100	1,3,11	None Detected		None Detected		03/31/15

Sample No: 1500620-54 Client ID: 28

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Tile with grout	2	100	-	-		-		03/31/15
Gray/brown cementitious	(A)	75	1,3	None Detected		None Detected		
Gray granular cementitious	(B)	25	1,3	Cellulose <1		None Detected		

Sample No: 1500620-55 Client ID: 29

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
White cementitious	1	100	1,3	Cellulose <1		None Detected		04/01/15

Sample No: 1500620-56 Client ID: 30

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Dark brown rubbery	1	100	1,3	None Detected		None Detected		04/01/15

Sample No: 1500620-57 Client ID: 31

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Sheetrock	2	100	1,3	Cellulose 10 Glass Fibers <1		None Detected		04/01/15
Brown/purple paper	(A)	10	3	Cellulose 95		None Detected		
White chalky	(B)	90	1,3	Cellulose <1 Glass Fibers <1		None Detected		

Sample No: 1500620-58 Client ID: 32

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Gray fibrous ceiling tile with paint	1	100	3,6,11	Cellulose 60 Glass Fibers 10		None Detected		04/01/15

Sample No: 1500620-59 Client ID: 33

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Gray compound	1	100	1,3	None Detected		None Detected		04/01/15

Sample No: 1500620-60 Client ID: 34

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Yellow adhesive	1	100	1,3,7,11	None Detected		None Detected		04/01/15

Sample No: 1500620-61 Client ID: 35

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Floor tile with adhesive	2	100	-	-		-		04/01/15
Gray floor tile	(A)	99	1,3,9	None Detected		None Detected		
Yellow adhesive	(B)	1	1,7	None Detected		None Detected		

Sample No: 1500620-62 Client ID: 36

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Floor tile with adhesive and mastic	2	100	-	-		-		04/01/15
Red floor tile	(A)	99	1,3,9	None Detected		None Detected		
Black mastic/yellow adhesive	(B)	1	1,7	None Detected		Chrysotile 7		

Sample No: 1500620-63 Client ID: 37

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Floor tile with adhesive	2	100	-	-		-		04/01/15
Gray floor tile	(A)	>99	1,3,9	None Detected		None Detected		
Yellow adhesive	(B)	<1	1,7	None Detected		None Detected		

Sample No: 1500620-64 Client ID: 38

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
White compound	1	100	1,3	Cellulose 20		None Detected		04/01/15

Sample No: 1500620-65 Client ID: 39

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Brown tacky compound	1	100	1,3	None Detected		None Detected		04/01/15

Sample No: 1500620-66 Client ID: 40

Macroscopic Description	No. of Layers and Layer Designator	Percent of Total Sample	Non-Fibrous Components*	Other Fibrous Non-Asbestos Content Total or Layer %	Footnotes	Asbestos Content Total or Layer %	Footnotes	Analytical Date
Gray rubbery compound	1	100	1,3	None Detected		None Detected		04/01/15

Footnotes and Definitions

bmya	Black mastic/yellow adhesive
<	Less Than
>	Greater Than

*** Key to Non-Fibrous Components**

1 = Rock/Mineral fragments	5 = Diatoms	9 = Vinyl	13 = Spores/Pollen
2 = Mica/Vermiculite	6 = Perlite	10 = Foam/Rubber	14 = Foil
3 = Binders	7 = Adhesive/Mastic	11 = Paint	
4 = Opaques	8 = Tar	12 = Other	

1500620

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Table II. Bulk Asbestos Analytical Results

Client: CITY OF MINNEAPOLIS
Location: 1860 28th STREET, MPLS, MN
Date of Inspection: 3-25-15 → 3/26/2015
Project No.: B1500394

	Sample No.	Sample Location	Material	Asbestos Content (%)*
01	1A	BASEMENT – BOILER ROOM	EXTERIOR BOILER INSULATION	
02	1B	↓ – ↓	↓	
03	1C	↓ – ↓	↓	
04	2A	↓ – ↓	BOILER BREECHING INSULATION	
05	2B	↓ – ↓	↓	
06	2C	↓ – ↓	↓	
07	3A	↓ – ↓	INTERIOR BOILER REFRACTORY	
08	3B	↓ – ↓	↓	
09	3C	↓ – ↓	↓	
10	4	↓ – ↓	BOILER BRICK	
11	5A	↓ – ↓	SILVER EXTERIOR BOILER BRICK INSULATION	
12	5B	↓ – ↓	↓	
13	5C	↓ – ↓	↓	
14	6A	↓ – ↓	1"-6" PIPE INSULATION – FELT W/ TAR PAPER	
15	6B	↓ – ↓	↓	
16	6C	↓ – ↓	↓	
17	7A	↓ – ↓	1"-6" PFI ON FELT W/ TARPAPER P.I.	
18	7B	↓ – ↓	↓	
19	7C	↓ – ↓	↓	
20	8A	↓ – ↓	1"-6" PIPE INSULATION – AIR CELL	
21	8B	↓ – ↓	↓	
22	8C	↓ – ↓	↓	
23	9A	↓ – ↓	1"-6" PFI ON AIR CELL P.I.	
24	9B	↓ – ↓	↓	
25	9C	↓ – ↓	↓	

* Materials containing 1 percent of asbestos or less are not considered to be Asbestos-Containing-Materials (ACMs) by the US EPA.

1. Asbestos content is indicated as an approximate percent by weight.

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1500620

BRAUN INTERTEC

Table II. Bulk Asbestos Analytical Results

Client: CITY OF MINNEAPOLIS
Location: 1860 28th STREET, MPLS, MN
Date of Inspection: 3-25-15 → 3/26/2015
Project No.: B1500394

	Sample No.	Sample Location	Material	Asbestos Content(%)
26	10A	BASEMENT – BOILER ROOM	7"-12" PIPE INSULATION AIR CELL	–
27	10B	↓ – ↓	↓	
28	10C	↓ – ↓	↓	
29	11A	↓ – ↓	7"-12" PFI ON AIR CELL P.I.	
30	11B	↓ – ↓	↓	
31	11C	↓ – ↓	↓	
32	12A	↓ – ↓	13"-20" PIPE INSULATION – AIR CELL	
33	12B	↓ – ↓	↓	
34	12C	↓ – ↓	↓	
35	13A	↓ – ↓	13"-20" PFI ON AIR CELL P.I.	
36	13B	↓ – ↓	↓	
37	13C	↓ – ↓	↓	
38	14	MAIN LEVEL – HAZ MAT OFFICE	SHEETROCK/JOINT COMPOUND	
39	15	↓ – HAZ MAT RESTROOM	TAN CERAMIC FLOOR TILE W/GROUT	
40	16	↓ – ↓	WHITE CERAMIC WALL TILE W/GROUT	
41	17	↓ – SOUTH WAREHOUSE NW LOCKER ROOM	2'x4' CEILING PANELS - PITTED	
42	18	↓ – SOUTH WAREHOUSE BY NORTH WALL	9"x9" BROWN FLOOR TILE W/BLACK MASTIC	
43	19	↓ – SOUTH WAREHOUSE BEAMS & TRANSFORMER AREA	TRANSITE PANELS	
44	20	↓ – NORTH WAREHOUSE SHIPPING/RECEIVING RESTROOM	12"x12" TAN FLOOR TILE W/ADHESIVE	
45	21	↓ – ↓	TAN VINYL BASE W/ADHESIVE	
46	22	↓ – ↓	SHEETROCK/JOINT COMPOUND	
47	23	↓ – NORTH WAREHOUSE SHIPPING/RECEIVING OFFICE	12"x12" GRAY FLOOR TILE W/ADHESIVE	
48	24	↓ – ↓	GRAY VINYL BASE W/ADHESIVE	
49	25	↓ – NORTH WAREHOUSE & OFFICE WINDOWS	INTERIOR GRAY SILICON CAULKING	
50	26	↓ – NORTH WAREHOUSE SW OFFICE AREA	2'x4' CEILING PANELS - PITTED	

* Materials containing 1 percent of asbestos or less are not considered to be Asbestos-Containing-Materials (ACMs) by the US EPA.

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1500620

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INTERTEC

Table II. Bulk Asbestos Analytical Results

Client: CITY OF MINNEAPOLIS
Location: 1860 28th STREET, MPLS, MN
Date of Inspection: 3-25-15 → 3/26/2015
Project No.: B1500394

	Sample No.	Sample Location	Material	Asbestos Content (%)
51	27A	MAIN LEVEL - NORTH WAREHOUSE SW OFFICE AREA	PLASTER	
52	27B	↓ - ↓	↓	
53	27C	↓ - ↓	↓	
54	28	↓ - ↓ - RESTROOMS	GRAY CERAMIC FLOOR TILE w/ GROUT	
55	29	↓ - ↓ - ↓	WHITE CERAMIC WALL TILE w/ GROUT	
56	30	↓ - SOUTH WAREHOUSE OFFICE WINDOWS	INTERIOR GRAY SILICON CAULKING	
57	31	↓ - SOUTH WAREHOUSE SW STORAGE ROOM	SHEETROCK JOINT COMPOUND	
58	32	↓ - SW MAIN OFFICES * SHOWROOM AREA	2'x4' CEILING PANEL - PITTED	
59	33	↓ - ↓	DUCT SEAM SEALER - GRAY	
60	34	↓ - ↓	TAN BROWN CARPET ADHESIVE	
61	35	↓ - ↓	12"x12" GRAY FLOOR TILE w/ ADHESIVE	
62	36	↓ - ↓	12"x12" RED FLOOR TILE w/ ADHESIVE	
63	37	↓ - ↓ - BREAK ROOM	12"x12" GRAY w/ WHITE FLOOR TILE w/ ADHESIVE	
64	38	↓ - ↓ - ↓	WHITE SINK UNDERCOATING	
65	39	EXTERIOR WEST OFFICE WINDOW	BROWN SILICON CAULKING	
66	40	EXTERIOR SOUTH AT DOOR FRAME	GRAY DOOR FRAME CAULKING	

* Materials containing 1 percent of asbestos or less are not considered to be Asbestos-Containing-Materials (ACMs) by the US EPA.

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For PASI Lab Use Only
Laboratory Work Order No.
1500620

Pace Analytical®
Pace Analytical Services, Inc.
1800 Elm St. SE – Suite 1830
Minneapolis, MN 55414

MICROSCOPY
REQUEST FOR IH LABORATORY ANALYTICAL SERVICES

Bottle orders and sampling inquires:
Phone: 612.656.1139

IMPORTANT
Date Results Requested: 4-2-2015
Time: 10:00AM
Rush Charges Authorized? Yes (No)
Rush/Quote #:

Page 1 of 1

REPORT RESULTS TO
Contact Name: JERRY WALLERIUS
Company: BRAUN INTERTEC CORPORATION
Mailing Address: 11001 HAMPSHIRE AVENUE SOUTH
City, State, Zip: BLOOMINGTON, MN 55438
Telephone #: 952-995-2478 Fax #: 952-995-2020
E-mail: JWALLERIUS@BRAUNINTERTEC.COM

Project ID/Name: 1860 28th STREET, MPLS
P.O. #/Project #: B15-00394

SEND INVOICE TO
Contact Name: Erin Campbell
Company: Braun Intertec
Address: 11001 Hampshire Ave So
City, State, Zip: Bloomington, MN 55438
Telephone #: 952.995.2000 Fax #: 952.995.2020

Special Instructions and/or Specific Regulatory Requirements:
(method, limit of detection, petrofund, reporting units)
$20.00 PLM EACH

Site Location (State): MN

Analysis Requested
(Enter an "X" in the boxes below to indicate request.)

Lab ID#	Client Sample Identification (IDs must be unique)	Date Sampled	Time Sampled	Matrix/ Media	Volume/Area (specify units)	Number of Containers	Metals Field Filtered Y/N	PLM ASBESTOS										FOR LAB USE ONLY
	1A THROUGH 40	3-25 → 3-26-15	–	BULK	–	66		✓										
	"SEE TABLE II"																	

CHAIN OF CUSTODY
Collected by: (Print) JERRY WALLERIUS / DAN CHELSTROM
Collector's Signature:
Relinquished by: Date/Time 3-27-15 1:10 PM
Received by: Pace BC Date/Time: 3/27/15 1:15
Relinquished by: Date/Time:
Received Contents Not Verified: Date/Time:
Received Contents Verified: Date/Time: 3/30/15 9:45
Custody Seal Intact: ☐ Yes ☐ No ☒ N/A ☐ Hand Delivered by Client
On Ice: ☐ Yes ☒ No
Temp Blank: ☐ Yes ☒ No
Temp: — °C
Comments: ALL REPORTS TO JERRY WALLERIUS AT BRAUN BLOOMINGTON 612-360-0733

Form # eCS01.02 F:\Groups\QA-QC\Forms\Client Services\COC-eCS01.02 Effective 10/02/14

Appendix E

Asbestos Building Inspector Certificate

Certificate No: 5LM09031405IR *Expiration Date: September 3, 2015*

This is to certify that

Gerald J. Wallerius

has attended and successfully completed an

ASBESTOS INSPECTOR REFRESHER TRAINING COURSE

permitted by

the State of Minnesota under Minnesota Rules 4620.3702 to 4620.3722

and meets the requirements of

Section 206 of Title II of the Toxic Substances Control Act (TSCA)

conducted by

Lake States Environmental, Ltd.

in

White Bear Lake, MN on September 3, 2014

Examination Date: September 3, 2014

Lake States Environmental, Ltd
P. O. Box 645, Rice Lake, WI 54868
(800) 254-9811

Training Instructor

MDH MINNESOTA DEPARTMENT OF HEALTH ASBESTOS INSPECTOR

Certified by:
State of Minnesota
Department of Health

Expires: 09/03/2015

Gerald J Wallerius
3040 Garland Ln N
Plymouth, MN 55447

Director, Env. Health Div.

No AI2305 Issued: 09/08/2014

Appendix F

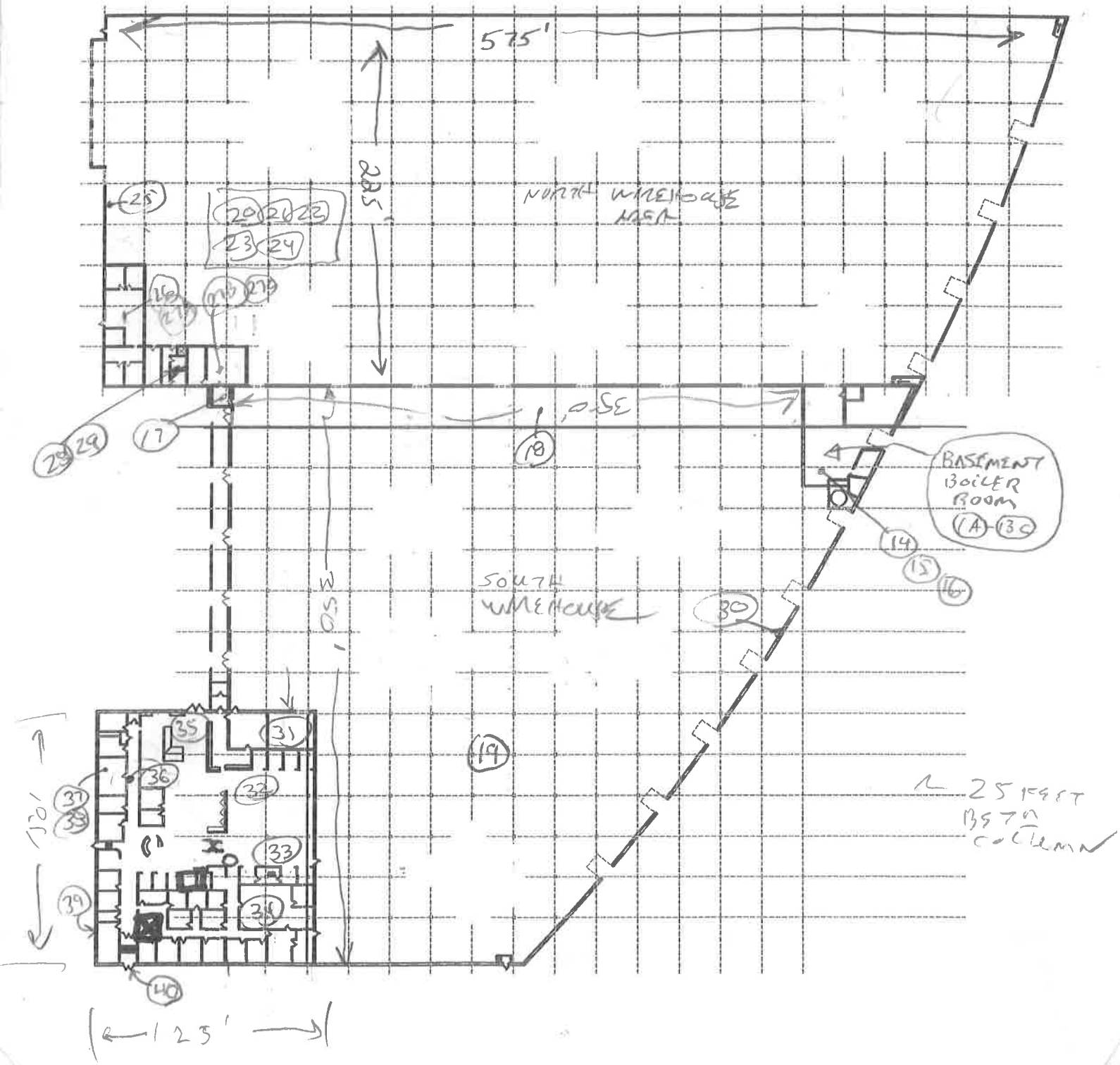
Asbestos Bulk Sample Location Maps
XRF Lead Paint Sample Locations Maps

BRAUN INTERTEC
B1500394

(#) = ASBESTOS BULK SAMPLE LOCATIONS

N

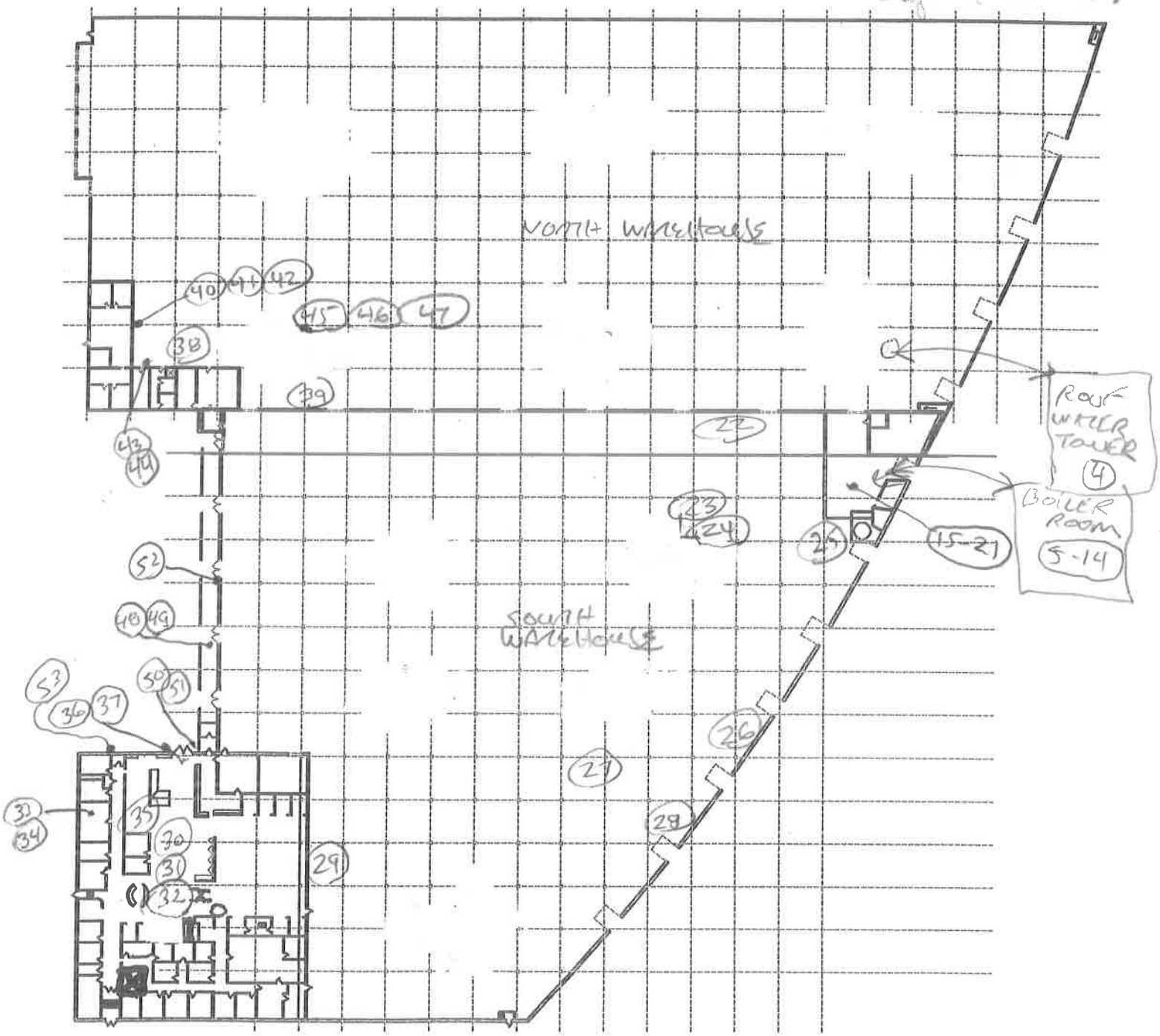
3-25-2015
JW & DW.C.
3-26-2015



BRAUN INTERTEC
B15 00394

3-26-2015

(E) XRF SAMPLE LOCATIONS
JAN & JAN. C.



DRAFT - Subject to Change printed 4-7-2015

Phase I Environmental Site Assessment

Roof Depot
1860 28th Street East and 2717 Longfellow Avenue
Minneapolis, Minnesota

Prepared For

City of Minneapolis

Project B15-00394
April 6, 2015

Braun Intertec Corporation

DRAFT - Subject to Change

April 6, 2015 Project B15-00394

City of Minneapolis
Mr. Chris Backes
Department of Public Works
233 City Hall
350 South 5th Street
Minneapolis, MN 55415

Re: Phase I Environmental Site Assessment
Roof Depot
1860 28th Street East and 2717 Longfellow Avenue
Minneapolis, Minnesota

Dear Mr. Backes:

In accordance with your written authorization, Braun Intertec Corporation conducted a Phase I environmental site assessment (ESA) of the above-referenced site (Site). The objective of the Phase I ESA was to evaluate the Site for indications of recognized environmental conditions and to assist in satisfying All Appropriate Inquiries (AAI) standards and practices. The Phase I ESA was conducted in general conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Practice E1527-13 and 40 CFR Part 312.

The Phase I ESA was prepared on behalf of, and for use by City of Minneapolis. No other party has a right to rely on the contents of the Phase I ESA without written authorization by Braun Intertec. The Phase I ESA was prepared in association with the purchase and potential redevelopment of the Site. Please refer to the attached report for the scope, methods and conclusions of our assessment.

We appreciate the opportunity to provide our professional services for you for this project. If you have any questions regarding this letter or the attached report, please contact Kevin Hoffman at 952.995.2458 or Mark Ciampone at 651.487.7015.

Sincerely,

BRAUN INTERTEC CORPORATION

Kevin J. Hoffman
Project Scientist

Mark A. Ciampone, PG
Associate Principal

Attachment:
Phase I Environmental Site Assessment Report

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Executive Summary

Braun Intertec Corporation conducted a Phase I Environmental Site Assessment (ESA) of the Roof Depot located at 1860 28th Street East and 2717 Longfellow Avenue in Minneapolis, Minnesota (Site) in general conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Practice E1527-13 and 40 CFR Part 312.

The Site has been used for housing, coal storage, warehousing, machining, as well as other commercial purposes. From at least 1912 though 1944 the eastern portion of the Site was used as a coal storage yard. The building at the Site was constructed in 1947 and used by Sears Roebuck and Company as a warehouse for merchandise from until 1947 until 1979. Since 1979 the Site had been used for various commercial purposes in addition to warehousing. The western portion of the Site along Longfellow Avenue had been used largely for residential purposes. The lot on the northeast corner of Longfellow Avenue and East 28th Street has been used for machining and for motor parts sales and auto repair. Adjoining properties to the north, east, and south have historically been used for industrial properties.

At the time of the reconnaissance, the Site consisted of two parcels totaling approximately 7.63 acres and developed with a warehouse building. Loading dock areas were located on the west side of the building. The building was located on the eastern portion of the Site and paved parking and outdoor storage on the western portion of the Site.

This assessment identified no recognized environmental conditions in connection with the Site, with the exception of the following:

- From at least 1912 though 1944 the eastern portion of the Site was used as a coal storage yard. The western portion of the Site along Longfellow Avenue had been used largely for residential purposes prior to the construction of the paved parking and outdoor storage area. As part of a Phase II completed in 2001, coal was encountered in four of the six borings advanced on the eastern portion of the Site within the building. In addition, concrete was encountered in one of the soil borings as well. The potential exists that buried materials which could include demolition debris, urban fill consisting of ash or clinker material, and other wastes are located at the Site. It is our opinion the presence of coal and debris at the Site and the potential to encounter other materials at the Site during redevelopment is considered a recognized environmental condition.

- The lot on the northeast corner of Longfellow Avenue and East 28th Street had been used for machining and for motor parts sales and auto repair. A previous investigation did not

encounter any contamination in the area of the former machining and motor sales and auto repair facility. Considering the proposed redevelopment of the Site, the potential exists to encounter residual or previously unidentified contamination associated with the past use in that area of the Site. Therefore, it is our opinion the previous use of a machining facility and former motor parts sales and auto repair facility on the southwest corner of the Site is considered a recognized environmental condition.

- The former CMC Heartland Site was located on the adjoining property east of the Site. Historically, the site had over 100 years of industrial use, and formerly supported a railroad yard, a lumber storage yard with woodworking and machine shop operations, an agricultural chemical manufacturing business, and two bulk petroleum storage facilities. Based on information obtained from previous environmental investigations, a plume of groundwater contamination extends to the southwest beneath the Site originating from the former CMC Heartland Site property. It is our opinion contamination at the Site associated the former CMC Heartland Site property is considered a recognized environmental condition.

This assessment identified no historical recognized environmental conditions in connection with the Site, with the exception of the following:

- In February 1999, expired roofing materials, such as glues, resins, and adhesives, and other hazardous waste were buried in an abandoned sub-grade loading dock at the Site. The waste materials were excavated in February 2000, placed in approximately fifty 55-gallon drums, and shipped to a hazardous waste facility. Results of two soil push probes advanced through the concrete floor of the loading dock area revealed slightly elevated concentrations of toluene (99 parts per billion [ppb] to 4,900 ppb), which were significantly below the residential Soil Reference Value (SRV) for toluene in soil of 107,000 ppb. The Minnesota Pollution Control Agency (MPCA) issued a letter on December 15, 2000 indicating that no further action was necessary. Considering the investigation was given closure by the MPCA and the levels of toluene were below the residential SRVs, it is our opinion the removed buried materials in the area of the loading dock is considered a historical recognized environmental condition.

A. Introduction

A.1. Purpose

Braun Intertec Corporation received authorization from Mr. Chris Backes of the City of Minneapolis, Property Services (Client) to conduct a Phase I Environmental Site Assessment (ESA) of the Roof Depot property located at 1860 28th Street East and 2717 Longfellow Avenue in Minneapolis, Minnesota (Site). The objective of the Phase I ESA was to evaluate the Site for indications of recognized environmental conditions and to assist in satisfying All Appropriate Inquiries (AAI) standards and practices. The Phase I ESA was conducted in general conformance with the scope and limitations of American Society for Testing and Materials (ASTM) Practice E1527-13 and 40 CFR Part 312. No intentional deviations from the ASTM Practice E1527-13 were made in conducting this Phase I ESA for the Site. The Phase I ESA was prepared on behalf of, and for the use by City of Minneapolis (User) in accordance with the contract between City of Minneapolis and Braun Intertec, including the Braun Intertec General Conditions. No other party has a right to rely on the contents of the Phase I ESA without written authorization by Braun Intertec. All authorized parties are entitled to rely on the attached report according to our contract with Client, and under the same terms, conditions and circumstances. Please note that our contract with Client may contain a limitation of our total liability. If so, such limitation also applies to all those receiving this permission.

According to the User, the Phase I ESA was conducted in association with the purchase of the Site.

The purpose of this Phase I ESA was to evaluate the Site for indications of "recognized environmental conditions." A recognized environmental condition is defined by ASTM Practice E1527-13 as: "the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: 1) due to any release to the environment, 2) under conditions indicative of a release to the environment: or 3) under conditions that pose a material threat of a future release to the environment. *De minimis* conditions are not recognized environmental conditions."

In addition, a "controlled recognized environmental condition" is also a recognized environmental condition. A controlled recognized environmental condition is defined by ASTM Practice E1527-13 as "a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls."

A.2. Site Location

We accessed various documents and online sources to obtain Site location information. The following is a summary our findings:

Parcel Address:	1860 28th Street East	2717 Longfellow Avenue
City:	Minneapolis	Minneapolis
County:	Hennepin	Hennepin
Parcel Property Identification Number:	36-029-24-32-0003	36-029-24-32-0075
Construction Year:	1946	None provided
Owner:	1860 East 28th Street, LLC	Longfellow Warehouse Company
Legal Description:	Unplatted	Lots 1 to 15 Including Adjacent Vacant Alley, Block 4, The Holding Company's Addition to Minneapolis
Parcel Size:	5.66 acres	1.97 acres
Site Latitude:	44.952 North	
Site Longitude:	93.244 West	
Site Section, Township, Range:	S 1/2 of the NW 1/4 of the SW 1/4 of Section 36, Township 29 North, Range 24 West	
Site Size:	7.63 acres	

A Site location map and Site sketch are attached in Appendices A and B, respectively. Information obtained from the Hennepin County Property Information web page is attached in Appendix C.

A.3. Scope of Services

Services provided for this project included:

- Preparing a description of the Site location, current use and improvements, and surrounding area.
- Preparing a general description of the topography, soils, geology, and groundwater flow direction at the Site.
- Reviewing reasonably ascertainable and practically reviewable regulatory information published by state and federal agencies, health, and/or environmental agencies.
- Reviewing the history of the Site, including aerial photographs, fire insurance maps, directories, and other readily available Site development data.

- Conducting a reconnaissance and environmental review of the Site, including observations of the Site for indications of hazardous materials, petroleum products, polychlorinated biphenyls (PCBs), wells, storage tanks, solid waste disposal, pits and sumps, and utilities.

- Conducting an area reconnaissance, including a brief review of adjoining property uses and pertinent environmental information noted in the Site vicinity.

- Interviewing current owners and/or occupants of the Site and accessible past Site owners, operators and/or occupants.

- Interviewing local government officials or agencies having jurisdiction over hazardous waste disposal or other environmental matters in the area of the Site.

- Reviewing previous environmental reports prepared for the Site, if provided.

- Preparing a written report of our methods, results, and conclusions.

The Standard Scope of the ASTM Practice E1527-13 is not intended to provide a universal analysis of potential environmental risks and hazards. This assessment included no analysis of non-standard scope environmental risks and hazards unless otherwise listed above. Analysis of other non-standard scope issues by Braun Intertec would require additional contractual arrangements.

This assessment does not include vapor encroachment screening as defined in ASTM Practice E2600-10, *Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions.* ASTM Practice E2600-10 is not a requirement or component of "all appropriate inquiry," but a tool for evaluating vapor migration. Its results are not determinative of whether hazardous substances from a release are or may be present at the property for the sake of "all appropriate inquiry" or ASTM Practice E1527-13. An ASTM Practice E2600-10 vapor encroachment screen is not within the scope of this Phase I ESA and will not be conducted unless specifically requested by the User. However, vapors present or likely present from hazardous substances or petroleum products are considered no differently than hazardous substances or petroleum products present or likely present as a result of a release to the environment. Therefore, while a vapor encroachment screening per the ASTM Practice E2600-10 standard is not part of this assessment, the potential for impacts to the property from vapor migration that is a result of a release of hazardous substances and/or petroleum products to the environment will be considered when assessing for the presence of a recognized environmental condition as defined by ASTM E1527-13.

A.4. User-Provided Information

The purpose of this section is to describe tasks to be performed by the "User." The "User" as defined by ASTM Practice E1527-13, is "the party seeking to use ASTM Practice E1527-13 to complete an environmental site assessment of the property. A User may include, without limitation, a potential purchaser of property, a potential tenant of property, an owner of property, a lender, or a property manager."

As stated in 40 CFR 312 (the rule), the Brownfields Amendments provide important liability protections for Users who qualify as contiguous property owners, bona fide prospective purchasers, or innocent landowners. To meet the statutory requirements for any of these Landowner Liability Protections (LLPs), a User must meet certain threshold requirements and satisfy certain continuing obligations. To qualify as one of the three LLPs, the User must perform "all appropriate inquiries" (AAI) on or before the date on which the User acquired the Site. The rule defines AAI, which includes inquiries and activities performed by the User and an environmental professional (EP).

The rule allows (but does not mandate) the User performing AAI to conduct inquiries or activities that may include searches for environmental liens, assessments of any specialized knowledge on the part of the User, an assessment of commonly known or reasonably ascertainable information about the Site, and an assessment of the relationship of the purchase price to fair market value. However, if the User performing AAI conducts one or more of these inquiries and/or activities, the rule allows (but does not mandate) that the User may communicate information gathered from these inquiries and/or activities to their EP to identify a possible recognized environmental condition.

Braun Intertec provided a User Questionnaire to the Client as a means to communicate information gathered from these inquiries and/or activities to the EP. The User may elect whether to communicate this information to the EP and/or to communicate this information to the EP by other means (e.g., through conversation or submission of documents). As indicated in our contract, if multiple Users are requesting reliance on the Phase I ESA, the Client was responsible for forwarding a copy of the questionnaire to all appropriate entities (collectively the User).

User-supplied information is discussed in applicable sections of this report. Sections A.4.a through A.4.f present any information communicated to us by the User that the EP has determined to indicate the possible presence or likely presence of a recognized environmental condition.

A.4.a. Environmental Liens

An environmental lien is a charge, security, or encumbrance, upon title to the Site to secure the payment of a cost, damage, debt, obligation, or duty arising out of response actions, cleanup, or other remediation of environmental issues at the Site.

The User was not aware of a record or awareness of environmental liens recorded against the Site.

A.4.b. Activity and Use Limitations

Activity and Use Limitations (AULs) are legal or physical restrictions or limitations on the use of, or access to, a Site to reduce or eliminate potential exposure to hazardous substances or petroleum products in the soil, soil vapor, groundwater, and/or surface water on the Site or to prevent activities that could interfere with the effectiveness of a response action, in order to ensure maintenance of a condition of no significant risk to public health or the environment. AULs, which may include institutional and/or engineering controls, are intended to prevent adverse impacts to individuals or populations that may be exposed to hazardous substances and petroleum products in the soil, groundwater, and/or surface water on the Site.

The User was not aware of a record or awareness of AULs recorded against the Site.

A.4.c. Specialized Environmental Knowledge

Specialized environmental knowledge includes any information and/or experience related to the Site or adjoining properties including, but not limited to, any obvious indicators that point to the presence or likely presence of environmental issues at the Site.

The User provided previous environmental reports conducted at the Site. A summary of those reports are in Section B.6. The User was not aware of additional information regarding specialized environmental knowledge pertaining to the Site.

A.4.d. Valuation Reduction for Environmental Issues

Valuation reduction for environmental issues includes the relationship of the purchase price to the fair market value of the property.

The User was not aware of a reduction in purchase price or fair market value of the Site due to environmental issues.

A.4.e. Commonly Known or Reasonably Ascertainable Information

Commonly known or reasonable ascertainable information includes information about the Site that generally is known to the public within the community where the Site is located and can be easily sought and found from individuals familiar with the Site or from easily attainable public sources of information.

The User stated the Site is currently and has historically been used for warehousing purposes.

A.4.f. Degree of Obviousness

The User must consider the degree of obviousness of the presence or likely presence of releases or threatened releases at the Site and the ability to detect releases or threatened releases by appropriate investigation.

The User was not aware of any obvious indications of the presence or likely presence of releases or threatened releases at the Site, with the exception of the information provided in the previous reports provided by the User and the adjacent former CMC Heartland Site property.

B. Records Review

The purpose of the records review is to obtain and review records that will help identify recognized environmental conditions in connection with the Site. We consulted only those regulatory and historical sources that were readily available, practically reviewable, and likely to be useful to develop a history of previous uses of the Site and surrounding area within the time and cost constraints of this Phase I ESA.

B.1. Physical Setting Information

B.1.a. Topography

According to the United States Geological Survey (USGS) 7.5-minute topographic map series, St. Paul West, Minnesota quadrangle, the Site is located at an elevation of approximately 850 feet above mean sea level.

B.1.b. Geology

The unconsolidated sediment in the Site vicinity are Pleistocene age middle- and upper-terrace deposits. The middle- and upper terrace deposits consist of sand, gravelly sand, and loamy sand with thin deposits of silt, loam, or organic sediment on top (Meyer and Hobbs, 1989).

The uppermost bedrock units in the Site vicinity are the Middle Ordovician, Platteville and Glenwood Formation (Olsen and Bloomgren, 1989). The Platteville Formation is described as fine-grained limestone containing thin shale partings near the top and base, underlain by green, sandy shale of the Glenwood Formation, which is very thin. The depth to bedrock in the Site vicinity is approximately 50 feet to 150 feet below land surface (Bloomgren et al., 1989).

B.1.c. Hydrogeology

According to published geologic information, the depth to the regional groundwater in the vicinity of the Site is approximately 40 feet below land surface and flows within the unconsolidated deposits in the Site vicinity toward the northeast (Kanivetsky, 1989). Based on our knowledge of the area of the Site, depth to ground water is approximately 28 feet below land surface and flows to the southwest.

The Site-specific groundwater flow direction was not determined through direct measurement during this Phase I ESA. Additional field investigation, beyond the Scope of Services of this Phase I ESA, would be required to determine this information.

B.2. Regulatory Report

We obtained regulatory database information pertaining to the Site and surrounding area from Environmental Data Resources, Inc. (EDR). The EDR report is a compilation of records of facilities that are included on current federal and state environmental regulatory databases. The databases were searched based on the specified minimum search distances from the Site as established by ASTM Practice E1527-13.

The EDR report also includes a description, source reference, date of acquisition, and the specified approximate minimum search distance criteria for each database and list. A copy of the EDR report is attached in Appendix D.

We reviewed the EDR report to identify records that indicate known or potential recognized environmental conditions on the Site and/or surrounding area and to evaluate the likelihood for those recognized environmental conditions to impact the Site based on the information obtained in this Phase I ESA.

B.2.a. Site

The Site is listed on the following federal and/or state databases in the EDR report:

- Roof Depot/Mattaini Warehouse Company, Inc., 1860 East 28th Street. The EDR report indicates the Site is listed on the Resource Conservation and Recovery Act (RCRA) Conditionally-Exempt Small Quantity Generator (CESQG), aboveground storage tank (AST), Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA)/Toxic Substances Control Act (TSCA) Tracking System (FTTS), Minnesota Tier 2, Spills, and State Remediation Site (SRS) databases. Identification of the Site on the RCRA-CESQG database indicates that the Site is required to register their hazardous waste activity under RCRA and does not imply that a release has occurred at the Site. According to the EDR report, two active 10,600-gallon fuel oil ASTs are registered at the Site. According to the EDR report, a Section 5 PCB State Investigation was conducted on November 10, 1993. Following the inspection, no violations were reported. According to the EDR report, Number 2 fuel oil is stored at the Site. An accident at the Site on August 4, 2000 caused a 2-inch gash in a saddle tank, causing approximately 20 gallons of diesel fuel to be spilled. The Minneapolis fire department was contacted and the area had been boomed and sanded. The spill was closed August 15, 2000. Hennepin County Hazardous Waste Department received an anonymous report that 20 to 50 5-gallon pails were buried and asphalted over at below-grade loading dock. For the SRS database listing, the EDR report indicated that in February 1999, expired roofing materials, such as adhesives, were buried in an abandoned sub-grade loading dock at the Site. The waste materials were excavated in February 2000, placed in approximately fifty 55-gallon drums, and shipped to a hazardous waste facility.

- Minnehaha Lake Motor, 1854 East 28th Street (southwest corner of the Site). According to the EDR report, the facility is listed on the EDR Historical Auto Station database. The EDR report indicates a automobile repair facility was located at the address in 1950.

B.2.b. Adjoining Properties

The following facilities are identified on properties that adjoin the Site in the EDR report:

- Midtown Greenway Phase Two, located along the eastern Site boundary. The EDR report indicates the location is listed on the Voluntary Investigation and Cleanup (VIC) Program, SRS, and Liens databases. The EDR report indicates the VIC listing for the property (VP15680) is associated with 29th Street Tunnel (VP16060) and HCRRA ROW (VP17710).

- Minneapolis Plant Site/Bituminous Roadways, 2820 Longfellow Avenue South, located on an adjoining property southwest of the Site. The EDR report indicates the facility is listed on the RCRA-CESQG and underground storage tank (UST) databases. Identification on the RCRA-CESQG database indicates that the facility is required to register their hazardous waste activity under RCRA and does not imply that a release has occurred at the facility. According to the EDR report, two gasoline USTs and one diesel UST have been removed from the facility. Identification on the UST database indicates that a storage tank(s) is registered at the facility and does not imply that a release has occurred.

- Minneapolis Fire Department/City of Minneapolis, 1858 East 27th Street, located on an adjoining property north of the Site. The EDR report indicates the facility is listed on the RCRA-CESQG and UST databases. Identification on the RCRA-CESQG database indicates that the facility is required to register their hazardous waste activity under RCRA and does not imply that a release has occurred at the facility. According to the EDR report, one active 8,000-gallon fuel oil UST is registered at the facility. Identification on the UST database indicates that a storage tank(s) is registered at the facility and does not imply that a release has occurred.

- City of Minneapolis Public Works/Minneapolis City of Engineering Lab/Minneapolis City of Equipment/Minneapolis Asphalt Plant/City of Minneapolis Concrete Plan, 1901 East 26th Street/1911 East 26th Street/1925 East 26th Street, located on an adjoining property north of the Site. According to the EDR report, the facility is listed on the RCRA-CESQG, UST, AST, and LAST databases. The EDR report indicates the facility is listed on the RCRA-CESQG and UST databases. Identification on the RCRA-CESQG database indicates that the facility is required to register their hazardous waste activity under RCRA. According to the EDR report, three active USTs are registered at the facility. The USTs range in capacity from 10,000 gallons to 15,000 gallons. Four removed ASTs and seven removed USTs are registered at the facility. According to the EDR report, thirteen removed ASTs and four active ASTs are registered for the Minneapolis Asphalt Plant facility. A release at the facility was reported to the State Duty Officer on May 16, 1995 and assigned Leak #8606. Groundwater contamination was not investigated as part of this release. The Minnesota Pollution Control Agency (MPCA) closed Leak #8606 on January 11, 2002. A second release at the facility was reported to the MPCA on July 9, 2008 and assigned Leak #17358. Groundwater contamination was identified but no off-site contamination was reported. The MPCA closed Leak #17358 on September 16, 2009.

- Smith Foundry, 1851 and 1855 East 28th Street, located on an adjoining property south of the Site. The EDR report indicates the facility is listed on the RCRA-CESQG, UST, and leaking aboveground storage tank (LAST), VIC, SRS, and Liens databases. Identification on the RCRA-

CESQG database indicates that the facility is required to register their hazardous waste activity under RCRA. According to the EDR report, one 500-gallon used or waste oil UST is registered at the Site. A release of diesel fuel at the facility was reported to the MPCA on January 10, 2013 and assigned Leak #19019. No groundwater contamination was reportedly associated with this release. The EDR report indicated that the release presented a low potential for soil gas issues due to the very limited extent and magnitude of the release. The MPCA closed Leak #19019 on February 7, 2014. The VIC Program assigned VP29770 for the facility. According to the EDR report, the owner was seeking a No Further Action letter for rebuilding on the northernmost 0.25 acres of the 0.41-acre parcel. A No Further Action letter was issued by the MPCA on December 3, 2013.

- CMC Heartland Lite Yard Site, located on an adjoining property east of the Site. The EDR report indicates the facility is listed on the Minnesota Permanent List of Priorities (PLP) database. Arsenic contamination had been documented at high levels in the soils from the soil surface to the water table at approximately 25 feet below ground surface. The site was formerly used for pesticide manufacturing that utilized sodium arsenate and/or lead arsenate in the early 1940's. Operations at the facility ceased around 1968. A Remedial Investigation determined the extent of contamination in the soils and ground water, and some historical off-site contamination in the neighboring residential areas. The Former landowner, CMC Heartland Partners (CMC) and U.S. Borax completed a Response Action at the site that involved the excavation of over 62,000 cubic yards (cy) of soil. A large portion of the excavated soil was stabilized for landfilling at a Minnesota landfill. The upper four feet of soil within the finished site grade met cleanup goals. Following the response actions, an office/warehouse and parking lot was constructed in 2005 to 2006. Groundwater monitoring by the present landowner continues with MDA oversight. During the Remedial Investigation for on-site soil contamination, an additional Remedial Investigation was started by the MDA in the adjoining neighborhood (see listing below for South Minneapolis Residential Soil Contamination) to determine extent of windblown deposition of contaminates from the site.

- South Minneapolis Residential Soil Contamination, 27th Street East and 17th Avenue South. The facility listing is due to the operations at CMC Heartland Lite Yard located on the adjoining property east of the Site. According to the EDR report, the area is listed on the PLP, Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), Engineering Controls, Institutional Control, and Record of Decision (ROD). municipal properties. The EDR report indicates the site was added to the NPL on September 19, 2007. The risk posed by exposure of residents to arsenic contaminated soil resulting from releases from the Site was the primary reason for the listing. The area encompassed by the

Site includes residential, commercial, industrial, and municipal properties. As the result of the investigation at the CMC Heartland Site, the Minnesota Department of Health (MDH) recommended in 1999 that soil sampling be performed in residential areas near the CMC Heartland Site property due to the elevated arsenic concentrations. Prevailing summer winds were determined to be from the southeast toward the northwest; therefore, the residential area located directly downwind of the CMC Heartland Site property became the focus of the initial sampling effort. Investigations in the residential neighborhood performed by the MDH and MDA identified arsenic impacts in the shallow soils. The MDA requested assistance from EPA in 2004 after sampling efforts in the residential neighborhood identified properties with elevated arsenic concentrations. A Record of Decision addressing the site-wide Operable Unit 00 was completed in September 2008.

- Hiawatha Business Center/Chicago Milwaukee Corp/Rollins Oil Company/Vacant Property/UMP Smileys Clinic/Greenway Surgery Center, 2000 - 2100 East 28th Street/2000 - 2020 East 28th Street/2016 - 2100 East 28th Street/2020 East 28th Street, located on an adjoining property east of the Site. The ERIS report indicates the facility is listed on the RCRA-CESQG, RCRA Small Quantity Generator (SQG), LUST, Brownfields, VIC, SRS, Liens, and Institutional Control databases. According to the EDR report, UMP Smileys Clinic and Greenway Surgery Center are listed on the RCRA-CESQG and RCRA-SQG databases, respectively. Identification on the RCRA-CESQG and RCRA-SQG databases indicate that the facilities are required to register their hazardous waste activity under RCRA. Two releases were reported at the facility. The first release was reported to the MPCA on August 29, 1989 and assigned Leak #1583. According to the EDR report, contaminated soil remains at the property and groundwater contamination and free product were associated with the release. The MPCA closed Leak #1583 on October 10, 1997. The second release was reported to the MPCA on December 13, 1995 and assigned Leak #9035. According to the EDR report, contaminated soil remains at the property and groundwater contamination were associated with the release. The MPCA closed Leak #9035 on January 9, 1996. The facility was listed three times on the VIC database (VP20770, VP20771, and VP20772). According to the EDR report, the MDA was the lead for the investigation of a former pesticide facility with arsenic contaminated soil and groundwater. For VP20770, an institutional control in the form of an environmental covenant was registered for the property in July 2008 and nine No Association Determinations were issued by the MPCA. For VP20771, a No Association Determination was issued to University of Minnesota Physicians. For VP20772, a No Association Determination was issued for lead in soil.

- John A. Dalsin & Sons/Jadco Supply, 2827 South 20th Avenue and 2830 South 20th Avenue, located on an adjoining property southeast of the Site. The EDR report indicates the facility is listed on the RCRA-SQG, UST, AST, and MDA Agriculture Voluntary Investigation and Cleanup (AgVIC) databases. Identification on the RCRA-SQG database indicates that the facility is required to register their hazardous waste activity under RCRA and does not imply that a release has occurred at the facility. According to the EDR report indicates that four removed USTs are registered at the facility ranging in capacity from 550 gallons to 8,000 gallons containing gasoline, diesel, and used oil or waste oil. According to the EDR report, one active 4,000-gallon gasoline AST and one active 4,000-gallon diesel AST are registered at the facility. The facility is listed on the AgVIC database with facility ID CF-2173. According to the EDR report, the investigation involved pesticides and was subsequently closed by MDA.

- Bituminous Roadways, 2825 Cedar Avenue South, located on an adjoining property southwest of the Site. The EDR report indicates the facility is listed on the UST and AST databases. According to the EDR report, one removed diesel 10,000-gallon UST and twenty-two removed ASTs are registered at the facility. Identification on the UST and/or AST databases indicates that storage tank(s) are registered at the facility and does not imply that a release has occurred.

- HCCRA ROW, South of 28th Street between Hiawatha Avenue and Longfellow Avenue, located on an adjoining property southeast of the Site. The EDR report indicates the area is listed on the VIC (VP17710), Liens, and SRS databases. According to the EDR report, a No Further Action for soil was issued by the MPCA on July 26, 2006.

B.2.c. Surrounding Area

We reviewed the EDR report for facilities located beyond adjoining properties that may indicate a release or likely release of hazardous substances and/or petroleum products that may impact the Site. The Site is located in an area of current and historical industrial use. Numerous properties are listed in the regulatory report in the vicinity of the Site with reported releases of hazardous substances and/or petroleum products. Refer to Section G for our opinion regarding the facilities with reported releases of hazardous substances and/or petroleum products in the surrounding area and their potential to impact the Site.

B.2.d. Unmapped Sites

The EDR report identified "orphan" sites, which, because of poor or inadequate address information could not be mapped by EDR. Using online mapping resources, all "orphan" sites were identified outside the appropriate minimum search distances for the Site or could not be located based on the information provided. It is our opinion the "orphan sites" do not warrant further consideration as potential recognized environmental conditions.

B.3. Regulatory Agency File and Records Review

The purpose of the regulatory file review is to obtain sufficient information to assist in determining if a recognized environmental condition, historical recognized environmental condition, controlled recognized environmental condition, or a *de minimis* condition exists at the Site in connection with a regulatory report listing.

Based on our review of the regulatory report, it is our opinion that a regulatory agency file and records review is warranted to determine if a recognized environmental condition, historical recognized environmental condition, controlled recognized environmental condition, or a *de minimis* condition exists at the Site in connection with the following regulatory report listings:

Midtown Greenway Phase Two, located along the eastern Site boundary. The EDR report indicates the location is listed on the VIC Program, SRS, and Liens databases.

According to the EDR report, the VIC listing for the property (VP15680) is associated with 29th Street Tunnel (VP16060) and HCRRA ROW (VP17710). The only documents available for review from the MPCA were plat maps and a VIC application requesting a No Action or No Further Action Letter be issued for the property. According to the EDR report, a No Further Action for soil was issued by the MPCA on July 26, 2006.

Smith Foundry, 1851 and 1855 East 28th Street, located on an adjoining property south of the Site. The EDR report indicates the facility is listed on the LAST, VIC, SRS, and Liens databases.

American Engineering Testing, Inc. (AET) was retained to provide environmental consulting, testing and investigation services during construction of the Smith Foundry Replacement Building Site. AET completed a Soil Management Plan (SMP) for the Site on February 15, 2013, and submitted it to the MPCA for approval. The objective of the SMP was to assist with the management of contaminated materials as they were encountered during construction activities associated with the Smith Foundry Replacement Building. The MPCA approved the SMP with modifications on March 22, 2013. The services were performed prior to and during site re-development activities.

The primary purpose of an Additional Phase II Investigation was to delineate the extent and magnitude of metals-contaminated soils first identified in the Limited Phase II ESA and again in the Limited Site Investigation (LSI). Although PCB-impacted soils were detected during the Limited Phase II Investigation, soils were tested for PCBs during the initial phase of the LSI around the original PCB detection and were not detected above reporting limits. Two soil samples were collected for laboratory analysis of metals

from eight different push probe borings (GP-1, GP-2C, GP-3, GP-4, GP-5, GP-6, GP-7 and GP-8) as part of the LSI and Additional Phase II Investigation Scopes. Of the metals detected, only arsenic and iron exceeded Tier II Industrial Soil Reference Values (SRVs). The origin of the arsenic contamination throughout the Site and the surrounding area is likely the former CMC Heartland Lite Yard grasshopper pesticide processing area. It is also likely that some of the other elevated metals concentrations in the soils on the site were due to the grasshopper pesticide, which is believed to have been transported via wind throughout the neighborhood. The elevated iron concentrations detected in some of the soils, especially in GP-7 (2'-3'), were most likely due to foundry operations including the temporary storage of pig iron and iron casts throughout the site. Other metals concentrations elevated in the soil, potentially because of foundry operations, included zinc, thallium, nickel, manganese, lead, copper, chromium, cadmium, beryllium and barium. None of the aforementioned metals exceed their respective Tier II Industrial SRVs except iron.

Groundwater was encountered and sampled for laboratory analysis of metals in seven of eight push-probe borings (GP-2C, GP-3, GP-4, GP-5, GP-6, GP-7 and GP-8). Arsenic was detected above the Environmental Protection Agency's (EPA) Maximum Contaminant Level (MCL) in six of the seven samples. Cadmium was detected above its Minnesota Department of Health (MDH) Derived Value in three of six samples (GP-2C, GP-3 and GP-5). Manganese was detected above its MDH Derived Value in three of four samples (GP-6, GP-7 and GP-8). Barium, iron, and magnesium were also detected above laboratory reporting limits but not regulatory thresholds. The source of the arsenic contamination in the groundwater was likely the grasshopper pesticide formerly processed at the CMC Heartland Lite Yard Superfund Site. Barium and magnesium appear to be within typical natural background concentrations for groundwater, whereas cadmium and manganese concentrations may be elevated in the groundwater due to foundry activities or grasshopper pesticide leaching.

AET prepared a Soil Management Implementation Report and Additional Phase II Investigation dated October 1, 2013 that addressed the management and investigation of contaminated soils and investigation of contaminated groundwater at the site.

Based on the results, discussion, and conclusions, AET requested that the MPCA VIC program issue a limited No Further Action letter to Smith Foundry Co. for the soil contaminants investigated and documented at the site. A No Further Action letter was issued by the MPCA on December 3, 2013.

Regarding the petroleum contamination at the facility, the LSI boreholes were completed for geotechnical exploration activities and environmental samples were collected from the geotechnical borings to satisfy Limited Phase II ESA data collection activities. Three borings were advanced at the site (SB-1, SB-2 and SB-3). Four additional push probe soil borings were advanced on site in response to the

petroleum contaminants detected in SB-2 (Leak #19019) and to satisfy the proposed LSI scope. Boring GP-4 was targeted near the former AST. GP-1, GP-2, and GP-3 were targeted north, east, and south of SB-2 (location of previous contaminant detections). Originally groundwater was expected around 25 feet below ground surface (bgs). Actual groundwater levels were measured no higher than 37 feet below ground surface upon advancing GP-1, GP-2, GP-3 and GP-4. Four final push probes were advanced on site because the extent and magnitude of petroleum contamination was not defined in the previous set of boring activities. GP-5 was extended as far east as practicable of the highest levels petroleum contamination. GP-6 was advanced near the property boundary near the northwest corner of the site. GP-7 was advanced near the property boundary southwest of the highest levels of petroleum contamination previously identified. GP-8 was advanced near the northeast corner of the site.

Local groundwater flow appeared to be to the west southwest on site based on water level measurements conducted during each soil boring event and final water level measurements conducted prior to sealing temporary wells.

Petroleum contaminants were detected in groundwater samples except GP-8, which was in the northeast corner of the site. The fact that petroleum contaminants were not detected in the groundwater at GP-8 was consistent with the on-site groundwater flow direction to the southwest. Relatively low detections of DRO were found in GP-5 and GP-6 at 180 µg/l and 280 µg/l, respectively. GP-5 was located in the far southeast portion of the site near the property boundary and GP-6 near the northwest property boundary. No other petroleum contaminants were detected in GP-5 and GP-6. The primary area of petroleum-contaminated groundwater was located beneath and around the former Smith Foundry Storage Building. BETX were detected in GP-2C, GP-3, GP-4 and GP-7. Of the BETX compounds, the highest and most abundant detections were of xylenes, ranging from 1,450 µg/l in GP-4 to 2,970 µg/l in GP-3. The highest concentrations of any petroleum contaminant measured in the on-site groundwater were of 1,2,4-trimethylbenzene ranging from 434 µg/l in GP-2C to 4,830 µg/l in GP-4. Although DRO was detected in six out of seven groundwater samples collected and GRO was only detected in GP-7 at a very high concentration of 14,900 µg/l, it's likely that GRO was also present in the groundwater at GP-2C, GP-3 and GP-4 based on the presence of some BETX compounds and other volatile organic compounds (VOCs). Based on the location and magnitude of petroleum contaminants measured near the south side of the former Smith Foundry Storage building, the source of the contamination was likely located nearby at one time.

Although, the exact source of the petroleum contamination was unknown, AET indicated it's likely (based on limited historical information and chemical signatures of the groundwater samples collected from the site) that the source of the petroleum contaminated groundwater was two former 3,000-gallon gasoline USTs removed from the site back in the 1980s. All other potential petroleum sources that have been

encountered throughout the duration of site investigation and development activities have since been addressed including the former diesel fuel AST, the undocumented waste oil UST, and the sump. AET requested that the MPCA issue a closure letter for Leak #19019. The MPCA closed Leak #19019 on February 7, 2014.

CMC Heartland Lite Yard Site, located on an adjoining property east of the Site. The EDR report indicates the facility is listed on the Minnesota Permanent List of Priorities (PLP) database.

Historically, the site had over 100 years of industrial use, and formerly supported a railroad yard, a lumber storage yard with woodworking and machine shop operations, an agricultural chemical manufacturing business, and two bulk petroleum storage facilities. These historical operations resulted in releases of hazardous substances and/or pollutants and contaminants to soil and groundwater at the site (the "Identified Releases"). The Identified Releases include both agricultural chemicals (i.e. arsenic and lead from arsenic-based pesticides) and other hazardous substances (i.e. lead, mercury and polynuclear aromatic hydrocarbons [PAHs]). The Identified Releases with respect to agricultural chemicals included arsenic and lead in soil and groundwater and are being addressed by the MDA. The Identified Releases at the site with respect to other hazardous substances include lead, mercury and PAHs in soil and lead in groundwater which are being addressed by the MPCA VIC Program.

Initially the MPCA required CMC, the former owner of the Site, and U.S. Borax, Inc. (U.S. Borax), a former operator of an agricultural chemical manufacturing business on the site, to conduct initial soil response actions at the site from October 2004 through July 2005 (the "2004/2005 Cleanup Actions"). The 2004/2005 Cleanup Actions included removal of arsenic and lead impacted soil that exceeded the Site Cleanup Standards of 20 milligrams per kilogram (mg/kg) total arsenic and 525 mg/kg total lead (the "Site Cleanup Standards"). The Site Cleanup Standards applied to soil within four feet of planned, finished development grades to prevent direct-contact exposure to contaminated soil and allow for commercial development of the site. In order to minimize long-term impacts to groundwater quality, additional deep impacted soil was also removed from the most contaminated area of the Site (the "Hot Spot Area"). The Hot Spot Area was excavated to the depth of the water table (26 feet below finished development grade).

As part of the 2004/2005 Cleanup Actions, more than 24,000 cy of contaminated soil with elevated concentrations of arsenic and lead was removed from the Hot Spot Area. An additional 18,200 cy of shallow contaminated soil within four feet of the planned, finished development grades was removed from portions of the site outside the Hot Spot Area. Over 4,000 cy of contaminated recycled asphalt was removed from the site during the 2004/2005 Cleanup Actions. In addition, 600 cy of concrete, railroad ties and other debris were removed, including 60 cy of battery casings intermixed with lead

contaminated soil. A soil berm, which contained a total of 1,300 cy of soil, had been constructed along the southern boundary of the site (the "South Berm"), and was found to contain mercury above the MPCA's SRV and arsenic above the Site Cleanup Standards. The mercury contaminated soil from the South Berm (300 cy) was disposed of at a landfill in Wisconsin and the remaining 1,000 cy of soil from the South Berm was disposed of as industrial waste at an industrial landfill in Minnesota.

A large portion of the excavated soil required treatment before off-site disposal because the arsenic and/or lead concentrations exceeded the Toxicity Characteristic Leaching Procedure (TCLP) disposal criterion. EnviroBlend treatment chemicals, including ferric sulfate and magnesium oxide in a pellet or powder form, were mixed with the soil in lifts as it was removed from the ground. The EnviroBlend chemicals stabilized the arsenic and lead within the soil so that minimal leaching from the soil would occur when it was placed into the industrial waste landfill. The treated soil was stockpiled and tested to ensure that it met the TCLP criterion before it was removed from the site. Less contaminated soil was disposed of directly as industrial waste or as daily cover at an industrial landfill without pretreatment.

Clean fill was imported and placed to restore the excavated areas as needed to maintain a four-foot separation between the contaminated soil and the finished development grade.

The MDA issued a Soil - No Further Action letter to CMC and U.S. Borax dated March 9, 2009 with respect to the 2004/2005 Cleanup Actions.

Development of the site included construction of a one-story office/warehouse building and required below grade excavations for a storm water retention pond, utility trenches (water main, storm sewer and sanitary sewer), the east building line, the loading dock footings, flammable liquid traps, and light poles. Soils removed from the excavations that were below the depth of four feet below finished development grades that had arsenic concentrations exceeding the Site Cleanup Standard were segregated and disposed of off-site. In addition, excavations were conducted to remove petroleum-contaminated soil located on the south of the building footprint, and lead-impacted soil (exceeding the Site Cleanup Standard) located in the southeastern portion of the site. Soil removed from the development-related excavations which did not exceed the Site Cleanup Standards was used as backfill in other areas of the site.

Approximately 4,000 cy of soil was removed for the storm water pond, 693 cy of which was disposed of off-site as daily cover at an industrial landfill, and the remainder was used as backfill in other parts of the Site. Approximately 1,200 cy of soil was removed because of either petroleum contamination or as part of the utility trench excavations; this soil was disposed of as industrial waste at an industrial landfill. Approximately 550 cy of soil was removed because of either lead contamination or as part of excavations

for the east building line, the loading dock or the utility trench excavation for the storm sewer; this soil was disposed of as daily cover at an industrial landfill. Soil removed for the utility trench excavation for the water main was reused as backfill in other parts of the site. A total of approximately 2,450 cy of contaminated soil was excavated and disposed of off-site.

Clean fill was imported and placed to restore the excavated areas as needed to maintain a four-foot separation between the contaminated soil and the finished development grade. Soil with arsenic levels below 55 mg/kg and lead below 700 mg/kg were allowed to be used in utility trenches below four feet of finished development grade.

Completion of the Development Response Actions together with the Completion of the 2004/2005 Cleanup Actions accounted for removal from the site of 1) all lead contaminated soil exceeding the Site Cleanup Standard of 525 mg/kg, and 2) all arsenic contaminated soil exceeding the Site Cleanup Standard of 20 mg/kg located within four feet of finished development grades. Arsenic contaminated soil remains at the site at depths greater than four feet below finished development grades and is being managed through an Environmental Covenant and Easement with an effective date of July 9, 2008 the ("Environmental Covenant") recorded July 15, 2008 in the office of the Hennepin County Recorder as Document No. 9159456.

Arsenic impacts from the site to the groundwater table aquifer are being managed through the source removal conducted as part of the 2004/2005 Site Cleanup Actions, a Special Well Construction Area established by MDH effective April 1, 2005, and long term groundwater quality monitoring. Groundwater monitoring is being conducted by 2800 Hiawatha, LLC per the "'Post Cleanup Ground Water Monitoring Plan" dated October 18, 2005, and amendments dated October 28, 2005, November 22, 2005 and December 5, 2008 (collectively the "2005 Monitoring Plan"). Prior to implementation, the 2005 Monitoring Plan was approved by the MDA and the MPCA. Groundwater quality mentioning includes semi-annual sampling and testing for dissolved arsenic, of eighteen groundwater monitoring wells, five of which are located on the site.

On August 25, 2011, the MDA Incident Response Unit (IRU) and the MPCA issued a Commissioners' Joint Certificate of Completion of Response Actions for the remedial investigation and response actions associated with the former CMC Heartland Lite Yard.

We reviewed the Groundwater Monitoring Report – December 2013 Event conducted by Peer Engineering, Inc. (Peer), dated February 28, 2014, that was prepared to document the annual groundwater monitoring event conducted in December 2013 from groundwater monitoring wells

associated with the Hiawatha Business Center. The December 2013 Groundwater Monitoring Report summarized the results of the groundwater-monitoring event conducted on December 2 through 4, 2013 (the December 2013 Monitoring Event). The monitoring network includes eighteen (18) groundwater monitoring wells (the Groundwater Monitoring Wells), five of which are located on the Property (MW-22, MW-28, MW-30, MW-31 and MW-32). The December 2013 Monitoring Event included sampling of all 18 Groundwater Monitoring Wells. The November 2010 Monitoring Event marked the conclusion of five years of post cleanup groundwater monitoring, which was a requirement of the 2005 Ground Water Monitoring Plan. In the November 2010 Groundwater Monitoring Report, Peer recommended changing the groundwater monitoring frequency from semi-annual to annual, and conducting two additional years of groundwater monitoring to confirm the effectiveness of soil cleanup activities conducted at the property in 2004-2005. MDA approved this modification in sampling frequency in a letter dated April 14, 2011. The November 2012 Monitoring Event marked the conclusion of two years of annual monitoring. In an MDA letter dated June 3, 2013, they requested an additional three years of annual groundwater monitoring including sampling and water level elevation measurement.

The following observations were provided regarding the results from the December 2013 Monitoring Event:

- Dissolved arsenic has previously been detected at varying concentrations in groundwater samples from Overburden Wells MW-28, MW-30 and MW-31 located on the Property. MW-28 is located in the southwestern portion of the Property, immediately downgradient of the area referred to in previous environmental reports as the "former Hot Spot Area" where deep soil impacts were remediated during soil response cleanup actions conducted by Peer from October 2004 through July 2005. During the December 2013 Monitoring Event, MW-30 showed increased dissolved arsenic concentrations while MW-28 and MW-31 remained the same (10,000 µg/l and non-detect, respectively) with respect to the November 2012 Monitoring Event. The dissolved arsenic concentration in MW-30 was 3,100 µg/l vs. 1,100 µg/l for the November 2012 Monitoring Event. Overall, the dissolved arsenic concentration in MW-30 has historically fluctuated from the high of 4,600 µg/l in November 2010 to a low of 390 µg/l in May 2009 since it's installation in 2006. MW-28 has had a general decreasing trend since May 2007 when the well had a historic high concentration of 20,000 µg/l. Dissolved arsenic has not been detected in MW-31 above the laboratory reporting limit of 2.0 µg/l for the last eleven monitoring events.

- Eleven Overburden Wells are located off the Property. All eleven of the Overburden Wells were sampled during the December 2013 Monitoring Event. Dissolved arsenic was detected in seven of the eleven Overburden Wells located off the Property (MW-16R, MW-17, MW-

17A, MW-18, MW-23, MW-27, and MW-29). Overburden Wells MW-16R and MW-29, and deep overburden well MW-17A showed increased dissolved arsenic concentrations during the December 2013 Monitoring Event as compared to the November 2012 Monitoring Event. MW-17A was installed in 1997. The concentration of dissolved arsenic detected in MW-17A was 700 µg/L; this well has had a historical average concentration of 477 µg/L with concentrations fluctuating from a low of 2.6 µg/L in November 2012 to a high of 1,500 µg/L in November 2011. Overburden Wells MW-17, MW-18, MW-23, and MW-27 each showed decreased dissolved arsenic concentrations as compared to the November 2012 Monitoring Event. Dissolved arsenic was not detected at or above the laboratory reporting limit of 2.0 µg/L in the three other Overburden Wells located off the Property which were sampled during the December 2013 Monitoring Event (i.e. MW-19, MW-20, MW-21, and MW-27C). These four Overburden Wells are located south, southwest, and west of the Property outside the downgradient extent of groundwater impacts.

- Dissolved arsenic was detected in the Platteville Limestone Well MW-18C during the December 2013 Monitoring Event at a concentration of 11 µg/L, which was an increase from the November 2012 concentration of 4.9 µg/L. MW-18C was installed in 2002, and historical concentrations of dissolved arsenic have fluctuated from 1.9 µg/L in June 2002 to 200 µg/L in November 2006.

- Dissolved arsenic was at concentrations just above the reporting limit of 2.0 µg/L in Sandstone Wells MW-22 and MW-32 during the December 2013 Monitoring Event. Both of these wells have had previous dissolved arsenic detects of a similar magnitude. Dissolved arsenic was not detected at or above the laboratory reporting limit of 2.0 µg/L in Sandstone Well MW-18D during the December 2013 Monitoring Event. Sandstone Wells MW-22 and MW-32 are located in the southwestern and southeastern portions of the Property, respectively. Sandstone Well MW-18D is located off and upgradient of the Property and southwest of the intersection of Cedar Avenue South and East 28th Street.

The December 2013 Monitoring Event represents the first of three additional years of annual groundwater monitoring, which was requested by the MDA in a letter dated June 3, 2013. Peer will conduct the second year of additional annual monitoring in November 2014 (the November 2014 Monitoring Event). This event will include water level monitoring of all 18 monitoring wells and sampling/testing of the following 15 wells: MW-16R, MW-17, MW-17A, MW-18, MW-18D, MW-22, MW-23, MW-27, MW-27C, MW-28, MW-29, MW-30, MW-31, and MW-32 (does not include MW-19, MW-20 and MW-21). The results will be submitted to the MDA in a report to be entitled Groundwater Monitoring Report– November 2014 Event in early 2015.

Tables and Figures from the December 2014 Monitoring Event are attached in Appendix E.

Hiawatha Business Center/Chicago Milwaukee Corp/Rollins Oil Company/Vacant Property/UMP Smileys Clinic/Greenway Surgery Center, 2000 - 2100 East 28th Street/2000 - 2020 East 28th Street/2016 - 2100 East 28th Street/2020 East 28th Street, located on an adjoining property east of the Site. The EDR report indicates the facility is listed on the LUST, Brownfields, VIC, SRS, Liens, and Institutional Control databases. Two releases were reported at the facility. The first release was reported to the MPCA on August 29, 1989 and assigned Leak #1583. The second release was reported to the MPCA on December 13, 1995 and assigned Leak #9035.

Rollins Oil operated the site as an AST bulk facility from 1943 to 1986, leasing the property from several railroad companies. After the tanks were removed in 1987, a small pool of free product was observed below one of the ASTs, which had a hole in the bottom of it. The release was reported to the State Duty Officer and assigned Leak #1583 by the MPCA. According to documents reviewed, groundwater contamination and free product were associated with the release. Groundwater monitoring began at the site in 1991. No groundwater contamination was detected in samples collected from downgradient monitoring wells. The approximate length of the groundwater plume was 100 feet that extended to the north. High levels of contamination were near the area of the ASTs. Six years of groundwater monitoring indicated that the plume was stable. Low levels of free product remained at the site with the levels remaining stable between 0.15 and 0.03 feet for four years. The MPCA closed Leak #1583 on October 10, 1997.

A petroleum release in the vicinity of the former ASTs at the property was reported to the State Duty Officer on December 13, 1995 and assigned Leak #9035 by the MPCA. Based on investigation results, contaminated soil remained at the property and groundwater contamination were associated with the release. Corrective actions regarding the petroleum release from the former ASTs did not appear warranted. The MPCA closed Leak #9035 on January 9, 1996.

B.4. Additional Federal, State, and Local Environmental Records

To enhance and supplement the regulatory database report, we obtained or reviewed practically reviewable or reasonably ascertainable local city and/or county records and/or additional state records to identify records that indicate known or potential recognized environmental conditions at the Site.

B.4.a. City of Minneapolis

We retained Historical Information Gatherers, Inc. (HIG) to conduct a file review of the City of Minneapolis (City) files regarding land-use activities at the Site. A copy of the files received from HIG are attached in Appendix F.

According to the files reviewed, a frame shed for a coal shed was constructed at the Site in 1911 for The St. Paul and Western Coal Company. Other buildings were constructed, additions were constructed, and buildings were demolished at the Site while a coal company occupied the Site until the mid-1940s. A permit was issued in 1945 for a warehouse to be constructed at the Site. An oil burner permit was issued in 1946. The permit indicates two 10,500-gallon storage tanks were used to store the fuel oil for the oil burner. A Hazardous Material Inventory Statement dated 2012 stated that two 10,000-gallon fuel oil storage tanks were located in the basement.

The files indicate the Site building has an approximate footprint of 233,000 square feet with a basement of approximately 2,550 square feet constructed in 1946. A 1982 fire department inspection document stated that the warehouse at the Site stored herbicides, insecticides, resins, tires, degreasing agents, fertilizers, isopropyl alcohol, asphalt adhesives and other combustibles before being transported off-site.

B.4.b. Well Databases

The Minnesota Geological Survey (MGS) maintains the Minnesota County Well Index (MCWI) , which is a limited database of water well records. The MCWI was accessed through the Minnesota Department of Health (MDH) website. Not all private water wells are listed in that database.

Our review of the MCWI database revealed no documentation of water wells located on the Site.

B.4.c. State Regulatory Web Pages

We accessed MDA "What's In My Neighborhood" Agricultural Interactive Mapping web page and the MPCA's "What's In My Neighborhood" web pages for information regarding the potential for the Site, adjoining properties, or surrounding properties to be of environmental concern that were not identified in the regulatory database report.

We did not identify facilities on the state regulatory web pages we accessed that were not already listed in the EDR report discussed in Section B.2 above.

B.5. Historical-Use Information

The objective of the historical-use information review was to develop a history of the previous uses of the Site and surrounding area, to help evaluate the likelihood of past uses having led to recognized environmental conditions in connection with the Site.

B.5.a. Historical Maps

We retained EDR to obtain fire insurance maps of the Site and surrounding area. EDR provided fire insurance maps for the years 1912, 1924, 1949, 1950, 1952, 1963, 1968. Copies of the fire insurance maps are attached in Appendix G.

1912

Buildings associated "The St. Paul & Western Coal Co's Yard No. 2" are located on the southeastern portion of the Site. The buildings consist of an office, coal bins, a coal shed, and a coal hopper. A notation in the area of a small building indicates that a 100-gallon gasoline UST is located at the Site. A railroad spur enters the Site near the northeast corner of the Site and continues to the structures on the southeastern portion of the Site. Railroad tracks are located on the adjoining property east of the Site. East 28th Street and Longfellow Avenue border the Site to the south and west, respectively. East 27th Street terminates near the northwest corner of the Site. A foundry is located on an adjoining property south of the Site. The properties to the north and west of the Site are vacant.

1924

The Site appears relatively similar to the 1912 historical map except that six residential dwellings are located along the western Site boundary and a machine shop is apparent in the southwest corner of the Site. The coal yard on the Site changed ownership to "The M.A. Hanna Coal & Dock Co." A valve manufacturing company is located on an adjoining property southwest of the Site. The adjoining property north of the Site is occupied by the City of Minneapolis Material Storage Yard of the Water and Bridge Departments. The adjoining properties northwest, southwest, and west of the Site are developed with residential dwellings.

1949

The Site and adjoining properties appear similar to the 1924 historical map except that the majority of the Site is developed with a warehouse occupied by Sears Roebuck & Company. A small basement is located in the east-central portion of the building.

1950 - 1952

The Site and adjoining properties appear similar to the 1949 historical map except that residential dwellings on the western portion of the Site have been removed. A farm implement warehouse and parking area are located in the northeastern portion of the Site.

1963 - 1968

The Site and adjoining properties appear similar to the 1952 historical map except the machine shop in the southwestern corner of the Site and the farm implement warehouse in the northwestern corner of the Site have been removed.

B.5.b. Historical Topographic Maps

The USGS topographic map used for the figure in Appendix A is dated 1967 with revisions made in 1993.

The majority of the Site is developed with a warehouse. Railroad tracks are located along the eastern boundary and the adjoining property to the east.

B.5.c. Aerial Photographs

We retained HIG to obtain aerial photographs of the Site and surrounding area. HIG provided aerial photographs for the years 1938, 1947, 1956, 1961, 1966, 1974, 1978, 1983, 1988, 1993, 1997, 2000, 2004, 2009, and 2012. Copies of the aerial photographs are attached in Appendix H.

1938

The majority of the Site consists of a coal storage yard. Buildings are located on the northeast corner and southwest corner of the coal yard. Residential properties are located on the western portion of the Site. A building consistent with the machine shop on the historical maps is located in the southwest corner of the Site. Buildings consistent with the foundry and valve company are apparent on the adjoining properties south and southwest of the Site, respectively. A railroad switch yard is located on the adjoining property east of the Site. The adjoining property north of the Site is occupied by the City of Minneapolis Material Storage Yard of the Water and Bridge Departments as depicted on the historical maps. The adjoining properties northwest, southwest, and west of the Site are developed with residential dwellings. East 28th Street and Longfellow Avenue border the Site to the south and west, respectively. East 27th Street terminates near the northwest corner of the Site.

1947

The Site and adjoining properties appear similar to the 1938 aerial photograph except that the majority of the Site is developed with a warehouse. ASTs are apparent on the property southeast of the Site between the railroad tracks.

1956

The Site and adjoining properties appear similar to the 1947 aerial photograph except that a majority of the residential dwellings on the western portion of the Site have been removed and replaced with outdoor storage and a farm implement warehouse as depicted on the historical maps.

1961 - 1974

The Site and adjoining properties appear similar to the 1956 aerial photograph except the machine shop in the southwestern corner of the Site has been removed and replaced with a parking area.

1978 - 2012

The Site appears similar to the 1974 aerial photograph except the farm implement warehouse has been removed. The northern three-quarters of the western portion of the Site consists of a parking area for semi-trailers and the southern one-quarter consists of a paved parking area. The adjoining properties appear similar to the 1974 aerial photograph until the 1993 aerial photograph when the storage tanks and railroad tracks on the adjoining property east of the Site were removed. Between the 2004 and 2009

aerial photographs, the building on the southern portion of the adjoining property east of the Site was removed and an office building was constructed. A bike/walking path is apparent off-site along the eastern Site boundary.

B.5.d. City Directory Information

We retained HIG to obtain city directory information pertaining to the Site and surrounding area. HIG provided city directories for West 28th Street and Longfellow Avenue at approximate five-year intervals from 1930 to 2012.

The following occupants were listed as occupying the Site for the indicated years:

1860 East 28th Street

1930 - 1940	coal yard
1946	No listing
1952 - 1977	Sears Roebuck & Co. (warehouse)
1981/82 - 1999	warehouse/distribution
2002 - 2012	Roof Depot/Building Material Supply/Ax Man Surplus/McGean Rohco

1854 East 28th Street

1930 - 1952	Minnehaha Lake Motor Parts
1957	Vacant
1962 - 2012	No listing

B.6. Previous Environmental Documents

We reviewed the following previous environmental documents regarding the Site provided to us by the Client:

***Phase I Environmental Site Assessment Update, Mattaini Warehouse, 1860 East 28th Street, Minneapolis, Minnesota*, prepared by Nova Environmental Services, Inc. (Nova), Project No. M98-0362, dated March 26, 1998 (1998 Nova Phase I ESA Update).**

At the time of the 1998 Nova Phase I ESA Update, the Site consisted of approximately 7.7 acres and was occupied by an approximately 234,000-square-foot, one-level warehouse and distribution building. The southwestern part of the building contained an office area and the east-central part of the building contained a sub-grade boiler room and a vault housing two 10,000-gallon aboveground fuel oil storage tanks.

A water tower was located on the roof on the east-central portion of the building. The water tower was not in use at the time of the 1998 Nova Phase I ESA Update and was believed to have been formerly used to store water used in the building's boilers. The water tower was reportedly not associated with any on-site wells and was filled with city-provided water when in use.

The 1998 Nova Phase I ESA Update revealed no evidence of recognized environmental conditions in connection with the Site except the following:

- Review of a previous assessment of the Site indicated that an underground storage tank was installed at the Site in 1951 and removed in 1975. No documentation was available concerning the condition of the tank or surrounding soils at the time of removal. If the tank impacted surrounding soils, impacted soils may be present at the Site.

- Based on the review of regulatory agency databases, a number of facilities in the vicinity of the Site have been associated with releases of petroleum products and other hazardous substances, which have likely impacted groundwater conditions in the Site area on a regional level and may have impacted groundwater beneath the Site. Two groundwater monitoring wells, likely associated with a release investigation, were observed adjacent to the east of the Site.

***Phase II Limited Subsurface Investigation, 1860 East 28th Street, Minneapolis, Minnesota,* prepared by Nova, Project No. M98-0405, dated April 1, 1998 (1998 Nova Phase II).**

The purposes of the 1998 Phase II was to assess whether a former gasoline UST may have impacted soil beneath the Site. Two soil borings were advanced at the Site in the assumed former location of a UST, indicated on a fire insurance map (see 1912 map described in Section B.5.a above). One soil sample was collected from the bottom of each soil boring at a depth of approximately 16 feet below ground surface and submitted for analyses of BETX and GRO.

No detectable concentrations of organic vapors, BETX, or GRO were observed in any of the sample analyzed. Based on the results of this limited investigation, Nova found no evidence that the subsurface was impacted by the former gasoline UST. No further investigation was recommended.

***Phase I Environmental Site Assessment, Roof Depot Property, 1860 East 28th Street, Minneapolis, Minnesota*, prepared by Frontline Environmental (Frontline), dated August 2001 (2001 Frontline Phase I ESA).**

At the time of the 2001 Frontline Phase I ESA, the Site was occupied by Roof Depot for warehouse and distribution purposes. The 2001 Frontline Phase I ESA stated that portions of the Site has been used for housing, coal storage, warehousing, machining, as well as other commercial purposes. From at least 1912 though 1944 the eastern portion of the Site was used as a coal storage yard. The building at the Site was constructed in 1947 and used by Sears Roebuck and Company as a warehouse for merchandise from until 1947 until 1979. Since 1979 the Site had been used for various commercial purposes in addition to warehousing. The western portion of the Site along Longfellow Avenue had been used largely for residential purposes. The lot on the northeast corner of Longfellow Avenue and East 28th Street has been used for machining and foundry activities, as well as for motor parts sales and auto repair. Adjacent properties to the north, east, and south have historically been used for industrial properties.

According to the 2001 Frontline Phase I ESA, there were two concrete lined sumps in the lower level boiler room associated with the boilers to discard water from the boilers. Building drawings indicated the sumps were labeled "boiler blowoff basin" and "duplex sump." A vertical chute in the boiler room was used to transport items between the main floor and the boiler room. In building drawings, the chute was referred to as a refuse chute and the room at the bottom of the chute was referred to as the refuse room.

The 2001 Frontline Phase I ESA identified the following recognized environmental conditions regarding the Site:

- Documented elevated levels of arsenic in the groundwater under the Site originating from an adjacent property.
- Documented elevated levels of dissolved mercury in the groundwater under the Site. No source for the elevated mercury levels had been identified.
- Documentation showing an underground storage tank on the Site in the early-1900s with no further information available.
- Documentation showing the installation in 1951 and removal in 1975 of a 560-gallon capacity gasoline underground storage tank with no information available on the condition of the tank, lines, dispenser, or soil during removal.
- Potentially elevated levels of various metals associated with precipitation and leaching from outdoor coal storage on the Site.

- Potentially elevated levels of arsenic and lead in the soil originating from an adjacent property.

- Potentially elevated levels of petroleum compounds in the groundwater from petroleum releases on adjacent properties located hydraulically up gradient from the Site.

- Potentially elevated levels of lead in the groundwater from releases on adjacent properties located hydraulically up gradient from the Site.

***Phase II Environmental Investigation Report, Roof Depot Property, 1860 East 28th Street, Minneapolis, Minnesota*, prepared by Frontline, dated December 2001 (2001 Frontline Phase II Report).**

Frontline advanced eight push probe soil borings at the Site. Two of the push probes (SB-6 and SB-7) were advanced outside the building and the remaining six push probes (SB-1 through SB-5 and SB-8) were advanced within the building. Soil samples were collected for metals analysis from borings SB-1 through SB-5 and SB-8. Soil samples from SB-6 and SB-7 were collected only for arsenic and lead. In addition to arsenic and lead, SB-6 and SB-7 were advanced in areas where information from the 2001 Frontline Phase I ESA suggested the past presence of petroleum-related USTs to be located. As a result, one soil sample was collected from each boring at a depth of 16 feet below ground surface for laboratory analysis of DRO, GRO, and BETX.

Coal was encountered in four of the six borings (SB-2, SB-3. SB-4, and SB-8) advanced on the eastern portion of the Site within the building. Where encountered, the coal was mixed with sand and in some cases wood (SB-2) and slag (SB-4) and ranged from six inches (SB-8) to three feet (SB-4) in thickness. At SB-4, the coal and sand mixture was encountered from immediately below the concrete floor of the building to a depth of 3 feet and again at a depth of 13 to 14 feet below ground surface. Concrete was encountered in SB-4 at a depth of approximately 3 feet below ground surface. Groundwater at the Site was encountered between approximately 29 feet to 32 feet below ground surface.

The 2001 Phase II Report stated the metal analysis results indicated the concentrations were within the lower portion of common ranges for metals in soil suggesting that there were no elevated levels of metals in the soil samples. According to the 2001 Phase II Report, the uniformity of the metal analysis results across the Site at varying depths also suggested the levels of metals in the samples represented background conditions. No DRO, GRO, or BETX were detected in samples SB-6 and SB-7 above laboratory method detection limits.

Groundwater samples were collected from each boring except for SB-2 where auger refusal occurred at 24.5 feet below ground surface. Groundwater samples were collected for laboratory analysis of DRO, GRO, BETX, lead, and mercury. All groundwater samples had elevated levels of lead ranging from 102 micrograms per liter (µg/l) at SB-8 to 332 µg/l at SB-1. Laboratory results for seven of the groundwater samples analyzed for mercury ranged from 0.276 µg/l at SB-8 to 1.82 µg/l at SB-3. At the time of the 2001 Frontline Phase II Report, the United States Environmental Protection Agency's (US EPA) Maximum Contaminant Level for mercury in public drinking water systems was 2 µg/l. No DRO, GRO, or BETX were detected in any of the groundwater samples collected except for SB-5 and SB-6, which had concentrations at 100 µg/l and 120 µg/l, respectively. Both of the results were at their respective method detection limits.

The 2001 Frontline Phase II Report concluded the following:

- Based on the laboratory results from the eight soil samples collected during the Phase II, it did not appear that elevated levels of the sixteen metals sampled for were present in the soil at the Site.

- No DRO, GRO, or BETX were detected in the soil samples collected from the areas at the Site where petroleum related USTs may have previously been located.

- Two of the seven groundwater samples had levels of DRO at 100 µg/l and 120 µg/l. It was Frontline's opinion that the levels of DRO in the water table were insignificant.

C. Interviews

We contacted the following individual to obtain knowledge or historical and current land-use information regarding the Site:

Mr. Tim Sauro, Project Manager, MG McGrath (Site owner)

According to Mr. Sauro, the Site consists of two parcels totaling approximately 7.7-acres and developed with a building occupied by warehouse and construction retail sales. Mr. Sauro stated that the building has a footprint of approximately 227,961-square feet and was constructed in 1947. Additional information obtained from Mr. Sauro is in Section D.

D. Site Reconnaissance

The objective of the Site reconnaissance is to obtain information indicating the likelihood of identifying recognized environmental conditions in connection with the Site.

A Braun Intertec environmental professional, Kevin Hoffman, conducted a Site reconnaissance on January 22, 2015. We were accompanied during the Site reconnaissance by the following individuals:

Mr. Dan Friedner, Vice President, Colliers International (broker for the Site owner)

Mr. Chris Backes, Project Manager, Property Services, City of Minneapolis (potential buyer representative)

At the time of the Site reconnaissance, the weather was clear and breezy with a temperature of about 20 degrees Fahrenheit.

D.1. Site Characteristics

At the time of the reconnaissance, the Site consisted of two parcels totaling approximately 7.63 acres and developed with a warehouse building. Loading dock areas were located on the west side of the building. The Site topography was relatively flat with a gentle slopes downward toward stormwater catch basins in the paved parking and storage area on the eastern portion of the Site.

D.2. Adjoining Property Use and Characteristics

The Site was bordered on the north by residential property and the City of Minneapolis Public Works with residences located beyond; on the east by the Midtown Greenway and University Hospital Services with Hiawatha Avenue located beyond; on the south by East 28th Street, Bituminous Roadways, Smith Foundry, and Dalsin & Son with a cemetery located beyond; and on the west by Longfellow Avenue and residential properties with residential properties located beyond. The Site was located in a light-industrial and residential area within the city of Minneapolis.

No observations of environmental concern were noted on adjoining properties to the Site at the time of the reconnaissance, with the exception of the Smith Foundry and Bituminous Roadways located southwest of the Site.

D.3. Site Improvements and Layout

The Site was developed with an approximately 228,000-square-foot warehouse building constructed in 1947. Access to the Site was provided by a driveway located on the south side of the Site from East 28th Street. The building was located on the eastern portion of the Site and paved parking and outdoor storage on the western portion of the Site. The building was heated by three combination natural gas- and fuel oil-fired boilers located in the basement on the east-central portion of the building. A Site Sketch and Site Photographs are attached in Appendices B and I, respectively.

D.4. Pits, Ponds, or Lagoons

No indications of pools of liquids, standing water, cisterns, cesspools, or other surface-water features were observed at the Site or on adjoining properties at the time of our reconnaissance.

D.5. Stained Soil, Pavement, or Corroded Surfaces

No stained or discolored soil or pavement was observed at the time of the Site reconnaissance, with the exception of small oil stains located within the parking areas. It is our opinion that this staining is considered a *de minimis* condition for the Site.

D.6. Solid Waste Disposal

No indications of waste disposal areas, observed fill or graded areas by non-natural causes, mounds, depressions, or burn pits were observed at the Site at the time of the reconnaissance.

Solid wastes generated at the Site are disposed in dumpsters at the Site and are serviced by Veolia and Allied Waste.

D.7. Stressed Vegetation

No areas of stressed, discolored, stained or dead vegetation beyond what would be expected due to seasonal conditions were observed at the time of the Site reconnaissance.

D.8. Hazardous Substances

One parts washer was observed in the west-central portion of the warehouse area. Based on our observations, it appeared the parts washer had not been used for some time. No indications of leaks, spills, or staining were observed on the concrete floor in the vicinity of the parts washer. Mr. Sauro was not aware of hazardous substances located at the Site.

D.9. Petroleum Products

Three flammable storage lockers, four 55-gallon drums, and small containers (5-gallons or less) of lubricants were observed in a petroleum storage area in the east-central portion of the building near the stairs leading to the basement. The flammable storage lockers contained 5-gallon containers of gasoline and smaller containers (1-gallon and less) of oil-based stains and paints, spray paint, spray lubricants, and spray engine cleaners. The 55-gallon drums contained used anti-freeze, used oil, new oil, and used clay-based floor dry. Minor staining was observed on the concrete floor in the petroleum storage area. The floor appeared in relatively good condition and no floor drains were noted in the area.

Leaking hydraulic fluid was observed on the concrete floor in the northwest portion of the warehouse area. The hydraulic fluid was leaking from an attachment for a forklift. The floor appeared in relatively good condition and no floor drains were noted in the area.

Two 55-gallon drums were observed on a secondary containment pallet in the northwest portion of the warehouse. The drums contained used and new oil. No staining was observed in the area of the two 55-gallon drums.

D.10. Storage Tanks

Two 10,000-gallon fuel oil storage tanks are located in a room between the basement and ground level in the east-central portion of the warehouse area. The fuel oil is used as an alternate fuel source for the boilers located in the basement. Besides the two 10,000-gallon fuel oil storage tanks, Mr. Sauro was not aware of additional storage tanks currently or previously located at the Site.

D.11. Unidentified Drums and Containers

No drums containing unidentified substances suspected of being a hazardous substance or petroleum product were observed at the Site at the time of our reconnaissance.

D.12. Odors

No indications of strong, pungent, or noxious odors were observed at the time of the Site reconnaissance.

D.13. Potential PCB-Containing Electrical and Hydraulic Equipment

One slab-mounted electrical transformer was located near the southwest corner of the building. No indications of leaking or staining was observed on the concrete slab beneath the transformer.

D.14. Wastewater Discharges

No indications of wastewater discharging into a drain, ditch, underground injection system, or stream on or adjacent to the Site were observed at the Site at the time of the reconnaissance.

Two sumps were observed in the basement of the warehouse adjacent to the boilers. According to Mr. Sauro, the sumps are used as emergency backup for the boilers. Mr. Sauro is not aware of any groundwater entering the sumps.

D.15. Sewage Disposal System

According to Mr. Sauro, the Site is connected to municipal sewer services.

D.16. Wells

No indications of wells such as monitoring wells, dry wells, irrigation wells, injection wells, abandoned wells, or other non-potable wells were observed at the Site at the time of the reconnaissance.

Five groundwater monitoring wells were observed off-site near the southwest corner and adjoining property southeast and east o f the Site. One of the two groundwater monitoring wells near the southwest corner o f the Site was unlabeled and the other had Unique ID Number 549026. Two groundwater monitoring wells southeast of the Site had Unique ID Numbers 733214 and 608680. The groundwater monitoring well on the adjoining property east of the Site had Unique ID Number 733213. The groundwater monitoring wells are associated with contamination originating from the former CMC Heartland Site on the adjoining property east of the Site.

D.17. Potable Water Supply

According to Mr. Sauro, the Site is connected to municipal water services. A water tower was observed on the roof on the east-central portion of the building. According to Mr. Sauro, the water tower is no longer in use and was formerly used in association with the fire system.

E. Summary of Land-Use Activities

E.1. Historical Site and Adjoining Property Land Use

The Site has been used for housing, coal storage, warehousing, machining, as well as other commercial purposes. From at least 1912 though 1944 the eastern portion of the Site was used as a coal storage yard. The building at the Site was constructed in 1947 and used by Sears Roebuck and Company as a warehouse for merchandise from until 1947 until 1979. Since 1979 the Site had been used for various commercial purposes in addition to warehousing. The western portion of the Site along Longfellow Avenue had been used largely for residential purposes. The lot on the northeast corner of Longfellow Avenue and East 28th Street has been used for machining and for motor parts sales and auto repair. Adjoining properties to the north, east, and south have historically been used for industrial properties.

E.2. Current Site and Adjoining Property Land Use

At the time of the reconnaissance, the Site consisted of two parcels totaling approximately 7.63 acres and developed with a warehouse building. Loading dock areas were located on the west side of the building. The building was located on the eastern portion of the Site and paved parking and outdoor storage on the western portion of the Site.

F. Limiting Conditions and Data Gaps

The findings and conclusions presented in this report are based on procedures described in ASTM Practice E1527-13, inquiries with public officials, available literature cited in this report, conditions noted at the time of our Phase I ESA, and our interpretation of the information obtained as part of this Phase I ESA. Our findings and conclusions are limited to the specific project and properties described in this report and by the accuracy and completeness of information provided by others.

An environmental site assessment cannot wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with a property. Performance of this practice is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions in connection with a property within reasonable limits of time and cost.

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

The following limiting condition was encountered:

- Observation of the landscaped areas of the Site and adjoining properties was limited due to snow cover.

The identified limiting condition did not affect the environmental professional's ability to render opinions regarding conditions indicative of a release or threatened release.

No data gaps were identified during the Phase I ESA process, with the exception of the following:

- Historical resources were not readily available for 5-year-or-less intervals from the time of the first developed use.

The identified data gap did not affect the environmental professional's ability to render opinions regarding conditions indicative of a release or threatened release.

G. Findings

The findings include identified known or suspect recognized environmental conditions, controlled recognized environmental conditions, historical recognized conditions, *de minimis* conditions and additional issues in connection with the Site.

The following findings are based on the results of our assessment:

- From at least 1912 though 1944 the eastern portion of the Site was used as a coal storage yard. As part of a Phase II completed in 2001, coal was encountered in four of the six borings advanced on the eastern portion of the Site within the building footprint. In addition, concrete was encountered in one of the soil borings.

- The building at the Site was constructed in 1947 and used by Sears Roebuck and Company as a warehouse for merchandise from until 1947 until 1979. Since 1979 the Site had been used for various commercial purposes in addition to warehousing.

- The western portion of the Site along Longfellow Avenue had been used largely for residential purposes. The lot on the northeast corner of Longfellow Avenue and East 28th Street has been used for machining and for motor parts sales and auto repair.

- The former CMC Heartland Site was located on the adjoining property east of the Site. Historically, the site had over 100 years of industrial use, and formerly supported a railroad yard, a lumber storage yard with woodworking and machine shop operations, an agricultural chemical manufacturing business, and two bulk petroleum storage facilities. Groundwater monitoring wells associated with CMC Heartland were observed on adjoining properties to the Site.

- In February 1999, expired roofing materials, such as glues, resins, and adhesives, and other hazardous waste were buried in an abandoned sub-grade loading dock at the Site. The waste materials were excavated in February 2000 and placed in approximately fifty 55-gallon drums and shipped to a hazardous waste facility.

- Petroleum storage and minor staining were observed in the warehouse area of the Site building.

- Two 10,000-gallon fuel oil storage tanks are located in a room between the basement and ground level in the east-central portion o f the warehouse area.

- The government database records review identified several regulated facilities within the vicinity of the Site.

H. Opinions

According to the User, the Phase I ESA was conducted in association with the purchase and potential redevelopment of the Site. Opinions expressed herein are influenced by the stated reason for conducting the Phase I ESA. Furthermore, the expressed opinions might not be applicable to alternate reasons for reliance on the content of the Phase I ESA.

H.1. Recognized Environmental Conditions

A recognized environmental condition is defined by ASTM Practice E1527-13 as: "the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: 1) due to any release to the environment, 2) under conditions indicative of a release to the environment: or 3) under conditions that pose a material threat of a future release to the environment. *De minimis* conditions are not recognized environmental conditions."

This assessment identified no recognized environmental conditions in connection with the Site, with the exception of the following:

- From at least 1912 though 1944 the eastern portion of the Site was used as a coal storage yard. The western portion of the Site along Longfellow Avenue had been used largely for residential purposes prior to the construction of the paved parking and outdoor storage area. As part of a Phase II completed in 2001, coal was encountered in four of the six borings advanced on the eastern portion of the Site within the building. In addition, concrete was encountered in one of the soil borings. The potential exists that buried materials, which could include demolition debris, urban fill consisting of ash, slag or clinker material, and other wastes are located at the Site. It is our opinion the presence of coal and debris at the Site and the potential to encounter other materials at the Site during redevelopment is considered a recognized environmental condition.

- The lot on the northeast corner of Longfellow Avenue and East 28th Street had been used for machining and for motor parts sales and auto repair. A previous investigation did not encounter contamination in the area of the former machining and motor sales and auto repair facility. Considering the proposed redevelopment of the Site, the potential exists to encounter residual or previously unidentified contamination associated with the past use in that area of the Site. Therefore, it is our opinion the previous use of a machining facility and former motor parts sales and auto repair facility on the southwest corner of the Site is considered a recognized environmental condition.

- The former CMC Heartland Site was located on the adjoining property east of the Site. Historically, the site had over 100 years of industrial use, and formerly supported a railroad yard, a lumber storage yard with woodworking and machine shop operations, an agricultural chemical manufacturing business, and two bulk petroleum storage facilities. Based on information obtained from previous environmental investigations, a plume of groundwater contamination extends to the southwest beneath the Site originating from the former CMC Heartland Site property. It is our opinion contamination at the Site associated the former CMC Heartland Site property is considered a recognized environmental condition.

H.2. Controlled Recognized Environmental Conditions

A controlled recognized environmental condition is defined by ASTM Practice E1527-13 as "a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls."

This assessment identified no controlled recognized environmental conditions in connection with the Site.

H.3. Historical Recognized Environmental Conditions

A historical recognized environmental condition is defined by ASTM Practice E1527-13 as "a past release of any hazardous substances or petroleum products that has occurred in connection with the Site and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the Site to any required controls."

This assessment identified no historical recognized environmental conditions in connection with the Site, with the exception of the following:

- In February 1999, expired roofing materials, such as glues, resins, and adhesives, and other hazardous waste were buried in an abandoned sub-grade loading dock at the Site. The waste materials were excavated in February 2000 and placed in approximately fifty 55-gallon drums and shipped to a hazardous waste facility. Results of two soil push probes advanced through the concrete floor of the loading dock area revealed slightly elevated concentrations of toluene (99 parts per billion [ppb] to 4,900 ppb), which were significantly below the residential SRV for toluene in soil of 107,000 ppb. The MPCA issued a letter on December 15, 2000 indicating that no further action was necessary. Considering the investigation was given closure by the MPCA and the levels of toluene were below the residential SRVs, it is our opinion the removed buried materials in the area of the loading dock is considered a historical recognized environmental condition.

H.4. *De Minimis* Conditions

A *de minimis* condition is defined by ASTM Practice E1527-13 as "a condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies."

The following findings are considered *de minimis* conditions:

- The building at the Site was constructed in 1947 and used by Sears Roebuck and Company as a warehouse for merchandise from until 1947 until 1979. Since 1979 the Site had been used for various commercial purposes in addition to warehousing. It is our opinion the past and current use of the Site for warehousing and commercial purposes are considered *de minimis* conditions.

- Petroleum storage and minor staining were observed in the warehouse area of the Site building. Based on the relative small quantities of petroleum stored at the Site and staining observed, it is our opinion the petroleum storage at the Site is considered a *de minimis* condition.

- Two 10,000-gallon fuel oil storage tanks are located in a room between the basement and ground level in the east-central portion o f the warehouse area. Considering the location of the storage tanks and that a release from the storage tanks would unlikely go undetected for long, minimizes the potential for a release to impact the soil and/or groundwater at the Site. Therefore, it is our opinion the two 10,000-gallon storage tanks are considered a *de minimis* condition.

- The government database records review identified several regulated facilities in the vicinity of the Site. Based on information obtained from regulatory file reviews, mitigating factors that affect the apparent significance of the identified facilities on the Site, such as regulatory status, distance from the Site, location of the facility in relation to the groundwater flow direction, and/or the database(s) the identified regulated facilities are listed on, it is our opinion that the identified regulated facilities are considered *de minimis* conditions.

I. Conclusions

We have conducted this Phase I ESA of the Site in general conformance with the scope and limitations of ASTM Practice E1527-13. Any exceptions to, or deletions from, this practice are described in Section F of this report.

This assessment identified no recognized environmental conditions in connection with the Site, with the exception of the following:

- From at least 1912 though 1944 the eastern portion of the Site was used as a coal storage yard. The western portion of the Site along Longfellow Avenue had been used largely for residential purposes prior to the construction of the paved parking and outdoor storage area. As part of a Phase II completed in 2001, coal was encountered in four of the six borings advanced on the eastern portion of the Site within the building. In addition, concrete was encountered in one of the soil borings as well. The potential exists that buried materials which could include demolition debris, urban fill consisting of ash or clinker material, and other wastes are located at the Site. It is our opinion the presence of coal and debris at the Site and the potential to encounter other materials at the Site during redevelopment is considered a recognized environmental condition.

- The lot on the northeast corner of Longfellow Avenue and East 28th Street had been used for machining and for motor parts sales and auto repair. A previous investigation did not encounter any contamination in the area of the former machining and motor sales and auto repair facility. Considering the proposed redevelopment of the Site, the potential exists to encounter residual or previously unidentified contamination associated with the past use in that area of the Site. Therefore, it is our opinion the previous use of a machining facility and former motor parts sales and auto repair facility on the southwest corner of the Site is considered a recognized environmental condition.

- The former CMC Heartland Site was located on the adjoining property east of the Site. Historically, the site had over 100 years of industrial use, and formerly supported a railroad yard, a lumber storage yard with woodworking and machine shop operations, an agricultural chemical manufacturing business, and two bulk petroleum storage facilities. Based on information obtained from previous environmental investigations, a plume of groundwater contamination extends to the southwest beneath the Site originating from the former CMC Heartland Site property. It is our opinion contamination at the Site associated the former CMC Heartland Site property is considered a recognized environmental condition.

This assessment identified no historical recognized environmental conditions in connection with the Site, with the exception of the following:

- In February 1999, expired roofing materials, such as glues, resins, and adhesives, and other hazardous waste were buried in an abandoned sub-grade loading dock at the Site. The waste materials were excavated in February 2000 and placed in approximately fifty 55-gallon drums

and shipped to a hazardous waste facility. Results of two soil push probes advanced through the concrete floor of the loading dock area revealed slightly elevated concentrations of toluene (99 parts per billion [ppb] to 4,900 ppb), which were significantly below the residential SRV for toluene in soil of 107,000 ppb. The MPCA issued a letter on December 15, 2000 indicating that no further action was necessary. Considering the investigation was given closure by the MPCA and the levels of toluene were below the residential SRVs, it is our opinion the removed buried materials in the area of the loading dock is considered a historical recognized environmental condition.

J. References

References are listed in Appendix J.

K. Environmental Professional Statement and Qualifications

We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed the all-appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Qualifications of the environmental professional and the qualifications of the personnel conducting the site reconnaissance and interviews, if conducted by someone other than an environmental professional, are attached in Appendix K.

We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in §312.10 of 40 CFR 312.

BRAUN INTERTEC CORPORATION

Kevin J. Hoffman
Project Scientist

Mark A. Ciampone, PG
Associate Principal

Appendix A

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Appendix B

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Appendix K

Resumes

Phase II Environmental Site Assessment

Roof Depot
1860 East 28th Street and
2717 Longfellow Avenue
Minneapolis, Minnesota

Prepared For

City of Minneapolis

DRAFT

April 21, 2015
Project B1500394

Braun Intertec Corporation

Braun Intertec Corporation
11001 Hampshire Avenue S
Minneapolis, MN 55438

Phone: 952.995.2000
Fax: 952.995.2020
Web: braunintertec.com

April 21, 2015 Project B1500394

Mr. Chris Backes
Department of Public Works
City of Minneapolis
223 City Hall
350 South 5th Street
Minneapolis, MN 55415

Re: Phase II Environmental Site Assessment
Roof Depot
1860 East 28th Street and
2717 Longfellow Avenue
Minneapolis, Minnesota

Dear Mr. Backes:

On behalf of the City of Minneapolis, Braun Intertec Corporation conducted a Phase II Environmental Site Assessment (ESA) at the referenced site in Minneapolis, Minnesota (Site). The purpose of the Phase II ESA was to further evaluate the nature, magnitude, and extent of potential contamination associated with recognized environmental conditions (RECs) identified as part of the Phase I ESA.

If you have any questions or comments regarding this report, please call Jeremy Hansen at 952.995.2464 or Tim Lenway at 952.995.2488.

Sincerely,

BRAUN INTERTEC CORPORATION

Jeremiah R. Hansen
Senior Scientist

Timothy S. Lenway, MPH
Principal – Senior Scientist

Attachment:
Phase II Environmental Site Assessment

DRAFT

AA/EOE

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DRAFT

A. Introduction

On behalf of the City of Minneapolis, Braun Intertec Corporation conducted a Phase II Environmental Site Assessment (ESA) at the property located at 1860 East 28th Street and 2717 Longfellow Avenue in Minneapolis, Minnesota (Site). The purpose of the Phase II ESA was to further evaluate the nature, magnitude, and extent of potential contamination associated with recognized environmental conditions (RECs) identified as part of the Phase I ESA.

The investigation was prepared on behalf of, and for the use by the City of Minneapolis in accordance with the contract between the City of Minneapolis and Braun Intertec. No other party has a right to rely on the contents of this investigation without written authorization by Braun Intertec.

A.1. Site Location and Description

Address:	1860 28th Street East	2717 Longfellow Avenue
City:	Minneapolis	Minneapolis
County:	Hennepin	Hennepin
Property Identification Number:	36-029-24-32-0003	36-029-24-32-0075
Construction Year:	1946	None Provided
Owner:	1860 East 28th Street, LLC	Longfellow Warehouse Company
Parcel Size:	5.66 acres	1.97 acres
Latitude:	44.952 North	
Longitude:	93.244 West	
Site Section, Township, Range:	S 1/2 of the NW 1/4 of the SW 1/4 of Section 36, Township 29 North, Range 24 West	
Site Size:	7.63 acres	

The Site includes 1860 East 28th Street and 2717 Longfellow Avenue in Minneapolis, Minnesota and consists of a 5.66 acre warehouse and 1.97 acre paved surface parking lot. A Site location map and Site sketch are included as Figure 1 and Figure 2, respectively.

A.2. Previous Environmental Investigations

Braun Intertec conducted a Phase I ESA at the Site titled: *Phase I Environmental Site Assessment; Roof Depot; 1860 28th Street East and 2717 Longfellow Avenue; Minneapolis, Minnesota;* dated April 6, 2015. The following RECs were identified as part of the Phase I ESA:

- From at least 1912 though 1944 the eastern portion of the Site was used as a coal storage yard. The western portion of the Site along Longfellow Avenue had been used largely for residential purposes prior to the construction of the paved parking and outdoor storage area. As part of a Phase II completed in 2001, coal was encountered in four of the six borings advanced on the eastern portion of the Site within the building. In addition, concrete was encountered in one of the soil borings. The potential exists that buried materials which could include demolition debris, urban fill consisting of ash or clinker material, and other wastes are located at the Site.

- The lot on the northeast corner of Longfellow Avenue and East 28th Street had been used for machining and for motor parts sales and auto repair. A previous investigation did not encounter any contamination in the area of the former machining and motor sales and auto repair facility. Considering the proposed redevelopment of the Site, the potential exists to encounter residual or previously unidentified contamination associated with the past use in that area of the Site.

- The former CMC Heartland Site was located on the adjoining property east of the Site. Historically, the site had over 100 years of industrial use, and formerly supported a railroad yard, a lumber storage yard with woodworking and machine shop operations, an agricultural chemical manufacturing business, and two bulk petroleum storage facilities. Based on information obtained from previous environmental investigations, a plume of groundwater contamination extends to the southwest beneath the Site originating from the former CMC Heartland Site property.

The Phase I ESA identified no historical recognized environmental conditions in connection with the Site with the exception of the following:

- In February 1999, expired roofing materials, such as glues, resins, and adhesives, and other hazardous waste were buried in an abandoned sub-grade loading dock at the Site. The waste materials were excavated in February 2000, placed in approximately fifty 55-gallon drums, and shipped to a hazardous waste facility.

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A.3. Scope of Services

To meet the project objective, the following tasks were conducted at the Site as part of the investigation:

- Advanced 10 soil borings, six hand auger borings, two soil vapor probes, and three sub-slab soil vapor sampling points.
- Screened soil samples collected from the soil borings for the presence of organic vapors using a photoionization detector (PID).
- Collected soil, groundwater, and soil vapor samples for chemical analyses.
- Evaluated the data and prepared this report.

B. Investigation Methods and Procedures

The fieldwork relating to the investigation was conducted on March 25 and 26, 2015. The investigation locations are shown on Figure 2.

B.1. Soil Borings

Braun Intertec advanced 10 soil borings designated as PP-1 through PP-10. The soil borings were advanced to depths ranging from 15 feet to 35 feet below ground surface (bgs) using a push probe rig. Upon completion, each soil boring was sealed in accordance with Minnesota Department of Health (MDH) regulations. In addition, six hand auger borings, designated as HAB-1, HAB-2 and PP-11 through PP-14, were advanced within the building to depths between 2 and 4 feet bgs. Hand Auger Borings PP-11 through PP-14 were originally planned to be advanced using the push probe, but due to complications with sub-slab utilities, the push probe soil borings were changed to hand auger soil borings.

B.2. Soil Vapor Probes

Two soil vapor probes (labeled SV-1 and SV-2) were advanced using the push probe rig to drive the sampling rods to a depth of 10 feet bgs. The sampling rods were then retracted 1 foot to allow for sample collection.

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The three sub-slab soil vapor sampling points (labeled SSV-1 through SSV-3) were advanced to a depth of approximately 6 inches below the bottom of the Site building's concrete floor slab using a 1-inch-diameter rotary-hammer drill. A temporary sampling point was constructed using new, polyethylene tubing, well-grade sand, and hydrated bentonite.

B.3. Soil Classification

During advancement of the soil borings, soil samples were collected at 2-foot intervals to the termination depth of each soil boring. The soil encountered in the soil borings were visually and manually classified in the field by an environmental technician using American Society for Testing and Materials (ASTM) D 2487 "Unified Soils Classification System" and ASTM D 2488 "Recommended Practice for Visual and Manual Description of Soils." Additionally, soil was classified at the Braun Intertec soil laboratory by a geotechnical engineer using ASTM D 2487 and ASTM D 2488. Soil boring logs, with descriptions of the various soil strata encountered during the soil borings are included in Appendix A. The depths shown as changes between the soil types are approximate. The actual changes may be transitional, and the transition depths are likely to be horizontally variable.

B.4. Soil Screening

Soil samples retrieved were examined by an environmental technician, who was a licensed asbestos inspector for unusual staining, odors, and other apparent signs of contamination. In addition, the soil samples were screened for the presence of organic vapors using a PID. The PID was equipped with a 10.6-electron-volt lamp and calibrated to an isobutylene standard. The PID was used to perform a headspace method of field-analyses, as recommended by the Minnesota Pollution Control Agency (MPCA) in Petroleum Remediation Program Guidance Document 4-04 (September 2008).

B.5. Sampling and Analytical Testing

B.5.a. Soil Samples

A total of 12 soil samples were collected from the soil borings for chemical analysis. If potentially contaminated fill soil was identified, soil samples were collected for chemical analyses from the interval where potential impacts were identified. If no indications of contamination were encountered in the fill soil, samples for chemical analyses were collected from depths most likely to have been impacted by past land use.

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The soil samples were analyzed for the presence and concentrations for the following chemical parameters:

- Volatile organic compounds (VOCs) using the United States Environmental Protection Agency (EPA) Method 8260.
- Polyaromatic hydrocarbons (PAHs) using EPA Method 8270.
- Diesel range organics (DRO) using the Wisconsin Department of Natural Resources (WDNR) Method.
- Gasoline range organics (GRO) using WDNR Method.
- Priority Pollutant metals using EPA Methods 6020 and 7471.

B.5.b. Groundwater Samples

Temporary monitoring wells were installed within Soil Borings PP-8, PP-10, and HAB-2 in attempt to collect groundwater samples for laboratory chemical analysis. The temporary wells were constructed with new, one-inch diameter polyvinyl chloride (PVC) casing and screen. Dedicated polyethylene tubing fitted with a stainless-steel check valve was used to collect the groundwater samples. Groundwater was encountered and sampled in Soil Boring PP-8 at a depth of 31 feet bgs, in Soil Boring PP-10 at a depth of 26.5 feet bgs, and in HAB-2 at a depth of 4 feet below the boiler room floor slab located in the basement. The sample was placed in clean sample containers, preserved, labeled, and transported to Pace Analytical under refrigerated conditions using chain-of-custody procedures.

The groundwater sample was analyzed for the presence and concentration of VOCs, DRO, and priority pollutant metals.

B.5.c. Soil Vapor Samples

To collect the soil vapor samples (SV-1 and SV-2) from the soil vapor probes outside the building, new polyethylene tubing was attached to the top of the sampler. The sampling point and tubing were purged to remove two volumes of air prior to sample collection. After purging, the tubing was clamped closed, the sample canister was attached and the clamp released. The soil vapor sample was collected as a grab sample using laboratory-supplied negative pressurized air-sample collection canister in accordance with MPCA guidelines.

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Three sub-slab soil vapor samples (SSV-1 through SSV-3) were collected below the facility floor slab. Following construction of the sampling point, the point was purged using an Apex pump and a negative-pressure air-sampling canister was connected to the sample tubing to allow for collection of a grab sample. Following sample collection, the sample tubing and the bentonite were removed and the sample locations were patched with concrete.

The soil vapor samples were analyzed for the VOCs using EPA Method TO-15.

C. Investigation Results

C.1. Geologic Conditions

Two to four inches of bituminous pavement was encountered in each investigation location outside the facility. The bituminous was generally underlain by a sandy gravel aggregate base ranging from 2 to 8 inches thick. Six inches of concrete was observed below the bituminous in Soil Borings PP-2 and PP-9. The fill soil located beneath the pavement sections extended to depths between 2 feet and 6 feet bgs. The fill soil consisted primarily of silty sand with gravel. The underlying native soil consisted of poorly graded sand and poorly graded sand with gravel.

Inside the building the floor slab ranged from 7 inches to 8 inches thick. Fill soil beneath the floor slab consisted of silty sand to depths ranging from 2 feet to 4 feet. Native soil encountered underneath the building consisted of poorly graded sand with gravel. Soil boring logs are included in Appendix A.

C.2. Field Screening

No PID readings were detected above background levels and no evidence of staining or chemical odors were noted. The PID readings are included on the soil boring logs included in Appendix A. Trace clinker and coal was observed in the fill soil in Soil Borings PP-1, PP-11, PP-13 and PP-14; and concrete was observed in the fill soil in Soil Boring PP-7.

C.3. Soil Analytical Testing Results

The soil analytical testing results for samples collected from the soil borings are summarized in Table 1, and the laboratory analytical reports are attached in Appendix B. For comparison purposes, the tables also include MPCA Residential and Industrial Soil Reference Values (SRVs) and Soil Leaching Values (SLVs).

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The SRVs and SLVs are allowable risk-based contaminant concentrations established by the MPCA to guide Site investigation and cleanup actions.

Results of the laboratory analysis indicate that:

- Several VOCs were detected above laboratory Method Reporting Limits (MRLs); however, no concentrations exceeded regulatory criteria with the exception of benzene in Soil Sample PP-11 (1-2). Benzene was detected at a concentration of 0.32 milligrams per kilogram (mg/kg), which exceeded the SLV of 0.017 mg/kg, but did not exceed Residential or Industrial SRVs.

- PAHs were detected above laboratory MRLs in four of the twelve soil samples; however, none of the individual compounds were detected at concentrations above regulatory criteria, where established. The calculated benzo (a) pyrene (BaP) equivalent concentration for Soil Sample PP-2 (2-4) was 10.7 mg/kg, which exceeded the Industrial SRV of 3 mg/kg, and the calculated BaP for Soil Sample PP-6 (3-5) was 2.1 mg/kg, which exceeded the Residential SRV of 2 mg/kg.

- DRO was detected at concentrations between 11.2 mg/kg and 212 mg/kg in nine soil samples collected during the investigation. There are currently no MPCA established SRVs or SLVs for DRO. However, the MPCA considers soil with DRO concentrations greater than 100 mg/kg as restricted fill.

- GRO was detected at concentrations of 14.9 mg/kg in Soil Sample PP-2 (2-4) and 14.4 mg/kg in Soil Sample PP-11 (1-2). There are currently no MPCA established SRVs or SLVs for GRO. However, the MPCA considers soil with GRO concentrations greater than 100 mg/kg as restricted fill.

- Several priority pollutant metals were detected above the laboratory MRLs; however, no concentrations exceeded regulatory criteria.

C.4. Groundwater Analytical Testing Results

The groundwater analytical results are summarized in Table 2, and the laboratory analytical report is attached in Appendix B. For comparison purposes, the table also includes the Minnesota Drinking Water Criteria. The Drinking Water Criteria are allowable risk-based contaminant concentrations established by the MPCA to guide site investigation and cleanup actions.

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The results of the laboratory analysis indicate that:

- No VOCs were detected at concentrations exceeding the laboratory MRLs with the exception of trichloroethene (TCE). TCE was detected at a concentration of 1.0 microgram per liter (ug/L), which is below the Drinking Water Criteria of 5 ug/L.

- No DRO was detected above laboratory MRLs.

- Several priority pollutant metals were detected above the laboratory MRLs but did not exceed the Drinking Water Criteria, with the exception of antimony and arsenic. Antimony was detected in Groundwater Samples PP-8W at a concentration of 13.7 ug/L and HA-W at a concentration of 6.9 ug/L, which exceed the Drinking Water Criteria of 6 ug/L. Arsenic was detected in all three groundwater samples at concentrations ranging from 10.8 ug/L to 737 ug/L, which exceeded the Drinking Water Criteria of 10 mg/L.

C.5. Soil Vapor Analytical Testing Results

The soil vapor analytical testing results are summarized in Table 3, and the laboratory analytical report is attached in Appendix B. The analytical results were compared to the MPCA Industrial Intrusion Screening Values (ISVs). The ISVs were developed by the MPCA to be used as screening values for evaluating risks posed by volatile compounds identified in indoor air when those compounds are present due to vapor intrusion. Per MPCA guidance, soil vapor results are compared to either ten times (10x) or one hundred times (100x) the ISVs. Soil vapor concentrations greater than 10x the ISV indicate a higher potential for risks associated with vapor intrusion, and per MPCA guidance, when vapor concentrations exceed 10x an ISV, sub-slab vapor samples and/or a building survey to identify entry points may need to be conducted. In cases where volatile compounds exceed 100x an ISV, the MPCA guidance indicates sub-slab vapor samples and indoor air samples be collected.

The analytical results indicate that several VOCs exceeded laboratory MRLs; however, none of the detected compounds exceeded their respective 10x Industrial ISVs.

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D. Conclusions and Recommendations

Based on the results of the investigation, fill soil consisting of silty sand is present to depths of up to 6 feet bgs at the Site. Trace concrete, coal, and clinker were observed at four locations. Elevated concentrations of DRO were detected at various locations within the fill soil, benzene was detected at one location and the BaP equivalent exceeded regulatory criteria at two locations. Elevated concentrations of arsenic and antimony were detected above regulatory criteria in the groundwater.

The elevated concentrations of contaminants, combined with the presence of debris will restrict on-site and off-site reuse options, and any fill soil proposed for export will need to meet the MPCA definition of unrestricted fill. If the fill soil proposed for export does not meet this definition, the fill soil will require disposal at a permitted landfill. In order to better quantify and characterize fill soil, consideration should be made to complete test pits within the surface parking lot on the west side of the Site.

We recommend that the Site be entered into the MPCA's Voluntary Investigation and Cleanup Program and that a request for a No Association Determination be made and obtained for the non-petroleum impacts prior to closing. We also recommend that prior to any redevelopment, a site specific response action plan and construction contingency plan (RAP/CCP) be prepared and approved by the MPCA for future redevelopment plans at the Site. The RAP/CCP outlines the provisions for the proper management and/or offsite disposal of contaminated soil, or other materials that might be encountered during the construction activities. The RAP/CCP also will provide contingency procedures in the event an underground storage tank (UST) or other previously unidentified contamination is encountered. The RAP/CCP should be submitted to the MPCA for review and approval prior to the start of construction.

E. Assessment Limitations

The analyses and recommendations submitted in this report are based on our field observations and the results of laboratory chemical analyses of samples collected for this project. It is important to note that our investigation is limited to the diameter or limits of our investigation locations and cannot be assumed to be completely representative of the soil conditions throughout the Site.

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty express or implied, is made.

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Figures

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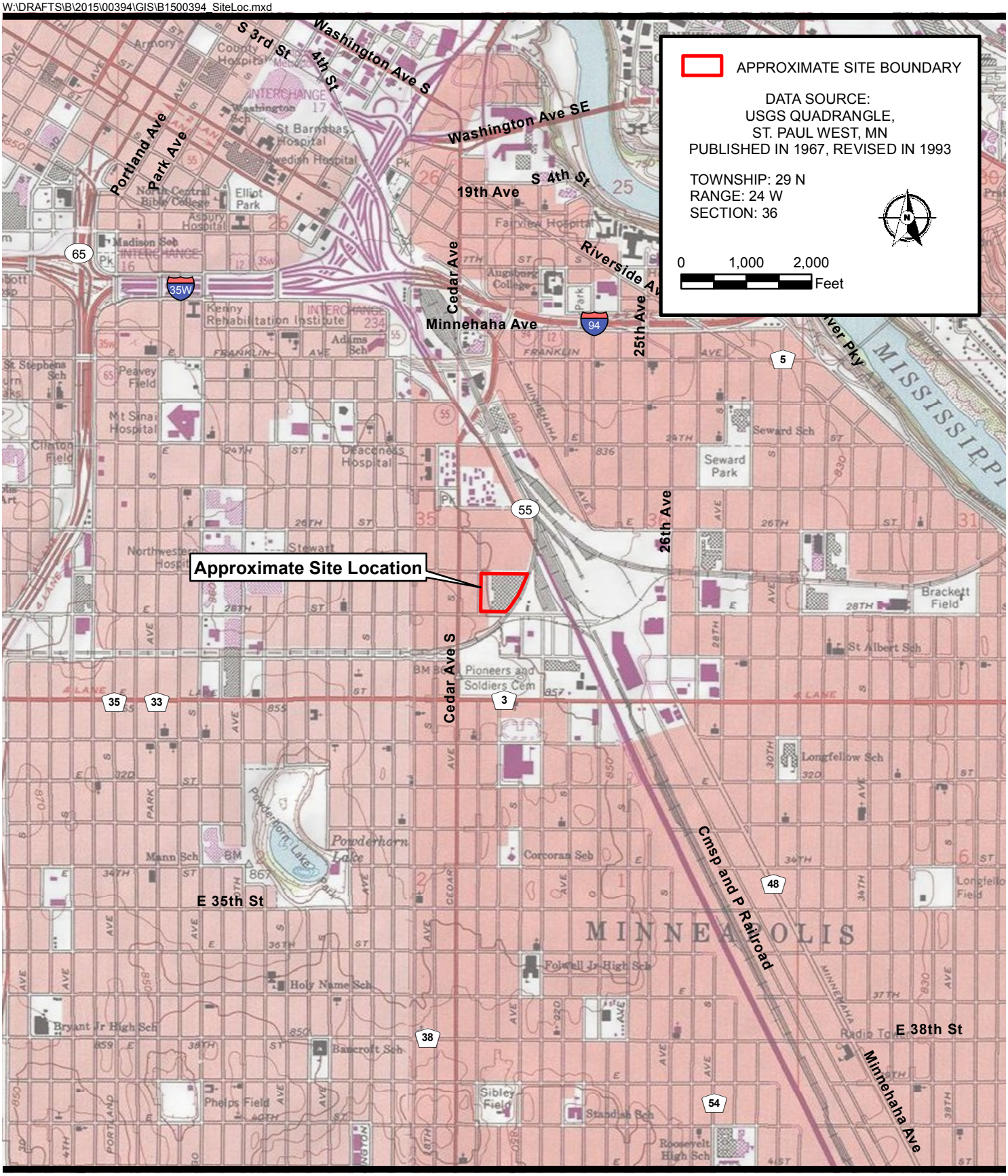

Sheet: 1 of 1

Fig. 1

Project No:	B1500394
Drawing No.	B1500394_SiteLoc
Scale:	1 in = 2,000 ft
Drawn By:	FER
Date Drawn:	1/16/15
Checked By:	KJH
Last Modified:	1/16/15

SITE LOCATION MAP
ROOF DEPOT SITE
1860 28TH STREET
MINNEAPOLIS, MINNESOTA

BRAUN INTERTEC
11001 Hampshire Avenue So.
Minneapolis, MN 55438
PH. (952) 995-2000
FAX (952) 995-2020

F:\2015\B1500394B.dwg,BLAND,4/16/2015 11:48:15 AM

- PUSH PROBE SOIL BORING
- PUSH PROBE SOIL BORING WITH GROUNDWATER SAMPLE
- HAND AUGER SOIL BORING
- HAND AUGER SOIL BORING WITH GROUNDWATER SAMPLE
- SOIL VAPOR PROBE
- SUB-SLAB SOIL VAPOR SAMPLE

N

40' 0 80'

SCALE: 1" = 80'

BRAUN INTERTEC
The Science You Build On.
11001 Hampshire Avenue S
Minneapolis, MN 55438
PH. (952) 995-2000
FAX (952) 995-2020

SITE SKETCH
PHASE II ENVIRONMENTAL SITE ASSESSMENT
ROOF DEPOT
1860 28th STREET AND 2717 LONGFELLOW AVENUE
MINNEAPOLIS, MINNESOTA

Project No:	B1500394
Drawing No:	B1500394B
Scale:	1" = 80'
Drawn By:	BJB
Date Drawn:	3/19/15
Checked By:	JEH
Last Modified:	4/16/15
Sheet: of	Fig: 2

Tables

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Table 1
Summary of Soil Analytical Results
Roof Depot
Minneapolis, Minnesota
Project B1500394

Compound/Parameter	CAS No.	Sample Identifier												Residential Soil Reference Value (mg/kg)	Industrial Soil Reference Value (mg/kg)	Tier 1 Soil Leaching Value (mg/kg)
		PP-2 (2-4)	PP-3 (1-2)	PP-5 (2-4)	PP-6 (3-5)	PP-7 (3-5)	PP-8 (2)	PP-10 (2)	PP-11 (1-2)	PP-12 (1-2)	PP-13 (2-4)	PP-14 (2-3)	HA-2 (1-3)			
		3/25/15	3/25/15	3/26/15	3/26/15	3/26/15	3/25/15	3/25/15	3/26/15	3/26/15	3/26/15	3/26/15	3/25/15			
		10300830002	10300830003	10300830005	10300830006	10300830007	10300830008	10300830010	10300830011	10300830012	10300830013	10300830014	10300830016			
Volatile Organic Compounds (mg/kg)																
Benzene	71-43-2	<0.026	<0.022	<0.023	<0.024	<0.021	<0.024	<0.026	**0.032**	<0.021	<0.021	<0.023	<0.025	6	10	0.017
Ethylbenzene	100-41-4	<0.066	<0.054	<0.058	<0.059	<0.052	<0.059	<0.066	**0.062**	<0.053	<0.052	<0.058	<0.062	200	200	1
Naphthalene	91-20-3	<0.26	<0.22	<0.23	**0.40**	<0.21	<0.24	<0.26	**0.40**	**0.28**	<0.21	**0.26**	<0.25	10	28	4.5
Toluene	108-88-3	<0.066	<0.054	**0.069**	**0.069**	<0.052	<0.059	<0.066	**0.27**	**0.17**	**0.079**	**0.21**	<0.062	107	305	2.5
1,2,4-Trimethylbenzene	95-63-6	<0.066	<0.054	<0.058	<0.059	<0.052	<0.059	<0.066	**0.17**	**0.094**	<0.052	**0.10**	<0.062	8	25	2.7
1,3,5-Trimethylbenzene	108-67-8	<0.066	<0.054	<0.058	<0.059	<0.052	<0.059	<0.066	**0.066**	<0.053	<0.052	<0.058	<0.062	3	10	2.7
Xylene (Total)	1330-20-7	<0.20	<0.16	<0.17	<0.18	<0.16	<0.18	<0.20	**0.64**	**0.39**	**0.18**	**0.38**	<0.19	45	130	5.4
All other reported VOCs	NE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NE	NE	NE
Semivolatile Organic Compounds (mg/kg)																
Acenaphthene	83-32-9	**0.86**	**0.19**	<0.011	**0.58**	**0.082**	<0.012	<0.012	<0.011	<0.010	<0.010	<0.010	<0.011	1,200	5,260	81
Acenaphthylene	208-96-8	**0.36**	**0.15**	**0.020**	**0.25**	**0.074**	<0.012	**0.029**	<0.011	<0.010	<0.010	<0.010	<0.011	NE	NE	NE
Anthracene	120-12-7	**3.3**	**0.53**	**0.019**	**1.6**	**0.22**	<0.012	**0.028**	**0.034**	**0.014**	**0.017**	**0.024**	<0.011	7,880	45,400	1,300
Benzo(a)anthracene	56-55-3	**8.3**	**0.47**	**0.046**	**1.8**	**0.62**	<0.012	**0.045**	**0.20**	**0.057**	**0.082**	**0.085**	<0.011	cPAH	cPAH	cPAH
Benzo(a)pyrene	50-32-8	**8.1**	**0.52**	**0.063**	**1.6**	**0.94**	<0.012	**0.076**	**0.90**	**0.12**	**0.12**	**0.13**	<0.011	cPAH	cPAH	1.4
Benzo(b)fluoranthene	205-99-2	**9.2**	**0.69**	**0.078**	**1.8**	**1.0**	<0.012	**0.11**	**0.94**	**0.14**	**0.17**	**0.13**	<0.011	cPAH	cPAH	cPAH
Benzo(g,h,i)perylene	191-24-2	**4.4**	**0.24**	**0.052**	**0.72**	**0.59**	<0.012	**0.096**	**1.7**	**0.28**	**0.16**	**0.14**	<0.011	NE	NE	NE
Benzo(k)fluoranthene	207-08-9	**3.6**	**0.27**	**0.027**	**0.76**	**0.43**	<0.012	**0.039**	**0.32**	**0.048**	**0.049**	**0.044**	<0.011	cPAH	cPAH	cPAH
Chrysene	218-01-9	**8.4**	**0.59**	**0.057**	**1.8**	**0.71**	<0.012	**0.064**	**0.43**	**0.090**	**0.11**	**0.15**	<0.011	cPAH	cPAH	cPAH
Fluoranthene	206-44-0	**16.2**	**1.2**	**0.062**	**3.7**	**0.94**	<0.012	**0.070**	**0.16**	**0.080**	**0.13**	**0.084**	<0.011	1,080	6,800	670
Fluorene	86-73-7	**0.81**	**0.35**	<0.011	**1.1**	**0.062**	<0.012	<0.012	**0.011**	<0.010	<0.010	<0.010	<0.011	850	4,120	110
Indeno(1,2,3-cd)pyrene	193-39-5	**3.8**	**0.20**	**0.041**	**0.72**	**0.51**	<0.012	**0.065**	**1.1**	**0.16**	**0.11**	**0.064**	<0.011	cPAH	cPAH	cPAH
Naphthalene	91-20-3	**0.10**	**0.056**	<0.011	**0.44**	<0.054	<0.012	<0.012	**0.084**	**0.024**	**0.020**	**0.031**	<0.011	10	28	4.5
Phenanthrene	85-01-8	**11.5**	**1.7**	**0.035**	**4.2**	**0.71**	<0.012	**0.048**	**0.34**	**0.090**	**0.079**	**0.16**	<0.011	NE	NE	NE
Pyrene	129-00-0	**21.4**	**1.3**	**0.082**	**4.2**	**1.2**	<0.012	**0.085**	**0.26**	**0.11**	**0.15**	**0.15**	<0.011	890	5,800	440
BaP Equivalent**	NA	**10.7**	**0.69**	**0.083**	**2.1**	**1.2**	<0.012	**0.10**	**1.2**	**0.16**	**0.17**	**0.16**	<0.011	2	3	NE
Total Petroleum Hydrocarbons (mg/kg)																
Gasoline Range Organics	NA	**14.9**	<11.1	<11.4	<11.2	<11.0	<11.5	<11.3	**14.4**	<12.0	<11.6	<10.7	<12.1	NE	NE	NE
WDRO C10-C28	NA	**68.5** [4]	**212** [4]	<8.6	**169** [4]	**112** [4]	<9.5	**46.1** [4]	**64.0** [4]	**19.2** [4]	**11.2** [4]	**39.1** [4]	<9.0	NE	NE	NE
Metals (mg/kg)																
Antimony	7440-36-0	<0.52 [2]	<0.45	<0.45	<0.44	**0.53**	<0.49	<0.55	<0.49	<0.47	<0.48	<0.47	<0.45	12	100	5.4
Arsenic	7440-38-2	**3.0**	**1.6**	**3.1**	**1.1**	**2.6**	**2.2**	**2.4**	**2.8**	**1.5**	**1.6**	**1.9**	**3.3**	9	20	5.8
Barium	7440-39-3	**65.4** [1]	**26.4**	**25.3**	**31.2**	**58.2**	**94.6**	**43.5**	**25.5**	**18.9**	**26.3**	**23.3**	**7.6**	1,100	18,000	1,700
Beryllium	7440-41-7	**0.36** [3]	<0.18	<0.18	<0.18	<0.20	**0.30**	<0.22	<0.20	<0.19	<0.19	<0.19	<0.18	55	230	2.7
Cadmium	7440-43-9	**0.17**	**0.085**	**0.15**	<0.071	**0.72**	<0.079	**1.3**	**0.096**	<0.076	**0.078**	<0.075	<0.071	25	200	8.8
Chromium	7440-47-3	**8.4** [1]	**4.4**	**4.1**	**3.8**	**7.5**	**7.9**	**12.7**	**4.0**	**2.4**	**3.4**	**4.0**	**1.9**	87 [c]	650 [c]	36 [c]
Copper	7440-50-8	**7.0**	**4.8**	**3.2**	**1.8**	**14.6**	**4.7**	**18.6**	**7.5**	**3.5**	**4.0**	**4.5**	**2.0**	100	9,000	700
Lead	7439-92-1	**16.2** [1]	**11.0**	**16.2**	**2.5**	**99.4**	**5.0**	**24.4**	**8.7**	**3.2**	**3.4**	**3.8**	**0.66**	300	700	2,700
Mercury	7439-97-6	**0.022**	**0.024**	**0.030**	<0.020	**0.069**	<0.023	**0.025**	**0.022**	<0.020	<0.021	<0.021	<0.019	0.5	1.5	3.3
Nickel	7440-02-0	**9.6** [1]	**5.3**	**3.9**	**3.6**	**9.9**	**8.3**	**10.3**	**5.5**	**3.3**	**6.4**	**5.4**	**3.0**	560	2,500	180
Selenium	7782-49-2	<0.52 [3]	<0.45	<0.45	<0.44	<0.51	<0.49	<0.55	<0.49	<0.47	<0.48	<0.47	<0.45	160	1,300	2.6
Silver	7440-22-4	<0.52	<0.45	<0.45	<0.44	<0.51	<0.49	<0.55	<0.49	<0.47	<0.48	<0.47	<0.45	160	1,300	7.9
Thallium	7440-28-0	**0.11**	<0.090	<0.091	<0.088	<0.10	<0.099	<0.11	<0.099	<0.095	<0.096	<0.093	<0.089	3	21	0.89
Zinc	7440-66-6	**60.6** [1]	**27.2**	**40.7**	**13.7**	**90.6**	**27.1**	**84.6**	**21.2**	**9.6**	**12.8**	**14.7**	<4.5	8,700	75,000	3,000
Other Parameters																
Percent Moisture (%)	NA	**13.1**	**5.0**	**10.2**	**12.2**	**7.2**	**14.8**	**13.9**	**5.1**	**4.8**	**4.5**	**4.4**	**9.6**	NE	NE	NE

Notes:

[1] [M6] Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

[2] [M6] Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution. - [R1] RPD value was outside control limits.

[3] [R1] RPD value was outside control limits.

[4] [T6] High boiling point hydrocarbons are present in the sample.

mg/kg = Milligrams per kilogram.

< = Less than the reporting limit

---- = Not analyzed or calculated for this parameter

NE = Not Established

ND = Not detected above reporting limit

SRV - Soil Reference Value Established by the Minnesota Pollution Control Agency; 1999, revised 2009

SLV - Soil Leaching Value Established by the Minnesota Pollution Control Agency; 1999, revised 2005

cPAH = Individual criteria not established. Included in BaP equivalent calculation.

** = Benzo(a)pyrene (BaP) equivalent is calculated based on the concentration and weighted toxicity of carcinogenic PAHs (cPAH); Minnesota Pollution

[c] = Criteria for hexavalent chromium.

BRAUN INTERTEC

Table 2
Summary of Groundwater Analytical Results
Roof Depot
Minneapolis, Minnesota
Project B1500394

Compound/Parameter	CAS No.	Sample Identifier			Drinking Water Criteria (ug/L)
		PP-8W	**PP-10W**	**HA-W**	
		3/25/15 10:20	**3/25/15 12:30**	**3/26/15 11:00**	
		10300830018	**10300830019**	**10300830020**	
Volatile Organic Compounds (ug/L)					
Trichloroethene	79-01-6	<0.40	**1.0**	<0.40	5
All other reported VOCs	NE	ND	ND	ND	NE
Total Petroleum Hydrocarbons (ug/L)					
WDRO C10-C28	NA	<116	<110	<116	NE
Metals (ug/L)					
Antimony, Dissolved	7440-36-0	**13.7**	<0.50	**6.9**	6
Arsenic, Dissolved	7440-38-2	**348**	**10.8**	**737**	10
Barium, Dissolved	7440-39-3	**66.5**	**74.6**	**39.9**	2,000
Beryllium, Dissolved	7440-41-7	<0.20	<0.20	<0.20	0.08
Cadmium, Dissolved	7440-43-9	<0.080	<0.080	<0.080	4
Chromium, Dissolved	7440-47-3	<0.50	<0.50	**0.90**	100 [c]
Copper, Dissolved	7440-50-8	<1.0	<1.0	<1.0	1,000
Lead, Dissolved	7439-92-1	<0.10	<0.10	<0.10	NE
Mercury, Dissolved	7439-97-6	<0.20	<0.20	<0.20	2
Nickel, Dissolved	7440-02-0	**10.8**	**11.0**	**0.50**	NE
Selenium, Dissolved	7782-49-2	**2.5**	**0.62**	**2.7**	30
Silver, Dissolved	7440-22-4	<0.50	<0.50	<0.50	30
Thallium, Dissolved	7440-28-0	<0.10	<0.10	<0.10	0.6
Zinc, Dissolved	7440-66-6	<5.0	<5.0	<5.0	2,000

Notes:

ug/L = Micrograms per liter.

<RL = Less than the reporting limit

---- = Not analyzed or calculated for this parameter

NE = Not Established

ND = Not detected above reporting limit

Drinking Water Criteria from Minnesota Pollution Control Agency Risk Based Site Evaluation Process Groundwater Guidance Document, Revised 08/2010.

Minnesota Drinking Water Criteria based on following hierarchy of MDH recommended values: Health Risk Levels, Health Based Values, Risk Assessment Advise, Maximum Contaminant Level and Unit Risk Level or Lifetime Health Advisory Level.

[c] = Criteria for hexavalent chromium.

BRAUN INTERTEC

Table 3
Summary of Soil Vapor Analytical Results
Roof Depot
Minneapolis, Minnesota
Project B1500394

Compound/Parameter	CAS No.	Sample Identifier					Residential ISV (ug/m^3)	Residential 10X ISV (ug/m^3)	Residential 100X ISV (ug/m^3)	Industrial ISV (ug/m^3)	Industrial 10X ISV (ug/m^3)	Industrial 100X ISV (ug/m^3)
		SV-1	**SV-2**	**SSV-1**	**SSV-2**	**SSV-3**						
		3/25/15	**3/25/15**	**3/25/15**	**3/25/15**	**3/25/15**						
		10300700001	**10300700002**	**10300700003**	**10300700004**	**10300700005**						
Volatile Organic Compounds (ug/m3)												
Acetone	67-64-1	**37.4** [2]	**24.3** [2]	**24.6** [2]	**80.9** [2]	**32.4** [2]	31,000	310,000	3,100,000	87,000	870,000	8,700,000
Benzene	71-43-2	**5.6**	**4.2**	**1.0**	**2.9**	**0.98**	4.5	45	450	13	130	1,300
2-Butanone (MEK)	78-93-3	**12.6**	**10.4**	**8.4**	**22.6**	**10.1**	5,000	50,000	500,000	10,000	100,000	1,000,000
Carbon disulfide	75-15-0	**0.88**	**2.6**	**5.1**	**9.3**	**4.8**	700	7,000	70,000	2,000	20,000	200,000
Chloromethane	74-87-3	**0.90**	<0.56	<0.65	<0.63	<0.53	90	900	9,000	300	3,000	30,000
Cyclohexane	110-82-7	**2.8**	**3.1**	**3.8**	**15.3**	**5.4**	6,000	60,000	600,000	20,000	200,000	2,000,000
Dichlorodifluoromethane	75-71-8	**2.1**	**2.1**	**11.8**	<1.5	**2.5**	200	2,000	20,000	600	6,000	60,000
Ethanol	64-17-5	**14.1**	**6.1**	**9.3**	**20.2**	**6.6**	15,000	150,000	1,500,000	42,000	420,000	4,200,000
Ethylbenzene	100-41-4	**2.3**	**3.2**	<1.4	**2.4**	<1.1	1,000	10,000	100,000	3,000	30,000	300,000
n-Heptane	142-82-5	**9.4**	**10.0**	<1.3	**10.1**	**3.2**	NE	NE	NE	NE	NE	NE
n-Hexane	110-54-3	**10.2**	**10.7**	**1.2**	**35.7**	**5.6**	2,000	20,000	200,000	6,000	60,000	600,000
2-Propanol	67-63-0	<1.7	<1.7	**4.7**	<1.9	**4.0**	7,000	70,000	700,000	20,000	200,000	2,000,000
Propylene	115-07-1	**37.3** [1]	**38.2**	<0.54	**30.5**	<0.44	3,000	30,000	300,000	8,000	80,000	800,000
Tetrachloroethene	127-18-4	<0.92	<0.92	**1.8**	<1.0	<0.87	2	20	200	30	300	3,000
Toluene	108-88-3	**11.2**	**9.8**	**3.7**	**52.0**	**16.8**	5,000	50,000	500,000	10,000	100,000	1,000,000
1,1,1-Trichloroethane	71-55-6	<0.94	**2.0**	**78.2**	**2.9**	<0.88	5,000	50,000	500,000	10,000	100,000	1,000,000
Trichlorofluoromethane	75-69-4	<1.5	**1.7**	**13.9**	**27.3**	<1.4	700	7,000	70,000	2,000	20,000	200,000
1,1,2-Trichlorotrifluoroethane	76-13-1	<2.1	<2.1	**3.7**	**6.4**	<2.0	30,000	300,000	3,000,000	80,000	800,000	8,000,000
1,2,4-Trimethylbenzene	95-63-6	**2.0**	**2.7**	<1.5	**2.1**	<1.3	7	70	700	20	200	2,000
m&p-Xylene	179601-23-1	**5.9**	**7.7**	<2.7	**9.4**	**2.5**	100 [a]	1,000 [a]	10,000 [a]	300 [a]	3,000 [a]	30,000 [a]
o-Xylene	95-47-6	**2.0**	**2.6**	<1.4	**3.2**	<1.1	100 [a]	1,000 [a]	10,000 [a]	300 [a]	3,000 [a]	30,000 [a]
All other reported VOCs	NE	ND	ND	ND	ND	ND	NE	NE	NE	NE	NE	NE

Notes:

[1] [E] Analyte concentration exceeded the calibration range. The reported result is estimated.

[2] [L2] Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results may be biased low.

ug/m3 = Micrograms per cubic meter.

< = Less than the reporting limit

---- = Not analyzed or calculated for this parameter

NE = Not Established

ND = Not detected above reporting limit

Intrusion Screening Values (ISV) from Risk-Based Guidance for the Vapor Intrusion Pathway, Minnesota Pollution Control Agency Superfund, RCRA, and Voluntary Cleanup Section, February 2009.

Intrusion Screening Values (ISVs) for the Minnsota Pollution Control Agency Petroleum Remediation Program, October 2010.

[a] Criteria for mixture of o, m and p-xylenes.

Appendix A

Soil Boring Logs

DRAFT

BRAUN INTERTEC

HAND AUGER BORING

Braun Project B1500394 **LIMITED SITE INVESTIGATION** **Roof Depot Site** **1860 28th Street** **Minneapolis, Minnesota**	HAND AUGER: **HAB-1** LOCATION: See attached sketch.

DRILLER: J. Friederichs	METHOD: Hand Auger	DATE: **3/25/15**	SCALE: **1" = 4'**

Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	pid ppm	Tests or Notes
0.7	CONC	About 7 inches of concrete.				
2.0	FILL	FILL: Silty Sand, with a little Gravel, dark brown, moist.			0.4	
4.0	SP	POORLY GRADED SAND, fine- to medium-grained, with a little Gravel, brown, moist to wet.			0.3	
		END OF HAND AUGER BORING @ 4 FEET. Water not observed in hand auger boring. Borehole filled with soil cuttings. Soil sample collected from 1 to 3 feet for analytical testing.			0.1	

(See Descriptive Terminology sheet for explanation of abbreviations)

HAND AUGER BORING N:\GINT\PROJECTS\AX PROJECTS\2015\00394.GPJ BRAUN_VS_GUIDE.GDT 4/17/15 11:39

BRAUN INTERTEC

HAND AUGER BORING

Braun Project B1500394 **LIMITED SITE INVESTIGATION** **Roof Depot Site** **1860 28th Street** **Minneapolis, Minnesota**	HAND AUGER: **HAB-2** LOCATION: See attached sketch.

DRILLER: J. Friederichs	METHOD: Hand Auger	DATE: **3/25/15**	SCALE: **1" = 4'**

Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	BPF	WL	pid ppm	Tests or Notes
0.7	CONC	8 inches of concrete.				
3.0	FILL	FILL: Silty Sand, fine- to medium-grained, trace Gravel, dark brown, moist.			0.1 0.2	
4.0	SP	POORLY GRADED SAND, fine- to medium-grained, with a little Gravel, brown, wet to waterbearing. (Glacial Outwash)		▼	0.0 0.4	
		END OF HAND AUGER @ 4 FEET. Water observed at 4 feet while drilling. Boring then backfilled with soil cuttings. Soil sample collected from 1 to 3 feet for analytical testing.				

(See Descriptive Terminology sheet for explanation of abbreviations)

HAND AUGER BORING N:\GINT\PROJECTS\AX PROJECTS\2015\00394.GPJ BRAUN_VS_GUIDE.GDT 4/17/15 11:39

Appendix B

Laboratory Analytical Reports

DRAFT

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

April 10, 2015

Jeremy Hansen
Braun Intertec Corp.
11001 Hampshire Ave S
Minneapolis, MN 55438

RE: Project: B1500394 Roof Depot
Pace Project No.: 10300830

Dear Jeremy Hansen:
Enclosed are the analytical results for sample(s) received by the laboratory on March 27, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Steve Albrecht
steve.albrecht@pacelabs.com
Project Manager

Enclosures

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

CERTIFICATIONS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Minnesota Certification IDs

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

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Minneapolis, MN 55414
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SAMPLE SUMMARY

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10300830001	**PP-1 (2-4)**	Solid	03/25/15 15:45	03/27/15 08:20
10300830002	**PP-2 (2-4)**	Solid	03/25/15 16:30	03/27/15 08:20
10300830003	**PP-3 (1-2)**	Solid	03/25/15 17:00	03/27/15 08:20
10300830004	**PP-4 (2-4)**	Solid	03/25/15 15:00	03/27/15 08:20
10300830005	**PP-5 (2-4)**	Solid	03/26/15 08:40	03/27/15 08:20
10300830006	**PP-6 (3-5)**	Solid	03/26/15 09:15	03/27/15 08:20
10300830007	**PP-7 (3-5)**	Solid	03/26/15 09:50	03/27/15 08:20
10300830008	**PP-8 (2)**	Solid	03/25/15 09:45	03/27/15 08:20
10300830009	**PP-9 (1-3)**	Solid	03/26/15 10:30	03/27/15 08:20
10300830010	**PP-10 (2)**	Solid	03/25/15 12:00	03/27/15 08:20
10300830011	**PP-11 (1-2)**	Solid	03/26/15 12:30	03/27/15 08:20
10300830012	**PP-12 (1-2)**	Solid	03/26/15 12:00	03/27/15 08:20
10300830013	**PP-13 (2-4)**	Solid	03/26/15 13:00	03/27/15 08:20
10300830014	**PP-14 (2-3)**	Solid	03/26/15 13:30	03/27/15 08:20
10300830015	**HA-1 (1-3)**	Solid	03/25/15 11:30	03/27/15 08:20
10300830016	**HA-2 (1-3)**	Solid	03/25/15 10:30	03/27/15 08:20
10300830017	**Trip Blank - SL**	Solid	03/25/15 00:00	03/27/15 08:20
10300830018	**PP-8W**	Water	03/25/15 10:20	03/27/15 08:20
10300830019	**PP-10W**	Water	03/25/15 12:30	03/27/15 08:20
10300830020	**HA-W**	Water	03/26/15 11:00	03/27/15 08:20

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SAMPLE ANALYTE COUNT

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10300830002	**PP-2 (2-4)**	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	BMM	2	PASI-M
		EPA 6020A	TT3	13	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	LT	19	PASI-M
		EPA 8260	SH2	70	PASI-M
10300830003	**PP-3 (1-2)**	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	BMM	2	PASI-M
		EPA 6020A	TT3	13	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	LT	19	PASI-M
		EPA 8260	SH2	70	PASI-M
10300830005	**PP-5 (2-4)**	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	BMM	2	PASI-M
		EPA 6020A	TT3	13	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	LT	19	PASI-M
		EPA 8260	SH2	70	PASI-M
10300830006	**PP-6 (3-5)**	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	BMM	2	PASI-M
		EPA 6020A	TT3	13	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	LT	19	PASI-M
		EPA 8260	SH2	70	PASI-M
10300830007	**PP-7 (3-5)**	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	BMM	2	PASI-M
		EPA 6020A	TT3	13	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	LT	19	PASI-M
		EPA 8260	AMT	70	PASI-M
10300830008	**PP-8 (2)**	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	BMM	2	PASI-M

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SAMPLE ANALYTE COUNT

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020A	TT3	13	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	LT	19	PASI-M
		EPA 8260	AMT	70	PASI-M
10300830010	**PP-10 (2)**	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	BMM	2	PASI-M
		EPA 6020A	TT3	13	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	LT	19	PASI-M
		EPA 8260	AMT	70	PASI-M
10300830011	**PP-11 (1-2)**	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	BMM	2	PASI-M
		EPA 6020A	TT3	13	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	LT	19	PASI-M
		EPA 8260	AMT	70	PASI-M
10300830012	**PP-12 (1-2)**	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	BMM	2	PASI-M
		EPA 6020A	TT3	13	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	LT	19	PASI-M
		EPA 8260	AMT	70	PASI-M
10300830013	**PP-13 (2-4)**	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	BMM	2	PASI-M
		EPA 6020A	TT3	13	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	LT	19	PASI-M
		EPA 8260	AMT	70	PASI-M
10300830014	**PP-14 (2-3)**	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	BMM	2	PASI-M
		EPA 6020A	TT3	13	PASI-M
		EPA 7471B	LMW	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	LT	19	PASI-M
		EPA 8260	AMT	70	PASI-M
10300830016	**HA-2 (1-3)**	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	BMM	2	PASI-M
		EPA 6020A	TT3	13	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	LT	19	PASI-M
		EPA 8260	AMT	70	PASI-M
10300830017	**Trip Blank - SL**	EPA 8260	AMT	70	PASI-M
10300830018	**PP-8W**	WI MOD DRO	MT	2	PASI-M
		EPA 6020A	RJS	13	PASI-M
		EPA 7470	LMW	1	PASI-M
		EPA 8260	AJC	70	PASI-M
10300830019	**PP-10W**	WI MOD DRO	MT	2	PASI-M
		EPA 6020A	RJS	13	PASI-M
		EPA 7470	LMW	1	PASI-M
		EPA 8260	AJC	70	PASI-M
10300830020	**HA-W**	WI MOD DRO	MT	2	PASI-M
		EPA 6020A	RJS	13	PASI-M
		EPA 7470	LMW	1	PASI-M
		EPA 8260	AJC	70	PASI-M

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **WI MOD DRO**
Description: WIDRO GCS
Client: Braun-BLM
Date: April 10, 2015

General Information:
12 samples were analyzed for WI MOD DRO. All samples were received in acceptable condition with any exceptions noted below.

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

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

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

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

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

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

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

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

Additional Comments:

Analyte Comments:

QC Batch: OEXT/28694

T6: High boiling point hydrocarbons are present in the sample.

- PP-10 (2) (Lab ID: 10300830010)
  - WDRO C10-C28
- PP-11 (1-2) (Lab ID: 10300830011)
  - WDRO C10-C28
- PP-12 (1-2) (Lab ID: 10300830012)
  - WDRO C10-C28
- PP-13 (2-4) (Lab ID: 10300830013)
  - WDRO C10-C28
- PP-14 (2-3) (Lab ID: 10300830014)
  - WDRO C10-C28

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **WI MOD DRO**
Description: WIDRO GCS
Client: Braun-BLM
Date: April 10, 2015

Analyte Comments:

QC Batch: OEXT/28694

T6: High boiling point hydrocarbons are present in the sample.

- PP-2 (2-4) (Lab ID: 10300830002)
  - WDRO C10-C28
- PP-3 (1-2) (Lab ID: 10300830003)
  - WDRO C10-C28
- PP-6 (3-5) (Lab ID: 10300830006)
  - WDRO C10-C28
- PP-7 (3-5) (Lab ID: 10300830007)
  - WDRO C10-C28

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **WI MOD DRO**
Description: WIDRO GCS
Client: Braun-BLM
Date: April 10, 2015

General Information:
3 samples were analyzed for WI MOD DRO. All samples were received in acceptable condition with any exceptions noted below.

P4: Sample field preservation does not meet EPA or method recommendations for this analysis.
- HA-W (Lab ID: 10300830020)
- PP-8W (Lab ID: 10300830018)

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

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

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

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

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

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

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

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

Additional Comments:

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **WI MOD GRO**
Description: WIGRO GCV
Client: Braun-BLM
Date: April 10, 2015

General Information:
12 samples were analyzed for WI MOD GRO. All samples were received in acceptable condition with any exceptions noted below.

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

Sample Preparation:
The samples were prepared in accordance with EPA 5030 Medium Soil with any exceptions noted below.

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

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

QC Batch: GCV/13574

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- MS (Lab ID: 1932401)
  - Gasoline Range Organics

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

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

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

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

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

QC Batch: GCV/13574

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10300504004

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

- MS (Lab ID: 1932401)
  - Gasoline Range Organics

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

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **WI MOD GRO**
Description: WIGRO GCV
Client: Braun-BLM
Date: April 10, 2015

Additional Comments:

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **EPA 6020A**
Description: 6020A MET ICPMS
Client: Braun-BLM
Date: April 10, 2015

General Information:
12 samples were analyzed for EPA 6020A. All samples were received in acceptable condition with any exceptions noted below.

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

Sample Preparation:
The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

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

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

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

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

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

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

QC Batch: MPRP/53233

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10300830002

M6: Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

- MS (Lab ID: 1927021)
  - Chromium
  - Lead
  - Zinc
- MSD (Lab ID: 1927022)
  - Antimony
  - Barium
  - Chromium
  - Nickel
  - Zinc

R1: RPD value was outside control limits.

- MSD (Lab ID: 1927022)
  - Antimony
  - Beryllium

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **EPA 6020A**
Description: 6020A MET ICPMS
Client: Braun-BLM
Date: April 10, 2015

QC Batch: MPRP/53233

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10300830002

R1: RPD value was outside control limits.

- Selenium

Additional Comments:

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **EPA 6020A**
Description: 6020A MET ICPMS, Dissolved
Client: Braun-BLM
Date: April 10, 2015

General Information:
3 samples were analyzed for EPA 6020A. All samples were received in acceptable condition with any exceptions noted below.

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

Sample Preparation:
The samples were prepared in accordance with EPA 3020 with any exceptions noted below.

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

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

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

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

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

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

Additional Comments:

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **EPA 7470**
Description: 7470 Mercury, Dissolved
Client: Braun-BLM
Date: April 10, 2015

General Information:
3 samples were analyzed for EPA 7470. All samples were received in acceptable condition with any exceptions noted below.

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

Sample Preparation:
The samples were prepared in accordance with EPA 7470A with any exceptions noted below.

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

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

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

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

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

Additional Comments:

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **EPA 7471B**
Description: 7471B Mercury
Client: Braun-BLM
Date: April 10, 2015

General Information:
12 samples were analyzed for EPA 7471B. All samples were received in acceptable condition with any exceptions noted below.

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

Sample Preparation:
The samples were prepared in accordance with EPA 7471B with any exceptions noted below.

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

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

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

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

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

Additional Comments:

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **EPA 8270D by SIM**
Description: 8270D MSSV PAH by SIM
Client: Braun-BLM
Date: April 10, 2015

General Information:
12 samples were analyzed for EPA 8270D by SIM. All samples were received in acceptable condition with any exceptions noted below.

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

Sample Preparation:
The samples were prepared in accordance with EPA 3550 with any exceptions noted below.

QC Batch: OEXT/28695

P3: Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.

- PP-3 (1-2) (Lab ID: 10300830003)

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

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

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

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

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

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

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

Additional Comments:

Analyte Comments:

QC Batch: OEXT/28695

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- PP-2 (2-4) (Lab ID: 10300830002)
  - 2-Fluorobiphenyl (S)
- PP-6 (3-5) (Lab ID: 10300830006)
  - 2-Fluorobiphenyl (S)

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **EPA 8270D by SIM**
Description: 8270D MSSV PAH by SIM
Client: Braun-BLM
Date: April 10, 2015

Analyte Comments:

QC Batch: OEXT/28695

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- PP-7 (3-5) (Lab ID: 10300830007)
  - 2-Fluorobiphenyl (S)

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **EPA 8260**
Description: 8260 MSV 5030 Med Level
Client: Braun-BLM
Date: April 10, 2015

General Information:
13 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below.

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

Sample Preparation:
The samples were prepared in accordance with EPA 5035/5030B with any exceptions noted below.

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

QC Batch: MSV/30929

SS: This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.

- LCS (Lab ID: 1928307)
  - 1,1,2,2-Tetrachloroethane
- MS (Lab ID: 1928308)
  - 1,1,2,2-Tetrachloroethane

QC Batch: MSV/30935

SS: This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.

- LCS (Lab ID: 1928536)
  - 1,1,2,2-Tetrachloroethane
- MS (Lab ID: 1928537)
  - 1,1,2,2-Tetrachloroethane

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

QC Batch: MSV/30929

CH: The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.

- LCS (Lab ID: 1928307)
  - 1,1,2,2-Tetrachloroethane

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

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

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

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **EPA 8260**
Description: 8260 MSV 5030 Med Level
Client: Braun-BLM
Date: April 10, 2015

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

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

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

Additional Comments:

Analyte Comments:

QC Batch: MSV/30929

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- LCS (Lab ID: 1928307)
  - 1,1,2,2-Tetrachloroethane
- MS (Lab ID: 1928308)
  - 1,1,2,2-Tetrachloroethane

QC Batch: MSV/30935

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- LCS (Lab ID: 1928536)
  - 1,1,2,2-Tetrachloroethane
- MS (Lab ID: 1928537)
  - 1,1,2,2-Tetrachloroethane

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **EPA 8260**
Description: 8260 VOC
Client: Braun-BLM
Date: April 10, 2015

General Information:
3 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below.

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

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

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

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

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

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

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

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

QC Batch: MSV/30955

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10300823003

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

- MS (Lab ID: 1930696)
  - 1,2,4-Trichlorobenzene
  - 1,2-Dibromoethane (EDB)
  - 1,2-Dichlorobenzene
  - 1,3-Dichlorobenzene
  - 1,4-Dichlorobenzene
  - Hexachloro-1,3-butadiene
  - sec-Butylbenzene

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

Additional Comments:

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PROJECT NARRATIVE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Method: **EPA 8260**
Description: 8260 VOC
Client: Braun-BLM
Date: April 10, 2015

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

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-2 (2-4) **Lab ID: 10300830002** Collected: 03/25/15 16:30 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	**68.5**	mg/kg	19.6	2	03/30/15 10:25	04/01/15 10:11		T6
Surrogates								
n-Triacontane (S)	101	%.	50-150	2	03/30/15 10:25	04/01/15 10:11	638-68-6	
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	**14.9**	mg/kg	12.0	1	04/06/15 09:34	04/08/15 12:48		
Surrogates								
a,a,a-Trifluorotoluene (S)	92	%.	80-150	1	04/06/15 09:34	04/08/15 12:48	98-08-8	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050							
Antimony	ND	mg/kg	0.52	20	03/31/15 13:57	04/01/15 09:04	7440-36-0	M6,R1
Arsenic	**3.0**	mg/kg	0.52	20	03/31/15 13:57	04/01/15 09:04	7440-38-2	
Barium	**65.4**	mg/kg	0.31	20	03/31/15 13:57	04/01/15 09:04	7440-39-3	M6
Beryllium	**0.36**	mg/kg	0.21	20	03/31/15 13:57	04/01/15 09:04	7440-41-7	R1
Cadmium	**0.17**	mg/kg	0.083	20	03/31/15 13:57	04/01/15 09:04	7440-43-9	
Chromium	**8.4**	mg/kg	0.52	20	03/31/15 13:57	04/01/15 09:04	7440-47-3	M6
Copper	**7.0**	mg/kg	1.0	20	03/31/15 13:57	04/01/15 09:04	7440-50-8	
Lead	**16.2**	mg/kg	0.10	20	03/31/15 13:57	04/01/15 09:04	7439-92-1	M6
Nickel	**9.6**	mg/kg	0.52	20	03/31/15 13:57	04/01/15 09:04	7440-02-0	M6
Selenium	ND	mg/kg	0.52	20	03/31/15 13:57	04/01/15 09:04	7782-49-2	R1
Silver	ND	mg/kg	0.52	20	03/31/15 13:57	04/01/15 09:04	7440-22-4	
Thallium	**0.11**	mg/kg	0.10	20	03/31/15 13:57	04/01/15 09:04	7440-28-0	
Zinc	**60.6**	mg/kg	5.2	20	03/31/15 13:57	04/01/15 09:04	7440-66-6	M6
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B							
Mercury	**0.022**	mg/kg	0.020	1	03/31/15 15:33	04/01/15 11:17	7439-97-6	
Dry Weight	Analytical Method: ASTM D2974							
Percent Moisture	**13.1**	%	0.10	1		03/30/15 11:43		
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	**0.86**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 16:12	83-32-9	
Acenaphthylene	**0.36**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 16:12	208-96-8	
Anthracene	**3.3**	mg/kg	0.23	20	03/30/15 10:46	04/01/15 16:34	120-12-7	
Benzo(a)anthracene	**8.3**	mg/kg	2.3	200	03/30/15 10:46	04/01/15 16:56	56-55-3	
Benzo(a)pyrene	**8.1**	mg/kg	2.3	200	03/30/15 10:46	04/01/15 16:56	50-32-8	
Benzo(b)fluoranthene	**9.2**	mg/kg	2.3	200	03/30/15 10:46	04/01/15 16:56	205-99-2	
Benzo(g,h,i)perylene	**4.4**	mg/kg	0.23	20	03/30/15 10:46	04/01/15 16:34	191-24-2	
Benzo(k)fluoranthene	**3.6**	mg/kg	0.23	20	03/30/15 10:46	04/01/15 16:34	207-08-9	
Chrysene	**8.4**	mg/kg	2.3	200	03/30/15 10:46	04/01/15 16:56	218-01-9	
Dibenz(a,h)anthracene	ND	mg/kg	0.057	5	03/30/15 10:46	04/01/15 16:12	53-70-3	
Fluoranthene	**16.2**	mg/kg	2.3	200	03/30/15 10:46	04/01/15 16:56	206-44-0	
Fluorene	**0.81**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 16:12	86-73-7	
Indeno(1,2,3-cd)pyrene	**3.8**	mg/kg	0.23	20	03/30/15 10:46	04/01/15 16:34	193-39-5	
Naphthalene	**0.10**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 16:12	91-20-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-2 (2-4) **Lab ID: 10300830002** Collected: 03/25/15 16:30 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Phenanthrene	**11.5**	mg/kg	2.3	200	03/30/15 10:46	04/01/15 16:56	85-01-8	
Pyrene	**21.4**	mg/kg	2.3	200	03/30/15 10:46	04/01/15 16:56	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	**10.7**	mg/kg	2.3	200	03/30/15 10:46	04/01/15 16:56		
Surrogates								
2-Fluorobiphenyl (S)	89	%.	55-125	5	03/30/15 10:46	04/01/15 16:12	321-60-8	D3
p-Terphenyl-d14 (S)	56	%.	30-150	5	03/30/15 10:46	04/01/15 16:12	1718-51-0	
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
Acetone	ND	mg/kg	1.3	1	03/31/15 11:46	04/01/15 18:57	67-64-1	
Allyl chloride	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	107-05-1	
Benzene	ND	mg/kg	0.026	1	03/31/15 11:46	04/01/15 18:57	71-43-2	
Bromobenzene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	108-86-1	
Bromochloromethane	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	74-97-5	
Bromodichloromethane	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	75-27-4	
Bromoform	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	75-25-2	
Bromomethane	ND	mg/kg	0.66	1	03/31/15 11:46	04/01/15 18:57	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.33	1	03/31/15 11:46	04/01/15 18:57	78-93-3	
n-Butylbenzene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	98-06-6	
Carbon tetrachloride	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	56-23-5	
Chlorobenzene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	108-90-7	
Chloroethane	ND	mg/kg	0.66	1	03/31/15 11:46	04/01/15 18:57	75-00-3	
Chloroform	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	67-66-3	
Chloromethane	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.66	1	03/31/15 11:46	04/01/15 18:57	96-12-8	
Dibromochloromethane	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	106-93-4	
Dibromomethane	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	156-60-5	
Dichlorofluoromethane	ND	mg/kg	0.66	1	03/31/15 11:46	04/01/15 18:57	75-43-4	
1,2-Dichloropropane	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	10061-01-5	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-2 (2-4) **Lab ID: 10300830002** Collected: 03/25/15 16:30 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
trans-1,3-Dichloropropene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	10061-02-6	
Diethyl ether (Ethyl ether)	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	60-29-7	
Ethylbenzene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	100-41-4	
Hexachloro-1,3-butadiene	ND	mg/kg	0.33	1	03/31/15 11:46	04/01/15 18:57	87-68-3	
Isopropylbenzene (Cumene)	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	99-87-6	
Methylene Chloride	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.33	1	03/31/15 11:46	04/01/15 18:57	108-10-1	
Methyl-tert-butyl ether	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	1634-04-4	
Naphthalene	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	91-20-3	
n-Propylbenzene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	103-65-1	
Styrene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	79-34-5	
Tetrachloroethene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	127-18-4	
Tetrahydrofuran	ND	mg/kg	2.6	1	03/31/15 11:46	04/01/15 18:57	109-99-9	
Toluene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	79-00-5	
Trichloroethene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	mg/kg	0.26	1	03/31/15 11:46	04/01/15 18:57	76-13-1	
1,2,4-Trimethylbenzene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.066	1	03/31/15 11:46	04/01/15 18:57	108-67-8	
Vinyl chloride	ND	mg/kg	0.026	1	03/31/15 11:46	04/01/15 18:57	75-01-4	
Xylene (Total)	ND	mg/kg	0.20	1	03/31/15 11:46	04/01/15 18:57	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	88	%.	55-150	1	03/31/15 11:46	04/01/15 18:57	17060-07-0	
Toluene-d8 (S)	101	%.	61-125	1	03/31/15 11:46	04/01/15 18:57	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	54-131	1	03/31/15 11:46	04/01/15 18:57	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-3 (1-2) **Lab ID: 10300830003** Collected: 03/25/15 17:00 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	**212**	mg/kg	85.7	10	03/30/15 10:25	04/01/15 10:18		T6
Surrogates								
n-Triacontane (S)	79	%.	50-150	10	03/30/15 10:25	04/01/15 10:18	638-68-6	
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	ND	mg/kg	11.1	1	04/06/15 09:34	04/08/15 13:11		
Surrogates								
a,a,a-Trifluorotoluene (S)	92	%.	80-150	1	04/06/15 09:34	04/08/15 13:11	98-08-8	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050							
Antimony	ND	mg/kg	0.45	20	03/31/15 13:57	04/01/15 08:56	7440-36-0	
Arsenic	**1.6**	mg/kg	0.45	20	03/31/15 13:57	04/01/15 08:56	7440-38-2	
Barium	**26.4**	mg/kg	0.27	20	03/31/15 13:57	04/01/15 08:56	7440-39-3	
Beryllium	ND	mg/kg	0.18	20	03/31/15 13:57	04/01/15 08:56	7440-41-7	
Cadmium	**0.085**	mg/kg	0.072	20	03/31/15 13:57	04/01/15 08:56	7440-43-9	
Chromium	**4.4**	mg/kg	0.45	20	03/31/15 13:57	04/01/15 08:56	7440-47-3	
Copper	**4.8**	mg/kg	0.90	20	03/31/15 13:57	04/01/15 08:56	7440-50-8	
Lead	**11.0**	mg/kg	0.090	20	03/31/15 13:57	04/01/15 08:56	7439-92-1	
Nickel	**5.3**	mg/kg	0.45	20	03/31/15 13:57	04/01/15 08:56	7440-02-0	
Selenium	ND	mg/kg	0.45	20	03/31/15 13:57	04/01/15 08:56	7782-49-2	
Silver	ND	mg/kg	0.45	20	03/31/15 13:57	04/01/15 08:56	7440-22-4	
Thallium	ND	mg/kg	0.090	20	03/31/15 13:57	04/01/15 08:56	7440-28-0	
Zinc	**27.2**	mg/kg	4.5	20	03/31/15 13:57	04/01/15 08:56	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B							
Mercury	**0.024**	mg/kg	0.019	1	03/31/15 15:33	04/01/15 11:23	7439-97-6	
Dry Weight	Analytical Method: ASTM D2974							
Percent Moisture	**5.0**	%	0.10	1		03/30/15 11:43		
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	**0.19**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	83-32-9	
Acenaphthylene	**0.15**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	208-96-8	
Anthracene	**0.53**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	120-12-7	
Benzo(a)anthracene	**0.47**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	56-55-3	
Benzo(a)pyrene	**0.52**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	50-32-8	
Benzo(b)fluoranthene	**0.69**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	205-99-2	
Benzo(g,h,i)perylene	**0.24**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	191-24-2	
Benzo(k)fluoranthene	**0.27**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	207-08-9	
Chrysene	**0.59**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	218-01-9	
Dibenz(a,h)anthracene	ND	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	53-70-3	
Fluoranthene	**1.2**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	206-44-0	
Fluorene	**0.35**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.20**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	193-39-5	
Naphthalene	**0.056**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	91-20-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-3 (1-2) **Lab ID: 10300830003** Collected: 03/25/15 17:00 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Phenanthrene	**1.7**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	85-01-8	
Pyrene	**1.3**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	**0.69**	mg/kg	0.052	1	03/30/15 10:46	04/01/15 19:28		
Surrogates								
2-Fluorobiphenyl (S)	75	%.	55-125	1	03/30/15 10:46	04/01/15 19:28	321-60-8	P3
p-Terphenyl-d14 (S)	63	%.	30-150	1	03/30/15 10:46	04/01/15 19:28	1718-51-0	
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
Acetone	ND	mg/kg	1.1	1	03/31/15 11:46	04/01/15 17:54	67-64-1	
Allyl chloride	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	107-05-1	
Benzene	ND	mg/kg	0.022	1	03/31/15 11:46	04/01/15 17:54	71-43-2	
Bromobenzene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	108-86-1	
Bromochloromethane	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	74-97-5	
Bromodichloromethane	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	75-27-4	
Bromoform	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	75-25-2	
Bromomethane	ND	mg/kg	0.54	1	03/31/15 11:46	04/01/15 17:54	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.27	1	03/31/15 11:46	04/01/15 17:54	78-93-3	
n-Butylbenzene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	98-06-6	
Carbon tetrachloride	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	56-23-5	
Chlorobenzene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	108-90-7	
Chloroethane	ND	mg/kg	0.54	1	03/31/15 11:46	04/01/15 17:54	75-00-3	
Chloroform	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	67-66-3	
Chloromethane	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.54	1	03/31/15 11:46	04/01/15 17:54	96-12-8	
Dibromochloromethane	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	106-93-4	
Dibromomethane	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	156-60-5	
Dichlorofluoromethane	ND	mg/kg	0.54	1	03/31/15 11:46	04/01/15 17:54	75-43-4	
1,2-Dichloropropane	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	10061-01-5	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-3 (1-2) **Lab ID: 10300830003** Collected: 03/25/15 17:00 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
trans-1,3-Dichloropropene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	10061-02-6	
Diethyl ether (Ethyl ether)	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	60-29-7	
Ethylbenzene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	100-41-4	
Hexachloro-1,3-butadiene	ND	mg/kg	0.27	1	03/31/15 11:46	04/01/15 17:54	87-68-3	
Isopropylbenzene (Cumene)	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	99-87-6	
Methylene Chloride	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.27	1	03/31/15 11:46	04/01/15 17:54	108-10-1	
Methyl-tert-butyl ether	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	1634-04-4	
Naphthalene	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	91-20-3	
n-Propylbenzene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	103-65-1	
Styrene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	79-34-5	
Tetrachloroethene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	127-18-4	
Tetrahydrofuran	ND	mg/kg	2.2	1	03/31/15 11:46	04/01/15 17:54	109-99-9	
Toluene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	79-00-5	
Trichloroethene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	mg/kg	0.22	1	03/31/15 11:46	04/01/15 17:54	76-13-1	
1,2,4-Trimethylbenzene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.054	1	03/31/15 11:46	04/01/15 17:54	108-67-8	
Vinyl chloride	ND	mg/kg	0.022	1	03/31/15 11:46	04/01/15 17:54	75-01-4	
Xylene (Total)	ND	mg/kg	0.16	1	03/31/15 11:46	04/01/15 17:54	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	87	%.	55-150	1	03/31/15 11:46	04/01/15 17:54	17060-07-0	
Toluene-d8 (S)	98	%.	61-125	1	03/31/15 11:46	04/01/15 17:54	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	54-131	1	03/31/15 11:46	04/01/15 17:54	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-5 (2-4) **Lab ID: 10300830005** Collected: 03/26/15 08:40 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	ND	mg/kg	8.6	1	03/30/15 10:25	03/31/15 15:05		
Surrogates								
n-Triacontane (S)	70	%.	50-150	1	03/30/15 10:25	03/31/15 15:05	638-68-6	
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	ND	mg/kg	11.4	1	04/06/15 09:34	04/06/15 22:34		
Surrogates								
a,a,a-Trifluorotoluene (S)	94	%.	80-150	1	04/06/15 09:34	04/06/15 22:34	98-08-8	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050							
Antimony	ND	mg/kg	0.45	20	03/31/15 13:57	04/01/15 08:58	7440-36-0	
Arsenic	**3.1**	mg/kg	0.45	20	03/31/15 13:57	04/01/15 08:58	7440-38-2	
Barium	**25.3**	mg/kg	0.27	20	03/31/15 13:57	04/01/15 08:58	7440-39-3	
Beryllium	ND	mg/kg	0.18	20	03/31/15 13:57	04/01/15 08:58	7440-41-7	
Cadmium	**0.15**	mg/kg	0.072	20	03/31/15 13:57	04/01/15 08:58	7440-43-9	
Chromium	**4.1**	mg/kg	0.45	20	03/31/15 13:57	04/01/15 08:58	7440-47-3	
Copper	**3.2**	mg/kg	0.91	20	03/31/15 13:57	04/01/15 08:58	7440-50-8	
Lead	**16.2**	mg/kg	0.091	20	03/31/15 13:57	04/01/15 08:58	7439-92-1	
Nickel	**3.9**	mg/kg	0.45	20	03/31/15 13:57	04/01/15 08:58	7440-02-0	
Selenium	ND	mg/kg	0.45	20	03/31/15 13:57	04/01/15 08:58	7782-49-2	
Silver	ND	mg/kg	0.45	20	03/31/15 13:57	04/01/15 08:58	7440-22-4	
Thallium	ND	mg/kg	0.091	20	03/31/15 13:57	04/01/15 08:58	7440-28-0	
Zinc	**40.7**	mg/kg	4.5	20	03/31/15 13:57	04/01/15 08:58	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B							
Mercury	**0.030**	mg/kg	0.020	1	03/31/15 15:33	04/01/15 11:25	7439-97-6	
Dry Weight	Analytical Method: ASTM D2974							
Percent Moisture	**10.2**	%	0.10	1		03/30/15 11:43		
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	ND	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	83-32-9	
Acenaphthylene	**0.020**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	208-96-8	
Anthracene	**0.019**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	120-12-7	
Benzo(a)anthracene	**0.046**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	56-55-3	
Benzo(a)pyrene	**0.063**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	50-32-8	
Benzo(b)fluoranthene	**0.078**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	205-99-2	
Benzo(g,h,i)perylene	**0.052**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	191-24-2	
Benzo(k)fluoranthene	**0.027**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	207-08-9	
Chrysene	**0.057**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	218-01-9	
Dibenz(a,h)anthracene	ND	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	53-70-3	
Fluoranthene	**0.062**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	206-44-0	
Fluorene	ND	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.041**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	193-39-5	
Naphthalene	ND	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	91-20-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-5 (2-4) **Lab ID: 10300830005** Collected: 03/26/15 08:40 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Phenanthrene	**0.035**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	85-01-8	
Pyrene	**0.082**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	**0.083**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 13:41		
Surrogates								
2-Fluorobiphenyl (S)	76	%.	55-125	1	03/30/15 10:46	04/01/15 13:41	321-60-8	
p-Terphenyl-d14 (S)	69	%.	30-150	1	03/30/15 10:46	04/01/15 13:41	1718-51-0	
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
Acetone	ND	mg/kg	1.2	1	03/31/15 11:46	04/01/15 18:15	67-64-1	
Allyl chloride	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	107-05-1	
Benzene	ND	mg/kg	0.023	1	03/31/15 11:46	04/01/15 18:15	71-43-2	
Bromobenzene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	108-86-1	
Bromochloromethane	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	74-97-5	
Bromodichloromethane	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	75-27-4	
Bromoform	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	75-25-2	
Bromomethane	ND	mg/kg	0.58	1	03/31/15 11:46	04/01/15 18:15	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.29	1	03/31/15 11:46	04/01/15 18:15	78-93-3	
n-Butylbenzene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	98-06-6	
Carbon tetrachloride	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	56-23-5	
Chlorobenzene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	108-90-7	
Chloroethane	ND	mg/kg	0.58	1	03/31/15 11:46	04/01/15 18:15	75-00-3	
Chloroform	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	67-66-3	
Chloromethane	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.58	1	03/31/15 11:46	04/01/15 18:15	96-12-8	
Dibromochloromethane	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	106-93-4	
Dibromomethane	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	156-60-5	
Dichlorofluoromethane	ND	mg/kg	0.58	1	03/31/15 11:46	04/01/15 18:15	75-43-4	
1,2-Dichloropropane	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	10061-01-5	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-5 (2-4) **Lab ID: 10300830005** Collected: 03/26/15 08:40 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
trans-1,3-Dichloropropene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	10061-02-6	
Diethyl ether (Ethyl ether)	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	60-29-7	
Ethylbenzene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	100-41-4	
Hexachloro-1,3-butadiene	ND	mg/kg	0.29	1	03/31/15 11:46	04/01/15 18:15	87-68-3	
Isopropylbenzene (Cumene)	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	99-87-6	
Methylene Chloride	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.29	1	03/31/15 11:46	04/01/15 18:15	108-10-1	
Methyl-tert-butyl ether	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	1634-04-4	
Naphthalene	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	91-20-3	
n-Propylbenzene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	103-65-1	
Styrene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	79-34-5	
Tetrachloroethene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	127-18-4	
Tetrahydrofuran	ND	mg/kg	2.3	1	03/31/15 11:46	04/01/15 18:15	109-99-9	
Toluene	**0.069**	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	79-00-5	
Trichloroethene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	mg/kg	0.23	1	03/31/15 11:46	04/01/15 18:15	76-13-1	
1,2,4-Trimethylbenzene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.058	1	03/31/15 11:46	04/01/15 18:15	108-67-8	
Vinyl chloride	ND	mg/kg	0.023	1	03/31/15 11:46	04/01/15 18:15	75-01-4	
Xylene (Total)	ND	mg/kg	0.17	1	03/31/15 11:46	04/01/15 18:15	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	87	%.	55-150	1	03/31/15 11:46	04/01/15 18:15	17060-07-0	
Toluene-d8 (S)	98	%.	61-125	1	03/31/15 11:46	04/01/15 18:15	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	54-131	1	03/31/15 11:46	04/01/15 18:15	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-6 (3-5) **Lab ID: 10300830006** Collected: 03/26/15 09:15 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	**169**	mg/kg	46.8	5	03/30/15 10:25	04/01/15 10:32		T6
Surrogates								
n-Triacontane (S)	94	%.	50-150	5	03/30/15 10:25	04/01/15 10:32	638-68-6	
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	ND	mg/kg	11.2	1	04/06/15 09:34	04/06/15 22:56		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	04/06/15 09:34	04/06/15 22:56	98-08-8	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050							
Antimony	ND	mg/kg	0.44	20	03/31/15 13:57	04/01/15 09:01	7440-36-0	
Arsenic	**1.1**	mg/kg	0.44	20	03/31/15 13:57	04/01/15 09:01	7440-38-2	
Barium	**31.2**	mg/kg	0.26	20	03/31/15 13:57	04/01/15 09:01	7440-39-3	
Beryllium	ND	mg/kg	0.18	20	03/31/15 13:57	04/01/15 09:01	7440-41-7	
Cadmium	ND	mg/kg	0.071	20	03/31/15 13:57	04/01/15 09:01	7440-43-9	
Chromium	**3.8**	mg/kg	0.44	20	03/31/15 13:57	04/01/15 09:01	7440-47-3	
Copper	**1.8**	mg/kg	0.88	20	03/31/15 13:57	04/01/15 09:01	7440-50-8	
Lead	**2.5**	mg/kg	0.088	20	03/31/15 13:57	04/01/15 09:01	7439-92-1	
Nickel	**3.6**	mg/kg	0.44	20	03/31/15 13:57	04/01/15 09:01	7440-02-0	
Selenium	ND	mg/kg	0.44	20	03/31/15 13:57	04/01/15 09:01	7782-49-2	
Silver	ND	mg/kg	0.44	20	03/31/15 13:57	04/01/15 09:01	7440-22-4	
Thallium	ND	mg/kg	0.088	20	03/31/15 13:57	04/01/15 09:01	7440-28-0	
Zinc	**13.7**	mg/kg	4.4	20	03/31/15 13:57	04/01/15 09:01	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B							
Mercury	ND	mg/kg	0.020	1	03/31/15 15:33	04/01/15 11:27	7439-97-6	
Dry Weight	Analytical Method: ASTM D2974							
Percent Moisture	**12.2**	%	0.10	1		03/30/15 11:43		
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	**0.58**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 17:39	83-32-9	
Acenaphthylene	**0.25**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 17:39	208-96-8	
Anthracene	**1.6**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 17:39	120-12-7	
Benzo(a)anthracene	**1.8**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 17:39	56-55-3	
Benzo(a)pyrene	**1.6**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 17:39	50-32-8	
Benzo(b)fluoranthene	**1.8**	mg/kg	0.23	20	03/30/15 10:46	04/01/15 18:01	205-99-2	
Benzo(g,h,i)perylene	**0.72**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 17:39	191-24-2	
Benzo(k)fluoranthene	**0.76**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 17:39	207-08-9	
Chrysene	**1.8**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 17:39	218-01-9	
Dibenz(a,h)anthracene	ND	mg/kg	0.057	5	03/30/15 10:46	04/01/15 17:39	53-70-3	
Fluoranthene	**3.7**	mg/kg	0.23	20	03/30/15 10:46	04/01/15 18:01	206-44-0	
Fluorene	**1.1**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 17:39	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.72**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 17:39	193-39-5	
Naphthalene	**0.44**	mg/kg	0.057	5	03/30/15 10:46	04/01/15 17:39	91-20-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-6 (3-5) **Lab ID: 10300830006** Collected: 03/26/15 09:15 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Phenanthrene	**4.2**	mg/kg	0.23	20	03/30/15 10:46	04/01/15 18:01	85-01-8	
Pyrene	**4.2**	mg/kg	0.23	20	03/30/15 10:46	04/01/15 18:01	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	**2.1**	mg/kg	0.23	20	03/30/15 10:46	04/01/15 18:01		
Surrogates								
2-Fluorobiphenyl (S)	87	%.	55-125	5	03/30/15 10:46	04/01/15 17:39	321-60-8	D3
p-Terphenyl-d14 (S)	81	%.	30-150	5	03/30/15 10:46	04/01/15 17:39	1718-51-0	
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
Acetone	ND	mg/kg	1.2	1	03/31/15 11:46	04/01/15 18:36	67-64-1	
Allyl chloride	ND	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	107-05-1	
Benzene	ND	mg/kg	0.024	1	03/31/15 11:46	04/01/15 18:36	71-43-2	
Bromobenzene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	108-86-1	
Bromochloromethane	ND	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	74-97-5	
Bromodichloromethane	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	75-27-4	
Bromoform	ND	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	75-25-2	
Bromomethane	ND	mg/kg	0.59	1	03/31/15 11:46	04/01/15 18:36	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.29	1	03/31/15 11:46	04/01/15 18:36	78-93-3	
n-Butylbenzene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	98-06-6	
Carbon tetrachloride	ND	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	56-23-5	
Chlorobenzene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	108-90-7	
Chloroethane	ND	mg/kg	0.59	1	03/31/15 11:46	04/01/15 18:36	75-00-3	
Chloroform	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	67-66-3	
Chloromethane	ND	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.59	1	03/31/15 11:46	04/01/15 18:36	96-12-8	
Dibromochloromethane	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	106-93-4	
Dibromomethane	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	156-60-5	
Dichlorofluoromethane	ND	mg/kg	0.59	1	03/31/15 11:46	04/01/15 18:36	75-43-4	
1,2-Dichloropropane	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	10061-01-5	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-6 (3-5) **Lab ID: 10300830006** Collected: 03/26/15 09:15 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
trans-1,3-Dichloropropene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	10061-02-6	
Diethyl ether (Ethyl ether)	ND	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	60-29-7	
Ethylbenzene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	100-41-4	
Hexachloro-1,3-butadiene	ND	mg/kg	0.29	1	03/31/15 11:46	04/01/15 18:36	87-68-3	
Isopropylbenzene (Cumene)	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	99-87-6	
Methylene Chloride	ND	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.29	1	03/31/15 11:46	04/01/15 18:36	108-10-1	
Methyl-tert-butyl ether	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	1634-04-4	
Naphthalene	**0.40**	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	91-20-3	
n-Propylbenzene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	103-65-1	
Styrene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	79-34-5	
Tetrachloroethene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	127-18-4	
Tetrahydrofuran	ND	mg/kg	2.4	1	03/31/15 11:46	04/01/15 18:36	109-99-9	
Toluene	**0.069**	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	79-00-5	
Trichloroethene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	mg/kg	0.24	1	03/31/15 11:46	04/01/15 18:36	76-13-1	
1,2,4-Trimethylbenzene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.059	1	03/31/15 11:46	04/01/15 18:36	108-67-8	
Vinyl chloride	ND	mg/kg	0.024	1	03/31/15 11:46	04/01/15 18:36	75-01-4	
Xylene (Total)	ND	mg/kg	0.18	1	03/31/15 11:46	04/01/15 18:36	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	88	%.	55-150	1	03/31/15 11:46	04/01/15 18:36	17060-07-0	
Toluene-d8 (S)	99	%.	61-125	1	03/31/15 11:46	04/01/15 18:36	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	54-131	1	03/31/15 11:46	04/01/15 18:36	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-7 (3-5) **Lab ID: 10300830007** Collected: 03/26/15 09:50 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	**112**	mg/kg	42.2	5	03/30/15 10:25	04/01/15 10:25		T6
Surrogates								
n-Triacontane (S)	84	%.	50-150	5	03/30/15 10:25	04/01/15 10:25	638-68-6	
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	ND	mg/kg	11.0	1	04/06/15 09:34	04/06/15 23:18		
Surrogates								
a,a,a-Trifluorotoluene (S)	98	%.	80-150	1	04/06/15 09:34	04/06/15 23:18	98-08-8	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050							
Antimony	**0.53**	mg/kg	0.51	20	03/31/15 13:57	04/01/15 09:24	7440-36-0	
Arsenic	**2.6**	mg/kg	0.51	20	03/31/15 13:57	04/01/15 09:24	7440-38-2	
Barium	**58.2**	mg/kg	0.31	20	03/31/15 13:57	04/01/15 09:24	7440-39-3	
Beryllium	ND	mg/kg	0.20	20	03/31/15 13:57	04/01/15 09:24	7440-41-7	
Cadmium	**0.72**	mg/kg	0.081	20	03/31/15 13:57	04/01/15 09:24	7440-43-9	
Chromium	**7.5**	mg/kg	0.51	20	03/31/15 13:57	04/01/15 09:24	7440-47-3	
Copper	**14.6**	mg/kg	1.0	20	03/31/15 13:57	04/01/15 09:24	7440-50-8	
Lead	**99.4**	mg/kg	0.10	20	03/31/15 13:57	04/01/15 09:24	7439-92-1	
Nickel	**9.9**	mg/kg	0.51	20	03/31/15 13:57	04/01/15 09:24	7440-02-0	
Selenium	ND	mg/kg	0.51	20	03/31/15 13:57	04/01/15 09:24	7782-49-2	
Silver	ND	mg/kg	0.51	20	03/31/15 13:57	04/01/15 09:24	7440-22-4	
Thallium	ND	mg/kg	0.10	20	03/31/15 13:57	04/01/15 09:24	7440-28-0	
Zinc	**90.6**	mg/kg	5.1	20	03/31/15 13:57	04/01/15 09:24	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B							
Mercury	**0.069**	mg/kg	0.021	1	03/31/15 15:33	04/01/15 11:33	7439-97-6	
Dry Weight	Analytical Method: ASTM D2974							
Percent Moisture	**7.2**	%	0.10	1		03/30/15 11:43		
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	**0.082**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	83-32-9	
Acenaphthylene	**0.074**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	208-96-8	
Anthracene	**0.22**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	120-12-7	
Benzo(a)anthracene	**0.62**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	56-55-3	
Benzo(a)pyrene	**0.94**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	50-32-8	
Benzo(b)fluoranthene	**1.0**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	205-99-2	
Benzo(g,h,i)perylene	**0.59**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	191-24-2	
Benzo(k)fluoranthene	**0.43**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	207-08-9	
Chrysene	**0.71**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	218-01-9	
Dibenz(a,h)anthracene	ND	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	53-70-3	
Fluoranthene	**0.94**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	206-44-0	
Fluorene	**0.062**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.51**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	193-39-5	
Naphthalene	ND	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	91-20-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-7 (3-5) **Lab ID: 10300830007** Collected: 03/26/15 09:50 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Phenanthrene	**0.71**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	85-01-8	
Pyrene	**1.2**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	**1.2**	mg/kg	0.054	5	03/30/15 10:46	04/01/15 18:23		
Surrogates								
2-Fluorobiphenyl (S)	84	%.	55-125	5	03/30/15 10:46	04/01/15 18:23	321-60-8	D3
p-Terphenyl-d14 (S)	87	%.	30-150	5	03/30/15 10:46	04/01/15 18:23	1718-51-0	
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
Acetone	ND	mg/kg	1.0	1	04/01/15 09:05	04/01/15 19:59	67-64-1	
Allyl chloride	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	107-05-1	
Benzene	ND	mg/kg	0.021	1	04/01/15 09:05	04/01/15 19:59	71-43-2	
Bromobenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	108-86-1	
Bromochloromethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	74-97-5	
Bromodichloromethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	75-27-4	
Bromoform	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	75-25-2	
Bromomethane	ND	mg/kg	0.52	1	04/01/15 09:05	04/01/15 19:59	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 19:59	78-93-3	
n-Butylbenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	98-06-6	
Carbon tetrachloride	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	56-23-5	
Chlorobenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	108-90-7	
Chloroethane	ND	mg/kg	0.52	1	04/01/15 09:05	04/01/15 19:59	75-00-3	
Chloroform	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	67-66-3	
Chloromethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.52	1	04/01/15 09:05	04/01/15 19:59	96-12-8	
Dibromochloromethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	106-93-4	
Dibromomethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	156-60-5	
Dichlorofluoromethane	ND	mg/kg	0.52	1	04/01/15 09:05	04/01/15 19:59	75-43-4	
1,2-Dichloropropane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	10061-01-5	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-7 (3-5) **Lab ID: 10300830007** Collected: 03/26/15 09:50 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
trans-1,3-Dichloropropene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	10061-02-6	
Diethyl ether (Ethyl ether)	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	60-29-7	
Ethylbenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	100-41-4	
Hexachloro-1,3-butadiene	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 19:59	87-68-3	
Isopropylbenzene (Cumene)	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	99-87-6	
Methylene Chloride	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 19:59	108-10-1	
Methyl-tert-butyl ether	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	1634-04-4	
Naphthalene	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	91-20-3	
n-Propylbenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	103-65-1	
Styrene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	79-34-5	
Tetrachloroethene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	127-18-4	
Tetrahydrofuran	ND	mg/kg	2.1	1	04/01/15 09:05	04/01/15 19:59	109-99-9	
Toluene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	79-00-5	
Trichloroethene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 19:59	76-13-1	
1,2,4-Trimethylbenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 19:59	108-67-8	
Vinyl chloride	ND	mg/kg	0.021	1	04/01/15 09:05	04/01/15 19:59	75-01-4	
Xylene (Total)	ND	mg/kg	0.16	1	04/01/15 09:05	04/01/15 19:59	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	87	%.	55-150	1	04/01/15 09:05	04/01/15 19:59	17060-07-0	
Toluene-d8 (S)	100	%.	61-125	1	04/01/15 09:05	04/01/15 19:59	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	54-131	1	04/01/15 09:05	04/01/15 19:59	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-8 (2) **Lab ID: 10300830008** Collected: 03/25/15 09:45 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	ND	mg/kg	9.5	1	03/30/15 10:25	03/31/15 15:54		
Surrogates								
n-Triacontane (S)	72	%.	50-150	1	03/30/15 10:25	03/31/15 15:54	638-68-6	
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	ND	mg/kg	11.5	1	04/08/15 13:24	04/08/15 15:49		
Surrogates								
a,a,a-Trifluorotoluene (S)	91	%.	80-150	1	04/08/15 13:24	04/08/15 15:49	98-08-8	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050							
Antimony	ND	mg/kg	0.49	20	03/31/15 13:57	04/01/15 09:27	7440-36-0	
Arsenic	**2.2**	mg/kg	0.49	20	03/31/15 13:57	04/01/15 09:27	7440-38-2	
Barium	**94.6**	mg/kg	0.30	20	03/31/15 13:57	04/01/15 09:27	7440-39-3	
Beryllium	**0.30**	mg/kg	0.20	20	03/31/15 13:57	04/01/15 09:27	7440-41-7	
Cadmium	ND	mg/kg	0.079	20	03/31/15 13:57	04/01/15 09:27	7440-43-9	
Chromium	**7.9**	mg/kg	0.49	20	03/31/15 13:57	04/01/15 09:27	7440-47-3	
Copper	**4.7**	mg/kg	0.99	20	03/31/15 13:57	04/01/15 09:27	7440-50-8	
Lead	**5.0**	mg/kg	0.099	20	03/31/15 13:57	04/01/15 09:27	7439-92-1	
Nickel	**8.3**	mg/kg	0.49	20	03/31/15 13:57	04/01/15 09:27	7440-02-0	
Selenium	ND	mg/kg	0.49	20	03/31/15 13:57	04/01/15 09:27	7782-49-2	
Silver	ND	mg/kg	0.49	20	03/31/15 13:57	04/01/15 09:27	7440-22-4	
Thallium	ND	mg/kg	0.099	20	03/31/15 13:57	04/01/15 09:27	7440-28-0	
Zinc	**27.1**	mg/kg	4.9	20	03/31/15 13:57	04/01/15 09:27	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B							
Mercury	ND	mg/kg	0.023	1	03/31/15 15:33	04/01/15 11:35	7439-97-6	
Dry Weight	Analytical Method: ASTM D2974							
Percent Moisture	**14.8**	%	0.10	1		03/30/15 11:44		
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	83-32-9	
Acenaphthylene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	208-96-8	
Anthracene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	120-12-7	
Benzo(a)anthracene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	56-55-3	
Benzo(a)pyrene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	50-32-8	
Benzo(b)fluoranthene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	205-99-2	
Benzo(g,h,i)perylene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	191-24-2	
Benzo(k)fluoranthene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	207-08-9	
Chrysene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	218-01-9	
Dibenz(a,h)anthracene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	53-70-3	
Fluoranthene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	206-44-0	
Fluorene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	193-39-5	
Naphthalene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	91-20-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-8 (2) **Lab ID: 10300830008** Collected: 03/25/15 09:45 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Phenanthrene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	85-01-8	
Pyrene	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	ND	mg/kg	0.012	1	03/30/15 10:46	03/31/15 15:28		
Surrogates								
2-Fluorobiphenyl (S)	56	%.	55-125	1	03/30/15 10:46	03/31/15 15:28	321-60-8	
p-Terphenyl-d14 (S)	60	%.	30-150	1	03/30/15 10:46	03/31/15 15:28	1718-51-0	
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
Acetone	ND	mg/kg	1.2	1	04/01/15 09:05	04/01/15 20:19	67-64-1	
Allyl chloride	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	107-05-1	
Benzene	ND	mg/kg	0.024	1	04/01/15 09:05	04/01/15 20:19	71-43-2	
Bromobenzene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	108-86-1	
Bromochloromethane	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	74-97-5	
Bromodichloromethane	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	75-27-4	
Bromoform	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	75-25-2	
Bromomethane	ND	mg/kg	0.59	1	04/01/15 09:05	04/01/15 20:19	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.30	1	04/01/15 09:05	04/01/15 20:19	78-93-3	
n-Butylbenzene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	98-06-6	
Carbon tetrachloride	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	56-23-5	
Chlorobenzene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	108-90-7	
Chloroethane	ND	mg/kg	0.59	1	04/01/15 09:05	04/01/15 20:19	75-00-3	
Chloroform	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	67-66-3	
Chloromethane	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.59	1	04/01/15 09:05	04/01/15 20:19	96-12-8	
Dibromochloromethane	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	106-93-4	
Dibromomethane	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	156-60-5	
Dichlorofluoromethane	ND	mg/kg	0.59	1	04/01/15 09:05	04/01/15 20:19	75-43-4	
1,2-Dichloropropane	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	10061-01-5	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-8 (2) **Lab ID: 10300830008** Collected: 03/25/15 09:45 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
trans-1,3-Dichloropropene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	10061-02-6	
Diethyl ether (Ethyl ether)	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	60-29-7	
Ethylbenzene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	100-41-4	
Hexachloro-1,3-butadiene	ND	mg/kg	0.30	1	04/01/15 09:05	04/01/15 20:19	87-68-3	
Isopropylbenzene (Cumene)	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	99-87-6	
Methylene Chloride	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.30	1	04/01/15 09:05	04/01/15 20:19	108-10-1	
Methyl-tert-butyl ether	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	1634-04-4	
Naphthalene	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	91-20-3	
n-Propylbenzene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	103-65-1	
Styrene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	79-34-5	
Tetrachloroethene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	127-18-4	
Tetrahydrofuran	ND	mg/kg	2.4	1	04/01/15 09:05	04/01/15 20:19	109-99-9	
Toluene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	79-00-5	
Trichloroethene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	mg/kg	0.24	1	04/01/15 09:05	04/01/15 20:19	76-13-1	
1,2,4-Trimethylbenzene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.059	1	04/01/15 09:05	04/01/15 20:19	108-67-8	
Vinyl chloride	ND	mg/kg	0.024	1	04/01/15 09:05	04/01/15 20:19	75-01-4	
Xylene (Total)	ND	mg/kg	0.18	1	04/01/15 09:05	04/01/15 20:19	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	90	%.	55-150	1	04/01/15 09:05	04/01/15 20:19	17060-07-0	
Toluene-d8 (S)	102	%.	61-125	1	04/01/15 09:05	04/01/15 20:19	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	54-131	1	04/01/15 09:05	04/01/15 20:19	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-10 (2) **Lab ID: 10300830010** Collected: 03/25/15 12:00 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	**46.1**	mg/kg	9.4	1	03/30/15 10:25	03/31/15 14:58		T6
Surrogates								
n-Triacontane (S)	71	%.	50-150	1	03/30/15 10:25	03/31/15 14:58	638-68-6	
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	ND	mg/kg	11.3	1	04/08/15 13:24	04/08/15 16:11		
Surrogates								
a,a,a-Trifluorotoluene (S)	92	%.	80-150	1	04/08/15 13:24	04/08/15 16:11	98-08-8	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050							
Antimony	ND	mg/kg	0.55	20	03/31/15 13:57	04/01/15 09:30	7440-36-0	
Arsenic	**2.4**	mg/kg	0.55	20	03/31/15 13:57	04/01/15 09:30	7440-38-2	
Barium	**43.5**	mg/kg	0.33	20	03/31/15 13:57	04/01/15 09:30	7440-39-3	
Beryllium	ND	mg/kg	0.22	20	03/31/15 13:57	04/01/15 09:30	7440-41-7	
Cadmium	**1.3**	mg/kg	0.088	20	03/31/15 13:57	04/01/15 09:30	7440-43-9	
Chromium	**12.7**	mg/kg	0.55	20	03/31/15 13:57	04/01/15 09:30	7440-47-3	
Copper	**18.6**	mg/kg	1.1	20	03/31/15 13:57	04/01/15 09:30	7440-50-8	
Lead	**24.4**	mg/kg	0.11	20	03/31/15 13:57	04/01/15 09:30	7439-92-1	
Nickel	**10.3**	mg/kg	0.55	20	03/31/15 13:57	04/01/15 09:30	7440-02-0	
Selenium	ND	mg/kg	0.55	20	03/31/15 13:57	04/01/15 09:30	7782-49-2	
Silver	ND	mg/kg	0.55	20	03/31/15 13:57	04/01/15 09:30	7440-22-4	
Thallium	ND	mg/kg	0.11	20	03/31/15 13:57	04/01/15 09:30	7440-28-0	
Zinc	**84.6**	mg/kg	5.5	20	03/31/15 13:57	04/01/15 09:30	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B							
Mercury	**0.025**	mg/kg	0.021	1	03/31/15 15:33	04/01/15 11:37	7439-97-6	
Dry Weight	Analytical Method: ASTM D2974							
Percent Moisture	**13.9**	%	0.10	1		03/30/15 11:44		
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	ND	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	83-32-9	
Acenaphthylene	**0.029**	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	208-96-8	
Anthracene	**0.028**	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	120-12-7	
Benzo(a)anthracene	**0.045**	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	56-55-3	
Benzo(a)pyrene	**0.076**	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	50-32-8	
Benzo(b)fluoranthene	**0.11**	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	205-99-2	
Benzo(g,h,i)perylene	**0.096**	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	191-24-2	
Benzo(k)fluoranthene	**0.039**	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	207-08-9	
Chrysene	**0.064**	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	218-01-9	
Dibenz(a,h)anthracene	ND	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	53-70-3	
Fluoranthene	**0.070**	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	206-44-0	
Fluorene	ND	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.065**	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	193-39-5	
Naphthalene	ND	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	91-20-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-10 (2) **Lab ID: 10300830010** Collected: 03/25/15 12:00 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Phenanthrene	**0.048**	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	85-01-8	
Pyrene	**0.085**	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	**0.10**	mg/kg	0.012	1	03/30/15 10:46	04/01/15 15:51		
Surrogates								
2-Fluorobiphenyl (S)	74	%.	55-125	1	03/30/15 10:46	04/01/15 15:51	321-60-8	
p-Terphenyl-d14 (S)	70	%.	30-150	1	03/30/15 10:46	04/01/15 15:51	1718-51-0	
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
Acetone	ND	mg/kg	1.3	1	04/01/15 09:05	04/01/15 20:39	67-64-1	
Allyl chloride	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	107-05-1	
Benzene	ND	mg/kg	0.026	1	04/01/15 09:05	04/01/15 20:39	71-43-2	
Bromobenzene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	108-86-1	
Bromochloromethane	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	74-97-5	
Bromodichloromethane	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	75-27-4	
Bromoform	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	75-25-2	
Bromomethane	ND	mg/kg	0.66	1	04/01/15 09:05	04/01/15 20:39	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.33	1	04/01/15 09:05	04/01/15 20:39	78-93-3	
n-Butylbenzene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	98-06-6	
Carbon tetrachloride	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	56-23-5	
Chlorobenzene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	108-90-7	
Chloroethane	ND	mg/kg	0.66	1	04/01/15 09:05	04/01/15 20:39	75-00-3	
Chloroform	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	67-66-3	
Chloromethane	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.66	1	04/01/15 09:05	04/01/15 20:39	96-12-8	
Dibromochloromethane	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	106-93-4	
Dibromomethane	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	156-60-5	
Dichlorofluoromethane	ND	mg/kg	0.66	1	04/01/15 09:05	04/01/15 20:39	75-43-4	
1,2-Dichloropropane	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	10061-01-5	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-10 (2) **Lab ID: 10300830010** Collected: 03/25/15 12:00 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
trans-1,3-Dichloropropene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	10061-02-6	
Diethyl ether (Ethyl ether)	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	60-29-7	
Ethylbenzene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	100-41-4	
Hexachloro-1,3-butadiene	ND	mg/kg	0.33	1	04/01/15 09:05	04/01/15 20:39	87-68-3	
Isopropylbenzene (Cumene)	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	99-87-6	
Methylene Chloride	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.33	1	04/01/15 09:05	04/01/15 20:39	108-10-1	
Methyl-tert-butyl ether	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	1634-04-4	
Naphthalene	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	91-20-3	
n-Propylbenzene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	103-65-1	
Styrene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	79-34-5	
Tetrachloroethene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	127-18-4	
Tetrahydrofuran	ND	mg/kg	2.6	1	04/01/15 09:05	04/01/15 20:39	109-99-9	
Toluene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	79-00-5	
Trichloroethene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 20:39	76-13-1	
1,2,4-Trimethylbenzene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.066	1	04/01/15 09:05	04/01/15 20:39	108-67-8	
Vinyl chloride	ND	mg/kg	0.026	1	04/01/15 09:05	04/01/15 20:39	75-01-4	
Xylene (Total)	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 20:39	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	90	%.	55-150	1	04/01/15 09:05	04/01/15 20:39	17060-07-0	
Toluene-d8 (S)	101	%.	61-125	1	04/01/15 09:05	04/01/15 20:39	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	54-131	1	04/01/15 09:05	04/01/15 20:39	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-11 (1-2) **Lab ID: 10300830011** Collected: 03/26/15 12:30 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	**64.0**	mg/kg	40.1	5	03/30/15 10:25	04/01/15 10:39		T6
Surrogates								
n-Triacontane (S)	75	%.	50-150	5	03/30/15 10:25	04/01/15 10:39	638-68-6	
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	**14.4**	mg/kg	11.0	1	04/08/15 13:24	04/08/15 16:34		
Surrogates								
a,a,a-Trifluorotoluene (S)	91	%.	80-150	1	04/08/15 13:24	04/08/15 16:34	98-08-8	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050							
Antimony	ND	mg/kg	0.49	20	03/31/15 13:57	04/01/15 09:33	7440-36-0	
Arsenic	**2.8**	mg/kg	0.49	20	03/31/15 13:57	04/01/15 09:33	7440-38-2	
Barium	**25.5**	mg/kg	0.30	20	03/31/15 13:57	04/01/15 09:33	7440-39-3	
Beryllium	ND	mg/kg	0.20	20	03/31/15 13:57	04/01/15 09:33	7440-41-7	
Cadmium	**0.096**	mg/kg	0.079	20	03/31/15 13:57	04/01/15 09:33	7440-43-9	
Chromium	**4.0**	mg/kg	0.49	20	03/31/15 13:57	04/01/15 09:33	7440-47-3	
Copper	**7.5**	mg/kg	0.99	20	03/31/15 13:57	04/01/15 09:33	7440-50-8	
Lead	**8.7**	mg/kg	0.099	20	03/31/15 13:57	04/01/15 09:33	7439-92-1	
Nickel	**5.5**	mg/kg	0.49	20	03/31/15 13:57	04/01/15 09:33	7440-02-0	
Selenium	ND	mg/kg	0.49	20	03/31/15 13:57	04/01/15 09:33	7782-49-2	
Silver	ND	mg/kg	0.49	20	03/31/15 13:57	04/01/15 09:33	7440-22-4	
Thallium	ND	mg/kg	0.099	20	03/31/15 13:57	04/01/15 09:33	7440-28-0	
Zinc	**21.2**	mg/kg	4.9	20	03/31/15 13:57	04/01/15 09:33	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B							
Mercury	**0.022**	mg/kg	0.021	1	03/31/15 15:33	04/01/15 11:39	7439-97-6	
Dry Weight	Analytical Method: ASTM D2974							
Percent Moisture	**5.1**	%	0.10	1		03/30/15 11:44		
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	ND	mg/kg	0.011	1	03/30/15 10:46	04/01/15 19:50	83-32-9	
Acenaphthylene	ND	mg/kg	0.011	1	03/30/15 10:46	04/01/15 19:50	208-96-8	
Anthracene	**0.034**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 19:50	120-12-7	
Benzo(a)anthracene	**0.20**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 19:50	56-55-3	
Benzo(a)pyrene	**0.90**	mg/kg	0.053	5	03/30/15 10:46	04/01/15 18:44	50-32-8	
Benzo(b)fluoranthene	**0.94**	mg/kg	0.053	5	03/30/15 10:46	04/01/15 18:44	205-99-2	
Benzo(g,h,i)perylene	**1.7**	mg/kg	0.11	10	03/30/15 10:46	04/01/15 19:06	191-24-2	
Benzo(k)fluoranthene	**0.32**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 19:50	207-08-9	
Chrysene	**0.43**	mg/kg	0.053	5	03/30/15 10:46	04/01/15 18:44	218-01-9	
Dibenz(a,h)anthracene	ND	mg/kg	0.011	1	03/30/15 10:46	04/01/15 19:50	53-70-3	
Fluoranthene	**0.16**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 19:50	206-44-0	
Fluorene	**0.011**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 19:50	86-73-7	
Indeno(1,2,3-cd)pyrene	**1.1**	mg/kg	0.053	5	03/30/15 10:46	04/01/15 18:44	193-39-5	
Naphthalene	**0.084**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 19:50	91-20-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-11 (1-2) **Lab ID: 10300830011** Collected: 03/26/15 12:30 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Phenanthrene	**0.34**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 19:50	85-01-8	
Pyrene	**0.26**	mg/kg	0.011	1	03/30/15 10:46	04/01/15 19:50	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	**1.2**	mg/kg	0.053	5	03/30/15 10:46	04/01/15 18:44		
Surrogates								
2-Fluorobiphenyl (S)	84	%.	55-125	1	03/30/15 10:46	04/01/15 19:50	321-60-8	
p-Terphenyl-d14 (S)	64	%.	30-150	1	03/30/15 10:46	04/01/15 19:50	1718-51-0	
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
Acetone	ND	mg/kg	1.1	1	04/01/15 09:05	04/01/15 21:00	67-64-1	
Allyl chloride	ND	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	107-05-1	
Benzene	**0.032**	mg/kg	0.022	1	04/01/15 09:05	04/01/15 21:00	71-43-2	
Bromobenzene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	108-86-1	
Bromochloromethane	ND	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	74-97-5	
Bromodichloromethane	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	75-27-4	
Bromoform	ND	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	75-25-2	
Bromomethane	ND	mg/kg	0.54	1	04/01/15 09:05	04/01/15 21:00	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.27	1	04/01/15 09:05	04/01/15 21:00	78-93-3	
n-Butylbenzene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	98-06-6	
Carbon tetrachloride	ND	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	56-23-5	
Chlorobenzene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	108-90-7	
Chloroethane	ND	mg/kg	0.54	1	04/01/15 09:05	04/01/15 21:00	75-00-3	
Chloroform	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	67-66-3	
Chloromethane	ND	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.54	1	04/01/15 09:05	04/01/15 21:00	96-12-8	
Dibromochloromethane	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	106-93-4	
Dibromomethane	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	156-60-5	
Dichlorofluoromethane	ND	mg/kg	0.54	1	04/01/15 09:05	04/01/15 21:00	75-43-4	
1,2-Dichloropropane	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	10061-01-5	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-11 (1-2) **Lab ID: 10300830011** Collected: 03/26/15 12:30 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
trans-1,3-Dichloropropene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	10061-02-6	
Diethyl ether (Ethyl ether)	ND	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	60-29-7	
Ethylbenzene	**0.062**	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	100-41-4	
Hexachloro-1,3-butadiene	ND	mg/kg	0.27	1	04/01/15 09:05	04/01/15 21:00	87-68-3	
Isopropylbenzene (Cumene)	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	99-87-6	
Methylene Chloride	ND	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.27	1	04/01/15 09:05	04/01/15 21:00	108-10-1	
Methyl-tert-butyl ether	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	1634-04-4	
Naphthalene	**0.40**	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	91-20-3	
n-Propylbenzene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	103-65-1	
Styrene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	79-34-5	
Tetrachloroethene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	127-18-4	
Tetrahydrofuran	ND	mg/kg	2.2	1	04/01/15 09:05	04/01/15 21:00	109-99-9	
Toluene	**0.27**	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	79-00-5	
Trichloroethene	ND	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	mg/kg	0.22	1	04/01/15 09:05	04/01/15 21:00	76-13-1	
1,2,4-Trimethylbenzene	**0.17**	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	95-63-6	
1,3,5-Trimethylbenzene	**0.066**	mg/kg	0.054	1	04/01/15 09:05	04/01/15 21:00	108-67-8	
Vinyl chloride	ND	mg/kg	0.022	1	04/01/15 09:05	04/01/15 21:00	75-01-4	
Xylene (Total)	**0.64**	mg/kg	0.16	1	04/01/15 09:05	04/01/15 21:00	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	89	%.	55-150	1	04/01/15 09:05	04/01/15 21:00	17060-07-0	
Toluene-d8 (S)	100	%.	61-125	1	04/01/15 09:05	04/01/15 21:00	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	54-131	1	04/01/15 09:05	04/01/15 21:00	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-12 (1-2) **Lab ID: 10300830012** Collected: 03/26/15 12:00 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	**19.2**	mg/kg	8.8	1	03/30/15 10:25	03/31/15 14:51		T6
Surrogates								
n-Triacontane (S)	70	%.	50-150	1	03/30/15 10:25	03/31/15 14:51	638-68-6	
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	ND	mg/kg	12.0	1	04/08/15 13:24	04/08/15 16:57		
Surrogates								
a,a,a-Trifluorotoluene (S)	91	%.	80-150	1	04/08/15 13:24	04/08/15 16:57	98-08-8	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050							
Antimony	ND	mg/kg	0.47	20	03/31/15 13:57	04/01/15 09:35	7440-36-0	
Arsenic	**1.5**	mg/kg	0.47	20	03/31/15 13:57	04/01/15 09:35	7440-38-2	
Barium	**18.9**	mg/kg	0.28	20	03/31/15 13:57	04/01/15 09:35	7440-39-3	
Beryllium	ND	mg/kg	0.19	20	03/31/15 13:57	04/01/15 09:35	7440-41-7	
Cadmium	ND	mg/kg	0.076	20	03/31/15 13:57	04/01/15 09:35	7440-43-9	
Chromium	**2.4**	mg/kg	0.47	20	03/31/15 13:57	04/01/15 09:35	7440-47-3	
Copper	**3.5**	mg/kg	0.95	20	03/31/15 13:57	04/01/15 09:35	7440-50-8	
Lead	**3.2**	mg/kg	0.095	20	03/31/15 13:57	04/01/15 09:35	7439-92-1	
Nickel	**3.3**	mg/kg	0.47	20	03/31/15 13:57	04/01/15 09:35	7440-02-0	
Selenium	ND	mg/kg	0.47	20	03/31/15 13:57	04/01/15 09:35	7782-49-2	
Silver	ND	mg/kg	0.47	20	03/31/15 13:57	04/01/15 09:35	7440-22-4	
Thallium	ND	mg/kg	0.095	20	03/31/15 13:57	04/01/15 09:35	7440-28-0	
Zinc	**9.6**	mg/kg	4.7	20	03/31/15 13:57	04/01/15 09:35	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B							
Mercury	ND	mg/kg	0.020	1	03/31/15 15:33	04/01/15 11:41	7439-97-6	
Dry Weight	Analytical Method: ASTM D2974							
Percent Moisture	**4.8**	%	0.10	1		03/30/15 11:44		
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	ND	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	83-32-9	
Acenaphthylene	ND	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	208-96-8	
Anthracene	**0.014**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	120-12-7	
Benzo(a)anthracene	**0.057**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	56-55-3	
Benzo(a)pyrene	**0.12**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	50-32-8	
Benzo(b)fluoranthene	**0.14**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	205-99-2	
Benzo(g,h,i)perylene	**0.28**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	191-24-2	
Benzo(k)fluoranthene	**0.048**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	207-08-9	
Chrysene	**0.090**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	218-01-9	
Dibenz(a,h)anthracene	ND	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	53-70-3	
Fluoranthene	**0.080**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	206-44-0	
Fluorene	ND	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.16**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	193-39-5	
Naphthalene	**0.024**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	91-20-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-12 (1-2) **Lab ID: 10300830012** Collected: 03/26/15 12:00 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Phenanthrene	**0.090**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	85-01-8	
Pyrene	**0.11**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	**0.16**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:02		
Surrogates								
2-Fluorobiphenyl (S)	76	%.	55-125	1	03/30/15 10:46	04/01/15 14:02	321-60-8	
p-Terphenyl-d14 (S)	84	%.	30-150	1	03/30/15 10:46	04/01/15 14:02	1718-51-0	
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
Acetone	ND	mg/kg	1.1	1	04/01/15 09:05	04/01/15 21:20	67-64-1	
Allyl chloride	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	107-05-1	
Benzene	ND	mg/kg	0.021	1	04/01/15 09:05	04/01/15 21:20	71-43-2	
Bromobenzene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	108-86-1	
Bromochloromethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	74-97-5	
Bromodichloromethane	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	75-27-4	
Bromoform	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	75-25-2	
Bromomethane	ND	mg/kg	0.53	1	04/01/15 09:05	04/01/15 21:20	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.27	1	04/01/15 09:05	04/01/15 21:20	78-93-3	
n-Butylbenzene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	98-06-6	
Carbon tetrachloride	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	56-23-5	
Chlorobenzene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	108-90-7	
Chloroethane	ND	mg/kg	0.53	1	04/01/15 09:05	04/01/15 21:20	75-00-3	
Chloroform	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	67-66-3	
Chloromethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.53	1	04/01/15 09:05	04/01/15 21:20	96-12-8	
Dibromochloromethane	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	106-93-4	
Dibromomethane	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	156-60-5	
Dichlorofluoromethane	ND	mg/kg	0.53	1	04/01/15 09:05	04/01/15 21:20	75-43-4	
1,2-Dichloropropane	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	10061-01-5	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-12 (1-2) **Lab ID: 10300830012** Collected: 03/26/15 12:00 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
trans-1,3-Dichloropropene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	10061-02-6	
Diethyl ether (Ethyl ether)	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	60-29-7	
Ethylbenzene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	100-41-4	
Hexachloro-1,3-butadiene	ND	mg/kg	0.27	1	04/01/15 09:05	04/01/15 21:20	87-68-3	
Isopropylbenzene (Cumene)	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	99-87-6	
Methylene Chloride	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.27	1	04/01/15 09:05	04/01/15 21:20	108-10-1	
Methyl-tert-butyl ether	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	1634-04-4	
Naphthalene	**0.28**	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	91-20-3	
n-Propylbenzene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	103-65-1	
Styrene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	79-34-5	
Tetrachloroethene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	127-18-4	
Tetrahydrofuran	ND	mg/kg	2.1	1	04/01/15 09:05	04/01/15 21:20	109-99-9	
Toluene	**0.17**	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	79-00-5	
Trichloroethene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:20	76-13-1	
1,2,4-Trimethylbenzene	**0.094**	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.053	1	04/01/15 09:05	04/01/15 21:20	108-67-8	
Vinyl chloride	ND	mg/kg	0.021	1	04/01/15 09:05	04/01/15 21:20	75-01-4	
Xylene (Total)	**0.39**	mg/kg	0.16	1	04/01/15 09:05	04/01/15 21:20	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	88	%.	55-150	1	04/01/15 09:05	04/01/15 21:20	17060-07-0	
Toluene-d8 (S)	99	%.	61-125	1	04/01/15 09:05	04/01/15 21:20	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	54-131	1	04/01/15 09:05	04/01/15 21:20	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-13 (2-4) **Lab ID: 10300830013** Collected: 03/26/15 13:00 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	**11.2**	mg/kg	8.6	1	03/30/15 10:25	03/31/15 15:12		T6
Surrogates								
n-Triacontane (S)	73	%.	50-150	1	03/30/15 10:25	03/31/15 15:12	638-68-6	
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	ND	mg/kg	11.6	1	04/08/15 13:24	04/08/15 17:19		
Surrogates								
a,a,a-Trifluorotoluene (S)	92	%.	80-150	1	04/08/15 13:24	04/08/15 17:19	98-08-8	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050							
Antimony	ND	mg/kg	0.48	20	03/31/15 13:57	04/01/15 09:38	7440-36-0	
Arsenic	**1.6**	mg/kg	0.48	20	03/31/15 13:57	04/01/15 09:38	7440-38-2	
Barium	**26.3**	mg/kg	0.29	20	03/31/15 13:57	04/01/15 09:38	7440-39-3	
Beryllium	ND	mg/kg	0.19	20	03/31/15 13:57	04/01/15 09:38	7440-41-7	
Cadmium	**0.078**	mg/kg	0.077	20	03/31/15 13:57	04/01/15 09:38	7440-43-9	
Chromium	**3.4**	mg/kg	0.48	20	03/31/15 13:57	04/01/15 09:38	7440-47-3	
Copper	**4.0**	mg/kg	0.96	20	03/31/15 13:57	04/01/15 09:38	7440-50-8	
Lead	**3.4**	mg/kg	0.096	20	03/31/15 13:57	04/01/15 09:38	7439-92-1	
Nickel	**6.4**	mg/kg	0.48	20	03/31/15 13:57	04/01/15 09:38	7440-02-0	
Selenium	ND	mg/kg	0.48	20	03/31/15 13:57	04/01/15 09:38	7782-49-2	
Silver	ND	mg/kg	0.48	20	03/31/15 13:57	04/01/15 09:38	7440-22-4	
Thallium	ND	mg/kg	0.096	20	03/31/15 13:57	04/01/15 09:38	7440-28-0	
Zinc	**12.8**	mg/kg	4.8	20	03/31/15 13:57	04/01/15 09:38	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B							
Mercury	ND	mg/kg	0.021	1	03/31/15 15:33	04/01/15 11:43	7439-97-6	
Dry Weight	Analytical Method: ASTM D2974							
Percent Moisture	**4.5**	%	0.10	1		03/30/15 11:45		
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	ND	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	83-32-9	
Acenaphthylene	ND	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	208-96-8	
Anthracene	**0.017**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	120-12-7	
Benzo(a)anthracene	**0.082**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	56-55-3	
Benzo(a)pyrene	**0.12**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	50-32-8	
Benzo(b)fluoranthene	**0.17**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	205-99-2	
Benzo(g,h,i)perylene	**0.16**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	191-24-2	
Benzo(k)fluoranthene	**0.049**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	207-08-9	
Chrysene	**0.11**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	218-01-9	
Dibenz(a,h)anthracene	ND	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	53-70-3	
Fluoranthene	**0.13**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	206-44-0	
Fluorene	ND	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.11**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	193-39-5	
Naphthalene	**0.020**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	91-20-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-13 (2-4) **Lab ID: 10300830013** Collected: 03/26/15 13:00 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Phenanthrene	**0.079**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	85-01-8	
Pyrene	**0.15**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	**0.17**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 14:24		
Surrogates								
2-Fluorobiphenyl (S)	80	%.	55-125	1	03/30/15 10:46	04/01/15 14:24	321-60-8	
p-Terphenyl-d14 (S)	92	%.	30-150	1	03/30/15 10:46	04/01/15 14:24	1718-51-0	
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
Acetone	ND	mg/kg	1.0	1	04/01/15 09:05	04/01/15 21:40	67-64-1	
Allyl chloride	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	107-05-1	
Benzene	ND	mg/kg	0.021	1	04/01/15 09:05	04/01/15 21:40	71-43-2	
Bromobenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	108-86-1	
Bromochloromethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	74-97-5	
Bromodichloromethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	75-27-4	
Bromoform	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	75-25-2	
Bromomethane	ND	mg/kg	0.52	1	04/01/15 09:05	04/01/15 21:40	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 21:40	78-93-3	
n-Butylbenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	98-06-6	
Carbon tetrachloride	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	56-23-5	
Chlorobenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	108-90-7	
Chloroethane	ND	mg/kg	0.52	1	04/01/15 09:05	04/01/15 21:40	75-00-3	
Chloroform	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	67-66-3	
Chloromethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.52	1	04/01/15 09:05	04/01/15 21:40	96-12-8	
Dibromochloromethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	106-93-4	
Dibromomethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	156-60-5	
Dichlorofluoromethane	ND	mg/kg	0.52	1	04/01/15 09:05	04/01/15 21:40	75-43-4	
1,2-Dichloropropane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	10061-01-5	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-13 (2-4) **Lab ID: 10300830013** Collected: 03/26/15 13:00 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
trans-1,3-Dichloropropene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	10061-02-6	
Diethyl ether (Ethyl ether)	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	60-29-7	
Ethylbenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	100-41-4	
Hexachloro-1,3-butadiene	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 21:40	87-68-3	
Isopropylbenzene (Cumene)	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	99-87-6	
Methylene Chloride	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.26	1	04/01/15 09:05	04/01/15 21:40	108-10-1	
Methyl-tert-butyl ether	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	1634-04-4	
Naphthalene	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	91-20-3	
n-Propylbenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	103-65-1	
Styrene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	79-34-5	
Tetrachloroethene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	127-18-4	
Tetrahydrofuran	ND	mg/kg	2.1	1	04/01/15 09:05	04/01/15 21:40	109-99-9	
Toluene	**0.079**	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	79-00-5	
Trichloroethene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	mg/kg	0.21	1	04/01/15 09:05	04/01/15 21:40	76-13-1	
1,2,4-Trimethylbenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.052	1	04/01/15 09:05	04/01/15 21:40	108-67-8	
Vinyl chloride	ND	mg/kg	0.021	1	04/01/15 09:05	04/01/15 21:40	75-01-4	
Xylene (Total)	**0.18**	mg/kg	0.16	1	04/01/15 09:05	04/01/15 21:40	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	89	%.	55-150	1	04/01/15 09:05	04/01/15 21:40	17060-07-0	
Toluene-d8 (S)	99	%.	61-125	1	04/01/15 09:05	04/01/15 21:40	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	54-131	1	04/01/15 09:05	04/01/15 21:40	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-14 (2-3) **Lab ID: 10300830014** Collected: 03/26/15 13:30 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	**39.1**	mg/kg	16.6	2	03/30/15 10:25	04/01/15 10:04		T6
Surrogates								
n-Triacontane (S)	95	%.	50-150	2	03/30/15 10:25	04/01/15 10:04	638-68-6	
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	ND	mg/kg	10.7	1	04/08/15 13:24	04/08/15 17:41		
Surrogates								
a,a,a-Trifluorotoluene (S)	92	%.	80-150	1	04/08/15 13:24	04/08/15 17:41	98-08-8	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050							
Antimony	ND	mg/kg	0.47	20	03/31/15 13:57	04/01/15 09:41	7440-36-0	
Arsenic	**1.9**	mg/kg	0.47	20	03/31/15 13:57	04/01/15 09:41	7440-38-2	
Barium	**23.3**	mg/kg	0.28	20	03/31/15 13:57	04/01/15 09:41	7440-39-3	
Beryllium	ND	mg/kg	0.19	20	03/31/15 13:57	04/01/15 09:41	7440-41-7	
Cadmium	ND	mg/kg	0.075	20	03/31/15 13:57	04/01/15 09:41	7440-43-9	
Chromium	**4.0**	mg/kg	0.47	20	03/31/15 13:57	04/01/15 09:41	7440-47-3	
Copper	**4.5**	mg/kg	0.93	20	03/31/15 13:57	04/01/15 09:41	7440-50-8	
Lead	**3.8**	mg/kg	0.093	20	03/31/15 13:57	04/01/15 09:41	7439-92-1	
Nickel	**5.4**	mg/kg	0.47	20	03/31/15 13:57	04/01/15 09:41	7440-02-0	
Selenium	ND	mg/kg	0.47	20	03/31/15 13:57	04/01/15 09:41	7782-49-2	
Silver	ND	mg/kg	0.47	20	03/31/15 13:57	04/01/15 09:41	7440-22-4	
Thallium	ND	mg/kg	0.093	20	03/31/15 13:57	04/01/15 09:41	7440-28-0	
Zinc	**14.7**	mg/kg	4.7	20	03/31/15 13:57	04/01/15 09:41	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B							
Mercury	ND	mg/kg	0.021	1	03/31/15 15:33	04/01/15 11:46	7439-97-6	
Dry Weight	Analytical Method: ASTM D2974							
Percent Moisture	**4.4**	%	0.10	1		03/30/15 11:45		
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	ND	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	83-32-9	
Acenaphthylene	ND	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	208-96-8	
Anthracene	**0.024**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	120-12-7	
Benzo(a)anthracene	**0.085**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	56-55-3	
Benzo(a)pyrene	**0.13**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	50-32-8	
Benzo(b)fluoranthene	**0.13**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	205-99-2	
Benzo(g,h,i)perylene	**0.14**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	191-24-2	
Benzo(k)fluoranthene	**0.044**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	207-08-9	
Chrysene	**0.15**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	218-01-9	
Dibenz(a,h)anthracene	ND	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	53-70-3	
Fluoranthene	**0.084**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	206-44-0	
Fluorene	ND	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.064**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	193-39-5	
Naphthalene	**0.031**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	91-20-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-14 (2-3) **Lab ID: 10300830014** Collected: 03/26/15 13:30 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Phenanthrene	**0.16**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	85-01-8	
Pyrene	**0.15**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	**0.16**	mg/kg	0.010	1	03/30/15 10:46	04/01/15 20:11		
Surrogates								
2-Fluorobiphenyl (S)	79	%.	55-125	1	03/30/15 10:46	04/01/15 20:11	321-60-8	
p-Terphenyl-d14 (S)	70	%.	30-150	1	03/30/15 10:46	04/01/15 20:11	1718-51-0	
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
Acetone	ND	mg/kg	1.2	1	04/01/15 09:05	04/01/15 19:18	67-64-1	
Allyl chloride	ND	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	107-05-1	
Benzene	ND	mg/kg	0.023	1	04/01/15 09:05	04/01/15 19:18	71-43-2	
Bromobenzene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	108-86-1	
Bromochloromethane	ND	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	74-97-5	
Bromodichloromethane	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	75-27-4	
Bromoform	ND	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	75-25-2	
Bromomethane	ND	mg/kg	0.58	1	04/01/15 09:05	04/01/15 19:18	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.29	1	04/01/15 09:05	04/01/15 19:18	78-93-3	
n-Butylbenzene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	98-06-6	
Carbon tetrachloride	ND	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	56-23-5	
Chlorobenzene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	108-90-7	
Chloroethane	ND	mg/kg	0.58	1	04/01/15 09:05	04/01/15 19:18	75-00-3	
Chloroform	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	67-66-3	
Chloromethane	ND	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.58	1	04/01/15 09:05	04/01/15 19:18	96-12-8	
Dibromochloromethane	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	106-93-4	
Dibromomethane	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	156-60-5	
Dichlorofluoromethane	ND	mg/kg	0.58	1	04/01/15 09:05	04/01/15 19:18	75-43-4	
1,2-Dichloropropane	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	10061-01-5	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-14 (2-3) **Lab ID: 10300830014** Collected: 03/26/15 13:30 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
trans-1,3-Dichloropropene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	10061-02-6	
Diethyl ether (Ethyl ether)	ND	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	60-29-7	
Ethylbenzene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	100-41-4	
Hexachloro-1,3-butadiene	ND	mg/kg	0.29	1	04/01/15 09:05	04/01/15 19:18	87-68-3	
Isopropylbenzene (Cumene)	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	99-87-6	
Methylene Chloride	ND	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.29	1	04/01/15 09:05	04/01/15 19:18	108-10-1	
Methyl-tert-butyl ether	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	1634-04-4	
Naphthalene	**0.26**	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	91-20-3	
n-Propylbenzene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	103-65-1	
Styrene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	79-34-5	
Tetrachloroethene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	127-18-4	
Tetrahydrofuran	ND	mg/kg	2.3	1	04/01/15 09:05	04/01/15 19:18	109-99-9	
Toluene	**0.21**	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	79-00-5	
Trichloroethene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	mg/kg	0.23	1	04/01/15 09:05	04/01/15 19:18	76-13-1	
1,2,4-Trimethylbenzene	**0.10**	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.058	1	04/01/15 09:05	04/01/15 19:18	108-67-8	
Vinyl chloride	ND	mg/kg	0.023	1	04/01/15 09:05	04/01/15 19:18	75-01-4	
Xylene (Total)	**0.38**	mg/kg	0.17	1	04/01/15 09:05	04/01/15 19:18	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	89	%.	55-150	1	04/01/15 09:05	04/01/15 19:18	17060-07-0	
Toluene-d8 (S)	99	%.	61-125	1	04/01/15 09:05	04/01/15 19:18	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	54-131	1	04/01/15 09:05	04/01/15 19:18	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: HA-2 (1-3) **Lab ID: 10300830016** Collected: 03/25/15 10:30 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	ND	mg/kg	9.0	1	03/30/15 10:25	03/31/15 15:19		
Surrogates								
n-Triacontane (S)	71	%.	50-150	1	03/30/15 10:25	03/31/15 15:19	638-68-6	
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: EPA 5030 Medium Soil							
Gasoline Range Organics	ND	mg/kg	12.1	1	04/08/15 13:24	04/08/15 18:03		
Surrogates								
a,a,a-Trifluorotoluene (S)	93	%.	80-150	1	04/08/15 13:24	04/08/15 18:03	98-08-8	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3050							
Antimony	ND	mg/kg	0.45	20	03/31/15 13:57	04/01/15 09:44	7440-36-0	
Arsenic	**3.3**	mg/kg	0.45	20	03/31/15 13:57	04/01/15 09:44	7440-38-2	
Barium	**7.6**	mg/kg	0.27	20	03/31/15 13:57	04/01/15 09:44	7440-39-3	
Beryllium	ND	mg/kg	0.18	20	03/31/15 13:57	04/01/15 09:44	7440-41-7	
Cadmium	ND	mg/kg	0.071	20	03/31/15 13:57	04/01/15 09:44	7440-43-9	
Chromium	**1.9**	mg/kg	0.45	20	03/31/15 13:57	04/01/15 09:44	7440-47-3	
Copper	**2.0**	mg/kg	0.89	20	03/31/15 13:57	04/01/15 09:44	7440-50-8	
Lead	**0.66**	mg/kg	0.089	20	03/31/15 13:57	04/01/15 09:44	7439-92-1	
Nickel	**3.0**	mg/kg	0.45	20	03/31/15 13:57	04/01/15 09:44	7440-02-0	
Selenium	ND	mg/kg	0.45	20	03/31/15 13:57	04/01/15 09:44	7782-49-2	
Silver	ND	mg/kg	0.45	20	03/31/15 13:57	04/01/15 09:44	7440-22-4	
Thallium	ND	mg/kg	0.089	20	03/31/15 13:57	04/01/15 09:44	7440-28-0	
Zinc	ND	mg/kg	4.5	20	03/31/15 13:57	04/01/15 09:44	7440-66-6	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B							
Mercury	ND	mg/kg	0.019	1	03/31/15 15:33	04/01/15 11:48	7439-97-6	
Dry Weight	Analytical Method: ASTM D2974							
Percent Moisture	**9.6**	%	0.10	1		03/30/15 11:45		
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Acenaphthene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	83-32-9	
Acenaphthylene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	208-96-8	
Anthracene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	120-12-7	
Benzo(a)anthracene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	56-55-3	
Benzo(a)pyrene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	50-32-8	
Benzo(b)fluoranthene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	205-99-2	
Benzo(g,h,i)perylene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	191-24-2	
Benzo(k)fluoranthene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	207-08-9	
Chrysene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	218-01-9	
Dibenz(a,h)anthracene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	53-70-3	
Fluoranthene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	206-44-0	
Fluorene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	193-39-5	
Naphthalene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	91-20-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: HA-2 (1-3) **Lab ID: 10300830016** Collected: 03/25/15 10:30 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270D MSSV PAH by SIM	Analytical Method: EPA 8270D by SIM Preparation Method: EPA 3550							
Phenanthrene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	85-01-8	
Pyrene	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50	129-00-0	
Total BaP Eq. MN 2006sh. ND=0	ND	mg/kg	0.011	1	03/30/15 10:46	03/31/15 15:50		
Surrogates								
2-Fluorobiphenyl (S)	74	%.	55-125	1	03/30/15 10:46	03/31/15 15:50	321-60-8	
p-Terphenyl-d14 (S)	78	%.	30-150	1	03/30/15 10:46	03/31/15 15:50	1718-51-0	
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
Acetone	ND	mg/kg	1.2	1	04/01/15 09:05	04/01/15 22:00	67-64-1	
Allyl chloride	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	107-05-1	
Benzene	ND	mg/kg	0.025	1	04/01/15 09:05	04/01/15 22:00	71-43-2	
Bromobenzene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	108-86-1	
Bromochloromethane	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	74-97-5	
Bromodichloromethane	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	75-27-4	
Bromoform	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	75-25-2	
Bromomethane	ND	mg/kg	0.62	1	04/01/15 09:05	04/01/15 22:00	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.31	1	04/01/15 09:05	04/01/15 22:00	78-93-3	
n-Butylbenzene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	98-06-6	
Carbon tetrachloride	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	56-23-5	
Chlorobenzene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	108-90-7	
Chloroethane	ND	mg/kg	0.62	1	04/01/15 09:05	04/01/15 22:00	75-00-3	
Chloroform	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	67-66-3	
Chloromethane	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.62	1	04/01/15 09:05	04/01/15 22:00	96-12-8	
Dibromochloromethane	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	106-93-4	
Dibromomethane	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	156-60-5	
Dichlorofluoromethane	ND	mg/kg	0.62	1	04/01/15 09:05	04/01/15 22:00	75-43-4	
1,2-Dichloropropane	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	10061-01-5	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: HA-2 (1-3) **Lab ID: 10300830016** Collected: 03/25/15 10:30 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
trans-1,3-Dichloropropene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	10061-02-6	
Diethyl ether (Ethyl ether)	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	60-29-7	
Ethylbenzene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	100-41-4	
Hexachloro-1,3-butadiene	ND	mg/kg	0.31	1	04/01/15 09:05	04/01/15 22:00	87-68-3	
Isopropylbenzene (Cumene)	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	99-87-6	
Methylene Chloride	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.31	1	04/01/15 09:05	04/01/15 22:00	108-10-1	
Methyl-tert-butyl ether	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	1634-04-4	
Naphthalene	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	91-20-3	
n-Propylbenzene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	103-65-1	
Styrene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	79-34-5	
Tetrachloroethene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	127-18-4	
Tetrahydrofuran	ND	mg/kg	2.5	1	04/01/15 09:05	04/01/15 22:00	109-99-9	
Toluene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	79-00-5	
Trichloroethene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 22:00	76-13-1	
1,2,4-Trimethylbenzene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.062	1	04/01/15 09:05	04/01/15 22:00	108-67-8	
Vinyl chloride	ND	mg/kg	0.025	1	04/01/15 09:05	04/01/15 22:00	75-01-4	
Xylene (Total)	ND	mg/kg	0.19	1	04/01/15 09:05	04/01/15 22:00	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	87	%.	55-150	1	04/01/15 09:05	04/01/15 22:00	17060-07-0	
Toluene-d8 (S)	100	%.	61-125	1	04/01/15 09:05	04/01/15 22:00	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	54-131	1	04/01/15 09:05	04/01/15 22:00	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: Trip Blank - SL **Lab ID: 10300830017** Collected: 03/25/15 00:00 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
Acetone	ND	mg/kg	1.0	1	04/01/15 09:05	04/01/15 15:42	67-64-1	
Allyl chloride	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	107-05-1	
Benzene	ND	mg/kg	0.020	1	04/01/15 09:05	04/01/15 15:42	71-43-2	
Bromobenzene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	108-86-1	
Bromochloromethane	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	74-97-5	
Bromodichloromethane	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	75-27-4	
Bromoform	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	75-25-2	
Bromomethane	ND	mg/kg	0.50	1	04/01/15 09:05	04/01/15 15:42	74-83-9	
2-Butanone (MEK)	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 15:42	78-93-3	
n-Butylbenzene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	104-51-8	
sec-Butylbenzene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	135-98-8	
tert-Butylbenzene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	98-06-6	
Carbon tetrachloride	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	56-23-5	
Chlorobenzene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	108-90-7	
Chloroethane	ND	mg/kg	0.50	1	04/01/15 09:05	04/01/15 15:42	75-00-3	
Chloroform	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	67-66-3	
Chloromethane	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	74-87-3	
2-Chlorotoluene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	95-49-8	
4-Chlorotoluene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	106-43-4	
1,2-Dibromo-3-chloropropane	ND	mg/kg	0.50	1	04/01/15 09:05	04/01/15 15:42	96-12-8	
Dibromochloromethane	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	124-48-1	
1,2-Dibromoethane (EDB)	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	106-93-4	
Dibromomethane	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	74-95-3	
1,2-Dichlorobenzene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	95-50-1	
1,3-Dichlorobenzene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	541-73-1	
1,4-Dichlorobenzene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	106-46-7	
Dichlorodifluoromethane	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	75-71-8	
1,1-Dichloroethane	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	75-34-3	
1,2-Dichloroethane	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	107-06-2	
1,1-Dichloroethene	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	75-35-4	
cis-1,2-Dichloroethene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	156-59-2	
trans-1,2-Dichloroethene	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	156-60-5	
Dichlorofluoromethane	ND	mg/kg	0.50	1	04/01/15 09:05	04/01/15 15:42	75-43-4	
1,2-Dichloropropane	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	78-87-5	
1,3-Dichloropropane	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	142-28-9	
2,2-Dichloropropane	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	594-20-7	
1,1-Dichloropropene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	563-58-6	
cis-1,3-Dichloropropene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	10061-01-5	
trans-1,3-Dichloropropene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	10061-02-6	
Diethyl ether (Ethyl ether)	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	60-29-7	
Ethylbenzene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	100-41-4	
Hexachloro-1,3-butadiene	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 15:42	87-68-3	
Isopropylbenzene (Cumene)	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	98-82-8	
p-Isopropyltoluene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	99-87-6	
Methylene Chloride	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	mg/kg	0.25	1	04/01/15 09:05	04/01/15 15:42	108-10-1	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: Trip Blank - SL **Lab ID: 10300830017** Collected: 03/25/15 00:00 Received: 03/27/15 08:20 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5030 Med Level	Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B							
Methyl-tert-butyl ether	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	1634-04-4	
Naphthalene	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	91-20-3	
n-Propylbenzene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	103-65-1	
Styrene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	79-34-5	
Tetrachloroethene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	127-18-4	
Tetrahydrofuran	ND	mg/kg	2.0	1	04/01/15 09:05	04/01/15 15:42	109-99-9	
Toluene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	108-88-3	
1,2,3-Trichlorobenzene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	87-61-6	
1,2,4-Trichlorobenzene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	120-82-1	
1,1,1-Trichloroethane	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	71-55-6	
1,1,2-Trichloroethane	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	79-00-5	
Trichloroethene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	79-01-6	
Trichlorofluoromethane	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	75-69-4	
1,2,3-Trichloropropane	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	mg/kg	0.20	1	04/01/15 09:05	04/01/15 15:42	76-13-1	
1,2,4-Trimethylbenzene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.050	1	04/01/15 09:05	04/01/15 15:42	108-67-8	
Vinyl chloride	ND	mg/kg	0.020	1	04/01/15 09:05	04/01/15 15:42	75-01-4	
Xylene (Total)	ND	mg/kg	0.15	1	04/01/15 09:05	04/01/15 15:42	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	87	%.	55-150	1	04/01/15 09:05	04/01/15 15:42	17060-07-0	
Toluene-d8 (S)	97	%.	61-125	1	04/01/15 09:05	04/01/15 15:42	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	54-131	1	04/01/15 09:05	04/01/15 15:42	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-8W **Lab ID: 10300830018** Collected: 03/25/15 10:20 Received: 03/27/15 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	ND	ug/L	116	1	03/31/15 10:53	04/01/15 12:29		
Surrogates								
n-Triacontane (S)	93	%.	50-150	1	03/31/15 10:53	04/01/15 12:29	638-68-6	P4
6020A MET ICPMS, Dissolved	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Antimony, Dissolved	**13.7**	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:11	7440-36-0	
Arsenic, Dissolved	**348**	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:11	7440-38-2	
Barium, Dissolved	**66.5**	ug/L	0.30	1	03/30/15 07:07	03/30/15 12:11	7440-39-3	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/30/15 07:07	03/30/15 12:11	7440-41-7	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/30/15 07:07	03/30/15 12:11	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:11	7440-47-3	
Copper, Dissolved	ND	ug/L	1.0	1	03/30/15 07:07	03/30/15 12:11	7440-50-8	
Lead, Dissolved	ND	ug/L	0.10	1	03/30/15 07:07	03/30/15 12:11	7439-92-1	
Nickel, Dissolved	**10.8**	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:11	7440-02-0	
Selenium, Dissolved	**2.5**	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:11	7782-49-2	
Silver, Dissolved	ND	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:11	7440-22-4	
Thallium, Dissolved	ND	ug/L	0.10	1	03/30/15 07:07	03/30/15 12:11	7440-28-0	
Zinc, Dissolved	ND	ug/L	5.0	1	03/30/15 07:07	03/30/15 12:11	7440-66-6	
7470 Mercury, Dissolved	Analytical Method: EPA 7470 Preparation Method: EPA 7470A							
Mercury, Dissolved	ND	ug/L	0.20	1	03/30/15 10:43	04/01/15 12:37	7439-97-6	
8260 VOC	Analytical Method: EPA 8260							
Acetone	ND	ug/L	20.0	1		04/01/15 23:38	67-64-1	
Allyl chloride	ND	ug/L	4.0	1		04/01/15 23:38	107-05-1	
Benzene	ND	ug/L	1.0	1		04/01/15 23:38	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/01/15 23:38	108-86-1	
Bromochloromethane	ND	ug/L	4.0	1		04/01/15 23:38	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/01/15 23:38	75-27-4	
Bromoform	ND	ug/L	4.0	1		04/01/15 23:38	75-25-2	
Bromomethane	ND	ug/L	4.0	1		04/01/15 23:38	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/01/15 23:38	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		04/01/15 23:38	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		04/01/15 23:38	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		04/01/15 23:38	98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		04/01/15 23:38	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/01/15 23:38	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/01/15 23:38	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/01/15 23:38	67-66-3	
Chloromethane	ND	ug/L	4.0	1		04/01/15 23:38	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		04/01/15 23:38	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		04/01/15 23:38	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		04/01/15 23:38	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		04/01/15 23:38	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/01/15 23:38	106-93-4	
Dibromomethane	ND	ug/L	4.0	1		04/01/15 23:38	74-95-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-8W **Lab ID: 10300830018** Collected: 03/25/15 10:20 Received: 03/27/15 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 VOC	Analytical Method: EPA 8260							
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/01/15 23:38	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/01/15 23:38	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/01/15 23:38	106-46-7	
Dichlorodifluoromethane	ND	ug/L	4.0	1		04/01/15 23:38	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/01/15 23:38	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/01/15 23:38	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/01/15 23:38	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/01/15 23:38	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/01/15 23:38	156-60-5	
Dichlorofluoromethane	ND	ug/L	1.0	1		04/01/15 23:38	75-43-4	
1,2-Dichloropropane	ND	ug/L	4.0	1		04/01/15 23:38	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/01/15 23:38	142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		04/01/15 23:38	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		04/01/15 23:38	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		04/01/15 23:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	1		04/01/15 23:38	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		04/01/15 23:38	60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		04/01/15 23:38	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		04/01/15 23:38	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		04/01/15 23:38	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		04/01/15 23:38	99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		04/01/15 23:38	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/01/15 23:38	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		04/01/15 23:38	1634-04-4	
Naphthalene	ND	ug/L	4.0	1		04/01/15 23:38	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		04/01/15 23:38	103-65-1	
Styrene	ND	ug/L	1.0	1		04/01/15 23:38	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/01/15 23:38	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/01/15 23:38	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/01/15 23:38	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		04/01/15 23:38	109-99-9	
Toluene	ND	ug/L	1.0	1		04/01/15 23:38	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/01/15 23:38	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/01/15 23:38	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/01/15 23:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/01/15 23:38	79-00-5	
Trichloroethene	ND	ug/L	0.40	1		04/01/15 23:38	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/01/15 23:38	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		04/01/15 23:38	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		04/01/15 23:38	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		04/01/15 23:38	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		04/01/15 23:38	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		04/01/15 23:38	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		04/01/15 23:38	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	75-125	1		04/01/15 23:38	17060-07-0	
Toluene-d8 (S)	99	%.	75-125	1		04/01/15 23:38	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-8W **Lab ID: 10300830018** Collected: 03/25/15 10:20 Received: 03/27/15 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 VOC	Analytical Method: EPA 8260							
Surrogates								
4-Bromofluorobenzene (S)	104	%.	75-125	1		04/01/15 23:38	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-10W **Lab ID: 10300830019** Collected: 03/25/15 12:30 Received: 03/27/15 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	ND	ug/L	110	1	03/31/15 10:53	04/01/15 12:36		
Surrogates								
n-Triacontane (S)	91	%.	50-150	1	03/31/15 10:53	04/01/15 12:36	638-68-6	
6020A MET ICPMS, Dissolved	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Antimony, Dissolved	ND	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:01	7440-36-0	
Arsenic, Dissolved	**10.8**	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:01	7440-38-2	
Barium, Dissolved	**74.6**	ug/L	0.30	1	03/30/15 07:07	03/30/15 12:01	7440-39-3	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/30/15 07:07	03/30/15 12:01	7440-41-7	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/30/15 07:07	03/30/15 12:01	7440-43-9	
Chromium, Dissolved	ND	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:01	7440-47-3	
Copper, Dissolved	ND	ug/L	1.0	1	03/30/15 07:07	03/30/15 12:01	7440-50-8	
Lead, Dissolved	ND	ug/L	0.10	1	03/30/15 07:07	03/30/15 12:01	7439-92-1	
Nickel, Dissolved	**11.0**	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:01	7440-02-0	
Selenium, Dissolved	**0.62**	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:01	7782-49-2	
Silver, Dissolved	ND	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:01	7440-22-4	
Thallium, Dissolved	ND	ug/L	0.10	1	03/30/15 07:07	03/30/15 12:01	7440-28-0	
Zinc, Dissolved	ND	ug/L	5.0	1	03/30/15 07:07	03/30/15 12:01	7440-66-6	
7470 Mercury, Dissolved	Analytical Method: EPA 7470 Preparation Method: EPA 7470A							
Mercury, Dissolved	ND	ug/L	0.20	1	03/30/15 10:43	04/01/15 12:40	7439-97-6	
8260 VOC	Analytical Method: EPA 8260							
Acetone	ND	ug/L	20.0	1		04/01/15 23:53	67-64-1	
Allyl chloride	ND	ug/L	4.0	1		04/01/15 23:53	107-05-1	
Benzene	ND	ug/L	1.0	1		04/01/15 23:53	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/01/15 23:53	108-86-1	
Bromochloromethane	ND	ug/L	4.0	1		04/01/15 23:53	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/01/15 23:53	75-27-4	
Bromoform	ND	ug/L	4.0	1		04/01/15 23:53	75-25-2	
Bromomethane	ND	ug/L	4.0	1		04/01/15 23:53	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/01/15 23:53	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		04/01/15 23:53	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		04/01/15 23:53	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		04/01/15 23:53	98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		04/01/15 23:53	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/01/15 23:53	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/01/15 23:53	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/01/15 23:53	67-66-3	
Chloromethane	ND	ug/L	4.0	1		04/01/15 23:53	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		04/01/15 23:53	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		04/01/15 23:53	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		04/01/15 23:53	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		04/01/15 23:53	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/01/15 23:53	106-93-4	
Dibromomethane	ND	ug/L	4.0	1		04/01/15 23:53	74-95-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-10W **Lab ID: 10300830019** Collected: 03/25/15 12:30 Received: 03/27/15 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 VOC	Analytical Method: EPA 8260							
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/01/15 23:53	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/01/15 23:53	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/01/15 23:53	106-46-7	
Dichlorodifluoromethane	ND	ug/L	4.0	1		04/01/15 23:53	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/01/15 23:53	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/01/15 23:53	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/01/15 23:53	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/01/15 23:53	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/01/15 23:53	156-60-5	
Dichlorofluoromethane	ND	ug/L	1.0	1		04/01/15 23:53	75-43-4	
1,2-Dichloropropane	ND	ug/L	4.0	1		04/01/15 23:53	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/01/15 23:53	142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		04/01/15 23:53	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		04/01/15 23:53	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		04/01/15 23:53	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	1		04/01/15 23:53	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		04/01/15 23:53	60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		04/01/15 23:53	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		04/01/15 23:53	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		04/01/15 23:53	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		04/01/15 23:53	99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		04/01/15 23:53	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/01/15 23:53	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		04/01/15 23:53	1634-04-4	
Naphthalene	ND	ug/L	4.0	1		04/01/15 23:53	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		04/01/15 23:53	103-65-1	
Styrene	ND	ug/L	1.0	1		04/01/15 23:53	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/01/15 23:53	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/01/15 23:53	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/01/15 23:53	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		04/01/15 23:53	109-99-9	
Toluene	ND	ug/L	1.0	1		04/01/15 23:53	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/01/15 23:53	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/01/15 23:53	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/01/15 23:53	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/01/15 23:53	79-00-5	
Trichloroethene	**1.0**	ug/L	0.40	1		04/01/15 23:53	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/01/15 23:53	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		04/01/15 23:53	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		04/01/15 23:53	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		04/01/15 23:53	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		04/01/15 23:53	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		04/01/15 23:53	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		04/01/15 23:53	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	75-125	1		04/01/15 23:53	17060-07-0	
Toluene-d8 (S)	100	%.	75-125	1		04/01/15 23:53	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: PP-10W **Lab ID: 10300830019** Collected: 03/25/15 12:30 Received: 03/27/15 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 VOC	Analytical Method: EPA 8260							
Surrogates								
4-Bromofluorobenzene (S)	100	%.	75-125	1		04/01/15 23:53	460-00-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: HA-W **Lab ID: 10300830020** Collected: 03/26/15 11:00 Received: 03/27/15 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO							
WDRO C10-C28	ND	ug/L	116	1	03/31/15 10:53	04/01/15 13:31		
Surrogates								
n-Triacontane (S)	94	%.	50-150	1	03/31/15 10:53	04/01/15 13:31	638-68-6	P4
6020A MET ICPMS, Dissolved	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Antimony, Dissolved	**6.9**	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:06	7440-36-0	
Arsenic, Dissolved	**737**	ug/L	5.0	10	03/30/15 07:07	03/31/15 07:41	7440-38-2	
Barium, Dissolved	**39.9**	ug/L	0.30	1	03/30/15 07:07	03/30/15 12:06	7440-39-3	
Beryllium, Dissolved	ND	ug/L	0.20	1	03/30/15 07:07	03/30/15 12:06	7440-41-7	
Cadmium, Dissolved	ND	ug/L	0.080	1	03/30/15 07:07	03/30/15 12:06	7440-43-9	
Chromium, Dissolved	**0.90**	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:06	7440-47-3	
Copper, Dissolved	ND	ug/L	1.0	1	03/30/15 07:07	03/30/15 12:06	7440-50-8	
Lead, Dissolved	ND	ug/L	0.10	1	03/30/15 07:07	03/30/15 12:06	7439-92-1	
Nickel, Dissolved	**0.50**	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:06	7440-02-0	
Selenium, Dissolved	**2.7**	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:06	7782-49-2	
Silver, Dissolved	ND	ug/L	0.50	1	03/30/15 07:07	03/30/15 12:06	7440-22-4	
Thallium, Dissolved	ND	ug/L	0.10	1	03/30/15 07:07	03/30/15 12:06	7440-28-0	
Zinc, Dissolved	ND	ug/L	5.0	1	03/30/15 07:07	03/30/15 12:06	7440-66-6	
7470 Mercury, Dissolved	Analytical Method: EPA 7470 Preparation Method: EPA 7470A							
Mercury, Dissolved	ND	ug/L	0.20	1	03/30/15 10:43	04/01/15 12:47	7439-97-6	
8260 VOC	Analytical Method: EPA 8260							
Acetone	ND	ug/L	20.0	1		04/02/15 00:07	67-64-1	
Allyl chloride	ND	ug/L	4.0	1		04/02/15 00:07	107-05-1	
Benzene	ND	ug/L	1.0	1		04/02/15 00:07	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/02/15 00:07	108-86-1	
Bromochloromethane	ND	ug/L	4.0	1		04/02/15 00:07	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/02/15 00:07	75-27-4	
Bromoform	ND	ug/L	4.0	1		04/02/15 00:07	75-25-2	
Bromomethane	ND	ug/L	4.0	1		04/02/15 00:07	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/02/15 00:07	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	1		04/02/15 00:07	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	1		04/02/15 00:07	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	1		04/02/15 00:07	98-06-6	
Carbon tetrachloride	ND	ug/L	1.0	1		04/02/15 00:07	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/02/15 00:07	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/02/15 00:07	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/02/15 00:07	67-66-3	
Chloromethane	ND	ug/L	4.0	1		04/02/15 00:07	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		04/02/15 00:07	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		04/02/15 00:07	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	1		04/02/15 00:07	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		04/02/15 00:07	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/02/15 00:07	106-93-4	
Dibromomethane	ND	ug/L	4.0	1		04/02/15 00:07	74-95-3	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: HA-W **Lab ID: 10300830020** Collected: 03/26/15 11:00 Received: 03/27/15 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 VOC	Analytical Method: EPA 8260							
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/02/15 00:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/02/15 00:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/02/15 00:07	106-46-7	
Dichlorodifluoromethane	ND	ug/L	4.0	1		04/02/15 00:07	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/02/15 00:07	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/02/15 00:07	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/02/15 00:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/02/15 00:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/02/15 00:07	156-60-5	
Dichlorofluoromethane	ND	ug/L	1.0	1		04/02/15 00:07	75-43-4	
1,2-Dichloropropane	ND	ug/L	4.0	1		04/02/15 00:07	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/02/15 00:07	142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	1		04/02/15 00:07	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		04/02/15 00:07	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	1		04/02/15 00:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	1		04/02/15 00:07	10061-02-6	
Diethyl ether (Ethyl ether)	ND	ug/L	4.0	1		04/02/15 00:07	60-29-7	
Ethylbenzene	ND	ug/L	1.0	1		04/02/15 00:07	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	1		04/02/15 00:07	87-68-3	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	1		04/02/15 00:07	98-82-8	
p-Isopropyltoluene	ND	ug/L	1.0	1		04/02/15 00:07	99-87-6	
Methylene Chloride	ND	ug/L	4.0	1		04/02/15 00:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/02/15 00:07	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	1		04/02/15 00:07	1634-04-4	
Naphthalene	ND	ug/L	4.0	1		04/02/15 00:07	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	1		04/02/15 00:07	103-65-1	
Styrene	ND	ug/L	1.0	1		04/02/15 00:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/02/15 00:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/02/15 00:07	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/02/15 00:07	127-18-4	
Tetrahydrofuran	ND	ug/L	10.0	1		04/02/15 00:07	109-99-9	
Toluene	ND	ug/L	1.0	1		04/02/15 00:07	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/02/15 00:07	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/02/15 00:07	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/02/15 00:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/02/15 00:07	79-00-5	
Trichloroethene	ND	ug/L	0.40	1		04/02/15 00:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/02/15 00:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1		04/02/15 00:07	96-18-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/L	1.0	1		04/02/15 00:07	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/L	1.0	1		04/02/15 00:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	1		04/02/15 00:07	108-67-8	
Vinyl chloride	ND	ug/L	0.40	1		04/02/15 00:07	75-01-4	
Xylene (Total)	ND	ug/L	3.0	1		04/02/15 00:07	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	75-125	1		04/02/15 00:07	17060-07-0	
Toluene-d8 (S)	101	%.	75-125	1		04/02/15 00:07	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Sample: HA-W **Lab ID: 10300830020** Collected: 03/26/15 11:00 Received: 03/27/15 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 VOC	Analytical Method: EPA 8260							
Surrogates								
4-Bromofluorobenzene (S)	98	%.	75-125	1		04/02/15 00:07	460-00-4	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

QC Batch: GCV/13574 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10300830002, 10300830003, 10300830005, 10300830006, 10300830007

METHOD BLANK: 1932398 Matrix: Solid
Associated Lab Samples: 10300830002, 10300830003, 10300830005, 10300830006, 10300830007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	04/06/15 15:52	
a,a,a-Trifluorotoluene (S)	%.	98	80-150	04/06/15 15:52	

LABORATORY CONTROL SAMPLE & LCSD: 1932399 1932400

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	46.2	50.6	92	101	80-120	9	20	
a,a,a-Trifluorotoluene (S)	%.				101	101	80-150			

MATRIX SPIKE SAMPLE: 1932401

Parameter	Units	10300504004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	ND	52.5	69.7	126	80-120	CH,M1
a,a,a-Trifluorotoluene (S)	%.				109	80-150	

SAMPLE DUPLICATE: 1932402

Parameter	Units	10300504005 Result	Dup Result	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	ND	ND		20	
a,a,a-Trifluorotoluene (S)	%.	99	99	4		

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

QC Batch: GCV/13582 Analysis Method: WI MOD GRO
QC Batch Method: EPA 5030 Medium Soil Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10300830008, 10300830010, 10300830011, 10300830012, 10300830013, 10300830014, 10300830016

METHOD BLANK: 1934294 Matrix: Solid
Associated Lab Samples: 10300830008, 10300830010, 10300830011, 10300830012, 10300830013, 10300830014, 10300830016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	10.0	04/08/15 15:26	
a,a,a-Trifluorotoluene (S)	%.	91	80-150	04/08/15 15:26	

LABORATORY CONTROL SAMPLE & LCSD: 1934295 1934296

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Gasoline Range Organics	mg/kg	50	50.3	52.6	101	105	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%.				100	101	80-150			

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

QC Batch: MERP/13082 Analysis Method: EPA 7470
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury Dissolved
Associated Lab Samples: 10300830018, 10300830019, 10300830020

METHOD BLANK: 1927057 Matrix: Water
Associated Lab Samples: 10300830018, 10300830019, 10300830020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	04/01/15 12:28	

LABORATORY CONTROL SAMPLE: 1927058

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	5.3	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1927059 1927060

Parameter	Units	10300830019 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	ND	5	5	4.9	5.0	98	100	75-125	1	20	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

QC Batch: MERP/13087 Analysis Method: EPA 7471B
QC Batch Method: EPA 7471B Analysis Description: 7471B Mercury Solids
Associated Lab Samples: 10300830002, 10300830003, 10300830005, 10300830006, 10300830007, 10300830008, 10300830010, 10300830011, 10300830012, 10300830013, 10300830014, 10300830016

METHOD BLANK: 1927082 Matrix: Solid
Associated Lab Samples: 10300830002, 10300830003, 10300830005, 10300830006, 10300830007, 10300830008, 10300830010, 10300830011, 10300830012, 10300830013, 10300830014, 10300830016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.017	04/01/15 11:13	

LABORATORY CONTROL SAMPLE: 1927083

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.44	0.45	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1927084 1927085

Parameter	Units	10300830002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.022	.51	.51	0.53	0.54	100	102	75-125	1	20	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

QC Batch: MPRP/53233 | Analysis Method: EPA 6020A
QC Batch Method: EPA 3050 | Analysis Description: 6020A Solids UPD4
Associated Lab Samples: 10300830002, 10300830003, 10300830005, 10300830006, 10300830007, 10300830008, 10300830010, 10300830011, 10300830012, 10300830013, 10300830014, 10300830016

METHOD BLANK: 1927019 | Matrix: Solid
Associated Lab Samples: 10300830002, 10300830003, 10300830005, 10300830006, 10300830007, 10300830008, 10300830010, 10300830011, 10300830012, 10300830013, 10300830014, 10300830016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/kg	ND	0.47	04/01/15 08:50	
Arsenic	mg/kg	ND	0.47	04/01/15 08:50	
Barium	mg/kg	ND	0.28	04/01/15 08:50	
Beryllium	mg/kg	ND	0.19	04/01/15 08:50	
Cadmium	mg/kg	ND	0.075	04/01/15 08:50	
Chromium	mg/kg	ND	0.47	04/01/15 08:50	
Copper	mg/kg	ND	0.94	04/01/15 08:50	
Lead	mg/kg	ND	0.094	04/01/15 08:50	
Nickel	mg/kg	ND	0.47	04/01/15 08:50	
Selenium	mg/kg	ND	0.47	04/01/15 08:50	
Silver	mg/kg	ND	0.47	04/01/15 08:50	
Thallium	mg/kg	ND	0.094	04/01/15 08:50	
Zinc	mg/kg	ND	4.7	04/01/15 08:50	

LABORATORY CONTROL SAMPLE: 1927020

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/kg	19.8	17.1	86	80-120	
Arsenic	mg/kg	19.8	17.3	87	80-120	
Barium	mg/kg	19.8	17.3	87	80-120	
Beryllium	mg/kg	19.8	18.8	95	80-120	
Cadmium	mg/kg	19.8	18.2	92	80-120	
Chromium	mg/kg	19.8	18.6	94	80-120	
Copper	mg/kg	19.8	17.5	88	80-120	
Lead	mg/kg	19.8	18.7	95	80-120	
Nickel	mg/kg	19.8	18.4	93	80-120	
Selenium	mg/kg	19.8	17.3	87	80-120	
Silver	mg/kg	19.8	19.4	98	80-120	
Thallium	mg/kg	19.8	19.0	96	80-120	
Zinc	mg/kg	19.8	18.1	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1927021 1927022

Parameter	Units	10300830002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/kg	ND	20.9	19.2	16.1	12.8	76	66	75-125	23	20	M6,R1
Arsenic	mg/kg	3.0	20.9	19.2	25.7	21.5	109	96	75-125	18	20	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1927021 1927022

Parameter	Units	10300830002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	mg/kg	65.4	20.9	19.2	90.6	94.6	121	153	75-125	4	20	M6
Beryllium	mg/kg	0.36	20.9	19.2	23.5	18.9	111	97	75-125	22	20	R1
Cadmium	mg/kg	0.17	20.9	19.2	23.8	19.4	113	100	75-125	20	20	
Chromium	mg/kg	8.4	20.9	19.2	36.8	35.9	136	144	75-125	2	20	M6
Copper	mg/kg	7.0	20.9	19.2	31.0	26.2	115	100	75-125	17	20	
Lead	mg/kg	16.2	20.9	19.2	43.6	36.3	131	105	75-125	18	20	M6
Nickel	mg/kg	9.6	20.9	19.2	35.8	36.8	125	142	75-125	3	20	M6
Selenium	mg/kg	ND	20.9	19.2	22.3	17.6	106	91	75-125	24	20	R1
Silver	mg/kg	ND	20.9	19.2	24.6	20.1	117	105	75-125	20	20	
Thallium	mg/kg	0.11	20.9	19.2	24.3	19.9	116	104	75-125	20	20	
Zinc	mg/kg	60.6	20.9	19.2	102	91.5	200	162	75-125	11	20	M6

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

QC Batch: MPRP/53235 | Analysis Method: EPA 6020A
QC Batch Method: EPA 3020 | Analysis Description: 6020A Water Dissolved UPD4
Associated Lab Samples: 10300830018, 10300830019, 10300830020

METHOD BLANK: 1927032 | Matrix: Water
Associated Lab Samples: 10300830018, 10300830019, 10300830020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	ND	0.50	03/30/15 11:51	
Arsenic, Dissolved	ug/L	ND	0.50	03/30/15 11:51	
Barium, Dissolved	ug/L	ND	0.30	03/30/15 11:51	
Beryllium, Dissolved	ug/L	ND	0.20	03/30/15 11:51	
Cadmium, Dissolved	ug/L	ND	0.080	03/30/15 11:51	
Chromium, Dissolved	ug/L	ND	0.50	03/30/15 11:51	
Copper, Dissolved	ug/L	ND	1.0	03/30/15 11:51	
Lead, Dissolved	ug/L	ND	0.10	03/30/15 11:51	
Nickel, Dissolved	ug/L	ND	0.50	03/30/15 11:51	
Selenium, Dissolved	ug/L	ND	0.50	03/30/15 11:51	
Silver, Dissolved	ug/L	ND	0.50	03/30/15 11:51	
Thallium, Dissolved	ug/L	ND	0.10	03/30/15 11:51	
Zinc, Dissolved	ug/L	ND	5.0	03/30/15 11:51	

LABORATORY CONTROL SAMPLE: 1927033

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	80	83.9	105	80-120	
Arsenic, Dissolved	ug/L	80	82.8	103	80-120	
Barium, Dissolved	ug/L	80	85.0	106	80-120	
Beryllium, Dissolved	ug/L	80	85.6	107	80-120	
Cadmium, Dissolved	ug/L	80	85.0	106	80-120	
Chromium, Dissolved	ug/L	80	84.6	106	80-120	
Copper, Dissolved	ug/L	80	85.2	106	80-120	
Lead, Dissolved	ug/L	80	88.2	110	80-120	
Nickel, Dissolved	ug/L	80	83.9	105	80-120	
Selenium, Dissolved	ug/L	80	83.4	104	80-120	
Silver, Dissolved	ug/L	80	85.1	106	80-120	
Thallium, Dissolved	ug/L	80	85.6	107	80-120	
Zinc, Dissolved	ug/L	80	85.2	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1927034 1927035

Parameter	Units	10300830018 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony, Dissolved	ug/L	13.7	80	80	100	99.7	108	108	75-125	0	20	
Arsenic, Dissolved	ug/L	348	80	80	430	434	103	107	75-125	1	20	
Barium, Dissolved	ug/L	66.5	80	80	154	153	110	108	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1927034 1927035

Parameter	Units	10300830018 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Beryllium, Dissolved	ug/L	ND	80	80	85.6	85.7	107	107	75-125	0	20	
Cadmium, Dissolved	ug/L	ND	80	80	85.2	85.3	106	107	75-125	0	20	
Chromium, Dissolved	ug/L	ND	80	80	84.8	84.9	106	106	75-125	0	20	
Copper, Dissolved	ug/L	ND	80	80	83.7	83.8	104	104	75-125	0	20	
Lead, Dissolved	ug/L	ND	80	80	87.4	87.4	109	109	75-125	0	20	
Nickel, Dissolved	ug/L	10.8	80	80	93.1	93.8	103	104	75-125	1	20	
Selenium, Dissolved	ug/L	2.5	80	80	87.4	86.2	106	105	75-125	1	20	
Silver, Dissolved	ug/L	ND	80	80	82.7	82.6	103	103	75-125	0	20	
Thallium, Dissolved	ug/L	ND	80	80	91.3	90.9	114	114	75-125	0	20	
Zinc, Dissolved	ug/L	ND	80	80	87.9	90.4	106	109	75-125	3	20	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

QC Batch: MPRP/53266 | Analysis Method: ASTM D2974
QC Batch Method: ASTM D2974 | Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10300830002, 10300830003, 10300830005, 10300830006, 10300830007, 10300830008, 10300830010, 10300830011, 10300830012, 10300830013, 10300830014, 10300830016

SAMPLE DUPLICATE: 1928054

Parameter	Units	10300367001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	0.72	0.70	3	30	

SAMPLE DUPLICATE: 1928055

Parameter	Units	10300830016 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	9.6	8.6	10	30	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

QC Batch: MSV/30929 Analysis Method: EPA 8260
QC Batch Method: EPA 5035/5030B Analysis Description: 8260 MSV 5030 Med Level
Associated Lab Samples: 10300830002, 10300830003, 10300830005, 10300830006

METHOD BLANK: 1928306 Matrix: Solid
Associated Lab Samples: 10300830002, 10300830003, 10300830005, 10300830006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	ND	0.050	03/31/15 17:05	
1,1,1-Trichloroethane	mg/kg	ND	0.050	03/31/15 17:05	
1,1,2,2-Tetrachloroethane	mg/kg	ND	0.050	03/31/15 17:05	
1,1,2-Trichloroethane	mg/kg	ND	0.050	03/31/15 17:05	
1,1,2-Trichlorotrifluoroethane	mg/kg	ND	0.20	03/31/15 17:05	
1,1-Dichloroethane	mg/kg	ND	0.050	03/31/15 17:05	
1,1-Dichloroethene	mg/kg	ND	0.20	03/31/15 17:05	
1,1-Dichloropropene	mg/kg	ND	0.050	03/31/15 17:05	
1,2,3-Trichlorobenzene	mg/kg	ND	0.050	03/31/15 17:05	
1,2,3-Trichloropropane	mg/kg	ND	0.20	03/31/15 17:05	
1,2,4-Trichlorobenzene	mg/kg	ND	0.050	03/31/15 17:05	
1,2,4-Trimethylbenzene	mg/kg	ND	0.050	03/31/15 17:05	
1,2-Dibromo-3-chloropropane	mg/kg	ND	0.50	03/31/15 17:05	
1,2-Dibromoethane (EDB)	mg/kg	ND	0.050	03/31/15 17:05	
1,2-Dichlorobenzene	mg/kg	ND	0.050	03/31/15 17:05	
1,2-Dichloroethane	mg/kg	ND	0.050	03/31/15 17:05	
1,2-Dichloropropane	mg/kg	ND	0.050	03/31/15 17:05	
1,3,5-Trimethylbenzene	mg/kg	ND	0.050	03/31/15 17:05	
1,3-Dichlorobenzene	mg/kg	ND	0.050	03/31/15 17:05	
1,3-Dichloropropane	mg/kg	ND	0.050	03/31/15 17:05	
1,4-Dichlorobenzene	mg/kg	ND	0.050	03/31/15 17:05	
2,2-Dichloropropane	mg/kg	ND	0.20	03/31/15 17:05	
2-Butanone (MEK)	mg/kg	ND	0.25	03/31/15 17:05	
2-Chlorotoluene	mg/kg	ND	0.050	03/31/15 17:05	
4-Chlorotoluene	mg/kg	ND	0.050	03/31/15 17:05	
4-Methyl-2-pentanone (MIBK)	mg/kg	ND	0.25	03/31/15 17:05	
Acetone	mg/kg	ND	1.0	03/31/15 17:05	
Allyl chloride	mg/kg	ND	0.20	03/31/15 17:05	
Benzene	mg/kg	ND	0.020	03/31/15 17:05	
Bromobenzene	mg/kg	ND	0.050	03/31/15 17:05	
Bromochloromethane	mg/kg	ND	0.20	03/31/15 17:05	
Bromodichloromethane	mg/kg	ND	0.050	03/31/15 17:05	
Bromoform	mg/kg	ND	0.20	03/31/15 17:05	
Bromomethane	mg/kg	ND	0.50	03/31/15 17:05	
Carbon tetrachloride	mg/kg	ND	0.20	03/31/15 17:05	
Chlorobenzene	mg/kg	ND	0.050	03/31/15 17:05	
Chloroethane	mg/kg	ND	0.50	03/31/15 17:05	
Chloroform	mg/kg	ND	0.050	03/31/15 17:05	
Chloromethane	mg/kg	ND	0.20	03/31/15 17:05	
cis-1,2-Dichloroethene	mg/kg	ND	0.050	03/31/15 17:05	
cis-1,3-Dichloropropene	mg/kg	ND	0.050	03/31/15 17:05	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

METHOD BLANK: 1928306 Matrix: Solid
Associated Lab Samples: 10300830002, 10300830003, 10300830005, 10300830006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	mg/kg	ND	0.050	03/31/15 17:05	
Dibromomethane	mg/kg	ND	0.050	03/31/15 17:05	
Dichlorodifluoromethane	mg/kg	ND	0.20	03/31/15 17:05	
Dichlorofluoromethane	mg/kg	ND	0.50	03/31/15 17:05	
Diethyl ether (Ethyl ether)	mg/kg	ND	0.20	03/31/15 17:05	
Ethylbenzene	mg/kg	ND	0.050	03/31/15 17:05	
Hexachloro-1,3-butadiene	mg/kg	ND	0.25	03/31/15 17:05	
Isopropylbenzene (Cumene)	mg/kg	ND	0.050	03/31/15 17:05	
Methyl-tert-butyl ether	mg/kg	ND	0.050	03/31/15 17:05	
Methylene Chloride	mg/kg	ND	0.20	03/31/15 17:05	
n-Butylbenzene	mg/kg	ND	0.050	03/31/15 17:05	
n-Propylbenzene	mg/kg	ND	0.050	03/31/15 17:05	
Naphthalene	mg/kg	ND	0.20	03/31/15 17:05	
p-Isopropyltoluene	mg/kg	ND	0.050	03/31/15 17:05	
sec-Butylbenzene	mg/kg	ND	0.050	03/31/15 17:05	
Styrene	mg/kg	ND	0.050	03/31/15 17:05	
tert-Butylbenzene	mg/kg	ND	0.050	03/31/15 17:05	
Tetrachloroethene	mg/kg	ND	0.050	03/31/15 17:05	
Tetrahydrofuran	mg/kg	ND	2.0	03/31/15 17:05	
Toluene	mg/kg	ND	0.050	03/31/15 17:05	
trans-1,2-Dichloroethene	mg/kg	ND	0.20	03/31/15 17:05	
trans-1,3-Dichloropropene	mg/kg	ND	0.050	03/31/15 17:05	
Trichloroethene	mg/kg	ND	0.050	03/31/15 17:05	
Trichlorofluoromethane	mg/kg	ND	0.20	03/31/15 17:05	
Vinyl chloride	mg/kg	ND	0.020	03/31/15 17:05	
Xylene (Total)	mg/kg	ND	0.15	03/31/15 17:05	
1,2-Dichloroethane-d4 (S)	%.	91	55-150	03/31/15 17:05	
4-Bromofluorobenzene (S)	%.	100	54-131	03/31/15 17:05	
Toluene-d8 (S)	%.	96	61-125	03/31/15 17:05	

LABORATORY CONTROL SAMPLE: 1928307

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	1	0.91	91	75-125	
1,1,1-Trichloroethane	mg/kg	1	0.94	94	66-125	
1,1,2,2-Tetrachloroethane	mg/kg	1	1.1	109	69-125	CH,E,SS
1,1,2-Trichloroethane	mg/kg	1	0.91	91	75-125	
1,1,2-Trichlorotrifluoroethane	mg/kg	1	0.84	84	55-125	
1,1-Dichloroethane	mg/kg	1	0.92	92	67-125	
1,1-Dichloroethene	mg/kg	1	0.90	90	62-125	
1,1-Dichloropropene	mg/kg	1	0.94	94	65-125	
1,2,3-Trichlorobenzene	mg/kg	1	0.92	92	58-132	
1,2,3-Trichloropropane	mg/kg	1	0.89	89	71-125	
1,2,4-Trichlorobenzene	mg/kg	1	0.91	91	63-128	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

LABORATORY CONTROL SAMPLE: 1928307

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	mg/kg	1	0.90	90	74-125	
1,2-Dibromo-3-chloropropane	mg/kg	2.5	2.3	94	55-142	
1,2-Dibromoethane (EDB)	mg/kg	1	0.91	91	75-125	
1,2-Dichlorobenzene	mg/kg	1	0.94	94	75-125	
1,2-Dichloroethane	mg/kg	1	0.85	85	71-125	
1,2-Dichloropropane	mg/kg	1	0.88	88	74-125	
1,3,5-Trimethylbenzene	mg/kg	1	0.92	92	72-125	
1,3-Dichlorobenzene	mg/kg	1	0.90	90	75-125	
1,3-Dichloropropane	mg/kg	1	0.88	88	75-125	
1,4-Dichlorobenzene	mg/kg	1	0.96	96	75-125	
2,2-Dichloropropane	mg/kg	1	0.89	89	45-125	
2-Butanone (MEK)	mg/kg	5	4.4	88	39-136	
2-Chlorotoluene	mg/kg	1	0.92	92	73-125	
4-Chlorotoluene	mg/kg	1	0.92	92	74-125	
4-Methyl-2-pentanone (MIBK)	mg/kg	5	4.6	92	55-132	
Acetone	mg/kg	5	4.5	90	55-131	
Allyl chloride	mg/kg	1	0.90	90	53-125	
Benzene	mg/kg	1	0.88	88	69-125	
Bromobenzene	mg/kg	1	0.89	89	75-125	
Bromochloromethane	mg/kg	1	0.94	94	75-125	
Bromodichloromethane	mg/kg	1	0.90	90	75-125	
Bromoform	mg/kg	1	0.90	90	71-125	
Bromomethane	mg/kg	1	0.78	78	42-150	
Carbon tetrachloride	mg/kg	1	0.86	86	62-125	
Chlorobenzene	mg/kg	1	0.94	94	75-125	
Chloroethane	mg/kg	1	0.76	76	41-150	
Chloroform	mg/kg	1	0.87	87	72-125	
Chloromethane	mg/kg	1	0.72	72	50-125	
cis-1,2-Dichloroethene	mg/kg	1	0.92	92	73-125	
cis-1,3-Dichloropropene	mg/kg	1	0.91	91	74-125	
Dibromochloromethane	mg/kg	1	0.95	95	75-125	
Dibromomethane	mg/kg	1	1.0	100	75-125	
Dichlorodifluoromethane	mg/kg	1	0.53	53	30-125	
Dichlorofluoromethane	mg/kg	1	0.73	73	30-150	
Diethyl ether (Ethyl ether)	mg/kg	1	0.87	87	58-125	
Ethylbenzene	mg/kg	1	0.92	92	72-125	
Hexachloro-1,3-butadiene	mg/kg	1	1.0	103	59-138	
Isopropylbenzene (Cumene)	mg/kg	1	0.99	99	72-125	
Methyl-tert-butyl ether	mg/kg	1	0.86	86	72-125	
Methylene Chloride	mg/kg	1	0.96	96	71-125	
n-Butylbenzene	mg/kg	1	0.89	89	65-125	
n-Propylbenzene	mg/kg	1	0.93	93	71-125	
Naphthalene	mg/kg	1	0.95	95	55-139	
p-Isopropyltoluene	mg/kg	1	0.95	95	69-125	
sec-Butylbenzene	mg/kg	1	0.94	94	68-125	
Styrene	mg/kg	1	1.0	102	75-125	
tert-Butylbenzene	mg/kg	1	0.93	93	70-125	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

LABORATORY CONTROL SAMPLE: 1928307

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Tetrachloroethene	mg/kg	1	0.94	94	69-125	
Tetrahydrofuran	mg/kg	10	9.5	95	62-129	
Toluene	mg/kg	1	0.92	92	72-125	
trans-1,2-Dichloroethene	mg/kg	1	0.94	94	68-125	
trans-1,3-Dichloropropene	mg/kg	1	0.91	91	74-125	
Trichloroethene	mg/kg	1	0.96	96	72-125	
Trichlorofluoromethane	mg/kg	1	0.66	66	30-150	
Vinyl chloride	mg/kg	1	0.73	73	53-125	
Xylene (Total)	mg/kg	3	2.9	98	74-125	
1,2-Dichloroethane-d4 (S)	%.			91	55-150	
4-Bromofluorobenzene (S)	%.			96	54-131	
Toluene-d8 (S)	%.			99	61-125	

MATRIX SPIKE SAMPLE: 1928308

Parameter	Units	10300640002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	ND	1.2	1.2	101	62-150	
1,1,1-Trichloroethane	mg/kg	ND	1.2	1.2	103	58-150	
1,1,2,2-Tetrachloroethane	mg/kg	ND	1.2	1.6	134	30-150	E,SS
1,1,2-Trichloroethane	mg/kg	ND	1.2	1.2	103	61-149	
1,1,2-Trichlorotrifluoroethane	mg/kg	ND	1.2	1.1	92	45-150	
1,1-Dichloroethane	mg/kg	ND	1.2	1.2	101	56-150	
1,1-Dichloroethene	mg/kg	ND	1.2	1.1	92	48-150	
1,1-Dichloropropene	mg/kg	ND	1.2	1.1	94	58-150	
1,2,3-Trichlorobenzene	mg/kg	ND	1.2	1.3	107	55-150	
1,2,3-Trichloropropane	mg/kg	ND	1.2	1.2	104	57-148	
1,2,4-Trichlorobenzene	mg/kg	ND	1.2	1.2	104	61-150	
1,2,4-Trimethylbenzene	mg/kg	ND	1.2	1.2	97	64-150	
1,2-Dibromo-3-chloropropane	mg/kg	ND	2.9	3.3	111	40-150	
1,2-Dibromoethane (EDB)	mg/kg	ND	1.2	1.2	101	62-147	
1,2-Dichlorobenzene	mg/kg	ND	1.2	1.2	102	73-133	
1,2-Dichloroethane	mg/kg	ND	1.2	1.0	88	63-132	
1,2-Dichloropropane	mg/kg	ND	1.2	1.1	96	69-127	
1,3,5-Trimethylbenzene	mg/kg	ND	1.2	1.2	99	63-137	
1,3-Dichlorobenzene	mg/kg	ND	1.2	1.2	98	69-133	
1,3-Dichloropropane	mg/kg	ND	1.2	1.2	98	70-130	
1,4-Dichlorobenzene	mg/kg	ND	1.2	1.1	94	69-130	
2,2-Dichloropropane	mg/kg	ND	1.2	1.1	95	54-135	
2-Butanone (MEK)	mg/kg	ND	5.9	5.7	97	49-145	
2-Chlorotoluene	mg/kg	ND	1.2	1.2	98	68-129	
4-Chlorotoluene	mg/kg	ND	1.2	1.1	95	67-134	
4-Methyl-2-pentanone (MIBK)	mg/kg	ND	5.9	6.4	109	60-150	
Acetone	mg/kg	ND	5.9	5.7	97	65-135	
Allyl chloride	mg/kg	ND	1.2	1.1	95	55-126	
Benzene	mg/kg	ND	1.2	1.1	93	63-126	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

MATRIX SPIKE SAMPLE: 1928308

Parameter	Units	10300640002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromobenzene	mg/kg	ND	1.2	1.1	93	68-133	
Bromochloromethane	mg/kg	ND	1.2	1.2	98	66-130	
Bromodichloromethane	mg/kg	ND	1.2	1.2	100	68-129	
Bromoform	mg/kg	ND	1.2	1.2	104	63-135	
Bromomethane	mg/kg	ND	1.2	1.0	84	30-150	
Carbon tetrachloride	mg/kg	ND	1.2	1.1	95	56-140	
Chlorobenzene	mg/kg	ND	1.2	1.2	98	69-130	
Chloroethane	mg/kg	ND	1.2	1.1	92	46-150	
Chloroform	mg/kg	ND	1.2	1.1	95	70-127	
Chloromethane	mg/kg	ND	1.2	0.92	77	51-125	
cis-1,2-Dichloroethene	mg/kg	ND	1.2	1.1	97	68-125	
cis-1,3-Dichloropropene	mg/kg	ND	1.2	1.1	94	67-126	
Dibromochloromethane	mg/kg	ND	1.2	1.2	103	66-135	
Dibromomethane	mg/kg	ND	1.2	1.3	107	68-132	
Dichlorodifluoromethane	mg/kg	ND	1.2	0.75	63	30-138	
Dichlorofluoromethane	mg/kg	ND	1.2	1.1	89	30-150	
Diethyl ether (Ethyl ether)	mg/kg	ND	1.2	1.1	95	56-135	
Ethylbenzene	mg/kg	ND	1.2	1.1	96	69-126	
Hexachloro-1,3-butadiene	mg/kg	ND	1.2	1.2	98	50-150	
Isopropylbenzene (Cumene)	mg/kg	ND	1.2	1.2	104	65-135	
Methyl-tert-butyl ether	mg/kg	ND	1.2	1.2	98	66-129	
Methylene Chloride	mg/kg	ND	1.2	1.1	97	64-125	
n-Butylbenzene	mg/kg	ND	1.2	1.1	95	62-141	
n-Propylbenzene	mg/kg	ND	1.2	1.2	98	65-135	
Naphthalene	mg/kg	ND	1.2	1.3	112	62-150	
p-Isopropyltoluene	mg/kg	ND	1.2	1.2	101	62-139	
sec-Butylbenzene	mg/kg	ND	1.2	1.2	99	64-137	
Styrene	mg/kg	ND	1.2	1.2	103	70-132	
tert-Butylbenzene	mg/kg	ND	1.2	1.2	100	65-136	
Tetrachloroethene	mg/kg	ND	1.2	1.2	101	61-142	
Tetrahydrofuran	mg/kg	ND	11.9	13.1	110	68-138	
Toluene	mg/kg	ND	1.2	1.2	100	66-128	
trans-1,2-Dichloroethene	mg/kg	ND	1.2	1.0	87	63-129	
trans-1,3-Dichloropropene	mg/kg	ND	1.2	1.1	96	67-132	
Trichloroethene	mg/kg	ND	1.2	1.1	96	52-150	
Trichlorofluoromethane	mg/kg	ND	1.2	1.0	87	39-150	
Vinyl chloride	mg/kg	ND	1.2	0.93	78	50-125	
Xylene (Total)	mg/kg	ND	3.5	3.7	103	70-130	
1,2-Dichloroethane-d4 (S)	%.				94	55-150	
4-Bromofluorobenzene (S)	%.				95	54-131	
Toluene-d8 (S)	%.				101	61-125	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

SAMPLE DUPLICATE: 1928309

Parameter	Units	10300640003 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	ND	ND		30	
1,1,1-Trichloroethane	mg/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	mg/kg	ND	ND		30	
1,1,2-Trichloroethane	mg/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	mg/kg	ND	ND		30	
1,1-Dichloroethane	mg/kg	ND	ND		30	
1,1-Dichloroethene	mg/kg	ND	ND		30	
1,1-Dichloropropene	mg/kg	ND	ND		30	
1,2,3-Trichlorobenzene	mg/kg	ND	ND		30	
1,2,3-Trichloropropane	mg/kg	ND	ND		30	
1,2,4-Trichlorobenzene	mg/kg	ND	ND		30	
1,2,4-Trimethylbenzene	mg/kg	ND	ND		30	
1,2-Dibromo-3-chloropropane	mg/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	mg/kg	ND	ND		30	
1,2-Dichlorobenzene	mg/kg	ND	ND		30	
1,2-Dichloroethane	mg/kg	ND	ND		30	
1,2-Dichloropropane	mg/kg	ND	ND		30	
1,3,5-Trimethylbenzene	mg/kg	ND	ND		30	
1,3-Dichlorobenzene	mg/kg	ND	ND		30	
1,3-Dichloropropane	mg/kg	ND	ND		30	
1,4-Dichlorobenzene	mg/kg	ND	ND		30	
2,2-Dichloropropane	mg/kg	ND	ND		30	
2-Butanone (MEK)	mg/kg	ND	ND		30	
2-Chlorotoluene	mg/kg	ND	ND		30	
4-Chlorotoluene	mg/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	mg/kg	ND	ND		30	
Acetone	mg/kg	ND	ND		30	
Allyl chloride	mg/kg	ND	ND		30	
Benzene	mg/kg	ND	ND		30	
Bromobenzene	mg/kg	ND	ND		30	
Bromochloromethane	mg/kg	ND	ND		30	
Bromodichloromethane	mg/kg	ND	ND		30	
Bromoform	mg/kg	ND	ND		30	
Bromomethane	mg/kg	ND	ND		30	
Carbon tetrachloride	mg/kg	ND	ND		30	
Chlorobenzene	mg/kg	ND	ND		30	
Chloroethane	mg/kg	ND	ND		30	
Chloroform	mg/kg	ND	ND		30	
Chloromethane	mg/kg	ND	ND		30	
cis-1,2-Dichloroethene	mg/kg	ND	ND		30	
cis-1,3-Dichloropropene	mg/kg	ND	ND		30	
Dibromochloromethane	mg/kg	ND	ND		30	
Dibromomethane	mg/kg	ND	ND		30	
Dichlorodifluoromethane	mg/kg	ND	ND		30	
Dichlorofluoromethane	mg/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	mg/kg	ND	ND		30	
Ethylbenzene	mg/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

SAMPLE DUPLICATE: 1928309

Parameter	Units	10300640003 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	mg/kg	ND	ND		30	
Isopropylbenzene (Cumene)	mg/kg	ND	ND		30	
Methyl-tert-butyl ether	mg/kg	ND	ND		30	
Methylene Chloride	mg/kg	ND	ND		30	
n-Butylbenzene	mg/kg	ND	ND		30	
n-Propylbenzene	mg/kg	ND	ND		30	
Naphthalene	mg/kg	ND	ND		30	
p-Isopropyltoluene	mg/kg	ND	ND		30	
sec-Butylbenzene	mg/kg	ND	ND		30	
Styrene	mg/kg	ND	ND		30	
tert-Butylbenzene	mg/kg	ND	ND		30	
Tetrachloroethene	mg/kg	ND	ND		30	
Tetrahydrofuran	mg/kg	ND	ND		30	
Toluene	mg/kg	ND	ND		30	
trans-1,2-Dichloroethene	mg/kg	ND	ND		30	
trans-1,3-Dichloropropene	mg/kg	ND	ND		30	
Trichloroethene	mg/kg	ND	ND		30	
Trichlorofluoromethane	mg/kg	ND	ND		30	
Vinyl chloride	mg/kg	ND	ND		30	
Xylene (Total)	mg/kg	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	91	90	2		
4-Bromofluorobenzene (S)	%.	99	100	0		
Toluene-d8 (S)	%.	101	100	1		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

QC Batch: MSV/30935 Analysis Method: EPA 8260
QC Batch Method: EPA 5035/5030B Analysis Description: 8260 MSV 5030 Med Level
Associated Lab Samples: 10300830007, 10300830008, 10300830010, 10300830011, 10300830012, 10300830013, 10300830014, 10300830016, 10300830017

METHOD BLANK: 1928535 Matrix: Solid
Associated Lab Samples: 10300830007, 10300830008, 10300830010, 10300830011, 10300830012, 10300830013, 10300830014, 10300830016, 10300830017

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	ND	0.050	04/01/15 15:22	
1,1,1-Trichloroethane	mg/kg	ND	0.050	04/01/15 15:22	
1,1,2,2-Tetrachloroethane	mg/kg	ND	0.050	04/01/15 15:22	
1,1,2-Trichloroethane	mg/kg	ND	0.050	04/01/15 15:22	
1,1,2-Trichlorotrifluoroethane	mg/kg	ND	0.20	04/01/15 15:22	
1,1-Dichloroethane	mg/kg	ND	0.050	04/01/15 15:22	
1,1-Dichloroethene	mg/kg	ND	0.20	04/01/15 15:22	
1,1-Dichloropropene	mg/kg	ND	0.050	04/01/15 15:22	
1,2,3-Trichlorobenzene	mg/kg	ND	0.050	04/01/15 15:22	
1,2,3-Trichloropropane	mg/kg	ND	0.20	04/01/15 15:22	
1,2,4-Trichlorobenzene	mg/kg	ND	0.050	04/01/15 15:22	
1,2,4-Trimethylbenzene	mg/kg	ND	0.050	04/01/15 15:22	
1,2-Dibromo-3-chloropropane	mg/kg	ND	0.50	04/01/15 15:22	
1,2-Dibromoethane (EDB)	mg/kg	ND	0.050	04/01/15 15:22	
1,2-Dichlorobenzene	mg/kg	ND	0.050	04/01/15 15:22	
1,2-Dichloroethane	mg/kg	ND	0.050	04/01/15 15:22	
1,2-Dichloropropane	mg/kg	ND	0.050	04/01/15 15:22	
1,3,5-Trimethylbenzene	mg/kg	ND	0.050	04/01/15 15:22	
1,3-Dichlorobenzene	mg/kg	ND	0.050	04/01/15 15:22	
1,3-Dichloropropane	mg/kg	ND	0.050	04/01/15 15:22	
1,4-Dichlorobenzene	mg/kg	ND	0.050	04/01/15 15:22	
2,2-Dichloropropane	mg/kg	ND	0.20	04/01/15 15:22	
2-Butanone (MEK)	mg/kg	ND	0.25	04/01/15 15:22	
2-Chlorotoluene	mg/kg	ND	0.050	04/01/15 15:22	
4-Chlorotoluene	mg/kg	ND	0.050	04/01/15 15:22	
4-Methyl-2-pentanone (MIBK)	mg/kg	ND	0.25	04/01/15 15:22	
Acetone	mg/kg	ND	1.0	04/01/15 15:22	
Allyl chloride	mg/kg	ND	0.20	04/01/15 15:22	
Benzene	mg/kg	ND	0.020	04/01/15 15:22	
Bromobenzene	mg/kg	ND	0.050	04/01/15 15:22	
Bromochloromethane	mg/kg	ND	0.20	04/01/15 15:22	
Bromodichloromethane	mg/kg	ND	0.050	04/01/15 15:22	
Bromoform	mg/kg	ND	0.20	04/01/15 15:22	
Bromomethane	mg/kg	ND	0.50	04/01/15 15:22	
Carbon tetrachloride	mg/kg	ND	0.20	04/01/15 15:22	
Chlorobenzene	mg/kg	ND	0.050	04/01/15 15:22	
Chloroethane	mg/kg	ND	0.50	04/01/15 15:22	
Chloroform	mg/kg	ND	0.050	04/01/15 15:22	
Chloromethane	mg/kg	ND	0.20	04/01/15 15:22	
cis-1,2-Dichloroethene	mg/kg	ND	0.050	04/01/15 15:22	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

METHOD BLANK: 1928535 Matrix: Solid

Associated Lab Samples: 10300830007, 10300830008, 10300830010, 10300830011, 10300830012, 10300830013, 10300830014, 10300830016, 10300830017

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
cis-1,3-Dichloropropene	mg/kg	ND	0.050	04/01/15 15:22	
Dibromochloromethane	mg/kg	ND	0.050	04/01/15 15:22	
Dibromomethane	mg/kg	ND	0.050	04/01/15 15:22	
Dichlorodifluoromethane	mg/kg	ND	0.20	04/01/15 15:22	
Dichlorofluoromethane	mg/kg	ND	0.50	04/01/15 15:22	
Diethyl ether (Ethyl ether)	mg/kg	ND	0.20	04/01/15 15:22	
Ethylbenzene	mg/kg	ND	0.050	04/01/15 15:22	
Hexachloro-1,3-butadiene	mg/kg	ND	0.25	04/01/15 15:22	
Isopropylbenzene (Cumene)	mg/kg	ND	0.050	04/01/15 15:22	
Methyl-tert-butyl ether	mg/kg	ND	0.050	04/01/15 15:22	
Methylene Chloride	mg/kg	ND	0.20	04/01/15 15:22	
n-Butylbenzene	mg/kg	ND	0.050	04/01/15 15:22	
n-Propylbenzene	mg/kg	ND	0.050	04/01/15 15:22	
Naphthalene	mg/kg	ND	0.20	04/01/15 15:22	
p-Isopropyltoluene	mg/kg	ND	0.050	04/01/15 15:22	
sec-Butylbenzene	mg/kg	ND	0.050	04/01/15 15:22	
Styrene	mg/kg	ND	0.050	04/01/15 15:22	
tert-Butylbenzene	mg/kg	ND	0.050	04/01/15 15:22	
Tetrachloroethene	mg/kg	ND	0.050	04/01/15 15:22	
Tetrahydrofuran	mg/kg	ND	2.0	04/01/15 15:22	
Toluene	mg/kg	ND	0.050	04/01/15 15:22	
trans-1,2-Dichloroethene	mg/kg	ND	0.20	04/01/15 15:22	
trans-1,3-Dichloropropene	mg/kg	ND	0.050	04/01/15 15:22	
Trichloroethene	mg/kg	ND	0.050	04/01/15 15:22	
Trichlorofluoromethane	mg/kg	ND	0.20	04/01/15 15:22	
Vinyl chloride	mg/kg	ND	0.020	04/01/15 15:22	
Xylene (Total)	mg/kg	ND	0.15	04/01/15 15:22	
1,2-Dichloroethane-d4 (S)	%.	87	55-150	04/01/15 15:22	
4-Bromofluorobenzene (S)	%.	101	54-131	04/01/15 15:22	
Toluene-d8 (S)	%.	97	61-125	04/01/15 15:22	

LABORATORY CONTROL SAMPLE: 1928536

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	1	1.0	101	75-125	
1,1,1-Trichloroethane	mg/kg	1	1.1	107	66-125	
1,1,2,2-Tetrachloroethane	mg/kg	1	1.2	120	69-125	E,SS
1,1,2-Trichloroethane	mg/kg	1	1.1	105	75-125	
1,1,2-Trichlorotrifluoroethane	mg/kg	1	0.97	97	55-125	
1,1-Dichloroethane	mg/kg	1	1.0	101	67-125	
1,1-Dichloroethene	mg/kg	1	0.93	93	62-125	
1,1-Dichloropropene	mg/kg	1	0.97	97	65-125	
1,2,3-Trichlorobenzene	mg/kg	1	1.1	106	58-132	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

LABORATORY CONTROL SAMPLE: 1928536

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,3-Trichloropropane	mg/kg	1	1.0	105	71-125	
1,2,4-Trichlorobenzene	mg/kg	1	1.0	103	63-128	
1,2,4-Trimethylbenzene	mg/kg	1	0.97	97	74-125	
1,2-Dibromo-3-chloropropane	mg/kg	2.5	2.8	111	55-142	
1,2-Dibromoethane (EDB)	mg/kg	1	1.0	103	75-125	
1,2-Dichlorobenzene	mg/kg	1	1.0	103	75-125	
1,2-Dichloroethane	mg/kg	1	0.91	91	71-125	
1,2-Dichloropropane	mg/kg	1	0.96	96	74-125	
1,3,5-Trimethylbenzene	mg/kg	1	0.98	98	72-125	
1,3-Dichlorobenzene	mg/kg	1	0.95	95	75-125	
1,3-Dichloropropane	mg/kg	1	0.99	99	75-125	
1,4-Dichlorobenzene	mg/kg	1	0.98	98	75-125	
2,2-Dichloropropane	mg/kg	1	0.95	95	45-125	
2-Butanone (MEK)	mg/kg	5	5.0	101	39-136	
2-Chlorotoluene	mg/kg	1	0.97	97	73-125	
4-Chlorotoluene	mg/kg	1	0.93	93	74-125	
4-Methyl-2-pentanone (MIBK)	mg/kg	5	5.3	105	55-132	
Acetone	mg/kg	5	5.3	105	55-131	
Allyl chloride	mg/kg	1	0.96	96	53-125	
Benzene	mg/kg	1	0.94	94	69-125	
Bromobenzene	mg/kg	1	0.93	93	75-125	
Bromochloromethane	mg/kg	1	0.98	98	75-125	
Bromodichloromethane	mg/kg	1	1.0	102	75-125	
Bromoform	mg/kg	1	1.0	101	71-125	
Bromomethane	mg/kg	1	0.83	83	42-150	
Carbon tetrachloride	mg/kg	1	0.96	96	62-125	
Chlorobenzene	mg/kg	1	0.98	98	75-125	
Chloroethane	mg/kg	1	0.87	87	41-150	
Chloroform	mg/kg	1	0.95	95	72-125	
Chloromethane	mg/kg	1	0.73	73	50-125	
cis-1,2-Dichloroethene	mg/kg	1	0.99	99	73-125	
cis-1,3-Dichloropropene	mg/kg	1	0.96	96	74-125	
Dibromochloromethane	mg/kg	1	1.1	107	75-125	
Dibromomethane	mg/kg	1	1.1	111	75-125	
Dichlorodifluoromethane	mg/kg	1	0.66	66	30-125	
Dichlorofluoromethane	mg/kg	1	0.87	87	30-150	
Diethyl ether (Ethyl ether)	mg/kg	1	1.0	102	58-125	
Ethylbenzene	mg/kg	1	0.97	97	72-125	
Hexachloro-1,3-butadiene	mg/kg	1	0.96	96	59-138	
Isopropylbenzene (Cumene)	mg/kg	1	1.0	104	72-125	
Methyl-tert-butyl ether	mg/kg	1	0.99	99	72-125	
Methylene Chloride	mg/kg	1	0.95	95	71-125	
n-Butylbenzene	mg/kg	1	0.94	94	65-125	
n-Propylbenzene	mg/kg	1	0.95	95	71-125	
Naphthalene	mg/kg	1	1.2	115	55-139	
p-Isopropyltoluene	mg/kg	1	0.99	99	69-125	
sec-Butylbenzene	mg/kg	1	0.96	96	68-125	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

LABORATORY CONTROL SAMPLE: 1928536

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Styrene	mg/kg	1	1.0	103	75-125	
tert-Butylbenzene	mg/kg	1	0.98	98	70-125	
Tetrachloroethene	mg/kg	1	1.0	103	69-125	
Tetrahydrofuran	mg/kg	10	11.8	118	62-129	
Toluene	mg/kg	1	0.99	99	72-125	
trans-1,2-Dichloroethene	mg/kg	1	0.91	91	68-125	
trans-1,3-Dichloropropene	mg/kg	1	0.96	96	74-125	
Trichloroethene	mg/kg	1	1.0	101	72-125	
Trichlorofluoromethane	mg/kg	1	0.89	89	30-150	
Vinyl chloride	mg/kg	1	0.76	76	53-125	
Xylene (Total)	mg/kg	3	3.1	104	74-125	
1,2-Dichloroethane-d4 (S)	%.			94	55-150	
4-Bromofluorobenzene (S)	%.			94	54-131	
Toluene-d8 (S)	%.			100	61-125	

MATRIX SPIKE SAMPLE: 1928537

Parameter	Units	10300801001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	ND	1.1	1.1	97	62-150	
1,1,1-Trichloroethane	mg/kg	ND	1.1	1.2	101	58-150	
1,1,2,2-Tetrachloroethane	mg/kg	ND	1.1	1.4	121	30-150	E,SS
1,1,2-Trichloroethane	mg/kg	ND	1.1	1.2	103	61-149	
1,1,2-Trichlorotrifluoroethane	mg/kg	ND	1.1	1.1	92	45-150	
1,1-Dichloroethane	mg/kg	ND	1.1	1.1	93	56-150	
1,1-Dichloroethene	mg/kg	ND	1.1	0.96	83	48-150	
1,1-Dichloropropene	mg/kg	ND	1.1	1.0	88	58-150	
1,2,3-Trichlorobenzene	mg/kg	ND	1.1	1.1	99	55-150	
1,2,3-Trichloropropane	mg/kg	ND	1.1	1.2	104	57-148	
1,2,4-Trichlorobenzene	mg/kg	ND	1.1	1.1	96	61-150	
1,2,4-Trimethylbenzene	mg/kg	ND	1.1	1.1	94	64-150	
1,2-Dibromo-3-chloropropane	mg/kg	ND	2.8	3.0	104	40-150	
1,2-Dibromoethane (EDB)	mg/kg	ND	1.1	1.1	97	62-147	
1,2-Dichlorobenzene	mg/kg	ND	1.1	1.1	97	73-133	
1,2-Dichloroethane	mg/kg	ND	1.1	0.96	84	63-132	
1,2-Dichloropropane	mg/kg	ND	1.1	1.0	91	69-127	
1,3,5-Trimethylbenzene	mg/kg	ND	1.1	1.1	94	63-137	
1,3-Dichlorobenzene	mg/kg	ND	1.1	1.0	88	69-133	
1,3-Dichloropropane	mg/kg	ND	1.1	1.1	95	70-130	
1,4-Dichlorobenzene	mg/kg	ND	1.1	1.0	89	69-130	
2,2-Dichloropropane	mg/kg	ND	1.1	1.0	87	54-135	
2-Butanone (MEK)	mg/kg	ND	5.8	5.6	98	49-145	
2-Chlorotoluene	mg/kg	ND	1.1	1.1	92	68-129	
4-Chlorotoluene	mg/kg	ND	1.1	1.0	87	67-134	
4-Methyl-2-pentanone (MIBK)	mg/kg	ND	5.8	5.9	102	60-150	
Acetone	mg/kg	ND	5.8	5.5	96	65-135	

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REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

MATRIX SPIKE SAMPLE: 1928537

Parameter	Units	10300801001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Allyl chloride	mg/kg	ND	1.1	0.97	84	55-126	
Benzene	mg/kg	ND	1.1	1.0	89	63-126	
Bromobenzene	mg/kg	ND	1.1	1.0	89	68-133	
Bromochloromethane	mg/kg	ND	1.1	0.98	85	66-130	
Bromodichloromethane	mg/kg	ND	1.1	1.1	94	68-129	
Bromoform	mg/kg	ND	1.1	1.1	96	63-135	
Bromomethane	mg/kg	ND	1.1	0.91	77	30-150	
Carbon tetrachloride	mg/kg	ND	1.1	1.1	91	56-140	
Chlorobenzene	mg/kg	ND	1.1	1.0	91	69-130	
Chloroethane	mg/kg	ND	1.1	0.93	81	46-150	
Chloroform	mg/kg	ND	1.1	1.0	87	70-127	
Chloromethane	mg/kg	ND	1.1	0.72	63	51-125	
cis-1,2-Dichloroethene	mg/kg	ND	1.1	0.99	86	68-125	
cis-1,3-Dichloropropene	mg/kg	ND	1.1	1.0	88	67-126	
Dibromochloromethane	mg/kg	ND	1.1	1.2	103	66-135	
Dibromomethane	mg/kg	ND	1.1	1.1	99	68-132	
Dichlorodifluoromethane	mg/kg	ND	1.1	0.56	49	30-138	
Dichlorofluoromethane	mg/kg	ND	1.1	0.99	86	30-150	
Diethyl ether (Ethyl ether)	mg/kg	ND	1.1	1.1	92	56-135	
Ethylbenzene	mg/kg	ND	1.1	1.1	92	69-126	
Hexachloro-1,3-butadiene	mg/kg	ND	1.1	1.1	93	50-150	
Isopropylbenzene (Cumene)	mg/kg	ND	1.1	1.1	96	65-135	
Methyl-tert-butyl ether	mg/kg	ND	1.1	1.1	95	66-129	
Methylene Chloride	mg/kg	ND	1.1	0.95	83	64-125	
n-Butylbenzene	mg/kg	ND	1.1	1.0	90	62-141	
n-Propylbenzene	mg/kg	ND	1.1	1.1	92	65-135	
Naphthalene	mg/kg	ND	1.1	1.2	107	62-150	
p-Isopropyltoluene	mg/kg	ND	1.1	1.1	95	62-139	
sec-Butylbenzene	mg/kg	ND	1.1	1.1	93	64-137	
Styrene	mg/kg	ND	1.1	1.1	94	70-132	
tert-Butylbenzene	mg/kg	ND	1.1	1.1	94	65-136	
Tetrachloroethene	mg/kg	ND	1.1	1.1	97	61-142	
Tetrahydrofuran	mg/kg	ND	11.5	12.8	111	68-138	
Toluene	mg/kg	ND	1.1	1.1	94	66-128	
trans-1,2-Dichloroethene	mg/kg	ND	1.1	0.86	75	63-129	
trans-1,3-Dichloropropene	mg/kg	ND	1.1	1.0	90	67-132	
Trichloroethene	mg/kg	ND	1.1	1.0	90	52-150	
Trichlorofluoromethane	mg/kg	ND	1.1	1.1	92	39-150	
Vinyl chloride	mg/kg	ND	1.1	0.74	64	50-125	
Xylene (Total)	mg/kg	ND	3.4	3.3	97	70-130	
1,2-Dichloroethane-d4 (S)	%.				93	55-150	
4-Bromofluorobenzene (S)	%.				96	54-131	
Toluene-d8 (S)	%.				102	61-125	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

SAMPLE DUPLICATE: 1928538

Parameter	Units	10300801002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	ND	ND		30	
1,1,1-Trichloroethane	mg/kg	ND	ND		30	
1,1,2,2-Tetrachloroethane	mg/kg	ND	ND		30	
1,1,2-Trichloroethane	mg/kg	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	mg/kg	ND	ND		30	
1,1-Dichloroethane	mg/kg	ND	ND		30	
1,1-Dichloroethene	mg/kg	ND	ND		30	
1,1-Dichloropropene	mg/kg	ND	ND		30	
1,2,3-Trichlorobenzene	mg/kg	ND	ND		30	
1,2,3-Trichloropropane	mg/kg	ND	ND		30	
1,2,4-Trichlorobenzene	mg/kg	ND	ND		30	
1,2,4-Trimethylbenzene	mg/kg	ND	ND		30	
1,2-Dibromo-3-chloropropane	mg/kg	ND	ND		30	
1,2-Dibromoethane (EDB)	mg/kg	ND	ND		30	
1,2-Dichlorobenzene	mg/kg	ND	ND		30	
1,2-Dichloroethane	mg/kg	ND	ND		30	
1,2-Dichloropropane	mg/kg	ND	ND		30	
1,3,5-Trimethylbenzene	mg/kg	ND	ND		30	
1,3-Dichlorobenzene	mg/kg	ND	ND		30	
1,3-Dichloropropane	mg/kg	ND	ND		30	
1,4-Dichlorobenzene	mg/kg	ND	ND		30	
2,2-Dichloropropane	mg/kg	ND	ND		30	
2-Butanone (MEK)	mg/kg	ND	ND		30	
2-Chlorotoluene	mg/kg	ND	ND		30	
4-Chlorotoluene	mg/kg	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	mg/kg	ND	ND		30	
Acetone	mg/kg	ND	ND		30	
Allyl chloride	mg/kg	ND	ND		30	
Benzene	mg/kg	ND	ND		30	
Bromobenzene	mg/kg	ND	ND		30	
Bromochloromethane	mg/kg	ND	ND		30	
Bromodichloromethane	mg/kg	ND	ND		30	
Bromoform	mg/kg	ND	ND		30	
Bromomethane	mg/kg	ND	ND		30	
Carbon tetrachloride	mg/kg	ND	ND		30	
Chlorobenzene	mg/kg	ND	ND		30	
Chloroethane	mg/kg	ND	ND		30	
Chloroform	mg/kg	ND	ND		30	
Chloromethane	mg/kg	ND	ND		30	
cis-1,2-Dichloroethene	mg/kg	ND	ND		30	
cis-1,3-Dichloropropene	mg/kg	ND	ND		30	
Dibromochloromethane	mg/kg	ND	ND		30	
Dibromomethane	mg/kg	ND	ND		30	
Dichlorodifluoromethane	mg/kg	ND	ND		30	
Dichlorofluoromethane	mg/kg	ND	ND		30	
Diethyl ether (Ethyl ether)	mg/kg	ND	ND		30	
Ethylbenzene	mg/kg	ND	ND		30	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

SAMPLE DUPLICATE: 1928538

Parameter	Units	10300801002 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	mg/kg	ND	ND		30	
Isopropylbenzene (Cumene)	mg/kg	ND	ND		30	
Methyl-tert-butyl ether	mg/kg	ND	ND		30	
Methylene Chloride	mg/kg	ND	ND		30	
n-Butylbenzene	mg/kg	ND	ND		30	
n-Propylbenzene	mg/kg	ND	ND		30	
Naphthalene	mg/kg	ND	ND		30	
p-Isopropyltoluene	mg/kg	ND	ND		30	
sec-Butylbenzene	mg/kg	ND	ND		30	
Styrene	mg/kg	ND	ND		30	
tert-Butylbenzene	mg/kg	ND	ND		30	
Tetrachloroethene	mg/kg	ND	ND		30	
Tetrahydrofuran	mg/kg	ND	ND		30	
Toluene	mg/kg	ND	.014J		30	
trans-1,2-Dichloroethene	mg/kg	ND	ND		30	
trans-1,3-Dichloropropene	mg/kg	ND	ND		30	
Trichloroethene	mg/kg	ND	ND		30	
Trichlorofluoromethane	mg/kg	ND	ND		30	
Vinyl chloride	mg/kg	ND	ND		30	
Xylene (Total)	mg/kg	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	92	91	2		
4-Bromofluorobenzene (S)	%.	97	97	2		
Toluene-d8 (S)	%.	100	101	0		

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

QC Batch: MSV/30955 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV 465 W
Associated Lab Samples: 10300830018, 10300830019, 10300830020

METHOD BLANK: 1929511 Matrix: Water
Associated Lab Samples: 10300830018, 10300830019, 10300830020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	04/01/15 19:46	
1,1,1-Trichloroethane	ug/L	ND	1.0	04/01/15 19:46	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	04/01/15 19:46	
1,1,2-Trichloroethane	ug/L	ND	1.0	04/01/15 19:46	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	1.0	04/01/15 19:46	
1,1-Dichloroethane	ug/L	ND	1.0	04/01/15 19:46	
1,1-Dichloroethene	ug/L	ND	1.0	04/01/15 19:46	
1,1-Dichloropropene	ug/L	ND	1.0	04/01/15 19:46	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	04/01/15 19:46	
1,2,3-Trichloropropane	ug/L	ND	4.0	04/01/15 19:46	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	04/01/15 19:46	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	04/01/15 19:46	
1,2-Dibromo-3-chloropropane	ug/L	ND	4.0	04/01/15 19:46	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	04/01/15 19:46	
1,2-Dichlorobenzene	ug/L	ND	1.0	04/01/15 19:46	
1,2-Dichloroethane	ug/L	ND	1.0	04/01/15 19:46	
1,2-Dichloropropane	ug/L	ND	4.0	04/01/15 19:46	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	04/01/15 19:46	
1,3-Dichlorobenzene	ug/L	ND	1.0	04/01/15 19:46	
1,3-Dichloropropane	ug/L	ND	1.0	04/01/15 19:46	
1,4-Dichlorobenzene	ug/L	ND	1.0	04/01/15 19:46	
2,2-Dichloropropane	ug/L	ND	4.0	04/01/15 19:46	
2-Butanone (MEK)	ug/L	ND	5.0	04/01/15 19:46	
2-Chlorotoluene	ug/L	ND	1.0	04/01/15 19:46	
4-Chlorotoluene	ug/L	ND	1.0	04/01/15 19:46	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	04/01/15 19:46	
Acetone	ug/L	ND	20.0	04/01/15 19:46	
Allyl chloride	ug/L	ND	4.0	04/01/15 19:46	
Benzene	ug/L	ND	1.0	04/01/15 19:46	
Bromobenzene	ug/L	ND	1.0	04/01/15 19:46	
Bromochloromethane	ug/L	ND	4.0	04/01/15 19:46	
Bromodichloromethane	ug/L	ND	1.0	04/01/15 19:46	
Bromoform	ug/L	ND	4.0	04/01/15 19:46	
Bromomethane	ug/L	ND	4.0	04/01/15 19:46	
Carbon tetrachloride	ug/L	ND	1.0	04/01/15 19:46	
Chlorobenzene	ug/L	ND	1.0	04/01/15 19:46	
Chloroethane	ug/L	ND	1.0	04/01/15 19:46	
Chloroform	ug/L	ND	1.0	04/01/15 19:46	
Chloromethane	ug/L	ND	4.0	04/01/15 19:46	
cis-1,2-Dichloroethene	ug/L	ND	1.0	04/01/15 19:46	
cis-1,3-Dichloropropene	ug/L	ND	4.0	04/01/15 19:46	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

METHOD BLANK: 1929511 Matrix: Water
Associated Lab Samples: 10300830018, 10300830019, 10300830020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromochloromethane	ug/L	ND	1.0	04/01/15 19:46	
Dibromomethane	ug/L	ND	4.0	04/01/15 19:46	
Dichlorodifluoromethane	ug/L	ND	4.0	04/01/15 19:46	
Dichlorofluoromethane	ug/L	ND	1.0	04/01/15 19:46	
Diethyl ether (Ethyl ether)	ug/L	ND	4.0	04/01/15 19:46	
Ethylbenzene	ug/L	ND	1.0	04/01/15 19:46	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	04/01/15 19:46	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	04/01/15 19:46	
Methyl-tert-butyl ether	ug/L	ND	1.0	04/01/15 19:46	
Methylene Chloride	ug/L	ND	4.0	04/01/15 19:46	
n-Butylbenzene	ug/L	ND	1.0	04/01/15 19:46	
n-Propylbenzene	ug/L	ND	1.0	04/01/15 19:46	
Naphthalene	ug/L	ND	4.0	04/01/15 19:46	
p-Isopropyltoluene	ug/L	ND	1.0	04/01/15 19:46	
sec-Butylbenzene	ug/L	ND	1.0	04/01/15 19:46	
Styrene	ug/L	ND	1.0	04/01/15 19:46	
tert-Butylbenzene	ug/L	ND	1.0	04/01/15 19:46	
Tetrachloroethene	ug/L	ND	1.0	04/01/15 19:46	
Tetrahydrofuran	ug/L	ND	10.0	04/01/15 19:46	
Toluene	ug/L	ND	1.0	04/01/15 19:46	
trans-1,2-Dichloroethene	ug/L	ND	1.0	04/01/15 19:46	
trans-1,3-Dichloropropene	ug/L	ND	4.0	04/01/15 19:46	
Trichloroethene	ug/L	ND	0.40	04/01/15 19:46	
Trichlorofluoromethane	ug/L	ND	1.0	04/01/15 19:46	
Vinyl chloride	ug/L	ND	0.40	04/01/15 19:46	
Xylene (Total)	ug/L	ND	3.0	04/01/15 19:46	
1,2-Dichloroethane-d4 (S)	%.	94	75-125	04/01/15 19:46	
4-Bromofluorobenzene (S)	%.	101	75-125	04/01/15 19:46	
Toluene-d8 (S)	%.	101	75-125	04/01/15 19:46	

LABORATORY CONTROL SAMPLE: 1929512

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	10	9.8	98	75-125	
1,1,1-Trichloroethane	ug/L	10	9.0	90	75-125	
1,1,2,2-Tetrachloroethane	ug/L	10	9.2	92	75-125	
1,1,2-Trichloroethane	ug/L	10	8.4	84	75-125	
1,1,2-Trichlorotrifluoroethane	ug/L	10	8.6	86	60-135	
1,1-Dichloroethane	ug/L	10	8.6	86	69-125	
1,1-Dichloroethene	ug/L	10	9.6	96	68-125	
1,1-Dichloropropene	ug/L	10	9.6	96	74-125	
1,2,3-Trichlorobenzene	ug/L	10	9.4	94	69-136	
1,2,3-Trichloropropane	ug/L	10	9.7	97	75-125	
1,2,4-Trichlorobenzene	ug/L	10	8.1	81	73-127	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

LABORATORY CONTROL SAMPLE: 1929512

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2,4-Trimethylbenzene	ug/L	10	10.4	104	75-125	
1,2-Dibromo-3-chloropropane	ug/L	25	22.9	92	65-145	
1,2-Dibromoethane (EDB)	ug/L	10	9.2	92	75-125	
1,2-Dichlorobenzene	ug/L	10	9.1	91	75-125	
1,2-Dichloroethane	ug/L	10	9.2	92	73-125	
1,2-Dichloropropane	ug/L	10	9.7	97	75-125	
1,3,5-Trimethylbenzene	ug/L	10	9.9	99	75-125	
1,3-Dichlorobenzene	ug/L	10	9.5	95	74-125	
1,3-Dichloropropane	ug/L	10	10.2	102	75-125	
1,4-Dichlorobenzene	ug/L	10	9.9	99	75-125	
2,2-Dichloropropane	ug/L	10	9.7	97	59-139	
2-Butanone (MEK)	ug/L	50	52.2	104	63-130	
2-Chlorotoluene	ug/L	10	9.8	98	72-125	
4-Chlorotoluene	ug/L	10	9.7	97	73-125	
4-Methyl-2-pentanone (MIBK)	ug/L	50	51.0	102	71-126	
Acetone	ug/L	50	51.3	103	69-131	
Allyl chloride	ug/L	10	8.9	89	67-125	
Benzene	ug/L	10	9.4	94	71-125	
Bromobenzene	ug/L	10	10.4	104	75-125	
Bromochloromethane	ug/L	10	9.8	98	75-125	
Bromodichloromethane	ug/L	10	9.8	98	75-125	
Bromoform	ug/L	10	9.5	95	70-125	
Bromomethane	ug/L	10	8.2	82	30-150	
Carbon tetrachloride	ug/L	10	9.0	90	75-126	
Chlorobenzene	ug/L	10	11.0	110	75-125	
Chloroethane	ug/L	10	8.4	84	65-134	
Chloroform	ug/L	10	9.6	96	75-125	
Chloromethane	ug/L	10	7.8	78	39-150	
cis-1,2-Dichloroethene	ug/L	10	9.7	97	72-125	
cis-1,3-Dichloropropene	ug/L	10	9.1	91	75-125	
Dibromochloromethane	ug/L	10	9.3	93	75-125	
Dibromomethane	ug/L	10	9.6	96	75-125	
Dichlorodifluoromethane	ug/L	10	8.0	80	50-134	
Dichlorofluoromethane	ug/L	10	10.3	103	69-125	
Diethyl ether (Ethyl ether)	ug/L	10	8.9	89	72-125	
Ethylbenzene	ug/L	10	9.9	99	75-125	
Hexachloro-1,3-butadiene	ug/L	10	10.7	107	70-138	
Isopropylbenzene (Cumene)	ug/L	10	10.0	100	75-125	
Methyl-tert-butyl ether	ug/L	10	10.2	102	73-125	
Methylene Chloride	ug/L	10	9.5	95	73-125	
n-Butylbenzene	ug/L	10	8.0	80	72-133	
n-Propylbenzene	ug/L	10	9.4	94	72-126	
Naphthalene	ug/L	10	8.2	82	70-127	
p-Isopropyltoluene	ug/L	10	9.1	91	72-132	
sec-Butylbenzene	ug/L	10	8.4	84	73-132	
Styrene	ug/L	10	10.3	103	75-125	
tert-Butylbenzene	ug/L	10	9.8	98	73-128	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

LABORATORY CONTROL SAMPLE: 1929512

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Tetrachloroethene	ug/L	10	9.4	94	74-125	
Tetrahydrofuran	ug/L	100	98.5	98	62-133	
Toluene	ug/L	10	10.2	102	74-125	
trans-1,2-Dichloroethene	ug/L	10	10.0	100	69-125	
trans-1,3-Dichloropropene	ug/L	10	9.7	97	75-125	
Trichloroethene	ug/L	10	9.7	97	75-125	
Trichlorofluoromethane	ug/L	10	8.1	81	74-127	
Vinyl chloride	ug/L	10	9.2	92	66-132	
Xylene (Total)	ug/L	30	31.0	103	75-125	
1,2-Dichloroethane-d4 (S)	%.			92	75-125	
4-Bromofluorobenzene (S)	%.			103	75-125	
Toluene-d8 (S)	%.			102	75-125	

MATRIX SPIKE SAMPLE: 1930696

Parameter	Units	10300823003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	10	7.5	75	70-138	
1,1,1-Trichloroethane	ug/L	ND	10	7.6	76	55-150	
1,1,2,2-Tetrachloroethane	ug/L	ND	10	9.8	98	64-140	
1,1,2-Trichloroethane	ug/L	ND	10	7.5	75	67-137	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	10	7.4	74	51-150	
1,1-Dichloroethane	ug/L	ND	10	7.7	77	49-150	
1,1-Dichloroethene	ug/L	ND	10	8.3	83	40-150	
1,1-Dichloropropene	ug/L	ND	10	7.3	73	50-150	
1,2,3-Trichlorobenzene	ug/L	ND	10	10.3	103	59-148	
1,2,3-Trichloropropane	ug/L	ND	10	10	100	65-141	
1,2,4-Trichlorobenzene	ug/L	ND	10	6.0	60	61-140	M1
1,2,4-Trimethylbenzene	ug/L	ND	10	6.8	68	58-141	
1,2-Dibromo-3-chloropropane	ug/L	ND	25	17.1	68	53-150	
1,2-Dibromoethane (EDB)	ug/L	ND	10	6.4	64	65-137	M1
1,2-Dichlorobenzene	ug/L	ND	10	6.1	61	66-133	M1
1,2-Dichloroethane	ug/L	ND	10	7.8	78	54-138	
1,2-Dichloropropane	ug/L	ND	10	7.2	72	62-138	
1,3,5-Trimethylbenzene	ug/L	ND	10	6.8	68	58-140	
1,3-Dichlorobenzene	ug/L	ND	10	6.3	63	66-132	M1
1,3-Dichloropropane	ug/L	ND	10	7.5	75	66-134	
1,4-Dichlorobenzene	ug/L	ND	10	6.2	62	65-129	M1
2,2-Dichloropropane	ug/L	ND	10	7.4	74	40-150	
2-Butanone (MEK)	ug/L	ND	50	37.3	75	51-147	
2-Chlorotoluene	ug/L	ND	10	6.8	68	58-147	
4-Chlorotoluene	ug/L	ND	10	6.4	64	64-138	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	50	38.1	76	59-143	
Acetone	ug/L	ND	50	43.6	87	63-147	
Allyl chloride	ug/L	ND	10	7.4	74	45-150	
Benzene	ug/L	ND	10	8.0	78	53-139	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

MATRIX SPIKE SAMPLE: 1930696

Parameter	Units	10300823003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromobenzene	ug/L	ND	10	7.3	73	66-136	
Bromochloromethane	ug/L	ND	10	7.1	71	64-136	
Bromodichloromethane	ug/L	ND	10	8.1	81	66-138	
Bromoform	ug/L	ND	10	7.6	76	59-136	
Bromomethane	ug/L	ND	10	8.3	83	30-150	
Carbon tetrachloride	ug/L	ND	10	7.4	74	56-150	
Chlorobenzene	ug/L	ND	10	7.8	78	65-133	
Chloroethane	ug/L	ND	10	8.7	87	48-150	
Chloroform	ug/L	ND	10	8.0	80	57-145	
Chloromethane	ug/L	ND	10	8.7	87	30-150	
cis-1,2-Dichloroethene	ug/L	ND	10	7.2	72	49-150	
cis-1,3-Dichloropropene	ug/L	ND	10	7.2	72	64-130	
Dibromochloromethane	ug/L	ND	10	6.8	68	68-138	
Dibromomethane	ug/L	ND	10	7.8	78	67-134	
Dichlorodifluoromethane	ug/L	ND	10	8.6	86	45-150	
Dichlorofluoromethane	ug/L	ND	10	10.1	101	54-150	
Diethyl ether (Ethyl ether)	ug/L	ND	10	7.5	75	50-145	
Ethylbenzene	ug/L	ND	10	8.1	76	55-139	
Hexachloro-1,3-butadiene	ug/L	ND	10	4.8	48	49-150	M1
Isopropylbenzene (Cumene)	ug/L	ND	10	6.7	67	64-142	
Methyl-tert-butyl ether	ug/L	ND	10	7.8	78	62-129	
Methylene Chloride	ug/L	ND	10	8.2	82	57-132	
n-Butylbenzene	ug/L	ND	10	5.7	57	55-150	
n-Propylbenzene	ug/L	ND	10	6.3	63	59-142	
Naphthalene	ug/L	ND	10	8.0	80	51-150	
p-Isopropyltoluene	ug/L	ND	10	6.0	60	60-149	
sec-Butylbenzene	ug/L	ND	10	5.8	58	60-150	M1
Styrene	ug/L	ND	10	7.4	74	68-134	
tert-Butylbenzene	ug/L	ND	10	6.2	62	62-146	
Tetrachloroethene	ug/L	ND	10	6.8	68	50-150	
Tetrahydrofuran	ug/L	ND	100	71.2	71	59-145	
Toluene	ug/L	ND	10	10.3	97	52-148	
trans-1,2-Dichloroethene	ug/L	ND	10	7.9	79	45-150	
trans-1,3-Dichloropropene	ug/L	ND	10	7.6	76	68-132	
Trichloroethene	ug/L	ND	10	7.4	74	52-150	
Trichlorofluoromethane	ug/L	ND	10	10	100	55-150	
Vinyl chloride	ug/L	ND	10	9.0	90	43-150	
Xylene (Total)	ug/L	ND	30	22.5	75	54-144	
1,2-Dichloroethane-d4 (S)	%.				95	75-125	HS
4-Bromofluorobenzene (S)	%.				113	75-125	
Toluene-d8 (S)	%.				104	75-125	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

SAMPLE DUPLICATE: 1930697

Parameter	Units	10300823005 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1,2-Trichlorotrifluoroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,1-Dichloropropene	ug/L	ND	ND		30	
1,2,3-Trichlorobenzene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2,4-Trichlorobenzene	ug/L	ND	ND		30	
1,2,4-Trimethylbenzene	ug/L	ND	ND		30	
1,2-Dibromo-3-chloropropane	ug/L	ND	ND		30	
1,2-Dibromoethane (EDB)	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,3,5-Trimethylbenzene	ug/L	ND	ND		30	
1,3-Dichlorobenzene	ug/L	ND	ND		30	
1,3-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2,2-Dichloropropane	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Chlorotoluene	ug/L	ND	ND		30	
4-Chlorotoluene	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Allyl chloride	ug/L	ND	ND		30	
Benzene	ug/L	ND	.38J		30	
Bromobenzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Dichlorodifluoromethane	ug/L	ND	ND		30	
Dichlorofluoromethane	ug/L	ND	ND		30	
Diethyl ether (Ethyl ether)	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	.89J		30	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

SAMPLE DUPLICATE: 1930697

Parameter	Units	10300823005 Result	Dup Result	RPD	Max RPD	Qualifiers
Hexachloro-1,3-butadiene	ug/L	ND	ND		30	
Isopropylbenzene (Cumene)	ug/L	ND	ND		30	
Methyl-tert-butyl ether	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
n-Butylbenzene	ug/L	ND	ND		30	
n-Propylbenzene	ug/L	ND	ND		30	
Naphthalene	ug/L	ND	ND		30	
p-Isopropyltoluene	ug/L	ND	ND		30	
sec-Butylbenzene	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
tert-Butylbenzene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Tetrahydrofuran	ug/L	ND	ND		30	
Toluene	ug/L	ND	.88J		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%.	100	98	2		HS
4-Bromofluorobenzene (S)	%.	102	96	5		
Toluene-d8 (S)	%.	101	100	1		

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

QC Batch: OEXT/28695 | Analysis Method: EPA 8270D by SIM
QC Batch Method: EPA 3550 | Analysis Description: 8270D Solid PAH by SIM MSSV
Associated Lab Samples: 10300830002, 10300830003, 10300830005, 10300830006, 10300830007, 10300830008, 10300830010, 10300830011, 10300830012, 10300830013, 10300830014, 10300830016

METHOD BLANK: 1928102 | Matrix: Solid
Associated Lab Samples: 10300830002, 10300830003, 10300830005, 10300830006, 10300830007, 10300830008, 10300830010, 10300830011, 10300830012, 10300830013, 10300830014, 10300830016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	mg/kg	ND	0.010	03/31/15 08:15	
Acenaphthylene	mg/kg	ND	0.010	03/31/15 08:15	
Anthracene	mg/kg	ND	0.010	03/31/15 08:15	
Benzo(a)anthracene	mg/kg	ND	0.010	03/31/15 08:15	
Benzo(a)pyrene	mg/kg	ND	0.010	03/31/15 08:15	
Benzo(b)fluoranthene	mg/kg	ND	0.010	03/31/15 08:15	
Benzo(g,h,i)perylene	mg/kg	ND	0.010	03/31/15 08:15	
Benzo(k)fluoranthene	mg/kg	ND	0.010	03/31/15 08:15	
Chrysene	mg/kg	ND	0.010	03/31/15 08:15	
Dibenz(a,h)anthracene	mg/kg	ND	0.010	03/31/15 08:15	
Fluoranthene	mg/kg	ND	0.010	03/31/15 08:15	
Fluorene	mg/kg	ND	0.010	03/31/15 08:15	
Indeno(1,2,3-cd)pyrene	mg/kg	ND	0.010	03/31/15 08:15	
Naphthalene	mg/kg	ND	0.010	03/31/15 08:15	
Phenanthrene	mg/kg	ND	0.010	03/31/15 08:15	
Pyrene	mg/kg	ND	0.010	03/31/15 08:15	
2-Fluorobiphenyl (S)	%.	81	55-125	03/31/15 08:15	
p-Terphenyl-d14 (S)	%.	92	30-150	03/31/15 08:15	

LABORATORY CONTROL SAMPLE: 1928103

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	mg/kg	.033	0.026	79	53-125	
Acenaphthylene	mg/kg	.033	0.027	81	53-125	
Anthracene	mg/kg	.033	0.031	94	61-125	
Benzo(a)anthracene	mg/kg	.033	0.027	80	62-125	
Benzo(a)pyrene	mg/kg	.033	0.029	87	64-125	
Benzo(b)fluoranthene	mg/kg	.033	0.028	85	66-125	
Benzo(g,h,i)perylene	mg/kg	.033	0.027	82	59-125	
Benzo(k)fluoranthene	mg/kg	.033	0.027	80	61-125	
Chrysene	mg/kg	.033	0.026	77	63-125	
Dibenz(a,h)anthracene	mg/kg	.033	0.029	86	59-125	
Fluoranthene	mg/kg	.033	0.026	77	64-125	
Fluorene	mg/kg	.033	0.028	84	57-125	
Indeno(1,2,3-cd)pyrene	mg/kg	.033	0.027	82	58-125	
Naphthalene	mg/kg	.033	0.025	74	52-125	
Phenanthrene	mg/kg	.033	0.026	79	60-125	
Pyrene	mg/kg	.033	0.032	97	63-125	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

LABORATORY CONTROL SAMPLE: 1928103

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2-Fluorobiphenyl (S)	%.			73	55-125	
p-Terphenyl-d14 (S)	%.			80	30-150	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1928104 1928105

Parameter	Units	10300367001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Acenaphthene	mg/kg	ND	.033	.033	0.030	0.031	82	86	39-125	5	30	
Acenaphthylene	mg/kg	ND	.033	.033	0.036	0.043	79	99	30-150	18	30	
Anthracene	mg/kg	ND	.033	.033	0.042	0.047	97	111	30-150	11	30	
Benzo(a)anthracene	mg/kg	28.2 ug/kg	.033	.033	0.052	0.070	71	125	30-150	30	30	
Benzo(a)pyrene	mg/kg	37.7 ug/kg	.033	.033	0.063	0.080	75	127	30-150	25	30	
Benzo(b)fluoranthene	mg/kg	54.8 ug/kg	.033	.033	0.076	0.10	63	133	30-150	27	30	
Benzo(g,h,i)perylene	mg/kg	34.4 ug/kg	.033	.033	0.058	0.070	71	107	30-150	19	30	
Benzo(k)fluoranthene	mg/kg	22.1 ug/kg	.033	.033	0.045	0.057	70	104	30-150	23	30	
Chrysene	mg/kg	38.9 ug/kg	.033	.033	0.062	0.082	69	128	30-150	28	30	
Dibenz(a,h)anthracene	mg/kg	ND	.033	.033	0.034	0.038	101	114	30-150	12	30	
Fluoranthene	mg/kg	67.0 ug/kg	.033	.033	0.086	0.11	57	125	30-150	23	30	
Fluorene	mg/kg	ND	.033	.033	0.030	0.032	82	89	30-146	7	30	
Indeno(1,2,3-cd)pyrene	mg/kg	25.5 ug/kg	.033	.033	0.049	0.059	71	100	30-150	18	30	
Naphthalene	mg/kg	ND	.033	.033	0.023	0.027	69	79	30-131	14	30	
Phenanthrene	mg/kg	26.1 ug/kg	.033	.033	0.052	0.056	78	88	30-150	7	30	
Pyrene	mg/kg	70.1 ug/kg	.033	.033	0.091	0.12	63	137	30-150	24	30	
2-Fluorobiphenyl (S)	%.						80	80	55-125			
p-Terphenyl-d14 (S)	%.						82	81	30-150			

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

QC Batch: OEXT/28694 Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS
Associated Lab Samples: 10300830002, 10300830003, 10300830005, 10300830006, 10300830007, 10300830008, 10300830010, 10300830011, 10300830012, 10300830013, 10300830014, 10300830016

METHOD BLANK: 1928091 Matrix: Solid
Associated Lab Samples: 10300830002, 10300830003, 10300830005, 10300830006, 10300830007, 10300830008, 10300830010, 10300830011, 10300830012, 10300830013, 10300830014, 10300830016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	mg/kg	ND	10.0	03/31/15 13:49	
n-Triacontane (S)	%.	52	50-150	03/31/15 13:49	

LABORATORY CONTROL SAMPLE & LCSD: 1928092 1928093

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	mg/kg	80	69.1	74.3	86	93	70-120	7	20	
n-Triacontane (S)	%.				74	77	50-150			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300830

QC Batch: OEXT/28707 Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS
Associated Lab Samples: 10300830018, 10300830019, 10300830020

METHOD BLANK: 1928671 Matrix: Water
Associated Lab Samples: 10300830018, 10300830019, 10300830020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
WDRO C10-C28	ug/L	ND	100	04/01/15 10:55	
n-Triacontane (S)	%.	90	50-150	04/01/15 10:55	

LABORATORY CONTROL SAMPLE & LCSD: 1928672 1928673

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
WDRO C10-C28	ug/L	2000	1820	1750	91	88	75-115	4	20	
n-Triacontane (S)	%.				93	88	50-150			

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QUALIFIERS

Project: B1500394 Roof Depot
Pace Project No.: 10300830

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
HS	Results are from sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
P3	Sample extract could not be concentrated to the routine final volume, resulting in elevated reporting limits.
P4	Sample field preservation does not meet EPA or method recommendations for this analysis.
R1	RPD value was outside control limits.
SS	This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.
T6	High boiling point hydrocarbons are present in the sample.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10300830002	**PP-2 (2-4)**	WI MOD DRO	OEXT/28694	WI MOD DRO	GCSV/15376
10300830003	**PP-3 (1-2)**	WI MOD DRO	OEXT/28694	WI MOD DRO	GCSV/15376
10300830005	**PP-5 (2-4)**	WI MOD DRO	OEXT/28694	WI MOD DRO	GCSV/15376
10300830006	**PP-6 (3-5)**	WI MOD DRO	OEXT/28694	WI MOD DRO	GCSV/15376
10300830007	**PP-7 (3-5)**	WI MOD DRO	OEXT/28694	WI MOD DRO	GCSV/15376
10300830008	**PP-8 (2)**	WI MOD DRO	OEXT/28694	WI MOD DRO	GCSV/15376
10300830010	**PP-10 (2)**	WI MOD DRO	OEXT/28694	WI MOD DRO	GCSV/15376
10300830011	**PP-11 (1-2)**	WI MOD DRO	OEXT/28694	WI MOD DRO	GCSV/15376
10300830012	**PP-12 (1-2)**	WI MOD DRO	OEXT/28694	WI MOD DRO	GCSV/15376
10300830013	**PP-13 (2-4)**	WI MOD DRO	OEXT/28694	WI MOD DRO	GCSV/15376
10300830014	**PP-14 (2-3)**	WI MOD DRO	OEXT/28694	WI MOD DRO	GCSV/15376
10300830016	**HA-2 (1-3)**	WI MOD DRO	OEXT/28694	WI MOD DRO	GCSV/15376
10300830018	**PP-8W**	WI MOD DRO	OEXT/28707	WI MOD DRO	GCSV/15381
10300830019	**PP-10W**	WI MOD DRO	OEXT/28707	WI MOD DRO	GCSV/15381
10300830020	**HA-W**	WI MOD DRO	OEXT/28707	WI MOD DRO	GCSV/15381
10300830002	**PP-2 (2-4)**	EPA 5030 Medium Soil	GCV/13574	WI MOD GRO	GCV/13577
10300830003	**PP-3 (1-2)**	EPA 5030 Medium Soil	GCV/13574	WI MOD GRO	GCV/13577
10300830005	**PP-5 (2-4)**	EPA 5030 Medium Soil	GCV/13574	WI MOD GRO	GCV/13577
10300830006	**PP-6 (3-5)**	EPA 5030 Medium Soil	GCV/13574	WI MOD GRO	GCV/13577
10300830007	**PP-7 (3-5)**	EPA 5030 Medium Soil	GCV/13574	WI MOD GRO	GCV/13577
10300830008	**PP-8 (2)**	EPA 5030 Medium Soil	GCV/13582	WI MOD GRO	GCV/13588
10300830010	**PP-10 (2)**	EPA 5030 Medium Soil	GCV/13582	WI MOD GRO	GCV/13588
10300830011	**PP-11 (1-2)**	EPA 5030 Medium Soil	GCV/13582	WI MOD GRO	GCV/13588
10300830012	**PP-12 (1-2)**	EPA 5030 Medium Soil	GCV/13582	WI MOD GRO	GCV/13588
10300830013	**PP-13 (2-4)**	EPA 5030 Medium Soil	GCV/13582	WI MOD GRO	GCV/13588
10300830014	**PP-14 (2-3)**	EPA 5030 Medium Soil	GCV/13582	WI MOD GRO	GCV/13588
10300830016	**HA-2 (1-3)**	EPA 5030 Medium Soil	GCV/13582	WI MOD GRO	GCV/13588
10300830002	**PP-2 (2-4)**	EPA 3050	MPRP/53233	EPA 6020A	ICPM/23615
10300830003	**PP-3 (1-2)**	EPA 3050	MPRP/53233	EPA 6020A	ICPM/23615
10300830005	**PP-5 (2-4)**	EPA 3050	MPRP/53233	EPA 6020A	ICPM/23615
10300830006	**PP-6 (3-5)**	EPA 3050	MPRP/53233	EPA 6020A	ICPM/23615
10300830007	**PP-7 (3-5)**	EPA 3050	MPRP/53233	EPA 6020A	ICPM/23615
10300830008	**PP-8 (2)**	EPA 3050	MPRP/53233	EPA 6020A	ICPM/23615
10300830010	**PP-10 (2)**	EPA 3050	MPRP/53233	EPA 6020A	ICPM/23615
10300830011	**PP-11 (1-2)**	EPA 3050	MPRP/53233	EPA 6020A	ICPM/23615
10300830012	**PP-12 (1-2)**	EPA 3050	MPRP/53233	EPA 6020A	ICPM/23615
10300830013	**PP-13 (2-4)**	EPA 3050	MPRP/53233	EPA 6020A	ICPM/23615
10300830014	**PP-14 (2-3)**	EPA 3050	MPRP/53233	EPA 6020A	ICPM/23615
10300830016	**HA-2 (1-3)**	EPA 3050	MPRP/53233	EPA 6020A	ICPM/23615
10300830018	**PP-8W**	EPA 3020	MPRP/53235	EPA 6020A	ICPM/23590
10300830019	**PP-10W**	EPA 3020	MPRP/53235	EPA 6020A	ICPM/23590
10300830020	**HA-W**	EPA 3020	MPRP/53235	EPA 6020A	ICPM/23590
10300830018	**PP-8W**	EPA 7470A	MERP/13082	EPA 7470	MERC/15205
10300830019	**PP-10W**	EPA 7470A	MERP/13082	EPA 7470	MERC/15205
10300830020	**HA-W**	EPA 7470A	MERP/13082	EPA 7470	MERC/15205

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10300830002	**PP-2 (2-4)**	EPA 7471B	MERP/13087	EPA 7471B	MERC/15216
10300830003	**PP-3 (1-2)**	EPA 7471B	MERP/13087	EPA 7471B	MERC/15216
10300830005	**PP-5 (2-4)**	EPA 7471B	MERP/13087	EPA 7471B	MERC/15216
10300830006	**PP-6 (3-5)**	EPA 7471B	MERP/13087	EPA 7471B	MERC/15216
10300830007	**PP-7 (3-5)**	EPA 7471B	MERP/13087	EPA 7471B	MERC/15216
10300830008	**PP-8 (2)**	EPA 7471B	MERP/13087	EPA 7471B	MERC/15216
10300830010	**PP-10 (2)**	EPA 7471B	MERP/13087	EPA 7471B	MERC/15216
10300830011	**PP-11 (1-2)**	EPA 7471B	MERP/13087	EPA 7471B	MERC/15216
10300830012	**PP-12 (1-2)**	EPA 7471B	MERP/13087	EPA 7471B	MERC/15216
10300830013	**PP-13 (2-4)**	EPA 7471B	MERP/13087	EPA 7471B	MERC/15216
10300830014	**PP-14 (2-3)**	EPA 7471B	MERP/13087	EPA 7471B	MERC/15216
10300830016	**HA-2 (1-3)**	EPA 7471B	MERP/13087	EPA 7471B	MERC/15216
10300830002	**PP-2 (2-4)**	ASTM D2974	MPRP/53266		
10300830003	**PP-3 (1-2)**	ASTM D2974	MPRP/53266		
10300830005	**PP-5 (2-4)**	ASTM D2974	MPRP/53266		
10300830006	**PP-6 (3-5)**	ASTM D2974	MPRP/53266		
10300830007	**PP-7 (3-5)**	ASTM D2974	MPRP/53266		
10300830008	**PP-8 (2)**	ASTM D2974	MPRP/53266		
10300830010	**PP-10 (2)**	ASTM D2974	MPRP/53266		
10300830011	**PP-11 (1-2)**	ASTM D2974	MPRP/53266		
10300830012	**PP-12 (1-2)**	ASTM D2974	MPRP/53266		
10300830013	**PP-13 (2-4)**	ASTM D2974	MPRP/53266		
10300830014	**PP-14 (2-3)**	ASTM D2974	MPRP/53266		
10300830016	**HA-2 (1-3)**	ASTM D2974	MPRP/53266		
10300830002	**PP-2 (2-4)**	EPA 3550	OEXT/28695	EPA 8270D by SIM	MSSV/12104
10300830003	**PP-3 (1-2)**	EPA 3550	OEXT/28695	EPA 8270D by SIM	MSSV/12104
10300830005	**PP-5 (2-4)**	EPA 3550	OEXT/28695	EPA 8270D by SIM	MSSV/12104
10300830006	**PP-6 (3-5)**	EPA 3550	OEXT/28695	EPA 8270D by SIM	MSSV/12104
10300830007	**PP-7 (3-5)**	EPA 3550	OEXT/28695	EPA 8270D by SIM	MSSV/12104
10300830008	**PP-8 (2)**	EPA 3550	OEXT/28695	EPA 8270D by SIM	MSSV/12104
10300830010	**PP-10 (2)**	EPA 3550	OEXT/28695	EPA 8270D by SIM	MSSV/12104
10300830011	**PP-11 (1-2)**	EPA 3550	OEXT/28695	EPA 8270D by SIM	MSSV/12104
10300830012	**PP-12 (1-2)**	EPA 3550	OEXT/28695	EPA 8270D by SIM	MSSV/12104
10300830013	**PP-13 (2-4)**	EPA 3550	OEXT/28695	EPA 8270D by SIM	MSSV/12104
10300830014	**PP-14 (2-3)**	EPA 3550	OEXT/28695	EPA 8270D by SIM	MSSV/12104
10300830016	**HA-2 (1-3)**	EPA 3550	OEXT/28695	EPA 8270D by SIM	MSSV/12104
10300830002	**PP-2 (2-4)**	EPA 5035/5030B	MSV/30929	EPA 8260	MSV/30945
10300830003	**PP-3 (1-2)**	EPA 5035/5030B	MSV/30929	EPA 8260	MSV/30945
10300830005	**PP-5 (2-4)**	EPA 5035/5030B	MSV/30929	EPA 8260	MSV/30945
10300830006	**PP-6 (3-5)**	EPA 5035/5030B	MSV/30929	EPA 8260	MSV/30945
10300830007	**PP-7 (3-5)**	EPA 5035/5030B	MSV/30935	EPA 8260	MSV/30956
10300830008	**PP-8 (2)**	EPA 5035/5030B	MSV/30935	EPA 8260	MSV/30956
10300830010	**PP-10 (2)**	EPA 5035/5030B	MSV/30935	EPA 8260	MSV/30956
10300830011	**PP-11 (1-2)**	EPA 5035/5030B	MSV/30935	EPA 8260	MSV/30956
10300830012	**PP-12 (1-2)**	EPA 5035/5030B	MSV/30935	EPA 8260	MSV/30956
10300830013	**PP-13 (2-4)**	EPA 5035/5030B	MSV/30935	EPA 8260	MSV/30956
10300830014	**PP-14 (2-3)**	EPA 5035/5030B	MSV/30935	EPA 8260	MSV/30956

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: B1500394 Roof Depot
Pace Project No.: 10300830

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10300830016	**HA-2 (1-3)**	EPA 5035/5030B	MSV/30935	EPA 8260	MSV/30956
10300830017	**Trip Blank - SL**	EPA 5035/5030B	MSV/30935	EPA 8260	MSV/30956
10300830018	**PP-8W**	EPA 8260	MSV/30955		
10300830019	**PP-10W**	EPA 8260	MSV/30955		
10300830020	**HA-W**	EPA 8260	MSV/30955		

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CHAIN-OF-CUSTODY / Analytical Request Document

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10 300830

Page: 1 of 3

1797139

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Braun Intertec	Report To: Jeremy Hansen	Attention:
Address: 11001 Hampshire Ave. Bloomington, MN 55438	Copy To:	Company Name:
		Address: Same.
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Roof Depot	Pace Project Manager:
Requested Due Date/TAT: STD	Project Number: B1500394	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☒ RCRA ☐ OTHER

Site Location STATE: MN

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	VOCs	GRO	DRO	PAHs	Priority Pollutant Metals 6020	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	PP-1 (2-4)	SL	G			3/25/15	1545		5							2			X	X	X	X	X		001
2	PP-2 (2-4)					3/25/15	1630		5							2			X	X	X	X	X		002
3	PP-3 (1-2)					3/25/15	1700		5							2									003
4	PP-4 (2-4)					3/25/15	1500		5							2									004
5	PP-5 (2-4)					3/26/15	840		5							2									005
6	PP-6 (3-5)					3/26/15	915		5							2									006
7	PP-7 (3-5)					3/26/15	950		5							2									007
8	PP-8 (2)					3/25/15	945		5							2									008
9	PP-9 (1-3)					3/26/15	1030		5							2									009
10	PP-10 (2)					3/25/15	1200		5							2									010
11	PP-11 (1-2)					3/26/15	1230		5							2									011
12	PP-12 (1-2)					3/26/15	1200		5							2									012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	TJM / Braun	3/27/15	@ 820	[signature] / Pace BL	3/27/15	0820	1.8/1.6	Y	N	Y
	[signature] / Pace BL	3/27/15	1040	[signature]	3/27/15	1040				

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jim H. Malitor

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): (03/25/15)

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

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

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10300830

Page: 2 of 3

1797141

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Braun Intertec	Report To: Jeremy Hansen	Attention:
Address: 11001 Hampshire Ave. Bloomington, MN 55438	Copy To:	Company Name:
		Address: Same
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Roof Depot	Pace Project Manager:
Requested Due Date/TAT: STD	Project Number: B1500394	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☒ RCRA ☐ OTHER

Site Location STATE: MN

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	VOCs	GRO	DRO	PAHs	Priority Pollutant Metals 6020	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	PP-13 (2-4)	SL	G			3/26/15	1300		5							2			X	X	X	X	X		013
2	PP-14 (2-3)	|	|			1	1330		5							2			X	X	X	X	X		014
3	HA-1 (1-3)	|	|			3/25/15	1130		5							2			X	X	X	X	X		015 T.M.
4	HA-2 (1-3)	|	|			1	1030		5							2			X	X	X	X	X		016
5	Trip Blank								2							2			X						017
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Soil trip blanks in each cooler	TAM / Braun	3/27/15	820	[signature] / Pace BL	3/27/15	0820	5/16	Y	N	Y
	[signature] / Pace BL	3/27/15	1040	[signature]	3/27/15	1040				

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Tim H. Mulitor

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 03/25/15

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

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

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

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1030083c

Page: 3 of 3

1797140

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Braun Intertec	Report To: Jeremy Hansen	Attention:
Address: 11001 Hampshire Ave. Bloomington, MN 55438	Copy To:	Company Name: Same
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Roof Depot	Pace Project Manager:
Requested Due Date/TAT: STD	Project Number: B1500394	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MN

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	VOCs	DRO	Priority Pollutant Metals (6020)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	PP-8W	WT	G			3/25/15	1020		6			1	5						X	X	X		018
2	PP-10W	|	|			1	1230		6			1	5						X	X	X		019
3	HA-W	|	|			3/26/15	1100		6			1	5						X	X	X		020
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	THM / Braun	3/27/15	@820	[signature] / Pace BC	3/27/15	0820	1.5/1.6	Y	N	X
	[signature] / Pace BC	3/27/15	1040	[signature]	3/27/15	1040				

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Tim H. Molitor

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 03/25/15

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

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

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

Pace Analytical®	Document Name: **BLM Sample Condition Upon Receipt Form**	Document Revised: 19Mar2015 Page 1 of 1
	Document No.: **F-MN-C-161-rev.01**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Brann

Project #: WO#: 10300830

10300830

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

Tracking Number:

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No **Seals Intact?** ☐ Yes ☒ No **Optional:** Proj. Due Date: Proj. Name:

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

Thermom. Used: ☐ B88A0143310092 **Type of Ice:** ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Read (°C): 1.3, 1.4 **Cooler Temp Corrected (°C):** 1.5, 1.6 **Biological Tissue Frozen?** ☐ Yes ☐ No ☒ N/A

Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** PW 5/27/15

Comments:

Chain of Custody Present?	☒ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☒ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☒ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☒ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☒ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☒ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☒ No	☐ N/A	7.
Sufficient Volume?	☒ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☒ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☒ Yes	☐ No	☐ N/A	
Containers Intact?	☒ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☒ Yes	☐ No	☒ N/A PW 5/27/15	
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: SL, WT	☒ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation have been checked?	☒ Yes	☐ No	☐ N/A	13. ☒ HNO_3 ☐ H_2SO_4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☒ Yes	☐ No	☐ N/A	Sample # 3/3
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	☒ Yes	☐ No		Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☒ No	☐ N/A	14.
Trip Blank Present?	☒ Yes	☐ No	☐ N/A	15. SL Trip Blanks only
Trip Blank Custody Seals Present?	☐ Yes	☒ No	☐ N/A	
Pace Trip Blank Lot # (if purchased):				

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

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: for Steve Albrecht **Date:** 3.30.15

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	Document Name: BLM to MN Sample Transfer Form	Revised Date: 14Nov2014 Page: 1 of 1
	Document Number: F-MN-C-162-rev.00	Issuing Authority: Pace Minnesota Quality Office

Shipping (circle):	UPS Fed Ex Courier
Tracking #:	
Client:	BS Farm
Due Date:	4/8/15
Pace WO:	10300830
Project Manager:	SJA

BLM to MN Sample Transfer Condition Upon Receipt Form

ANALYSIS REQUESTED

Method Number & Description	Container Type	# of Bottles	Lab ID's	Preservative Yes or No	Verify Arrival Date & Initials
Tests					
VOC, GRO	VG9M	2	10300830[001-016]	Yes	EM 3/27/15
DRO	BJFG	2	"	NO	EM 3/27/15
PAH, 8RCRA, Dry Weight	JGNU	1	"	NO	EM 3/27/15
Trip Blank	VG9M	2	10300830 [017]	Yes	EM 3/27/15
VOC	VG9H	3	10300830[018-020]	Yes	EM 3/27/15
DRO	AG1H	2	"	Yes	EM 3/27/15
8RCRA	BP3N	1	"	Yes	EM 3/27/15

REPORTING REQUIREMENTS/ADDITIONAL COMMENTS

MINNESOTA SAMPLE RECEIPT INFORMATION

IR Gun (circle): B88A9132521491, B88A912167504, B88A9130516413 Correction Factor: +0.2 Sample Matrix: WT, SL

Cooler Temp Read (°C): 0.4, 1.8 Cooler Temp Corrected (°C): 0.6, 2.0

Arrived on Ice:	Yes X No__	Sample Composites Required:	Yes __ No__ NA X
Short Hold Time Requested < 72 Hours:	Yes __ No X	Custody Seal Present:	Yes __ No X
Rush TAT Requested:	Yes __ No X	Trip Blank Present:	Yes X No__ NA __
Samples Arrived within Hold Time:	Yes X No__	Trip Blank Custody Seals Present:	Yes __ No__ NA X
		Containers Intact:	Yes X No__

CUSTODY TRANSFER

Relinquished by/Affiliation	Date	Time	Accepted By Affiliation	Date	Time
[signature]	3/27/15	1430	[signature] Pace	3/27/15	1430

FICATION/RESOLUTION

Person Contacted: _____ Date: _____

Comments/Resolution: _____

Project Manager Review: [signature] Date: 3.30.15

Data File: \\192.168.10.12\chem\10gcs9.i\040115dro.b/040115000008.D

Report Date: 04/01/2015

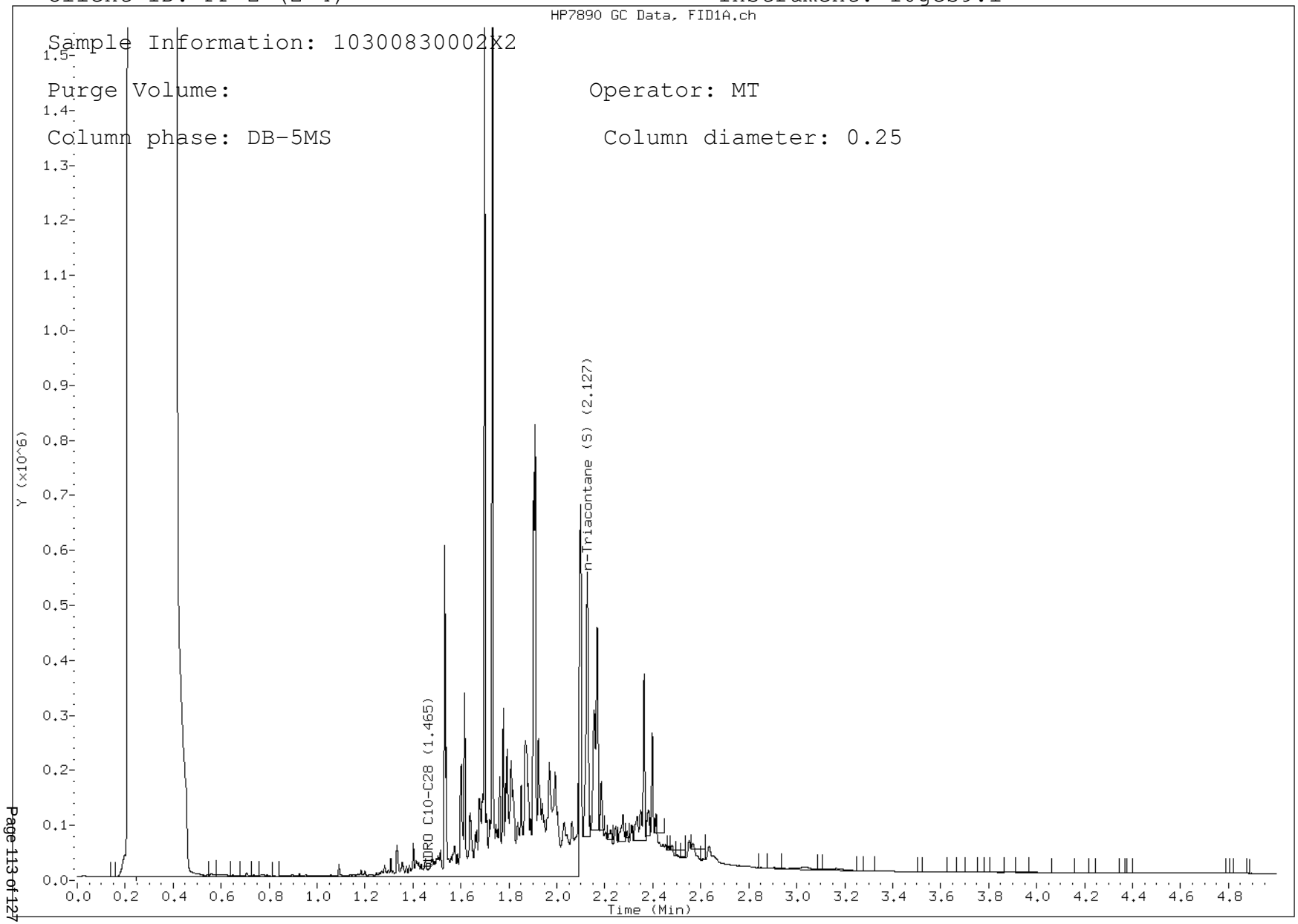
Sample ID: 10300830002

Client ID: PP-2 (2-4) Instrument: 10gcs9.i

Sample Information: 10300830002X2

Purge Volume: Operator: MT

Column phase: DB-5MS Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs9.i\040115dro.b/040115000009.D

Report Date: 04/01/2015

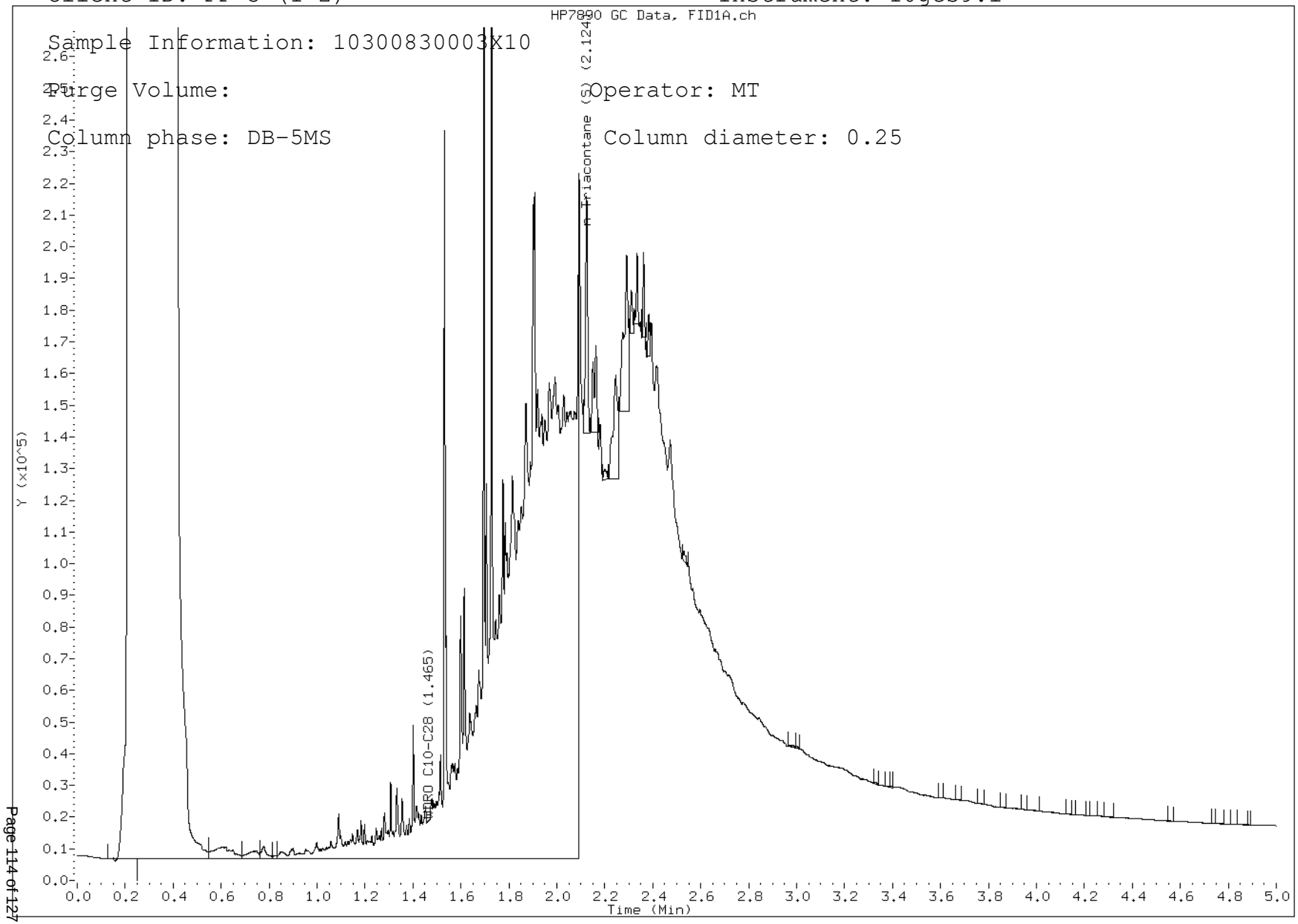
Sample ID: 10300830003

Client ID: PP-3 (1-2) Instrument: 10gcs9.i

Sample Information: 10300830003X10

Purge Volume: Operator: MT

Column phase: DB-5MS Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs9.i\033115dro.b/033115000047.D

Report Date: 04/01/2015

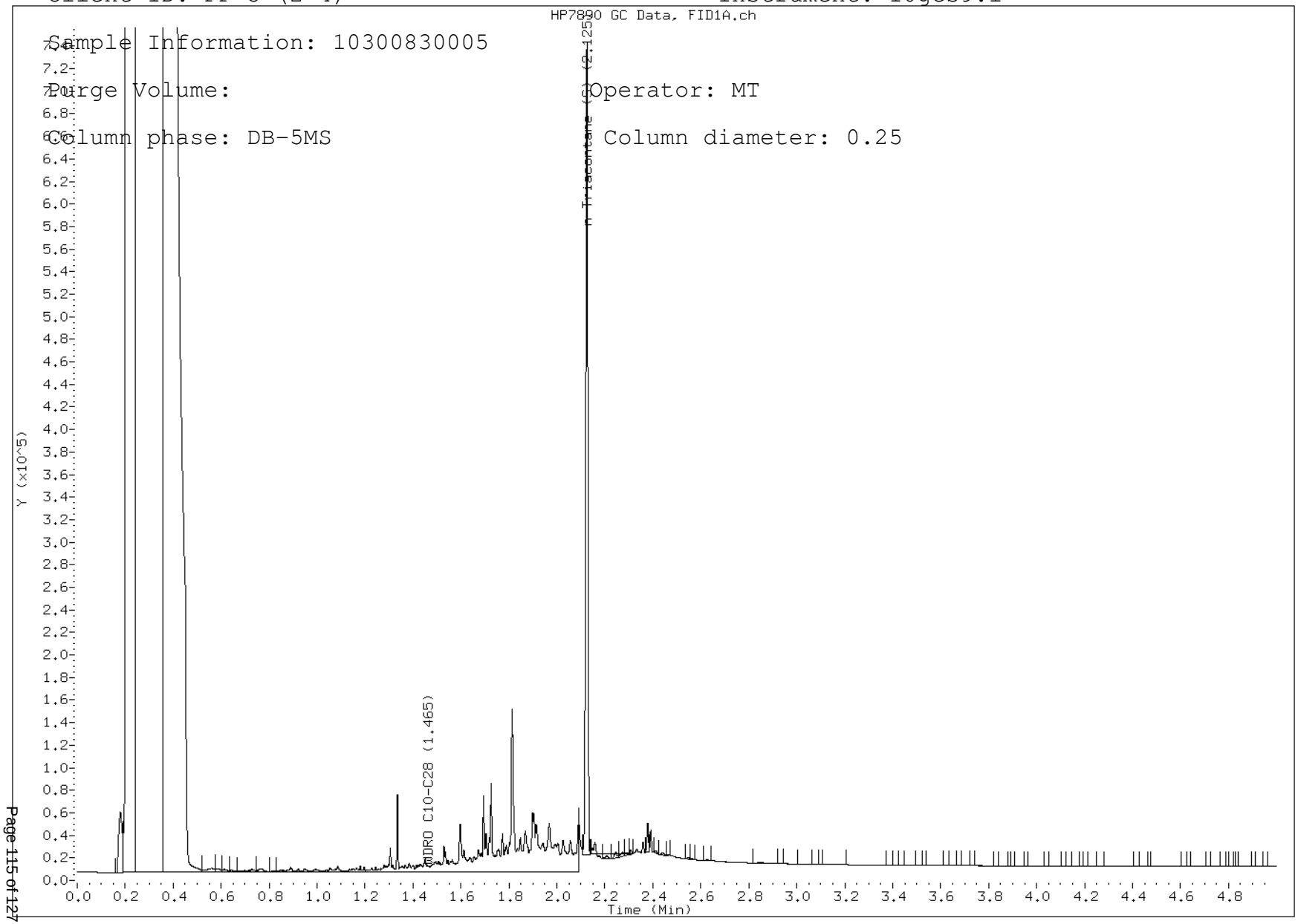
Sample ID: 10300830005

Client ID: PP-5 (2-4) Instrument: 10gcs9.i

Sample Information: 10300830005

Purge Volume: Operator: MT

Column phase: DB-5MS Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs9.i\040115dro.b/040115000011.D

Report Date: 04/01/2015

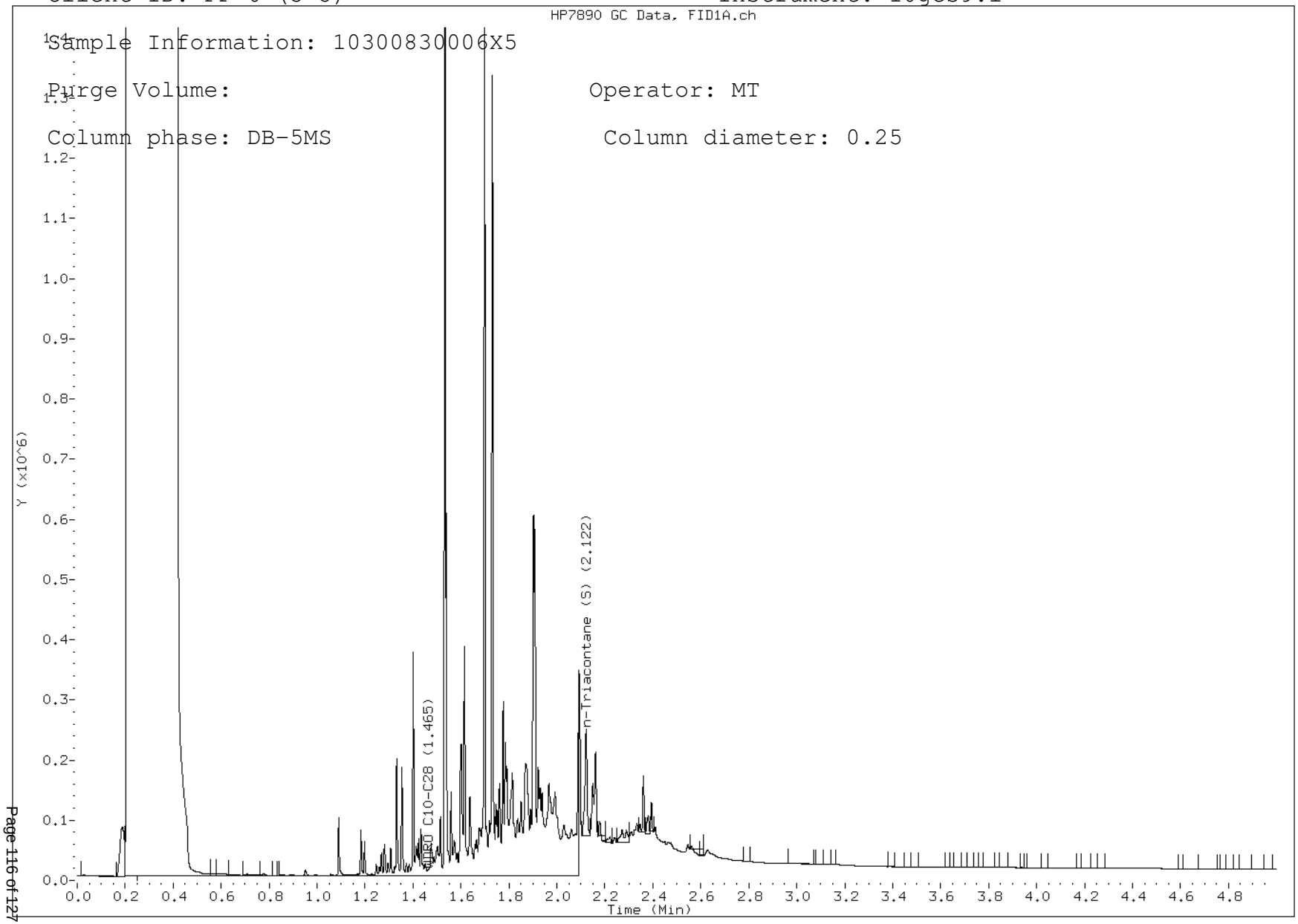
Sample ID: 10300830006

Client ID: PP-6 (3-5) Instrument: 10gcs9.i

Sample Information: 10300830006X5

Purge Volume: Operator: MT

Column phase: DB-5MS Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs9.i\040115dro.b/040115000010.D

Report Date: 04/01/2015

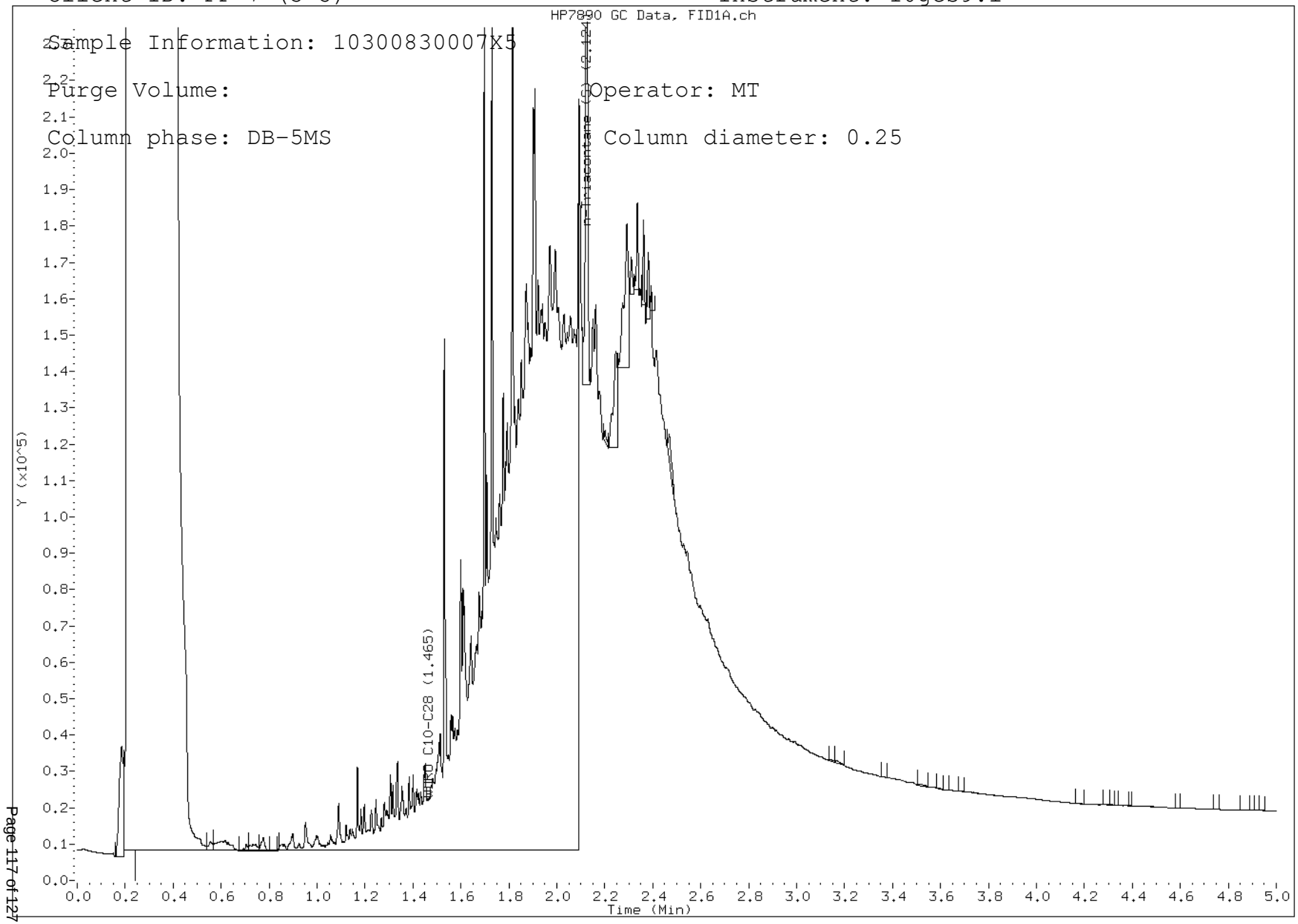
Sample ID: 10300830007

Client ID: PP-7 (3-5) Instrument: 10gcs9.i

Sample Information: 10300830007X5

Purge Volume: Operator: MT

Column phase: DB-5MS Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs9.i\033115dro.b/033115000054.D

Report Date: 04/01/2015

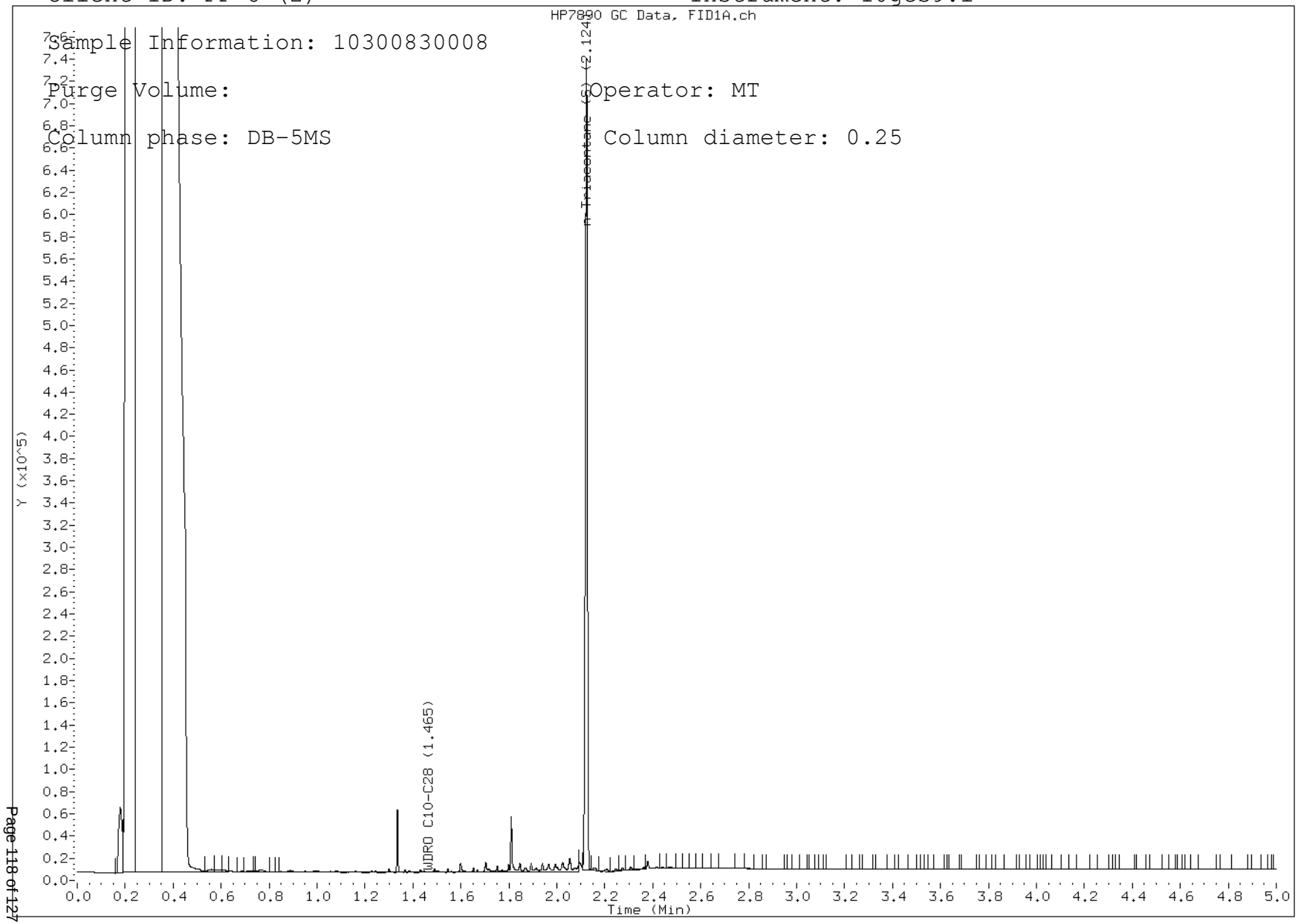
Sample ID: 10300830008

Client ID: PP-8 (2) Instrument: 10gcs9.i

Sample Information: 10300830008

Purge Volume: Operator: MT

Column phase: DB-5MS Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs9.i\033115dro.b/033115000046.D

Report Date: 04/01/2015

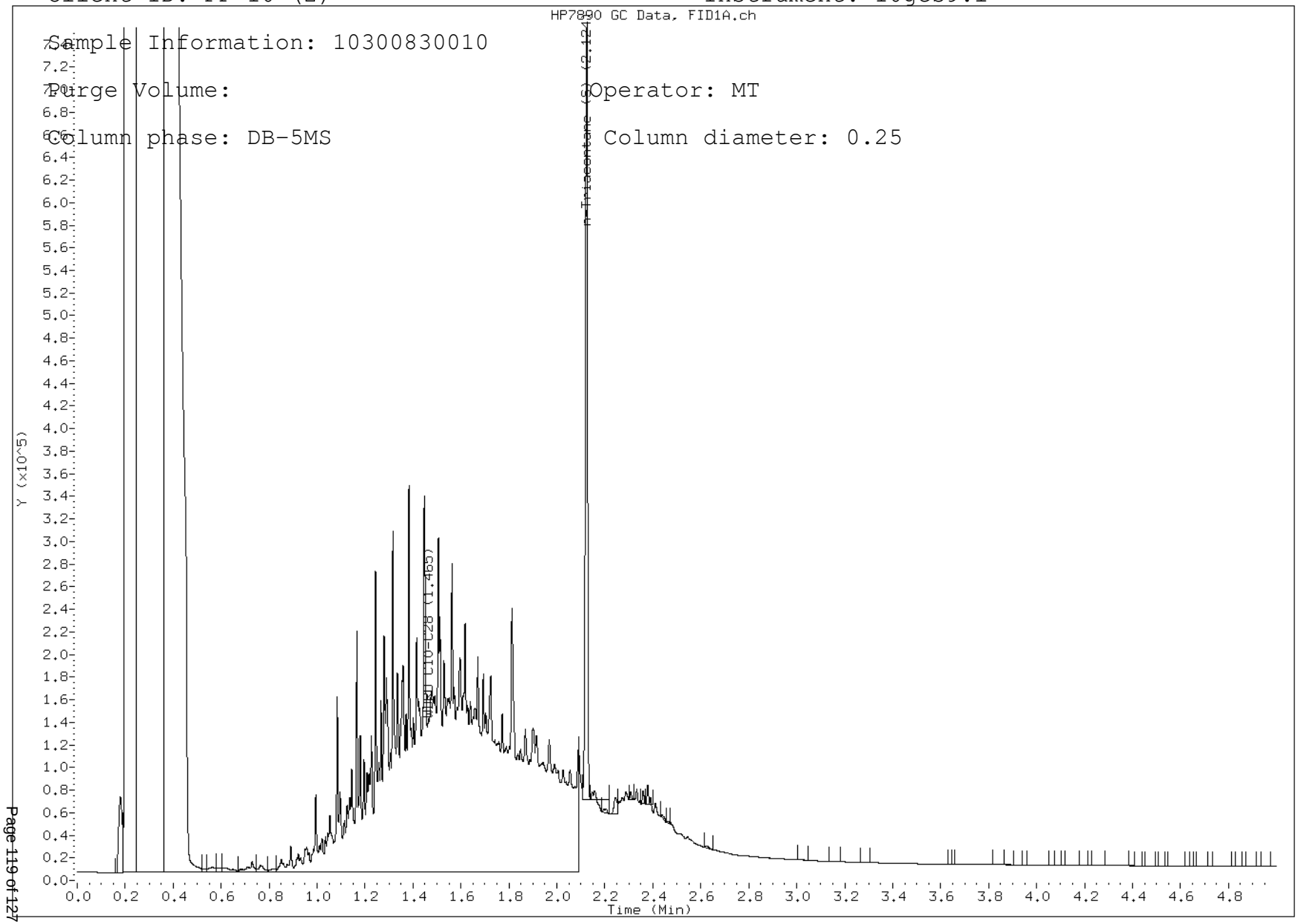
Sample ID: 10300830010

Client ID: PP-10 (2) Instrument: 10gcs9.i

Sample Information: 10300830010

Purge Volume: Operator: MT

Column phase: DB-5MS Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs9.i\040115dro.b/040115000012.D

Report Date: 04/01/2015

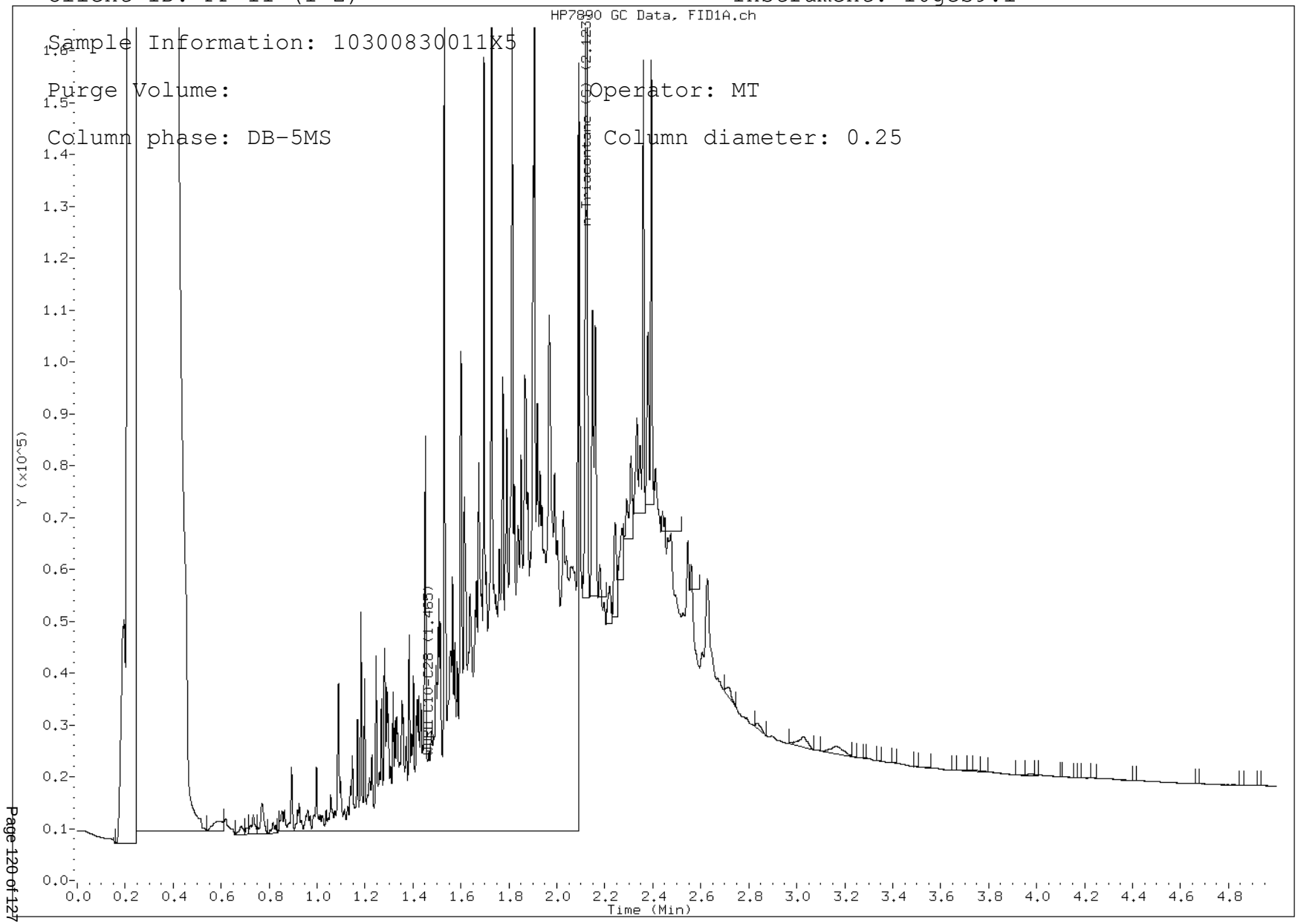
Sample ID: 10300830011

Client ID: PP-11 (1-2) Instrument: 10gcs9.i

Sample Information: 10300830011X5

Purge Volume: Operator: MT

Column phase: DB-5MS Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs9.i\033115dro.b/033115000045.D

Report Date: 04/01/2015

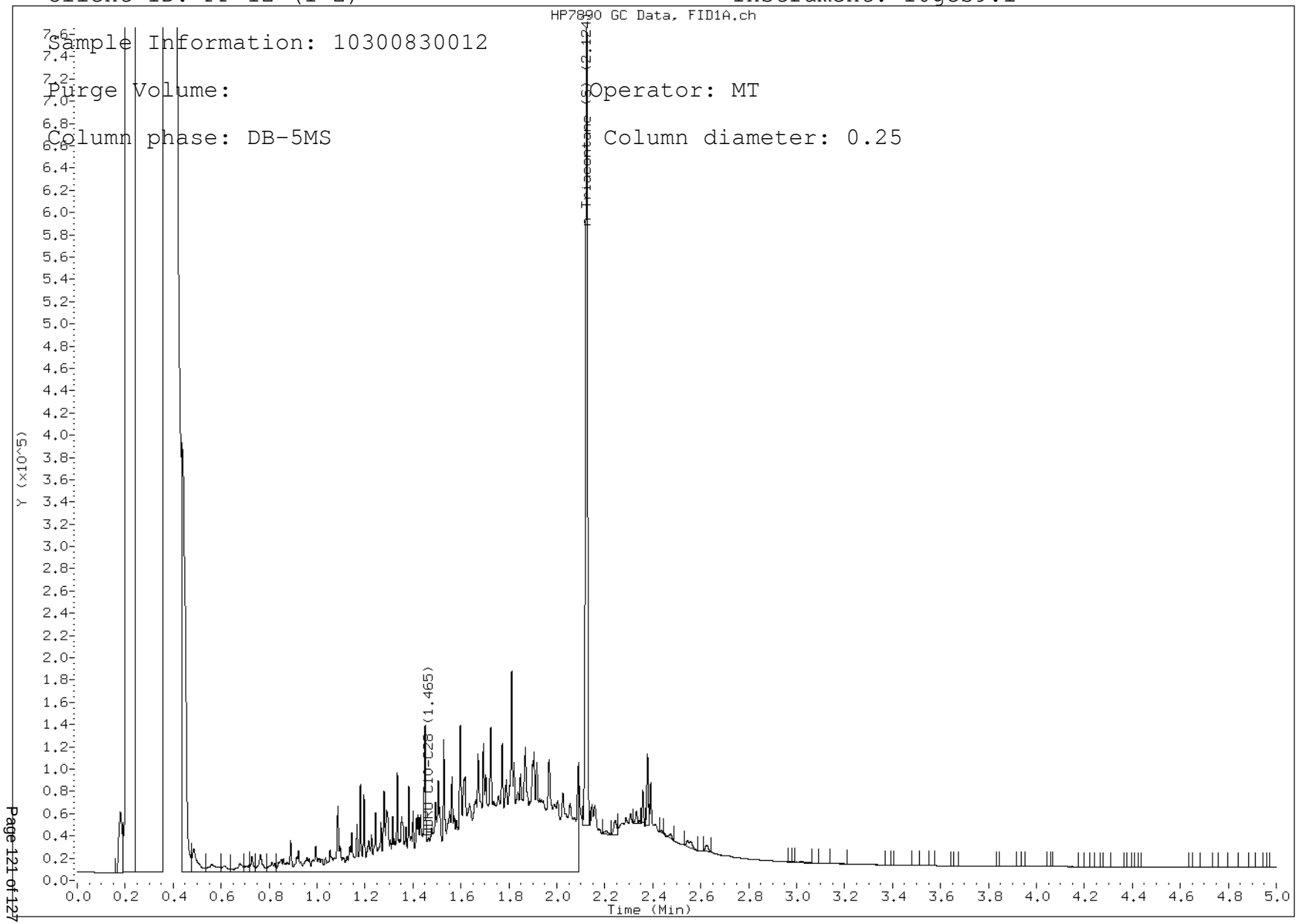
Sample ID: 10300830012

Client ID: PP-12 (1-2) Instrument: 10gcs9.i

Sample Information: 10300830012

Purge Volume: Operator: MT

Column phase: DB-5MS Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs9.i\033115dro.b/033115000048.D

Report Date: 04/01/2015

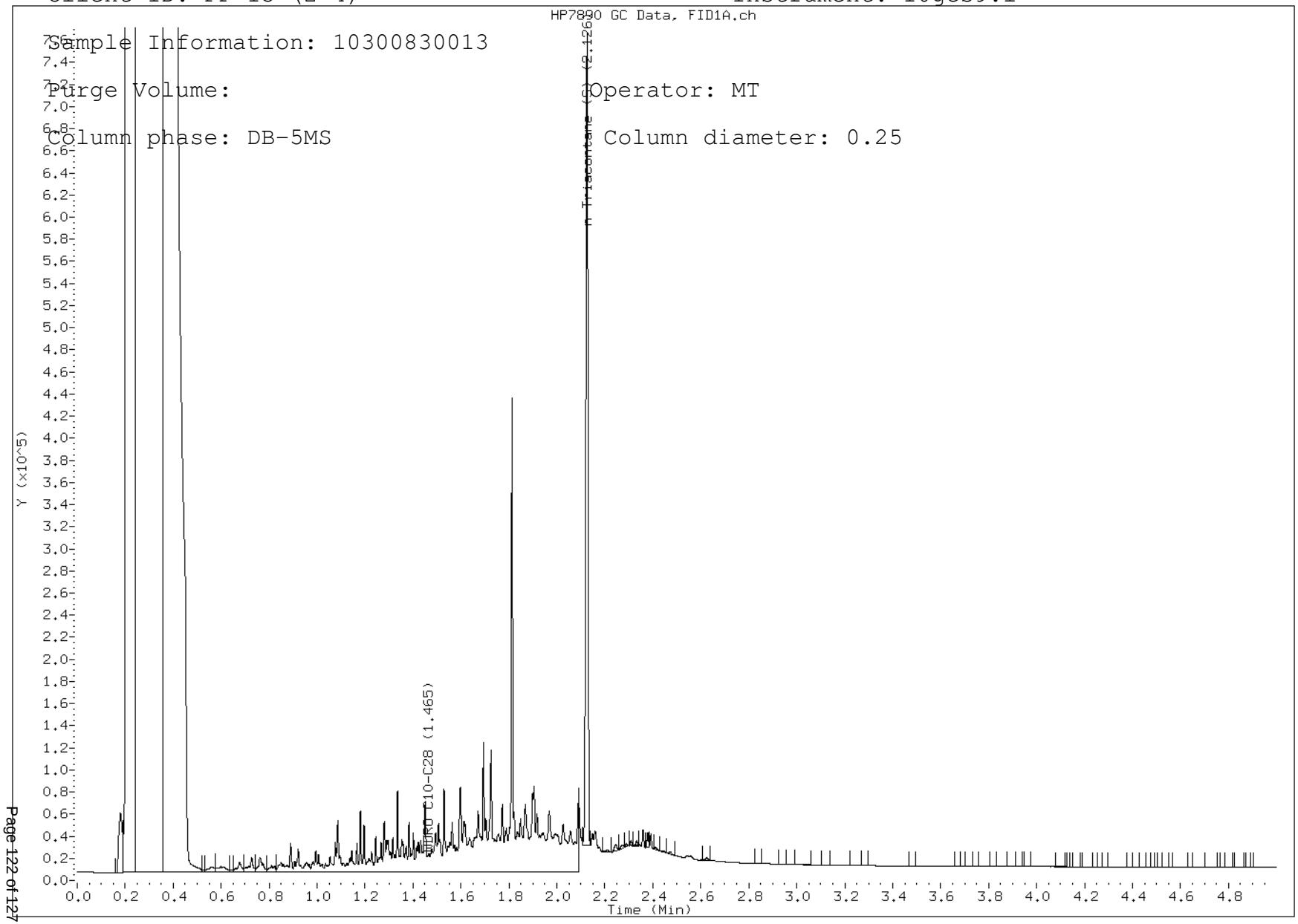
Sample ID: 10300830013

Client ID: PP-13 (2-4) Instrument: 10gcs9.i

Sample Information: 10300830013

Purge Volume: Operator: MT

Column phase: DB-5MS Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs9.i\040115dro.b/040115000007.D

Report Date: 04/01/2015

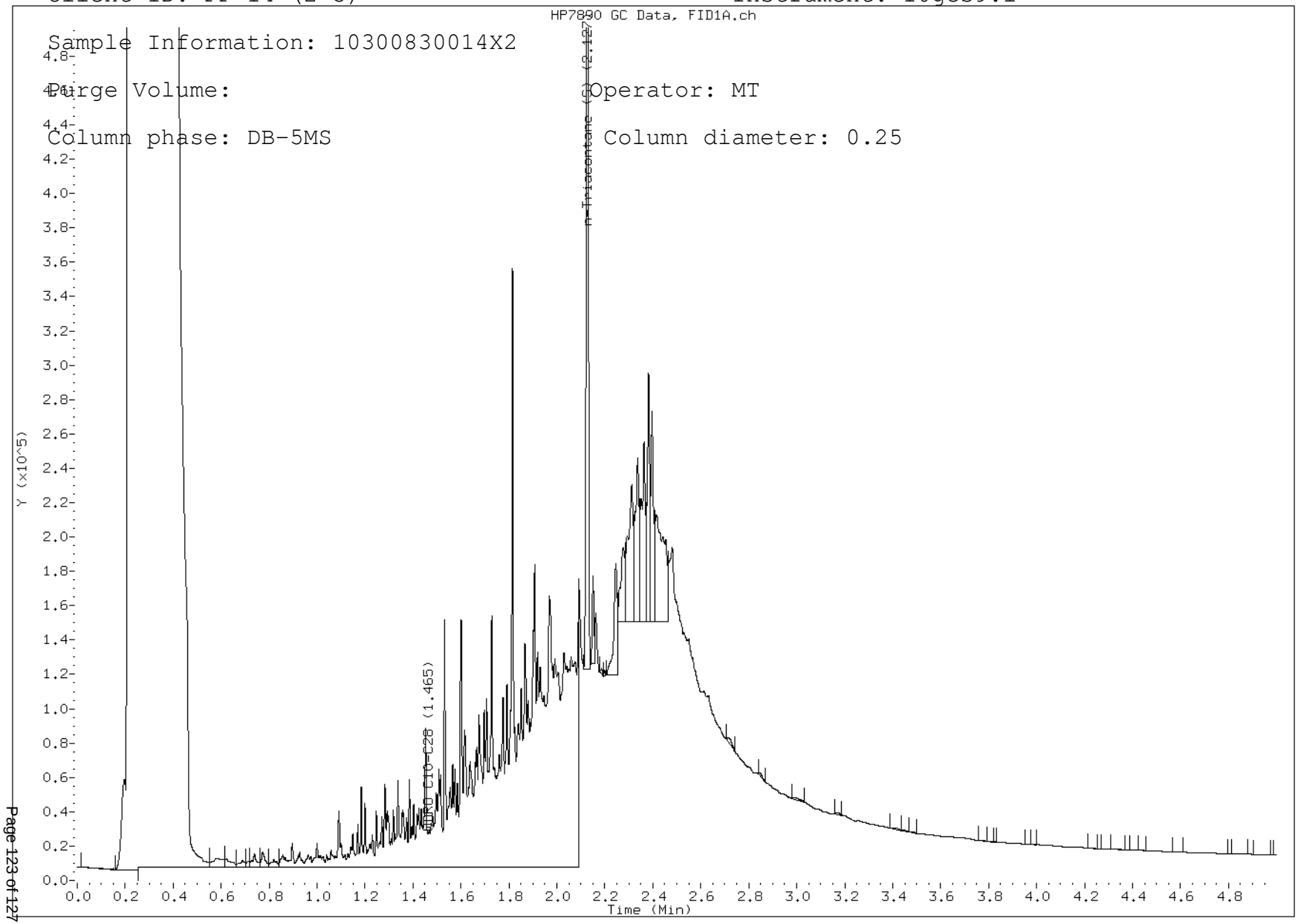
Sample ID: 10300830014

Client ID: PP-14 (2-3) Instrument: 10gcs9.i

Sample Information: 10300830014X2

Purge Volume: Operator: MT

Column phase: DB-5MS Column diameter: 0.25

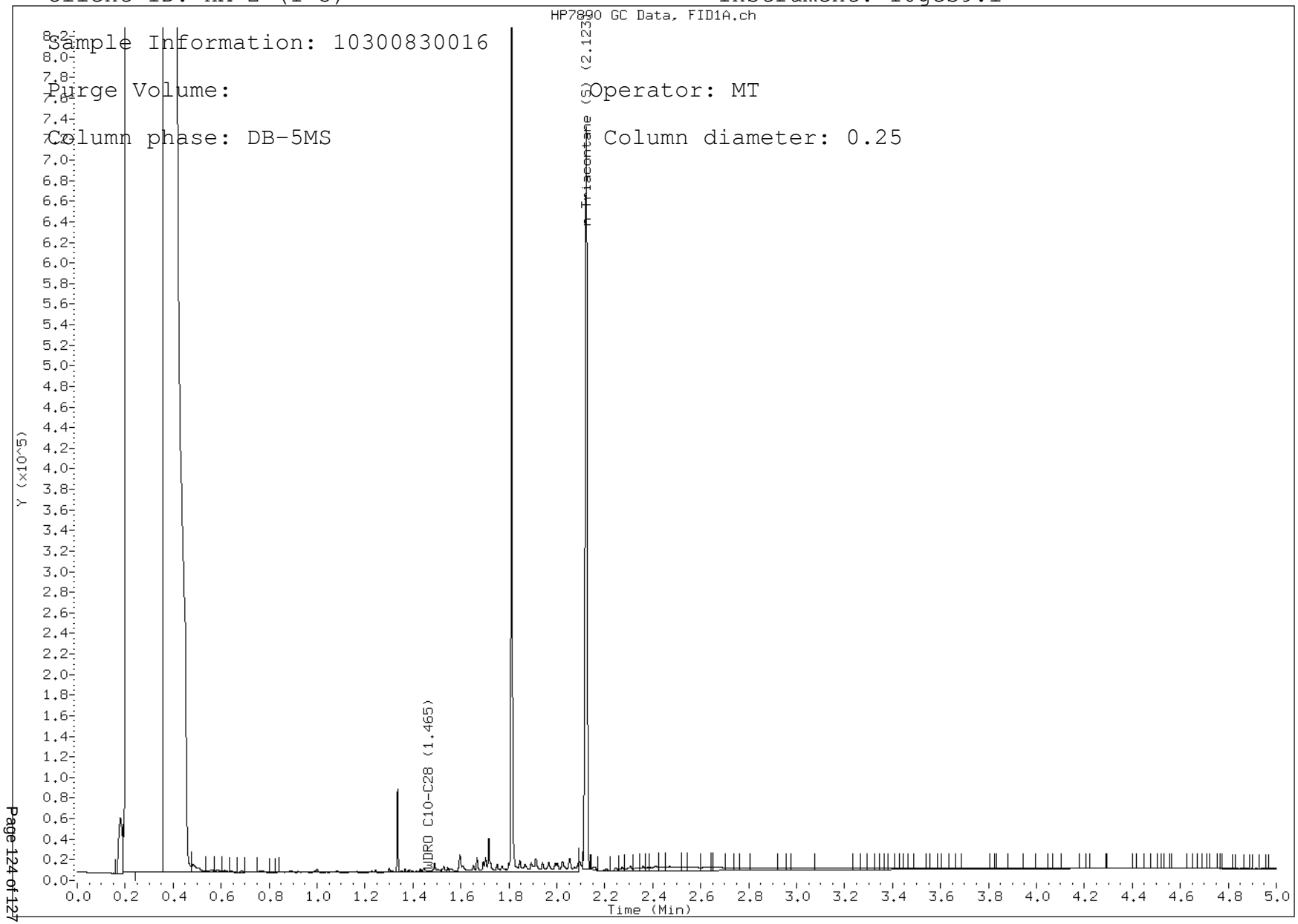


Data File: \\192.168.10.12\chem\10gcs9.i\033115dro.b/033115000049.D

Report Date: 04/01/2015

Sample ID: 10300830016

Client ID: HA-2 (1-3) Instrument: 10gcs9.i



Data File: \\192.168.10.12\chem\10gcs4.i\040115dro.b/04010017.D

Report Date: 04/02/2015

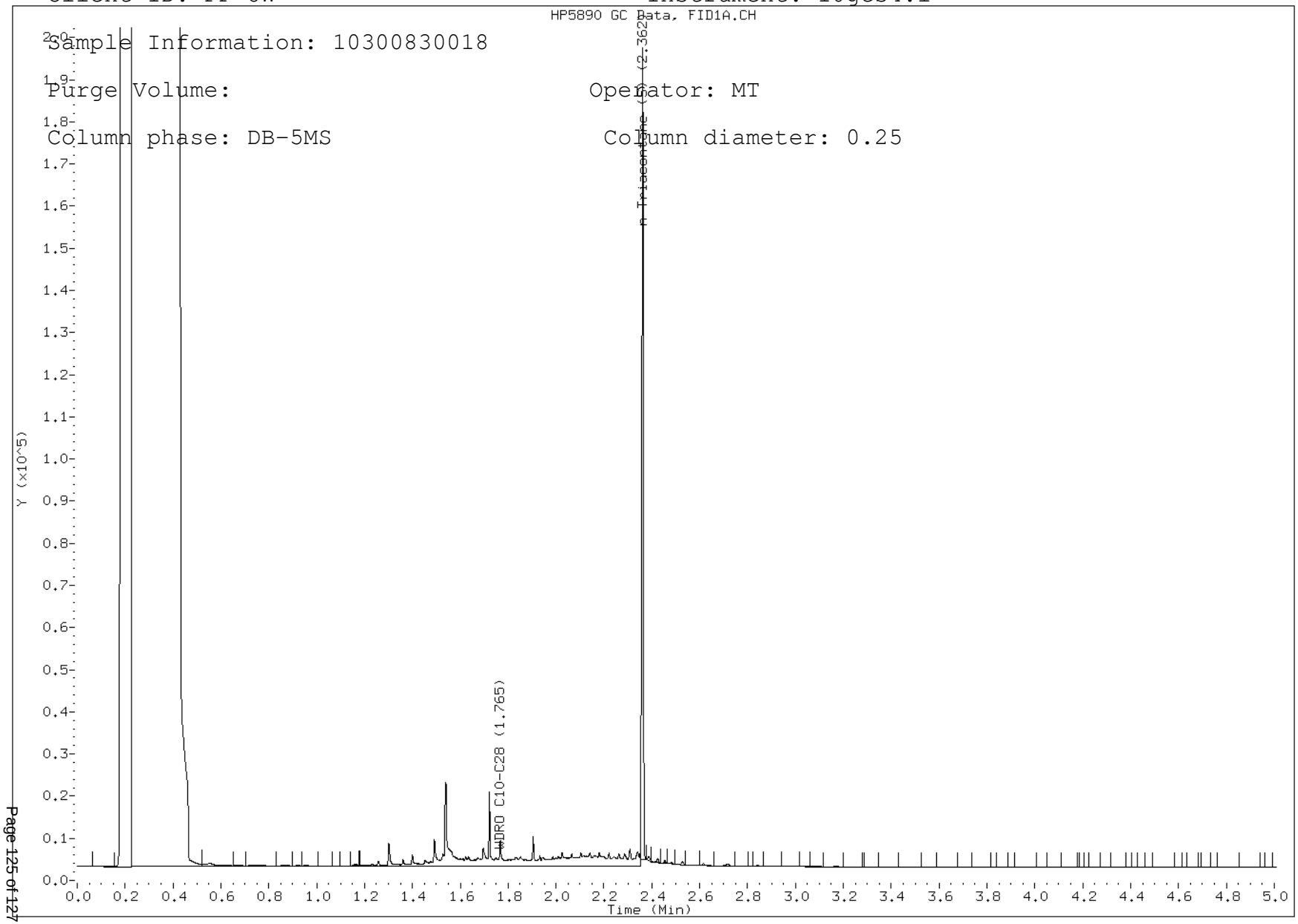
Sample ID: 10300830018

Client ID: PP-8W Instrument: 10gcs4.i

Sample Information: 10300830018

Purge Volume: Operator: MT

Column phase: DB-5MS Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\040115dro.b/04010018.D

Report Date: 04/02/2015

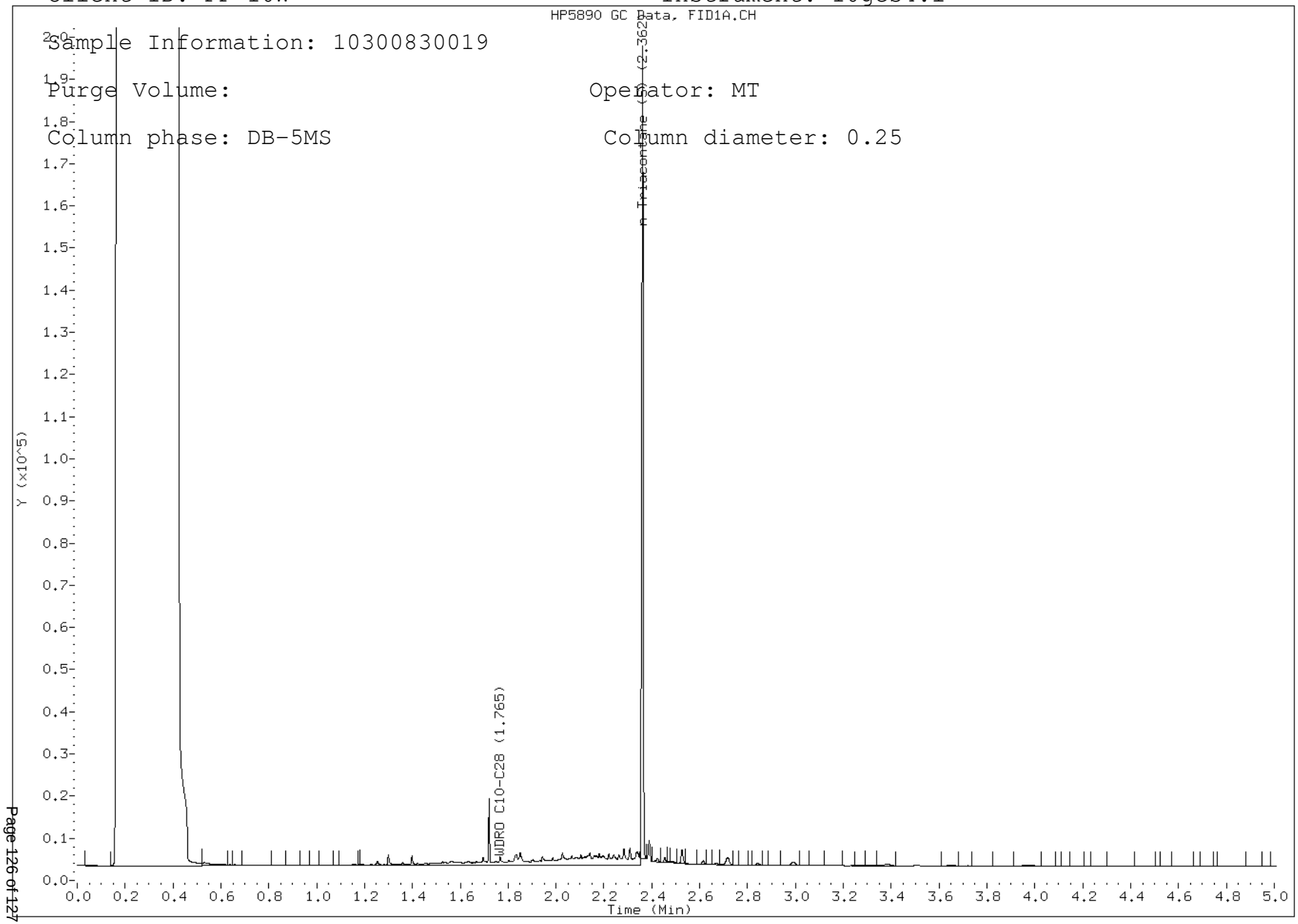
Sample ID: 10300830019

Client ID: PP-10W Instrument: 10gcs4.i

Sample Information: 10300830019

Purge Volume: Operator: MT

Column phase: DB-5MS Column diameter: 0.25



Data File: \\192.168.10.12\chem\10gcs4.i\040115dro.b/04010025.D

Report Date: 04/02/2015

Sample ID: 10300830020

Client ID: HA-W

Instrument: 10gcs4.i

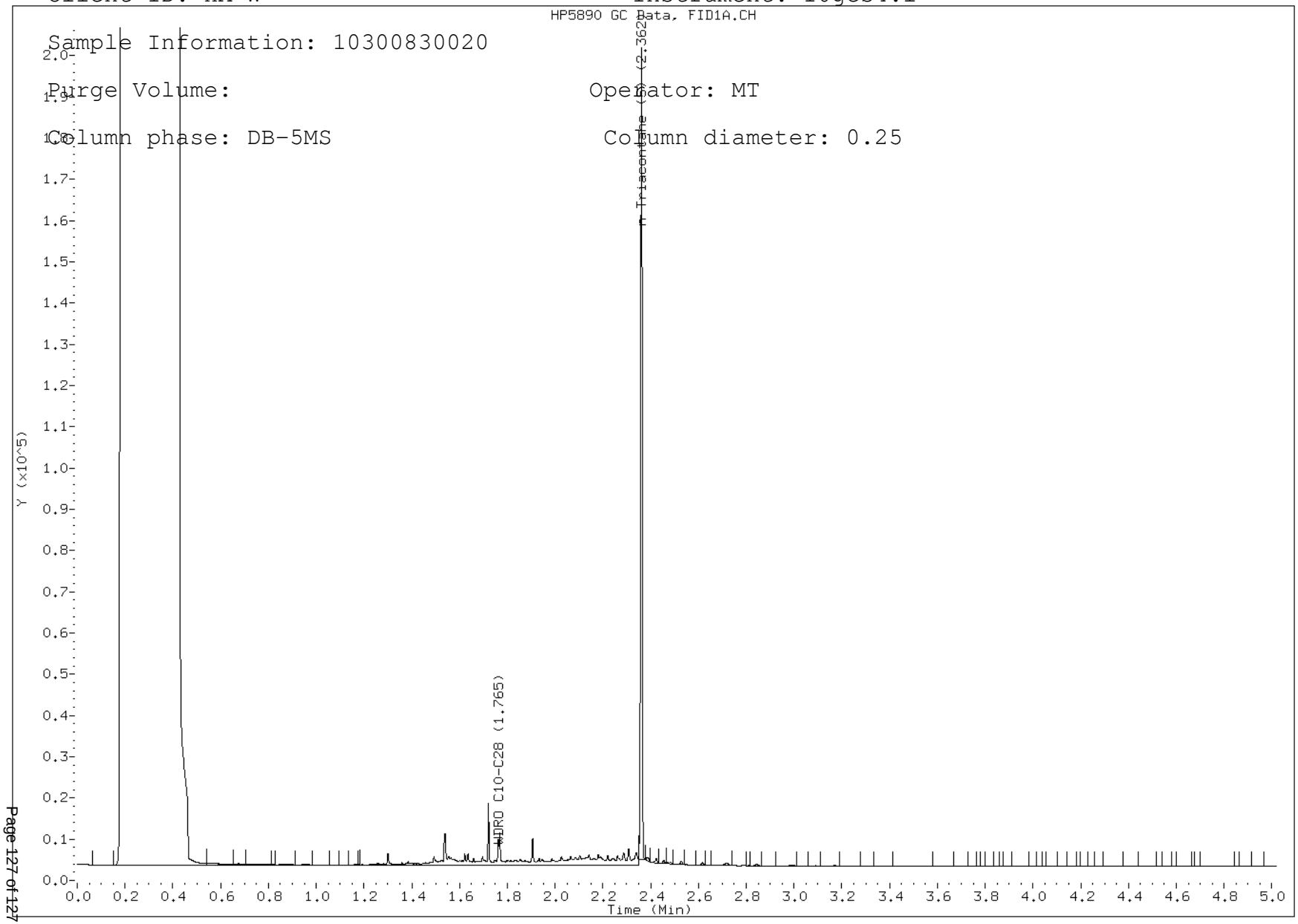
Sample Information: 10300830020

Purge Volume:

Operator: MT

Column phase: DB-5MS

Column diameter: 0.25



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

April 02, 2015

Jeremy Hansen
Braun Intertec Corp.
11001 Hampshire Ave S
Minneapolis, MN 55438

RE: Project: B1500394 Roof Depot
Pace Project No.: 10300700

Dear Jeremy Hansen:
Enclosed are the analytical results for sample(s) received by the laboratory on March 26, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Nathan Boberg
nathan.boberg@pacelabs.com
Project Manager

Enclosures

cc: Accounts Payable

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

CERTIFICATIONS

Project: B1500394 Roof Depot
Pace Project No.: 10300700

Minnesota Certification IDs

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

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Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: B1500394 Roof Depot
Pace Project No.: 10300700

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10300700001	**SV-1**	Air	03/25/15 13:15	03/26/15 12:10
10300700002	**SV-2**	Air	03/25/15 10:45	03/26/15 12:10
10300700003	**SSV-1**	Air	03/25/15 14:26	03/26/15 12:10
10300700004	**SSV-2**	Air	03/25/15 10:33	03/26/15 12:10
10300700005	**SSV-3**	Air	03/25/15 11:52	03/26/15 12:10

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Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: B1500394 Roof Depot
Pace Project No.: 10300700

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10300700001	**SV-1**	TO-15	MLS	81
10300700002	**SV-2**	TO-15	MLS	81
10300700003	**SSV-1**	TO-15	MLS	80
10300700004	**SSV-2**	TO-15	MLS	81
10300700005	**SSV-3**	TO-15	MLS	81

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Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300700

Sample: SV-1 **Lab ID: 10300700001** Collected: 03/25/15 13:15 Received: 03/26/15 12:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR (TICS)	Analytical Method: TO-15							
Acetone	**37.4**	ug/m3	3.2	1.34		03/30/15 21:20	67-64-1	L2
Benzene	**5.6**	ug/m3	0.44	1.34		03/30/15 21:20	71-43-2	
Benzyl chloride	ND	ug/m3	1.4	1.34		03/30/15 21:20	100-44-7	
Bromodichloromethane	ND	ug/m3	1.8	1.34		03/30/15 21:20	75-27-4	
Bromoform	ND	ug/m3	2.8	1.34		03/30/15 21:20	75-25-2	
Bromomethane	ND	ug/m3	1.1	1.34		03/30/15 21:20	74-83-9	
1,3-Butadiene	ND	ug/m3	0.60	1.34		03/30/15 21:20	106-99-0	
2-Butanone (MEK)	**12.6**	ug/m3	0.80	1.34		03/30/15 21:20	78-93-3	
Carbon disulfide	**0.88**	ug/m3	0.84	1.34		03/30/15 21:20	75-15-0	
Carbon tetrachloride	ND	ug/m3	0.86	1.34		03/30/15 21:20	56-23-5	
Chlorobenzene	ND	ug/m3	1.3	1.34		03/30/15 21:20	108-90-7	
Chloroethane	ND	ug/m3	0.72	1.34		03/30/15 21:20	75-00-3	
Chloroform	ND	ug/m3	0.66	1.34		03/30/15 21:20	67-66-3	
Chloromethane	**0.90**	ug/m3	0.56	1.34		03/30/15 21:20	74-87-3	
Cyclohexane	**2.8**	ug/m3	0.94	1.34		03/30/15 21:20	110-82-7	
Dibromochloromethane	ND	ug/m3	2.3	1.34		03/30/15 21:20	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.1	1.34		03/30/15 21:20	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	1.6	1.34		03/30/15 21:20	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	1.6	1.34		03/30/15 21:20	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	1.6	1.34		03/30/15 21:20	106-46-7	
Dichlorodifluoromethane	**2.1**	ug/m3	1.4	1.34		03/30/15 21:20	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.1	1.34		03/30/15 21:20	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.55	1.34		03/30/15 21:20	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.1	1.34		03/30/15 21:20	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	2.7	1.34		03/30/15 21:20	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.1	1.34		03/30/15 21:20	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.3	1.34		03/30/15 21:20	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.2	1.34		03/30/15 21:20	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.2	1.34		03/30/15 21:20	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	1.9	1.34		03/30/15 21:20	76-14-2	
Ethanol	**14.1**	ug/m3	1.3	1.34		03/30/15 21:20	64-17-5	
Ethyl acetate	ND	ug/m3	0.98	1.34		03/30/15 21:20	141-78-6	
Ethylbenzene	**2.3**	ug/m3	1.2	1.34		03/30/15 21:20	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.3	1.34		03/30/15 21:20	622-96-8	
n-Heptane	**9.4**	ug/m3	1.1	1.34		03/30/15 21:20	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	2.9	1.34		03/30/15 21:20	87-68-3	
n-Hexane	**10.2**	ug/m3	0.96	1.34		03/30/15 21:20	110-54-3	
2-Hexanone	ND	ug/m3	1.1	1.34		03/30/15 21:20	591-78-6	
Methylene Chloride	ND	ug/m3	4.7	1.34		03/30/15 21:20	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	2.8	1.34		03/30/15 21:20	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	0.98	1.34		03/30/15 21:20	1634-04-4	
Naphthalene	ND	ug/m3	3.6	1.34		03/30/15 21:20	91-20-3	
2-Propanol	ND	ug/m3	1.7	1.34		03/30/15 21:20	67-63-0	
Propylene	**37.3**	ug/m3	0.47	1.34		03/30/15 21:20	115-07-1	E
Styrene	ND	ug/m3	2.9	1.34		03/30/15 21:20	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	0.94	1.34		03/30/15 21:20	79-34-5	
Tetrachloroethene	ND	ug/m3	0.92	1.34		03/30/15 21:20	127-18-4	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300700

Sample: SV-1 **Lab ID: 10300700001** Collected: 03/25/15 13:15 Received: 03/26/15 12:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR (TICS)	Analytical Method: TO-15							
Tetrahydrofuran	ND	ug/m3	0.80	1.34		03/30/15 21:20	109-99-9	
Toluene	**11.2**	ug/m3	1.0	1.34		03/30/15 21:20	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	2.0	1.34		03/30/15 21:20	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	0.94	1.34		03/30/15 21:20	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.74	1.34		03/30/15 21:20	79-00-5	
Trichloroethene	ND	ug/m3	0.73	1.34		03/30/15 21:20	79-01-6	
Trichlorofluoromethane	ND	ug/m3	1.5	1.34		03/30/15 21:20	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.1	1.34		03/30/15 21:20	76-13-1	
1,2,4-Trimethylbenzene	**2.0**	ug/m3	1.3	1.34		03/30/15 21:20	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.3	1.34		03/30/15 21:20	108-67-8	
Vinyl acetate	ND	ug/m3	0.96	1.34		03/30/15 21:20	108-05-4	
Vinyl chloride	ND	ug/m3	0.35	1.34		03/30/15 21:20	75-01-4	
m&p-Xylene	**5.9**	ug/m3	2.4	1.34		03/30/15 21:20	179601-23-1	
o-Xylene	**2.0**	ug/m3	1.2	1.34		03/30/15 21:20	95-47-6	
Tentatively Identified Compounds								
Unknown	**135**	ppbv		1.34		03/30/15 21:20		N
Unknown	**146**	ppbv		1.34		03/30/15 21:20		N
Cyclopropane, 1,1-dimeth	**2.4**	ppbv		1.34		03/30/15 21:20	1630-94-0	N
Pentane, 2-methyl-	**0.69**	ppbv		1.34		03/30/15 21:20	107-83-5	N
Unknown	**0.93**	ppbv		1.34		03/30/15 21:20		N
Unknown	**1.7**	ppbv		1.34		03/30/15 21:20		N
Heptane, 3-methylene-	**2.0**	ppbv		1.34		03/30/15 21:20	1632-16-2	N
Unknown	**5.3**	ppbv		1.34		03/30/15 21:20		N
Undecane, 3-methylene-	**0.95**	ppbv		1.34		03/30/15 21:20	71138-64-2	N
Unknown	**0.16**	ppbv		1.34		03/30/15 21:20		N
Unknown	**0.071**	ppbv		1.34		03/30/15 21:20		N
Unknown	**0.087**	ppbv		1.34		03/30/15 21:20		N
Nonane, 3-methylene-	**0.16**	ppbv		1.34		03/30/15 21:20	51655-64-2	N
2-Decene, (Z)-	**1.8**	ppbv		1.34		03/30/15 21:20	20348-51-0	N
Decane	**2.2**	ppbv		1.34		03/30/15 21:20	124-18-5	N
Unknown	**0.69**	ppbv		1.34		03/30/15 21:20		N
Unknown	**0.60**	ppbv		1.34		03/30/15 21:20		N
Unknown	**1.0**	ppbv		1.34		03/30/15 21:20		N
Unknown	**0.64**	ppbv		1.34		03/30/15 21:20		N
Undecane, 3-methyl-	**0.54**	ppbv		1.34		03/30/15 21:20	1002-43-3	N

Sample: SV-2 **Lab ID: 10300700002** Collected: 03/25/15 10:45 Received: 03/26/15 12:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR (TICS)	Analytical Method: TO-15							
Acetone	**24.3**	ug/m3	3.2	1.34		03/30/15 22:16	67-64-1	L2
Benzene	**4.2**	ug/m3	0.44	1.34		03/30/15 22:16	71-43-2	
Benzyl chloride	ND	ug/m3	1.4	1.34		03/30/15 22:16	100-44-7	
Bromodichloromethane	ND	ug/m3	1.8	1.34		03/30/15 22:16	75-27-4	
Bromoform	ND	ug/m3	2.8	1.34		03/30/15 22:16	75-25-2	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300700

Sample: SV-2 **Lab ID: 10300700002** Collected: 03/25/15 10:45 Received: 03/26/15 12:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR (TICS)	Analytical Method: TO-15							
Bromomethane	ND	ug/m3	1.1	1.34		03/30/15 22:16	74-83-9	
1,3-Butadiene	ND	ug/m3	0.60	1.34		03/30/15 22:16	106-99-0	
2-Butanone (MEK)	**10.4**	ug/m3	0.80	1.34		03/30/15 22:16	78-93-3	
Carbon disulfide	**2.6**	ug/m3	0.84	1.34		03/30/15 22:16	75-15-0	
Carbon tetrachloride	ND	ug/m3	0.86	1.34		03/30/15 22:16	56-23-5	
Chlorobenzene	ND	ug/m3	1.3	1.34		03/30/15 22:16	108-90-7	
Chloroethane	ND	ug/m3	0.72	1.34		03/30/15 22:16	75-00-3	
Chloroform	ND	ug/m3	0.66	1.34		03/30/15 22:16	67-66-3	
Chloromethane	ND	ug/m3	0.56	1.34		03/30/15 22:16	74-87-3	
Cyclohexane	**3.1**	ug/m3	0.94	1.34		03/30/15 22:16	110-82-7	
Dibromochloromethane	ND	ug/m3	2.3	1.34		03/30/15 22:16	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.1	1.34		03/30/15 22:16	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	1.6	1.34		03/30/15 22:16	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	1.6	1.34		03/30/15 22:16	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	1.6	1.34		03/30/15 22:16	106-46-7	
Dichlorodifluoromethane	**2.1**	ug/m3	1.4	1.34		03/30/15 22:16	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.1	1.34		03/30/15 22:16	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.55	1.34		03/30/15 22:16	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.1	1.34		03/30/15 22:16	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	2.7	1.34		03/30/15 22:16	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.1	1.34		03/30/15 22:16	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.3	1.34		03/30/15 22:16	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.2	1.34		03/30/15 22:16	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.2	1.34		03/30/15 22:16	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	1.9	1.34		03/30/15 22:16	76-14-2	
Ethanol	**6.1**	ug/m3	1.3	1.34		03/30/15 22:16	64-17-5	
Ethyl acetate	ND	ug/m3	0.98	1.34		03/30/15 22:16	141-78-6	
Ethylbenzene	**3.2**	ug/m3	1.2	1.34		03/30/15 22:16	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.3	1.34		03/30/15 22:16	622-96-8	
n-Heptane	**10.0**	ug/m3	1.1	1.34		03/30/15 22:16	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	2.9	1.34		03/30/15 22:16	87-68-3	
n-Hexane	**10.7**	ug/m3	0.96	1.34		03/30/15 22:16	110-54-3	
2-Hexanone	ND	ug/m3	1.1	1.34		03/30/15 22:16	591-78-6	
Methylene Chloride	ND	ug/m3	4.7	1.34		03/30/15 22:16	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	2.8	1.34		03/30/15 22:16	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	0.98	1.34		03/30/15 22:16	1634-04-4	
Naphthalene	ND	ug/m3	3.6	1.34		03/30/15 22:16	91-20-3	
2-Propanol	ND	ug/m3	1.7	1.34		03/30/15 22:16	67-63-0	
Propylene	**38.2**	ug/m3	0.47	1.34		03/30/15 22:16	115-07-1	
Styrene	ND	ug/m3	2.9	1.34		03/30/15 22:16	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	0.94	1.34		03/30/15 22:16	79-34-5	
Tetrachloroethene	ND	ug/m3	0.92	1.34		03/30/15 22:16	127-18-4	
Tetrahydrofuran	ND	ug/m3	0.80	1.34		03/30/15 22:16	109-99-9	
Toluene	**9.8**	ug/m3	1.0	1.34		03/30/15 22:16	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	2.0	1.34		03/30/15 22:16	120-82-1	
1,1,1-Trichloroethane	**2.0**	ug/m3	0.94	1.34		03/30/15 22:16	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.74	1.34		03/30/15 22:16	79-00-5	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300700

Sample: SV-2 **Lab ID: 10300700002** Collected: 03/25/15 10:45 Received: 03/26/15 12:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR (TICS)	Analytical Method: TO-15							
Trichloroethene	ND	ug/m3	0.73	1.34		03/30/15 22:16	79-01-6	
Trichlorofluoromethane	**1.7**	ug/m3	1.5	1.34		03/30/15 22:16	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.1	1.34		03/30/15 22:16	76-13-1	
1,2,4-Trimethylbenzene	**2.7**	ug/m3	1.3	1.34		03/30/15 22:16	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.3	1.34		03/30/15 22:16	108-67-8	
Vinyl acetate	ND	ug/m3	0.96	1.34		03/30/15 22:16	108-05-4	
Vinyl chloride	ND	ug/m3	0.35	1.34		03/30/15 22:16	75-01-4	
m&p-Xylene	**7.7**	ug/m3	2.4	1.34		03/30/15 22:16	179601-23-1	
o-Xylene	**2.6**	ug/m3	1.2	1.34		03/30/15 22:16	95-47-6	
Tentatively Identified Compounds								
Unknown	**149**	ppbv		1.34		03/30/15 22:16		N
Unknown	**0.41**	ppbv		1.34		03/30/15 22:16		N
Pentane, 2-methyl-	**2.0**	ppbv		1.34		03/30/15 22:16	107-83-5	N
Unknown	**3.0**	ppbv		1.34		03/30/15 22:16		N
Unknown	**0.66**	ppbv		1.34		03/30/15 22:16		N
Unknown	**1.8**	ppbv		1.34		03/30/15 22:16		N
Heptane, 3-methylene-	**2.9**	ppbv		1.34		03/30/15 22:16	1632-16-2	N
Unknown	**2.9**	ppbv		1.34		03/30/15 22:16		N
Cyclotrisiloxane, hexame	**1.2**	ppbv		1.34		03/30/15 22:16	541-05-9	N
Unknown	**1.2**	ppbv		1.34		03/30/15 22:16		N
Unknown	**0.31**	ppbv		1.34		03/30/15 22:16		N
Unknown	**0.12**	ppbv		1.34		03/30/15 22:16		N
Unknown	**0.14**	ppbv		1.34		03/30/15 22:16		N
Nonane, 3-methylene-	**0.81**	ppbv		1.34		03/30/15 22:16	51655-64-2	N
1-Decene	**1.2**	ppbv		1.34		03/30/15 22:16	872-05-9	N
Decane	**1.7**	ppbv		1.34		03/30/15 22:16	124-18-5	N
1,4-Cyclohexadiene, 1-m	**0.52**	ppbv		1.34		03/30/15 22:16	99-85-4	N
Dodecane, 2,6,10-trimet	**0.36**	ppbv		1.34		03/30/15 22:16	3891-98-3	N
Unknown	**0.45**	ppbv		1.34		03/30/15 22:16		N
Unknown	**0.56**	ppbv		1.34		03/30/15 22:16		N

Sample: SSV-1 **Lab ID: 10300700003** Collected: 03/25/15 14:26 Received: 03/26/15 12:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR (TICS)	Analytical Method: TO-15							
Acetone	**24.6**	ug/m3	3.7	1.55		03/30/15 20:53	67-64-1	L2
Benzene	**1.0**	ug/m3	0.50	1.55		03/30/15 20:53	71-43-2	
Benzyl chloride	ND	ug/m3	1.6	1.55		03/30/15 20:53	100-44-7	
Bromodichloromethane	ND	ug/m3	2.1	1.55		03/30/15 20:53	75-27-4	
Bromoform	ND	ug/m3	3.3	1.55		03/30/15 20:53	75-25-2	
Bromomethane	ND	ug/m3	1.2	1.55		03/30/15 20:53	74-83-9	
1,3-Butadiene	ND	ug/m3	0.70	1.55		03/30/15 20:53	106-99-0	
2-Butanone (MEK)	**8.4**	ug/m3	0.93	1.55		03/30/15 20:53	78-93-3	
Carbon disulfide	**5.1**	ug/m3	0.98	1.55		03/30/15 20:53	75-15-0	
Carbon tetrachloride	ND	ug/m3	0.99	1.55		03/30/15 20:53	56-23-5	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300700

Sample: SSV-1 **Lab ID: 10300700003** Collected: 03/25/15 14:26 Received: 03/26/15 12:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR (TICS)	Analytical Method: TO-15							
Chlorobenzene	ND	ug/m3	1.5	1.55		03/30/15 20:53	108-90-7	
Chloroethane	ND	ug/m3	0.84	1.55		03/30/15 20:53	75-00-3	
Chloroform	ND	ug/m3	0.77	1.55		03/30/15 20:53	67-66-3	
Chloromethane	ND	ug/m3	0.65	1.55		03/30/15 20:53	74-87-3	
Cyclohexane	**3.8**	ug/m3	1.1	1.55		03/30/15 20:53	110-82-7	
Dibromochloromethane	ND	ug/m3	2.7	1.55		03/30/15 20:53	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.4	1.55		03/30/15 20:53	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	1.9	1.55		03/30/15 20:53	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	1.9	1.55		03/30/15 20:53	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	1.9	1.55		03/30/15 20:53	106-46-7	
Dichlorodifluoromethane	**11.8**	ug/m3	1.6	1.55		03/30/15 20:53	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.3	1.55		03/30/15 20:53	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.64	1.55		03/30/15 20:53	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.3	1.55		03/30/15 20:53	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	3.1	1.55		03/30/15 20:53	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.3	1.55		03/30/15 20:53	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.5	1.55		03/30/15 20:53	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.4	1.55		03/30/15 20:53	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.4	1.55		03/30/15 20:53	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.2	1.55		03/30/15 20:53	76-14-2	
Ethanol	**9.3**	ug/m3	1.5	1.55		03/30/15 20:53	64-17-5	
Ethyl acetate	ND	ug/m3	1.1	1.55		03/30/15 20:53	141-78-6	
Ethylbenzene	ND	ug/m3	1.4	1.55		03/30/15 20:53	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.6	1.55		03/30/15 20:53	622-96-8	
n-Heptane	ND	ug/m3	1.3	1.55		03/30/15 20:53	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.4	1.55		03/30/15 20:53	87-68-3	
n-Hexane	**1.2**	ug/m3	1.1	1.55		03/30/15 20:53	110-54-3	
2-Hexanone	ND	ug/m3	1.3	1.55		03/30/15 20:53	591-78-6	
Methylene Chloride	ND	ug/m3	5.5	1.55		03/30/15 20:53	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	3.2	1.55		03/30/15 20:53	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	1.1	1.55		03/30/15 20:53	1634-04-4	
Naphthalene	ND	ug/m3	4.1	1.55		03/30/15 20:53	91-20-3	
2-Propanol	**4.7**	ug/m3	1.9	1.55		03/30/15 20:53	67-63-0	
Propylene	ND	ug/m3	0.54	1.55		03/30/15 20:53	115-07-1	
Styrene	ND	ug/m3	3.4	1.55		03/30/15 20:53	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.1	1.55		03/30/15 20:53	79-34-5	
Tetrachloroethene	**1.8**	ug/m3	1.1	1.55		03/30/15 20:53	127-18-4	
Tetrahydrofuran	ND	ug/m3	0.93	1.55		03/30/15 20:53	109-99-9	
Toluene	**3.7**	ug/m3	1.2	1.55		03/30/15 20:53	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	2.3	1.55		03/30/15 20:53	120-82-1	
1,1,1-Trichloroethane	**78.2**	ug/m3	1.1	1.55		03/30/15 20:53	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.86	1.55		03/30/15 20:53	79-00-5	
Trichloroethene	ND	ug/m3	0.85	1.55		03/30/15 20:53	79-01-6	
Trichlorofluoromethane	**13.9**	ug/m3	1.8	1.55		03/30/15 20:53	75-69-4	
1,1,2-Trichlorotrifluoroethane	**3.7**	ug/m3	2.5	1.55		03/30/15 20:53	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/m3	1.5	1.55		03/30/15 20:53	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.5	1.55		03/30/15 20:53	108-67-8	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300700

Sample: SSV-1 **Lab ID: 10300700003** Collected: 03/25/15 14:26 Received: 03/26/15 12:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR (TICS)	Analytical Method: TO-15							
Vinyl acetate	ND	ug/m3	1.1	1.55		03/30/15 20:53	108-05-4	
Vinyl chloride	ND	ug/m3	0.40	1.55		03/30/15 20:53	75-01-4	
m&p-Xylene	ND	ug/m3	2.7	1.55		03/30/15 20:53	179601-23-1	
o-Xylene	ND	ug/m3	1.4	1.55		03/30/15 20:53	95-47-6	
Tentatively Identified Compounds								
Unknown	**0.46**	ppbv		1.55		03/30/15 20:53		N
Acetaldehyde	**47.0**	ppbv		1.55		03/30/15 20:53	75-07-0	N
Pentane, 2-methyl-	**0.86**	ppbv		1.55		03/30/15 20:53	107-83-5	N
Unknown	**0.32**	ppbv		1.55		03/30/15 20:53		N
Cyclopentane, methyl-	**0.78**	ppbv		1.55		03/30/15 20:53	96-37-7	N
Unknown	**0.34**	ppbv		1.55		03/30/15 20:53		N
Pentanal	**3.1**	ppbv		1.55		03/30/15 20:53	110-62-3	N
Unknown	**0.19**	ppbv		1.55		03/30/15 20:53		N
Cyclohexane, 1,4-dimethy	**0.54**	ppbv		1.55		03/30/15 20:53	624-29-3	N
Hexanal	**1.1**	ppbv		1.55		03/30/15 20:53	66-25-1	N
Cyclotrisiloxane, hexame	**0.73**	ppbv		1.55		03/30/15 20:53	541-05-9	N
Unknown	**0.36**	ppbv		1.55		03/30/15 20:53		N
Heptanal	**0.53**	ppbv		1.55		03/30/15 20:53	111-71-7	N
Unknown	**0.12**	ppbv		1.55		03/30/15 20:53		N
Unknown	**0.40**	ppbv		1.55		03/30/15 20:53		N
Unknown	**2.6**	ppbv		1.55		03/30/15 20:53		N
Unknown	**2.3**	ppbv		1.55		03/30/15 20:53		N
Unknown	**0.74**	ppbv		1.55		03/30/15 20:53		N
Unknown	**0.38**	ppbv		1.55		03/30/15 20:53		N

Sample: SSV-2 **Lab ID: 10300700004** Collected: 03/25/15 10:33 Received: 03/26/15 12:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR (TICS)	Analytical Method: TO-15							
Acetone	**80.9**	ug/m3	18.0	7.45		03/31/15 16:15	67-64-1	L2
Benzene	**2.9**	ug/m3	0.48	1.49		03/30/15 20:25	71-43-2	
Benzyl chloride	ND	ug/m3	1.6	1.49		03/30/15 20:25	100-44-7	
Bromodichloromethane	ND	ug/m3	2.0	1.49		03/30/15 20:25	75-27-4	
Bromoform	ND	ug/m3	3.1	1.49		03/30/15 20:25	75-25-2	
Bromomethane	ND	ug/m3	1.2	1.49		03/30/15 20:25	74-83-9	
1,3-Butadiene	ND	ug/m3	0.67	1.49		03/30/15 20:25	106-99-0	
2-Butanone (MEK)	**22.6**	ug/m3	0.89	1.49		03/30/15 20:25	78-93-3	
Carbon disulfide	**9.3**	ug/m3	0.94	1.49		03/30/15 20:25	75-15-0	
Carbon tetrachloride	ND	ug/m3	0.95	1.49		03/30/15 20:25	56-23-5	
Chlorobenzene	ND	ug/m3	1.4	1.49		03/30/15 20:25	108-90-7	
Chloroethane	ND	ug/m3	0.80	1.49		03/30/15 20:25	75-00-3	
Chloroform	ND	ug/m3	0.74	1.49		03/30/15 20:25	67-66-3	
Chloromethane	ND	ug/m3	0.63	1.49		03/30/15 20:25	74-87-3	
Cyclohexane	**15.3**	ug/m3	1.0	1.49		03/30/15 20:25	110-82-7	
Dibromochloromethane	ND	ug/m3	2.6	1.49		03/30/15 20:25	124-48-1	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300700

Sample: SSV-2 **Lab ID: 10300700004** Collected: 03/25/15 10:33 Received: 03/26/15 12:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR (TICS)	Analytical Method: TO-15							
1,2-Dibromoethane (EDB)	ND	ug/m3	2.3	1.49		03/30/15 20:25	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	1.8	1.49		03/30/15 20:25	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	1.8	1.49		03/30/15 20:25	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	1.8	1.49		03/30/15 20:25	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	1.5	1.49		03/30/15 20:25	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.2	1.49		03/30/15 20:25	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.61	1.49		03/30/15 20:25	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.2	1.49		03/30/15 20:25	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	3.0	1.49		03/30/15 20:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.2	1.49		03/30/15 20:25	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.4	1.49		03/30/15 20:25	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.4	1.49		03/30/15 20:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.4	1.49		03/30/15 20:25	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.1	1.49		03/30/15 20:25	76-14-2	
Ethanol	**20.2**	ug/m3	1.4	1.49		03/30/15 20:25	64-17-5	
Ethyl acetate	**7.4**	ug/m3	1.1	1.49		03/30/15 20:25	141-78-6	
Ethylbenzene	**2.4**	ug/m3	1.3	1.49		03/30/15 20:25	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.5	1.49		03/30/15 20:25	622-96-8	
n-Heptane	**10.1**	ug/m3	1.2	1.49		03/30/15 20:25	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.3	1.49		03/30/15 20:25	87-68-3	
n-Hexane	**35.7**	ug/m3	1.1	1.49		03/30/15 20:25	110-54-3	
2-Hexanone	ND	ug/m3	1.2	1.49		03/30/15 20:25	591-78-6	
Methylene Chloride	**32.0**	ug/m3	5.3	1.49		03/30/15 20:25	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	3.1	1.49		03/30/15 20:25	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	1.1	1.49		03/30/15 20:25	1634-04-4	
Naphthalene	ND	ug/m3	4.0	1.49		03/30/15 20:25	91-20-3	
2-Propanol	ND	ug/m3	1.9	1.49		03/30/15 20:25	67-63-0	
Propylene	**30.5**	ug/m3	2.6	7.45		03/31/15 16:15	115-07-1	
Styrene	ND	ug/m3	3.2	1.49		03/30/15 20:25	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.0	1.49		03/30/15 20:25	79-34-5	
Tetrachloroethene	ND	ug/m3	1.0	1.49		03/30/15 20:25	127-18-4	
Tetrahydrofuran	ND	ug/m3	0.89	1.49		03/30/15 20:25	109-99-9	
Toluene	**52.0**	ug/m3	5.7	7.45		03/31/15 16:15	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	2.2	1.49		03/30/15 20:25	120-82-1	
1,1,1-Trichloroethane	**2.9**	ug/m3	1.0	1.49		03/30/15 20:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.83	1.49		03/30/15 20:25	79-00-5	
Trichloroethene	ND	ug/m3	0.81	1.49		03/30/15 20:25	79-01-6	
Trichlorofluoromethane	**27.3**	ug/m3	1.7	1.49		03/30/15 20:25	75-69-4	
1,1,2-Trichlorotrifluoroethane	**6.4**	ug/m3	2.4	1.49		03/30/15 20:25	76-13-1	
1,2,4-Trimethylbenzene	**2.1**	ug/m3	1.5	1.49		03/30/15 20:25	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.5	1.49		03/30/15 20:25	108-67-8	
Vinyl acetate	ND	ug/m3	1.1	1.49		03/30/15 20:25	108-05-4	
Vinyl chloride	ND	ug/m3	0.39	1.49		03/30/15 20:25	75-01-4	
m&p-Xylene	**9.4**	ug/m3	2.6	1.49		03/30/15 20:25	179601-23-1	
o-Xylene	**3.2**	ug/m3	1.3	1.49		03/30/15 20:25	95-47-6	
Tentatively Identified Compounds								
Unknown	**13.4**	ppbv		1.49		03/30/15 20:25		N

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300700

Sample: SSV-2 **Lab ID: 10300700004** Collected: 03/25/15 10:33 Received: 03/26/15 12:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR (TICS)	Analytical Method: TO-15							
Tentatively Identified Compounds								
Unknown	**0.63**	ppbv		1.49		03/30/15 20:25		N
Pentane, 2-methyl-	**7.2**	ppbv		1.49		03/30/15 20:25	107-83-5	N
Cyclopentane, methyl-	**2.6**	ppbv		1.49		03/30/15 20:25	96-37-7	N
Hexane, 2-methyl-	**0.34**	ppbv		1.49		03/30/15 20:25	591-76-4	N
Unknown	**0.43**	ppbv		1.49		03/30/15 20:25		N
Cyclohexane, 1,3-dimethy	**0.53**	ppbv		1.49		03/30/15 20:25	638-04-0	N
Unknown	**0.96**	ppbv		1.49		03/30/15 20:25		N
Cyclotrisiloxane, hexame	**0.74**	ppbv		1.49		03/30/15 20:25	541-05-9	N
Unknown	**0.97**	ppbv		1.49		03/30/15 20:25		N
Cyclohexane, 1,1,3-trime	**1.6**	ppbv		1.49		03/30/15 20:25	3073-66-3	N
.alpha.-Pinene	**3.3**	ppbv		1.49		03/30/15 20:25	80-56-8	N
Unknown	**0.46**	ppbv		1.49		03/30/15 20:25		N
Benzene, 1-ethyl-2-methy	**0.51**	ppbv		1.49		03/30/15 20:25	611-14-3	N
Bicyclo[3.1.1]heptane,	**0.90**	ppbv		1.49		03/30/15 20:25	18172-67-3	N
Decane	**0.96**	ppbv		1.49		03/30/15 20:25	124-18-5	N
Unknown	**2.3**	ppbv		1.49		03/30/15 20:25		N
Unknown	**2.6**	ppbv		1.49		03/30/15 20:25		N
Dodecane	**3.8**	ppbv		1.49		03/30/15 20:25	112-40-3	N
Dodecane	**3.1**	ppbv		1.49		03/30/15 20:25	112-40-3	N

Sample: SSV-3 **Lab ID: 10300700005** Collected: 03/25/15 11:52 Received: 03/26/15 12:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR (TICS)	Analytical Method: TO-15							
Acetone	**32.4**	ug/m3	3.0	1.26		03/30/15 21:48	67-64-1	L2
Benzene	**0.98**	ug/m3	0.41	1.26		03/30/15 21:48	71-43-2	
Benzyl chloride	ND	ug/m3	1.3	1.26		03/30/15 21:48	100-44-7	
Bromodichloromethane	ND	ug/m3	1.7	1.26		03/30/15 21:48	75-27-4	
Bromoform	ND	ug/m3	2.6	1.26		03/30/15 21:48	75-25-2	
Bromomethane	ND	ug/m3	1.0	1.26		03/30/15 21:48	74-83-9	
1,3-Butadiene	ND	ug/m3	0.57	1.26		03/30/15 21:48	106-99-0	
2-Butanone (MEK)	**10.1**	ug/m3	0.76	1.26		03/30/15 21:48	78-93-3	
Carbon disulfide	**4.8**	ug/m3	0.79	1.26		03/30/15 21:48	75-15-0	
Carbon tetrachloride	ND	ug/m3	0.81	1.26		03/30/15 21:48	56-23-5	
Chlorobenzene	ND	ug/m3	1.2	1.26		03/30/15 21:48	108-90-7	
Chloroethane	ND	ug/m3	0.68	1.26		03/30/15 21:48	75-00-3	
Chloroform	ND	ug/m3	0.62	1.26		03/30/15 21:48	67-66-3	
Chloromethane	ND	ug/m3	0.53	1.26		03/30/15 21:48	74-87-3	
Cyclohexane	**5.4**	ug/m3	0.88	1.26		03/30/15 21:48	110-82-7	
Dibromochloromethane	ND	ug/m3	2.2	1.26		03/30/15 21:48	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.0	1.26		03/30/15 21:48	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	1.5	1.26		03/30/15 21:48	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	1.5	1.26		03/30/15 21:48	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	1.5	1.26		03/30/15 21:48	106-46-7	

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300700

Sample: SSV-3 **Lab ID: 10300700005** Collected: 03/25/15 11:52 Received: 03/26/15 12:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR (TICS)	Analytical Method: TO-15							
Dichlorodifluoromethane	**2.5**	ug/m3	1.3	1.26		03/30/15 21:48	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.0	1.26		03/30/15 21:48	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.52	1.26		03/30/15 21:48	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.0	1.26		03/30/15 21:48	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	2.5	1.26		03/30/15 21:48	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.0	1.26		03/30/15 21:48	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.2	1.26		03/30/15 21:48	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.2	1.26		03/30/15 21:48	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.2	1.26		03/30/15 21:48	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	1.8	1.26		03/30/15 21:48	76-14-2	
Ethanol	**6.6**	ug/m3	1.2	1.26		03/30/15 21:48	64-17-5	
Ethyl acetate	**2.5**	ug/m3	0.92	1.26		03/30/15 21:48	141-78-6	
Ethylbenzene	ND	ug/m3	1.1	1.26		03/30/15 21:48	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.3	1.26		03/30/15 21:48	622-96-8	
n-Heptane	**3.2**	ug/m3	1.0	1.26		03/30/15 21:48	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	2.8	1.26		03/30/15 21:48	87-68-3	
n-Hexane	**5.6**	ug/m3	0.91	1.26		03/30/15 21:48	110-54-3	
2-Hexanone	ND	ug/m3	1.0	1.26		03/30/15 21:48	591-78-6	
Methylene Chloride	ND	ug/m3	4.4	1.26		03/30/15 21:48	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	2.6	1.26		03/30/15 21:48	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	0.92	1.26		03/30/15 21:48	1634-04-4	
Naphthalene	ND	ug/m3	3.4	1.26		03/30/15 21:48	91-20-3	
2-Propanol	**4.0**	ug/m3	1.6	1.26		03/30/15 21:48	67-63-0	
Propylene	ND	ug/m3	0.44	1.26		03/30/15 21:48	115-07-1	
Styrene	ND	ug/m3	2.7	1.26		03/30/15 21:48	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	0.88	1.26		03/30/15 21:48	79-34-5	
Tetrachloroethene	ND	ug/m3	0.87	1.26		03/30/15 21:48	127-18-4	
Tetrahydrofuran	ND	ug/m3	0.76	1.26		03/30/15 21:48	109-99-9	
Toluene	**16.8**	ug/m3	0.97	1.26		03/30/15 21:48	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	1.9	1.26		03/30/15 21:48	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	0.88	1.26		03/30/15 21:48	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	0.70	1.26		03/30/15 21:48	79-00-5	
Trichloroethene	ND	ug/m3	0.69	1.26		03/30/15 21:48	79-01-6	
Trichlorofluoromethane	ND	ug/m3	1.4	1.26		03/30/15 21:48	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.0	1.26		03/30/15 21:48	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/m3	1.3	1.26		03/30/15 21:48	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.3	1.26		03/30/15 21:48	108-67-8	
Vinyl acetate	ND	ug/m3	0.90	1.26		03/30/15 21:48	108-05-4	
Vinyl chloride	ND	ug/m3	0.33	1.26		03/30/15 21:48	75-01-4	
m&p-Xylene	**2.5**	ug/m3	2.2	1.26		03/30/15 21:48	179601-23-1	
o-Xylene	ND	ug/m3	1.1	1.26		03/30/15 21:48	95-47-6	
Tentatively Identified Compounds								
Unknown	**6.5**	ppbv		1.26		03/30/15 21:48		N
Unknown	**0.26**	ppbv		1.26		03/30/15 21:48		N
Unknown	**0.82**	ppbv		1.26		03/30/15 21:48		N
Pentane, 2-methyl-	**1.6**	ppbv		1.26		03/30/15 21:48	107-83-5	N
Cyclopentane, methyl-	**1.2**	ppbv		1.26		03/30/15 21:48	96-37-7	N

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ANALYTICAL RESULTS

Project: B1500394 Roof Depot
Pace Project No.: 10300700

Sample: SSV-3 **Lab ID: 10300700005** Collected: 03/25/15 11:52 Received: 03/26/15 12:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR (TICS)	Analytical Method: TO-15							
Tentatively Identified Compounds								
Unknown	**0.49**	ppbv		1.26		03/30/15 21:48		N
Unknown	**0.67**	ppbv		1.26		03/30/15 21:48		N
Cyclohexane, 1,3-dimethy	**0.41**	ppbv		1.26		03/30/15 21:48	638-04-0	N
Unknown	**0.69**	ppbv		1.26		03/30/15 21:48		N
Cyclotrisiloxane, hexame	**1.6**	ppbv		1.26		03/30/15 21:48	541-05-9	N
Cyclohexane, 1,1,3-trime	**0.94**	ppbv		1.26		03/30/15 21:48	3073-66-3	N
Unknown	**0.42**	ppbv		1.26		03/30/15 21:48		N
.alpha.-Pinene	**0.68**	ppbv		1.26		03/30/15 21:48	80-56-8	N
Unknown	**0.87**	ppbv		1.26		03/30/15 21:48		N
Unknown	**1.2**	ppbv		1.26		03/30/15 21:48		N
Unknown	**1.2**	ppbv		1.26		03/30/15 21:48		N
Hydroxylamine, O-decyl-	**1.7**	ppbv		1.26		03/30/15 21:48	29812-79-1	N
Unknown	**1.1**	ppbv		1.26		03/30/15 21:48		N
Heptadecane	**2.0**	ppbv		1.26		03/30/15 21:48	629-78-7	N
Unknown	**1.2**	ppbv		1.26		03/30/15 21:48		N

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(612)607-1700

QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300700

QC Batch: AIR/22879 Analysis Method: TO-15
QC Batch Method: TO-15 Analysis Description: TO15 MSV AIR Low Level
Associated Lab Samples: 10300700001, 10300700002, 10300700003, 10300700004, 10300700005

METHOD BLANK: 1928388 Matrix: Air
Associated Lab Samples: 10300700001, 10300700002, 10300700003, 10300700004, 10300700005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	0.70	03/30/15 18:06	
1,1,2,2-Tetrachloroethane	ug/m3	ND	0.70	03/30/15 18:06	
1,1,2-Trichloroethane	ug/m3	ND	0.56	03/30/15 18:06	
1,1,2-Trichlorotrifluoroethane	ug/m3	ND	1.6	03/30/15 18:06	
1,1-Dichloroethane	ug/m3	ND	0.82	03/30/15 18:06	
1,1-Dichloroethene	ug/m3	ND	0.81	03/30/15 18:06	
1,2,4-Trichlorobenzene	ug/m3	ND	1.5	03/30/15 18:06	
1,2,4-Trimethylbenzene	ug/m3	ND	1.0	03/30/15 18:06	
1,2-Dibromoethane (EDB)	ug/m3	ND	1.6	03/30/15 18:06	
1,2-Dichlorobenzene	ug/m3	ND	1.2	03/30/15 18:06	
1,2-Dichloroethane	ug/m3	ND	0.41	03/30/15 18:06	
1,2-Dichloropropane	ug/m3	ND	0.94	03/30/15 18:06	
1,3,5-Trimethylbenzene	ug/m3	ND	1.0	03/30/15 18:06	
1,3-Butadiene	ug/m3	ND	0.45	03/30/15 18:06	
1,3-Dichlorobenzene	ug/m3	ND	1.2	03/30/15 18:06	
1,4-Dichlorobenzene	ug/m3	ND	1.2	03/30/15 18:06	
2-Butanone (MEK)	ug/m3	ND	0.60	03/30/15 18:06	
2-Hexanone	ug/m3	ND	0.83	03/30/15 18:06	
2-Propanol	ug/m3	ND	1.2	03/30/15 18:06	
4-Ethyltoluene	ug/m3	ND	1.0	03/30/15 18:06	
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	2.1	03/30/15 18:06	
Acetone	ug/m3	ND	2.4	03/30/15 18:06	L2
Benzene	ug/m3	ND	0.32	03/30/15 18:06	
Benzyl chloride	ug/m3	ND	1.0	03/30/15 18:06	
Bromodichloromethane	ug/m3	ND	1.4	03/30/15 18:06	
Bromoform	ug/m3	ND	2.1	03/30/15 18:06	
Bromomethane	ug/m3	ND	0.79	03/30/15 18:06	
Carbon disulfide	ug/m3	ND	0.63	03/30/15 18:06	
Carbon tetrachloride	ug/m3	ND	0.64	03/30/15 18:06	
Chlorobenzene	ug/m3	ND	0.94	03/30/15 18:06	
Chloroethane	ug/m3	ND	0.54	03/30/15 18:06	
Chloroform	ug/m3	ND	0.50	03/30/15 18:06	
Chloromethane	ug/m3	ND	0.42	03/30/15 18:06	
cis-1,2-Dichloroethene	ug/m3	ND	2.0	03/30/15 18:06	
cis-1,3-Dichloropropene	ug/m3	ND	0.92	03/30/15 18:06	
Cyclohexane	ug/m3	ND	0.70	03/30/15 18:06	
Dibromochloromethane	ug/m3	ND	1.7	03/30/15 18:06	
Dichlorodifluoromethane	ug/m3	ND	1.0	03/30/15 18:06	
Dichlorotetrafluoroethane	ug/m3	ND	1.4	03/30/15 18:06	
Ethanol	ug/m3	ND	0.96	03/30/15 18:06	
Ethyl acetate	ug/m3	ND	0.73	03/30/15 18:06	

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1700 Elm Street - Suite 200
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(612)607-1700

QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300700

METHOD BLANK: 1928388 Matrix: Air
Associated Lab Samples: 10300700001, 10300700002, 10300700003, 10300700004, 10300700005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylbenzene	ug/m3	ND	0.88	03/30/15 18:06	
Hexachloro-1,3-butadiene	ug/m3	ND	2.2	03/30/15 18:06	
m&p-Xylene	ug/m3	ND	1.8	03/30/15 18:06	
Methyl-tert-butyl ether	ug/m3	ND	0.73	03/30/15 18:06	
Methylene Chloride	ug/m3	ND	3.5	03/30/15 18:06	
n-Heptane	ug/m3	ND	0.83	03/30/15 18:06	
n-Hexane	ug/m3	ND	0.72	03/30/15 18:06	
Naphthalene	ug/m3	ND	2.7	03/30/15 18:06	
o-Xylene	ug/m3	ND	0.88	03/30/15 18:06	
Propylene	ug/m3	ND	0.35	03/30/15 18:06	
Styrene	ug/m3	ND	2.2	03/30/15 18:06	
Tetrachloroethene	ug/m3	ND	0.69	03/30/15 18:06	
Tetrahydrofuran	ug/m3	ND	0.60	03/30/15 18:06	
Toluene	ug/m3	ND	0.77	03/30/15 18:06	
trans-1,2-Dichloroethene	ug/m3	ND	0.81	03/30/15 18:06	
trans-1,3-Dichloropropene	ug/m3	ND	0.92	03/30/15 18:06	
Trichloroethene	ug/m3	ND	0.55	03/30/15 18:06	
Trichlorofluoromethane	ug/m3	ND	1.1	03/30/15 18:06	
Vinyl acetate	ug/m3	ND	0.72	03/30/15 18:06	
Vinyl chloride	ug/m3	ND	0.26	03/30/15 18:06	

LABORATORY CONTROL SAMPLE: 1928389

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/m3	55.5	49.3	89	72-140	
1,1,2,2-Tetrachloroethane	ug/m3	69.8	57.7	83	68-137	
1,1,2-Trichloroethane	ug/m3	55.5	50.4	91	66-138	
1,1,2-Trichlorotrifluoroethane	ug/m3	77.9	67.2	86	70-132	
1,1-Dichloroethane	ug/m3	41.2	35.2	85	68-137	
1,1-Dichloroethene	ug/m3	40.3	32.9	82	73-138	
1,2,4-Trichlorobenzene	ug/m3	75.5	95.1	126	48-150	
1,2,4-Trimethylbenzene	ug/m3	50	61.4	123	75-134	
1,2-Dibromoethane (EDB)	ug/m3	78.1	76.1	97	75-132	
1,2-Dichlorobenzene	ug/m3	61.2	74.9	122	71-129	
1,2-Dichloroethane	ug/m3	41.2	30.8	75	73-139	
1,2-Dichloropropane	ug/m3	47	44.3	94	70-130	
1,3,5-Trimethylbenzene	ug/m3	50	62.3	125	75-133	
1,3-Butadiene	ug/m3	22.5	19.2	85	66-135	
1,3-Dichlorobenzene	ug/m3	61.2	75.0	123	75-131	
1,4-Dichlorobenzene	ug/m3	61.2	67.3	110	69-135	
2-Butanone (MEK)	ug/m3	30	27.6	92	67-131	
2-Hexanone	ug/m3	41.7	41.2	99	72-130	
2-Propanol	ug/m3	25	20.7	83	66-133	
4-Ethyltoluene	ug/m3	50	57.9	116	75-130	

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(612)607-1700

QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300700

LABORATORY CONTROL SAMPLE: 1928389

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
4-Methyl-2-pentanone (MIBK)	ug/m3	41.7	40.6	97	68-134	
Acetone	ug/m3	24.2	15.0	62	63-144	L2
Benzene	ug/m3	32.5	30.6	94	64-139	
Benzyl chloride	ug/m3	52.5	52.5	100	75-129	
Bromodichloromethane	ug/m3	68.2	62.3	91	75-134	
Bromoform	ug/m3	105	114	109	72-130	
Bromomethane	ug/m3	39.5	31.4	79	71-132	
Carbon disulfide	ug/m3	31.7	26.7	84	56-139	
Carbon tetrachloride	ug/m3	64	62.8	98	75-150	
Chlorobenzene	ug/m3	46.8	42.8	91	71-132	
Chloroethane	ug/m3	26.8	21.7	81	71-129	
Chloroform	ug/m3	49.7	40.1	81	73-136	
Chloromethane	ug/m3	21	16.0	76	52-143	
cis-1,2-Dichloroethene	ug/m3	40.3	36.2	90	64-137	
cis-1,3-Dichloropropene	ug/m3	46.2	54.2	117	75-128	
Cyclohexane	ug/m3	35	32.8	94	62-143	
Dibromochloromethane	ug/m3	86.6	86.4	100	75-136	
Dichlorodifluoromethane	ug/m3	50.3	41.5	83	70-141	
Dichlorotetrafluoroethane	ug/m3	71.1	56.2	79	71-139	
Ethanol	ug/m3	19.2	17.5	91	60-144	
Ethyl acetate	ug/m3	36.6	27.8	76	64-137	
Ethylbenzene	ug/m3	44.2	49.8	113	71-136	
Hexachloro-1,3-butadiene	ug/m3	108	90.8	84	51-150	
m&p-Xylene	ug/m3	44.2	47.2	107	71-134	
Methyl-tert-butyl ether	ug/m3	36.7	42.2	115	73-134	
Methylene Chloride	ug/m3	35.3	26.8	76	64-130	
n-Heptane	ug/m3	41.7	39.2	94	63-135	
n-Hexane	ug/m3	35.8	29.8	83	69-135	
Naphthalene	ug/m3	53.3	68.2	128	43-150	
o-Xylene	ug/m3	44.2	47.6	108	75-134	
Propylene	ug/m3	17.5	13.4	77	58-135	
Styrene	ug/m3	43.3	40.9	94	75-133	
Tetrachloroethene	ug/m3	69	69.4	101	66-137	
Tetrahydrofuran	ug/m3	30	25.0	83	58-135	
Toluene	ug/m3	38.3	37.2	97	70-129	
trans-1,2-Dichloroethene	ug/m3	40.3	34.0	84	61-140	
trans-1,3-Dichloropropene	ug/m3	46.2	40.6	88	75-134	
Trichloroethene	ug/m3	54.6	55.8	102	70-134	
Trichlorofluoromethane	ug/m3	57.1	43.8	77	67-140	
Vinyl acetate	ug/m3	35.8	31.8	89	60-139	
Vinyl chloride	ug/m3	26	21.9	84	72-129	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300700

SAMPLE DUPLICATE: 1928954

Parameter	Units	10300883002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	ND		25	
1,1,2,2-Tetrachloroethane	ug/m3	ND	ND		25	
1,1,2-Trichloroethane	ug/m3	ND	ND		25	
1,1,2-Trichlorotrifluoroethane	ug/m3	ND	ND		25	
1,1-Dichloroethane	ug/m3	ND	ND		25	
1,1-Dichloroethene	ug/m3	ND	ND		25	
1,2,4-Trichlorobenzene	ug/m3	ND	ND		25	
1,2,4-Trimethylbenzene	ug/m3	2.1	2.1	1	25	
1,2-Dibromoethane (EDB)	ug/m3	ND	ND		25	
1,2-Dichlorobenzene	ug/m3	ND	ND		25	
1,2-Dichloroethane	ug/m3	ND	ND		25	
1,2-Dichloropropane	ug/m3	ND	ND		25	
1,3,5-Trimethylbenzene	ug/m3	ND	ND		25	
1,3-Butadiene	ug/m3	ND	ND		25	
1,3-Dichlorobenzene	ug/m3	ND	ND		25	
1,4-Dichlorobenzene	ug/m3	ND	ND		25	
2-Butanone (MEK)	ug/m3	2.0	2.0	2	25	
2-Hexanone	ug/m3	ND	ND		25	
2-Propanol	ug/m3	12.7	12.7	0	25	
4-Ethyltoluene	ug/m3	ND	.77J		25	
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	ND		25	
Acetone	ug/m3	9.1	8.6	6	25	L2
Benzene	ug/m3	4.3	4.2	2	25	
Benzyl chloride	ug/m3	ND	ND		25	
Bromodichloromethane	ug/m3	ND	ND		25	
Bromoform	ug/m3	ND	ND		25	
Bromomethane	ug/m3	ND	ND		25	
Carbon disulfide	ug/m3	ND	ND		25	
Carbon tetrachloride	ug/m3	ND	ND		25	
Chlorobenzene	ug/m3	ND	ND		25	
Chloroethane	ug/m3	ND	ND		25	
Chloroform	ug/m3	ND	ND		25	
Chloromethane	ug/m3	ND	ND		25	
cis-1,2-Dichloroethene	ug/m3	ND	ND		25	
cis-1,3-Dichloropropene	ug/m3	ND	ND		25	
Cyclohexane	ug/m3	4.8	4.7	1	25	
Dibromochloromethane	ug/m3	ND	ND		25	
Dichlorodifluoromethane	ug/m3	1.7	1.6	6	25	
Dichlorotetrafluoroethane	ug/m3	ND	ND		25	
Ethanol	ug/m3	2.8	2.8	2	25	
Ethyl acetate	ug/m3	ND	ND		25	
Ethylbenzene	ug/m3	17.3	17.0	2	25	
Hexachloro-1,3-butadiene	ug/m3	ND	ND		25	
m&p-Xylene	ug/m3	45.6	44.9	2	25	
Methyl-tert-butyl ether	ug/m3	ND	ND		25	
Methylene Chloride	ug/m3	ND	ND		25	
n-Heptane	ug/m3	7.0	6.8	3	25	

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QUALITY CONTROL DATA

Project: B1500394 Roof Depot
Pace Project No.: 10300700

SAMPLE DUPLICATE: 1928954

Parameter	Units	10300883002 Result	Dup Result	RPD	Max RPD	Qualifiers
n-Hexane	ug/m3	9.3	8.7	6	25	
Naphthalene	ug/m3	ND	ND		25	
o-Xylene	ug/m3	14.2	14.0	1	25	
Propylene	ug/m3	ND	ND		25	
Styrene	ug/m3	ND	ND		25	
Tetrachloroethene	ug/m3	ND	ND		25	
Tetrahydrofuran	ug/m3	ND	ND		25	
Toluene	ug/m3	12.0	11.8	2	25	
trans-1,2-Dichloroethene	ug/m3	ND	ND		25	
trans-1,3-Dichloropropene	ug/m3	ND	ND		25	
Trichloroethene	ug/m3	ND	ND		25	
Trichlorofluoromethane	ug/m3	ND	.86J		25	
Vinyl acetate	ug/m3	ND	ND		25	
Vinyl chloride	ug/m3	ND	ND		25	

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QUALIFIERS

Project: B1500394 Roof Depot
Pace Project No.: 10300700

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

E	Analyte concentration exceeded the calibration range. The reported result is estimated.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results may be biased low.
N	Tentatively identified compound (TIC) based on mass spectral library search

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(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: B1500394 Roof Depot
Pace Project No.: 10300700

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10300700001	**SV-1**	TO-15	AIR/22879		
10300700002	**SV-2**	TO-15	AIR/22879		
10300700003	**SSV-1**	TO-15	AIR/22879		
10300700004	**SSV-2**	TO-15	AIR/22879		
10300700005	**SSV-3**	TO-15	AIR/22879		

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10300 700

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AIR: CHAIN-OF-CUSTODY / Analytical Request Document

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

14460

Page: of

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Brown Intertec	Report To: Jeremy Hansen	Attention:
Address: 11001 Hampshire Ave S. Bloomington, MN 55438	Copy To:	Company Name:
		Address:
Email To: jhansen@Brownintertec.com	Purchase Order No.:	Pace Quote Reference:
Phone: 952.995.2464 Fax: 952.995.2020	Project Name: Roof Depot JF	Pace Project Manager/Sales Rep.
Requested Due Date/TAT:	Project Number: ~~B15 00734~~ B1500394	Pace Profile #:

Program: UST / Superfund / Emissions / Clean Air Act / Voluntary Clean Up / Dry Clean / RCRA / Other____

Location of Sampling by State _____

Reporting Units: ug/m³___ mg/m³___ PPBV___ PPMV___ Other___

Report Level II.___ III.___ IV.___ Other____

Method:

ITEM #	Section D Required Client Information — AIR SAMPLE ID (Sample IDs MUST BE UNIQUE)	MEDIA CODE	PID Reading (Client only)	COLLECTED: COMPOSITE START END/GRAB DATE	TIME	COMPOSITE - DATE	TIME	Canister Pressure (Initial Field - psig)	Canister Pressure (Final Field - psig)	Summa Can Number	Flow Control Number	PM10	3C- Fixed Gas (%)	TO-3	TO-3M (Methane)	TO-4 (PCBs)	TO-13 (PAH)	TO-14	TO-15	TO15 Short List*	Pace Lab ID
1	SV-1		0.7	3-25-15	1315			-29	0	2059									X		001
2	SV-2		0.3	3-25-15	1045			-27	0	2040									X		002
3	SSV-1		0.0	3-25-15	1426			-28	-4	2690									X		003
4	SSV-2		0.0	3-25-15	1033			-22	-4	947									X		004
5	SSV-3		0.0	3-25-15	1152			-28	-0	2026									X		005
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Valid Media Codes

MEDIA	CODE
Tedlar Bag	TB
1 Liter Summa Can	1LC
6 Liter Summa Can	6LC
Low Volume Puff	LVP
High Volume Puff	HVP
Other	PM10

Comments :

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Jake Friederichs / Brown	3-25-15		[signature] / Pace DL	3/25/15	1610
[signature] / Pace DL	3/25/15	1630	[signature]	3/26/15	1000
[signature]	3/26/15	1210	[signature] pace	32615	1210

SAMPLE CONDITIONS

Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact
21	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
AMB	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jake Friederichs

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM / DD / YY): 3-25-15

ORIGINAL

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414 Air Technical Phone: 612.607.6386

Pace Analytical	Document Name: Air Sample Condition Upon Receipt	Document Revised: 26Dec2013 Page 1 of 1
	Document No.: F-MN-A-106-rev.09	Issuing Authority: Pace Minnesota Quality Office

Air Sample Condition Upon Receipt

Client Name: Braun Intertec

Project #: WO#: 10300700

10300700

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

Tracking Number: _____

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

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ Foam ☑ None ☐ Other: _____ **Temp Blank rec:** ☐ Yes ☑ No

Temp. (TO17 and TO13 samples only) (°C): ✓ **Corrected Temp (°C):** ✓ **Thermom. Used:** ☐ B88A912167504 ☐ B88A9132521491 ☐ 72337080 ☐ 80512447

Temp should be above freezing to 6°C **Correction Factor:** ✓ **Date & Initials of Person Examining Contents:** ✓ 32615

Type of ice Received ☐ Blue ☐ Wet ☑ None

				Comments:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☑ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	7.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Media: air can				11.
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	12.

Samples Received: rec 2 gauges

Canisters		Flow Controllers		Stand Alone G	
Sample Number	Can ID	Sample Number	Can ID	Sample Number	Can ID
SV-1	2059				
SV-2	2040				
SSV-1	2690				
SSV-2	0947				
SSV-3	2026				

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

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [signature] **Date:** 3/26/15

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)

Hammel, Green and Abrahamson, Inc.
420 5th Street North, Suite 100
Minneapolis, Minnesota USA 55401

CITY OF MINNEAPOLIS WATER DISTRIBUTION SERVICES CENTER LOCATION WORKFLOW ANALYSIS

Final Report

July 2, 2013

Prepared for:

Minneapolis Public Works:
Water Treatment & Distribution Services

Author: Sean Bergstedt
Lead Industrial Engineer: Brent Peterson, PE
Project Manager: Kenny Horns, PE, LEED AP

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- Purpose
- Data
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  1. Assumptions
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- Narratives
  1. Security
  2. Co-location
  3. Storage
  4. Equipment
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- Appendices

Purpose

- Evaluate the movement implications of consolidating to either Fridley or Hiawatha sites for work order trips and vehicular movements associated with service center operations and meter operations

- Explore the advantages of consolidating the metering service and repair functions.

- Explore the advantages of consolidating the warehouse and distribution functions.

Data

What information was used to perform the analysis?

- Work order data from *Enquesta* for the meter shop and the east side yard.
- Projected work planning summaries based on foreman experience
- Site observations
- Institutional knowledge of operations

Contacts for Detailed Questions

• Karen Mosel & Ali	-	Work orders
• Bill Dougherty Mark Ebert	-	Warehouse or "in-and-out"
• Roy Richardson	-	Fridley warehouse
• John Wertjes	-	Traffic control information
• Bob Ervin & Nate Wold	-	Vehicles & fleet, equipment storage, heating and temperatures
• Mike Schelkoph Dean Anderson	-	Metering
• Bill Dougherty	-	Hydrants (procurement, storage, stock & inventory)

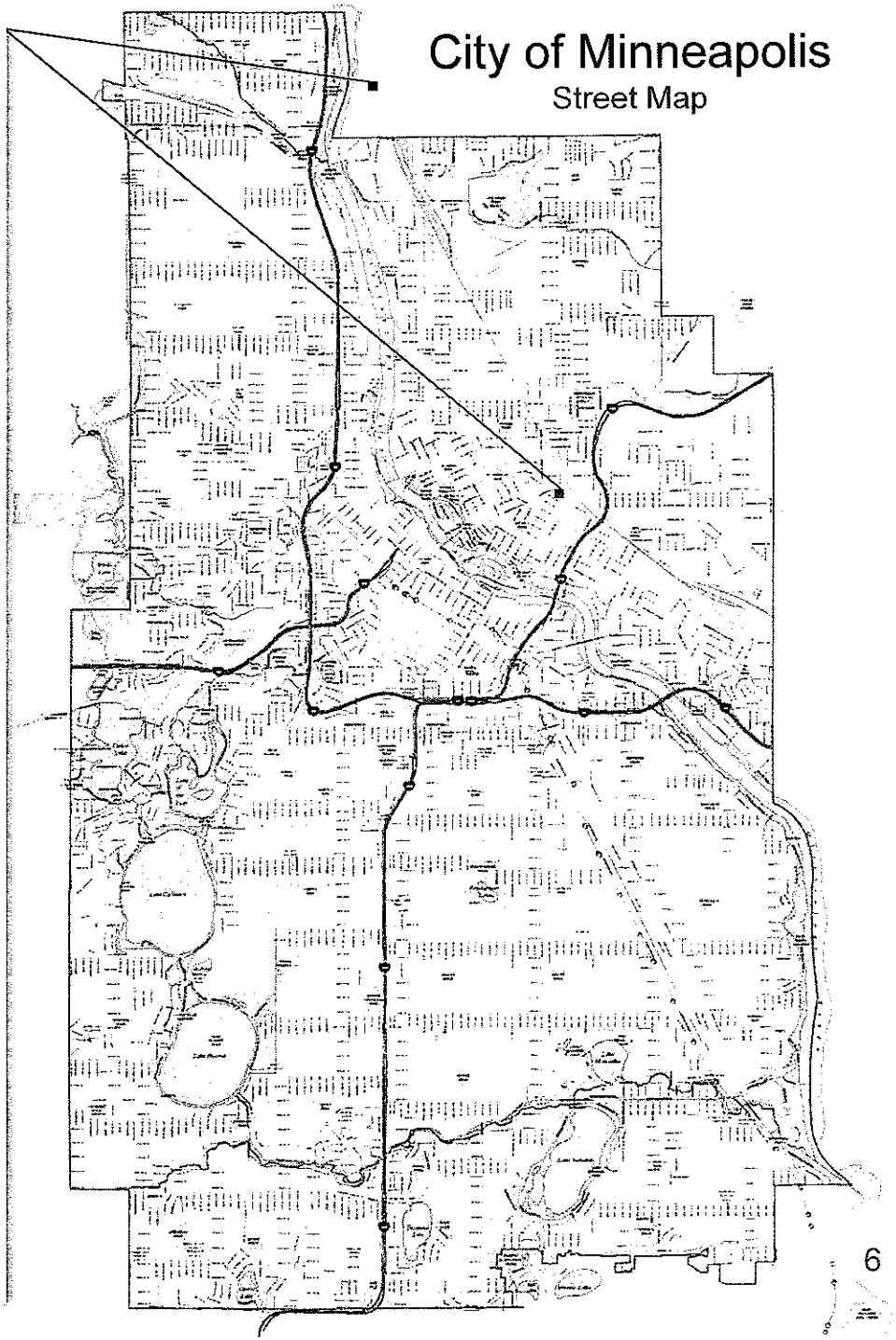
WORK ORDER DATA

FROM: Karen Moselle, Ali Solemohamed, Laura Loberg, and Anita Birmingham

Work Order Data (meter shop + East Side Yard [ESY]):

1. Crew types deployed per work order
2. Quantity of each crew type deployed
3. City address location of deployment for each crew
4. Work order description
5. Frequency of orders with seasonal variations
6. Distances relative to proposed sites

WORKORDERYEAR	ORDERTYPE	DESCRIPTION
2011	198	MIU/ERT REPAIR-COLD PCK
2011	318	CC TURN-OFF
2011	211	CS PROPERTY VACANT
2011	192	RO REMOTE ONLY EXCHG
2011	62	FINAL BILL SET NEW ACCT
2011	320	CC COLLECTIONS TURN ON
2011	318	CC TURN-OFF
2011	64	FINAL BILL SET NEW ACCT
2011	231	SP PROJECT - AMR REPAIR
2011	64	FINAL BILL SET NEW ACCT
2011	318	CC TURN-OFF
2011	211	CS PROPERTY VACANT
2011	211	CS PROPERTY VACANT
2011	67	CC FINAL OUT DELQ ACCT
	•	
	•	
	•	
2013	64	FINAL BILL SET NEW ACCT
2013	211	CS PROPERTY VACANT
2013	198	MIU/ERT REPAIR-COLD PCK
2013	198	MIU/ERT REPAIR-COLD PCK
2013	264	FNL BILL AMR/MTR RPR

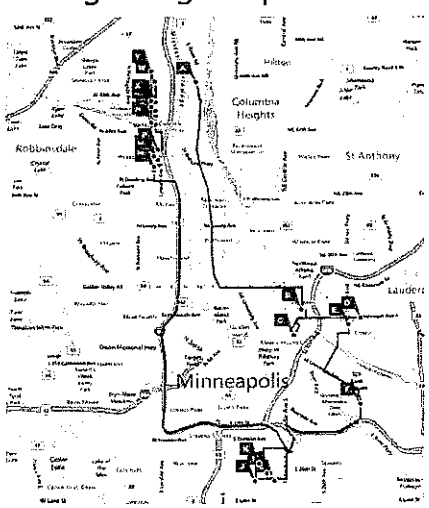


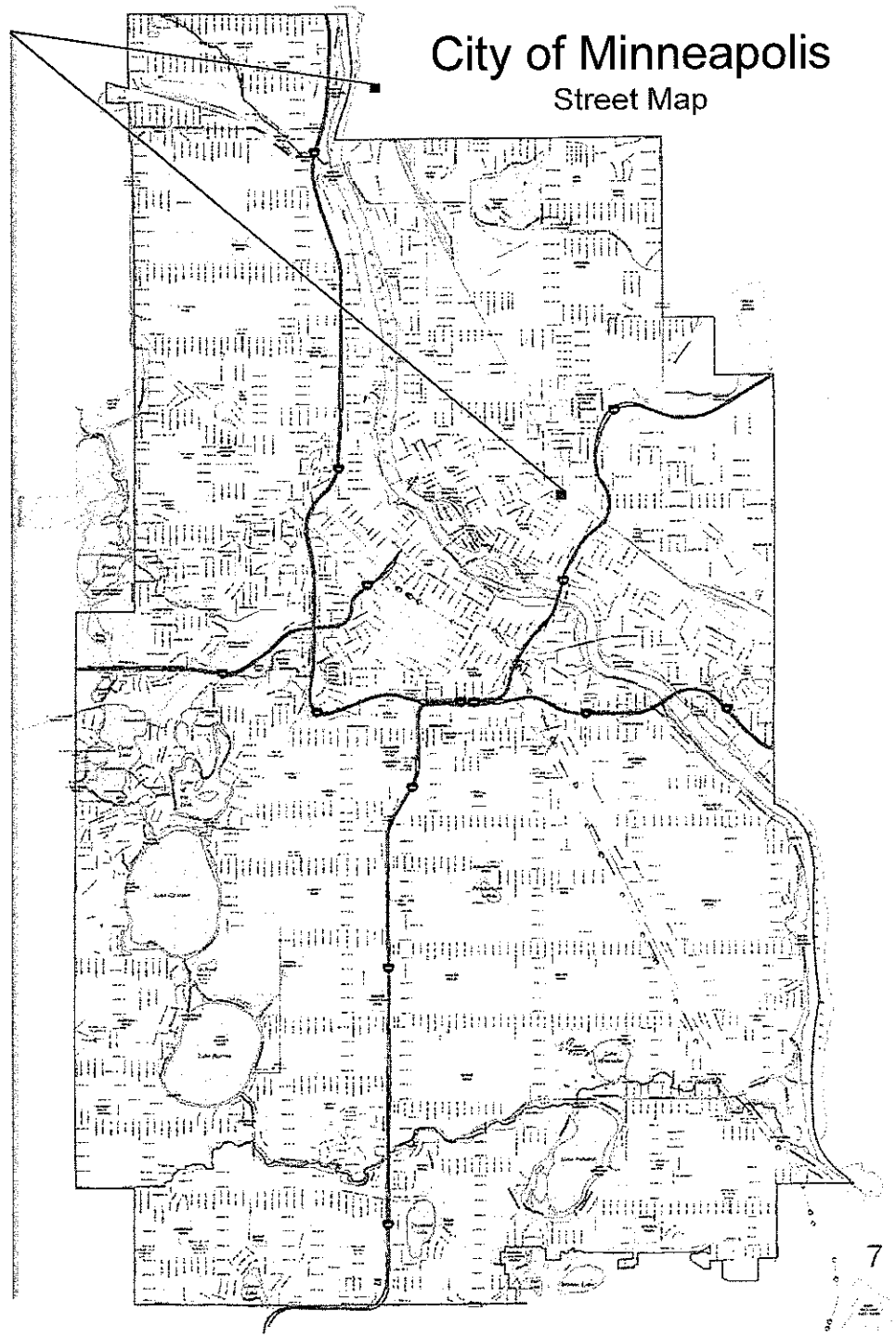
Work Order Data (meter shop + ESY):

1. I wrote a script to geocoded distances to each of the proposed facility addresses (160,000 data addresses)

Concatenated Address	Fridley Dist	Hiawatha Dist
4404 ABBOTT AVE S	15.54899646	5.608028335
2407 ALDRICH AVE N	3.699745231	5.954141552
2414 ALDRICH AVE N	3.681103585	6.049835332
2125 ALDRICH AVE N	3.905424719	5.748462064
3701 ABBOTT AVE S	15.34393836	6.231280681
3841 ABBOTT AVE S	15.33026782	6.451873485
4011 ALDRICH AVE N	1.657863667	7.558565836
3939 ALDRICH AVE N	1.696389735	7.487106195

2. Validated travel distances on a sample set of addresses using Bing maps manually



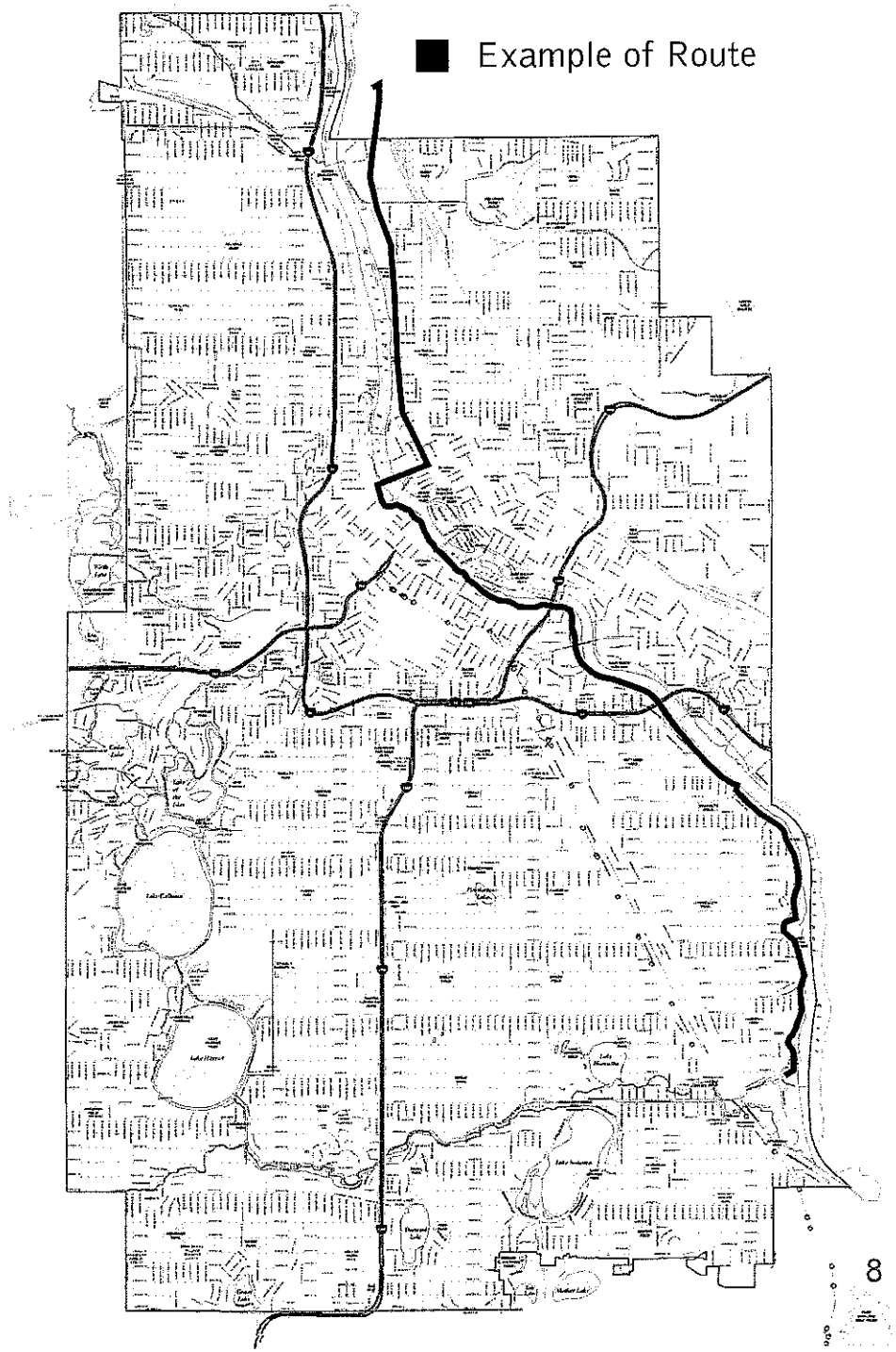


Shortest Path Routing:

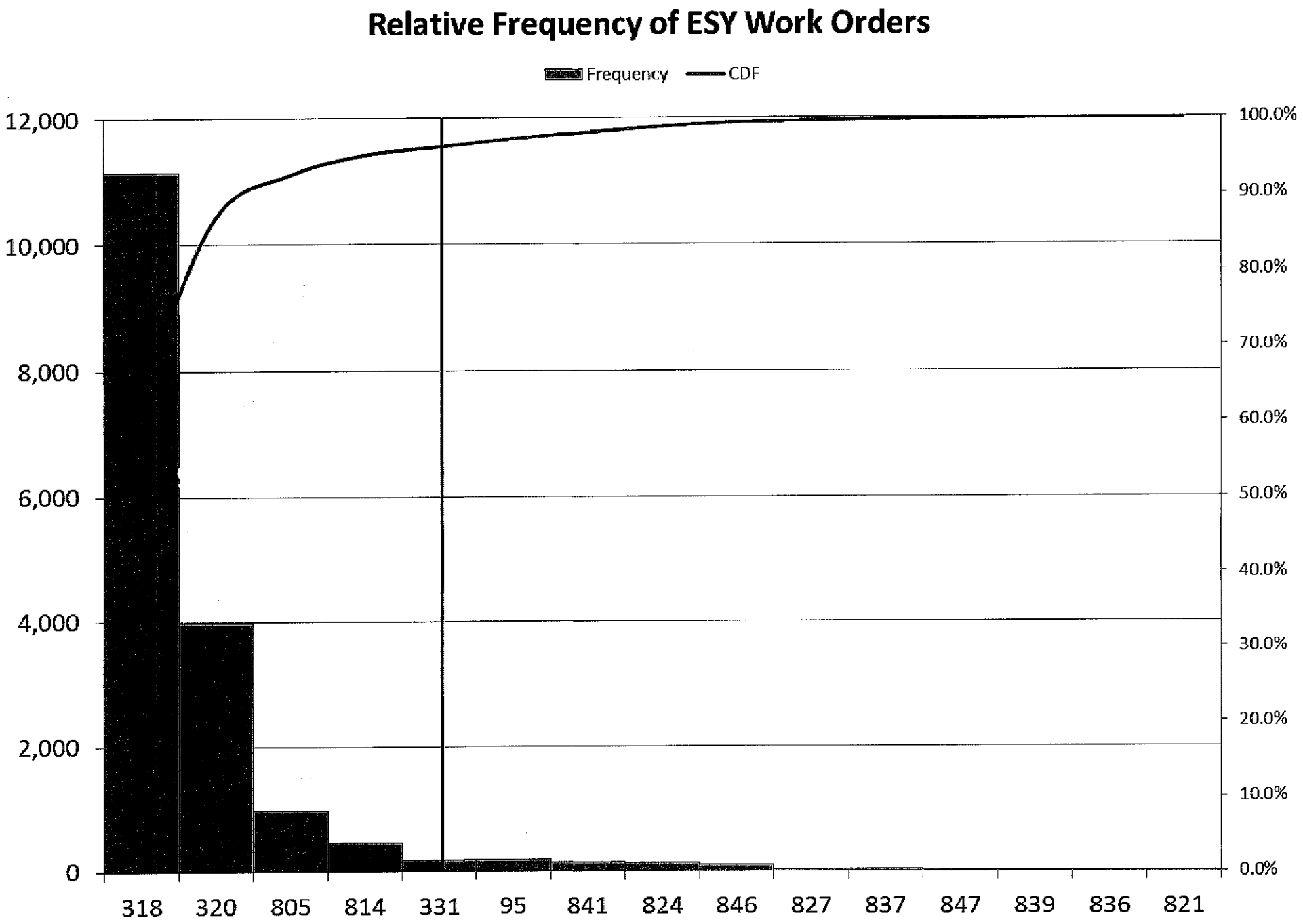
Discussion with user group brought to light the importance of calculating travel paths not on freeway travel.

Jim Jarosz volunteered to walk me through the Minneapolis map and show me the well established non-traffic travel paths that have been established as part of institutional knowledge

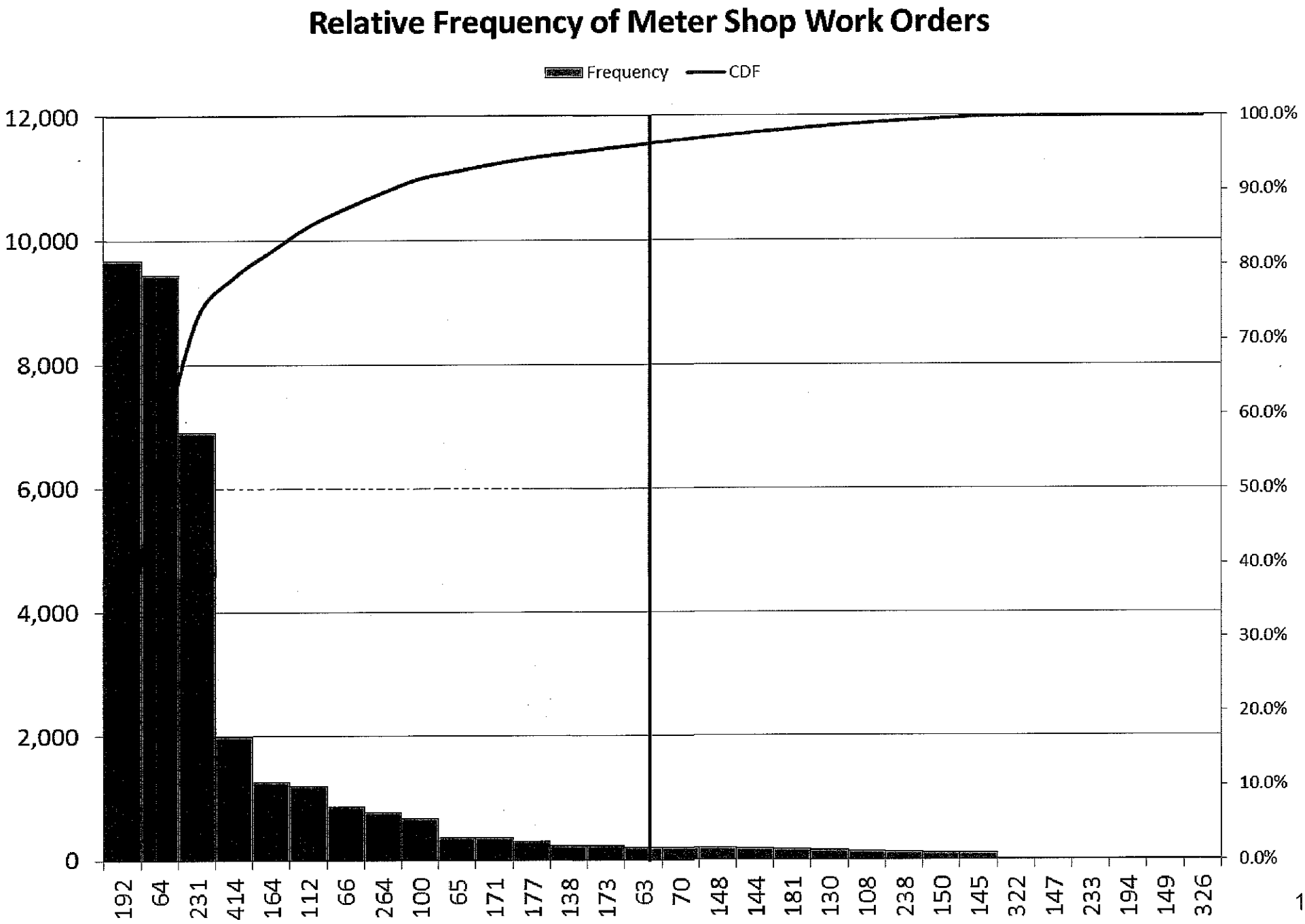
Although the travel path distances used in calculations are not the *exact* path of travel. A shortest path estimate is used as an approximation.



DISTRIBUTION OF WORK ORDERS – ESY



DISTRIBUTION OF WORK ORDERS – METER SHOP



PROJECTED ANNUAL TRAVEL DISTANCE

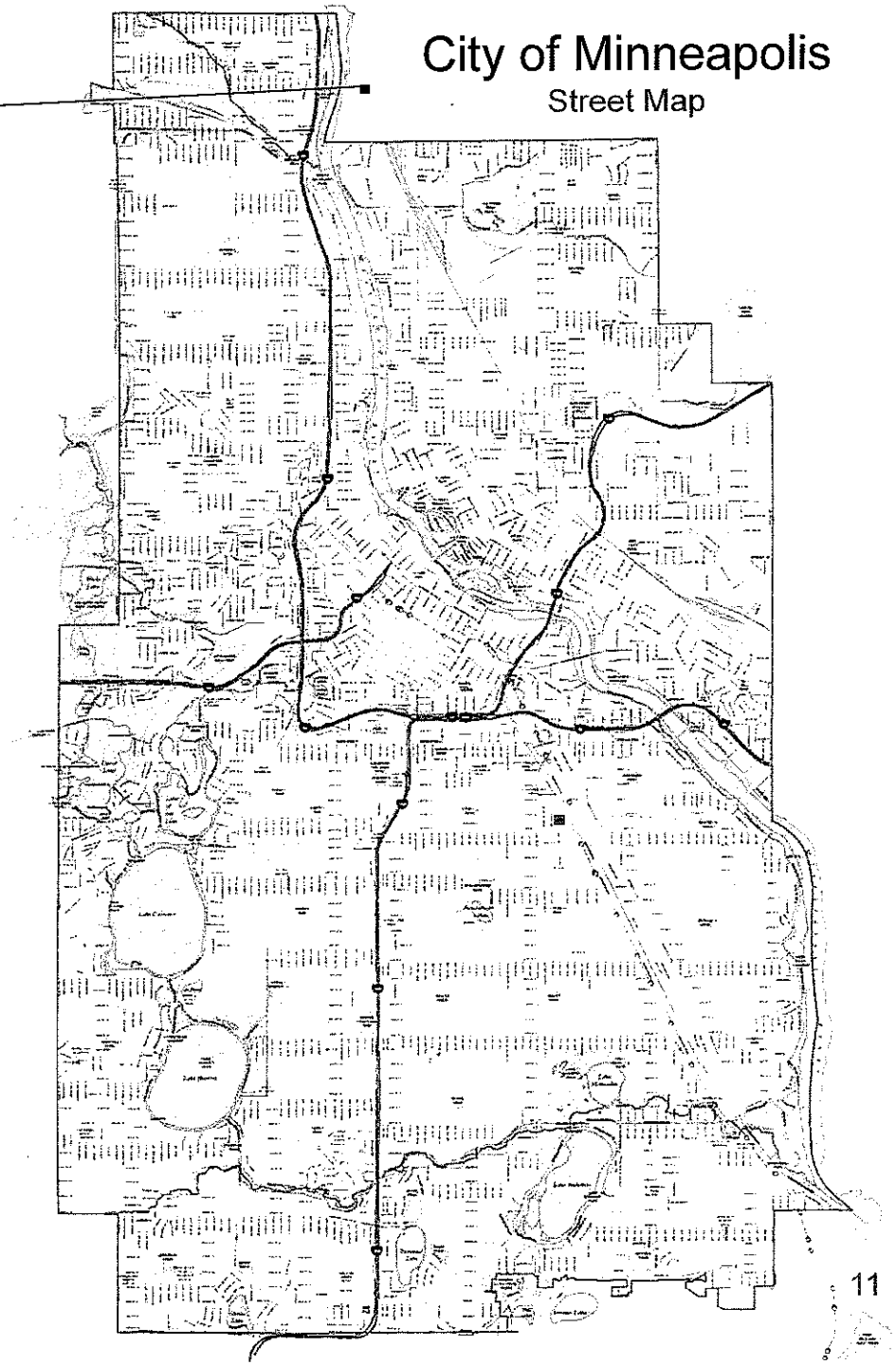
■ Fridley

(Mileage calculated form enquesta)

ESY	Miles/yr
Leaks, Cleaning, and Lining	25,467
Postings	14,462
318 (Delinquent Turnoffs)	14,462
320 (Turn-ons)	14,126
805 (Turnoff for repair)	7,404
814 (Stopbox repair)	846
95 (Vacant Turnoff)	1,249
	78,016

Meter Shop	Miles/yr
192	27,694
64	8,915
231	10,697
414	5,192
164	4,359
112	4,980
66	2,890
264	2,311
100	2,130
65	1,090
171	1,059
	71,317

TOTAL: **149,333**



PROJECTED ANNUAL TRAVEL DISTANCE

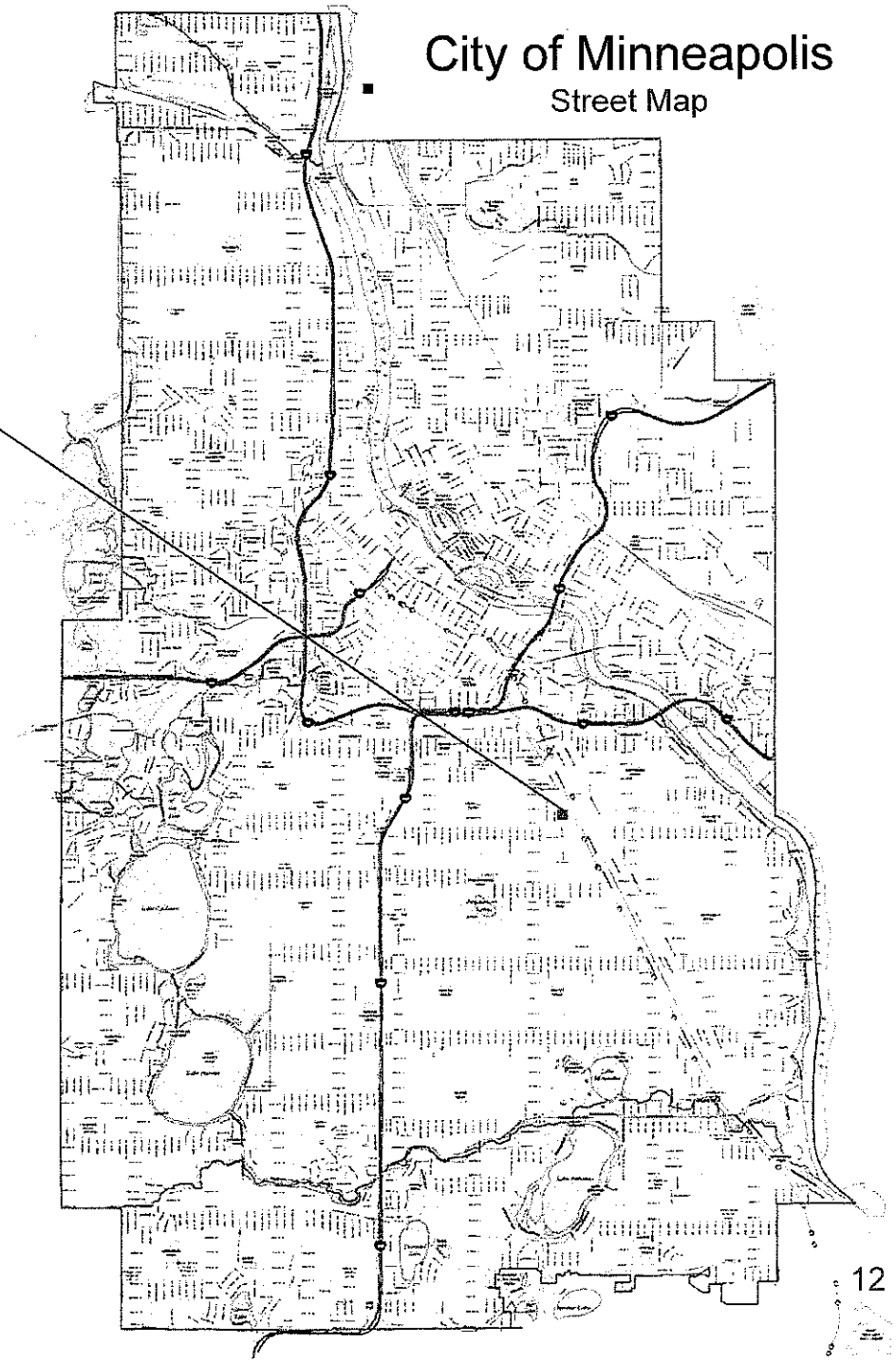
■ Hiawatha

(Mileage calculated form enquesta)

ESY	Miles/yr
Leaks, Cleaning, and Lining	16,875
Postings	9,601
318 (Delinquent Turnoffs)	9,601
320 (Turn-ons)	9,357
805 (Turnoff for repair)	3,974
814 (Stopbox repair)	557
95 (Vacant Turnoff)	919
	50,884

Meter Shop	Miles/yr
192	15,303
64	5,371
231	5,869
414	3,729
164	2,897
112	2,304
66	2,185
264	1,128
100	1,425
65	740
171	494
	41,445

TOTAL:	**92,329**
	+38%
Advantage:	**57,004**



Summary of Transportation Miles

	ESY Miles	Meter Shop Miles	TOTAL
Fridley	78,016	71,317	**149,333**
Hiawatha	50,884	41,445	**92,329**
		Δ =	57,004

The calculated miles that contribute directly to the *difference* in travel between the propose sites equate to 57k miles. The reader should be aware that the mileage values do not include:

1. Side excursions
2. Interstitial travel (travel between the first site to the last destination of the day)

Analysis of Routing Assumption

Key Assumptions:

1. For those work orders such as turnoff/turn-ons (318s/320s/postings) that have multiple destinations on the same day, only the first trip of the day and the last trip matters to the *difference* in travel between the two sites. Therefore, only the first trip and the last trip are included in the distance calculations.
2. Workers who are on these special routes, will always take the optimal path of travel.

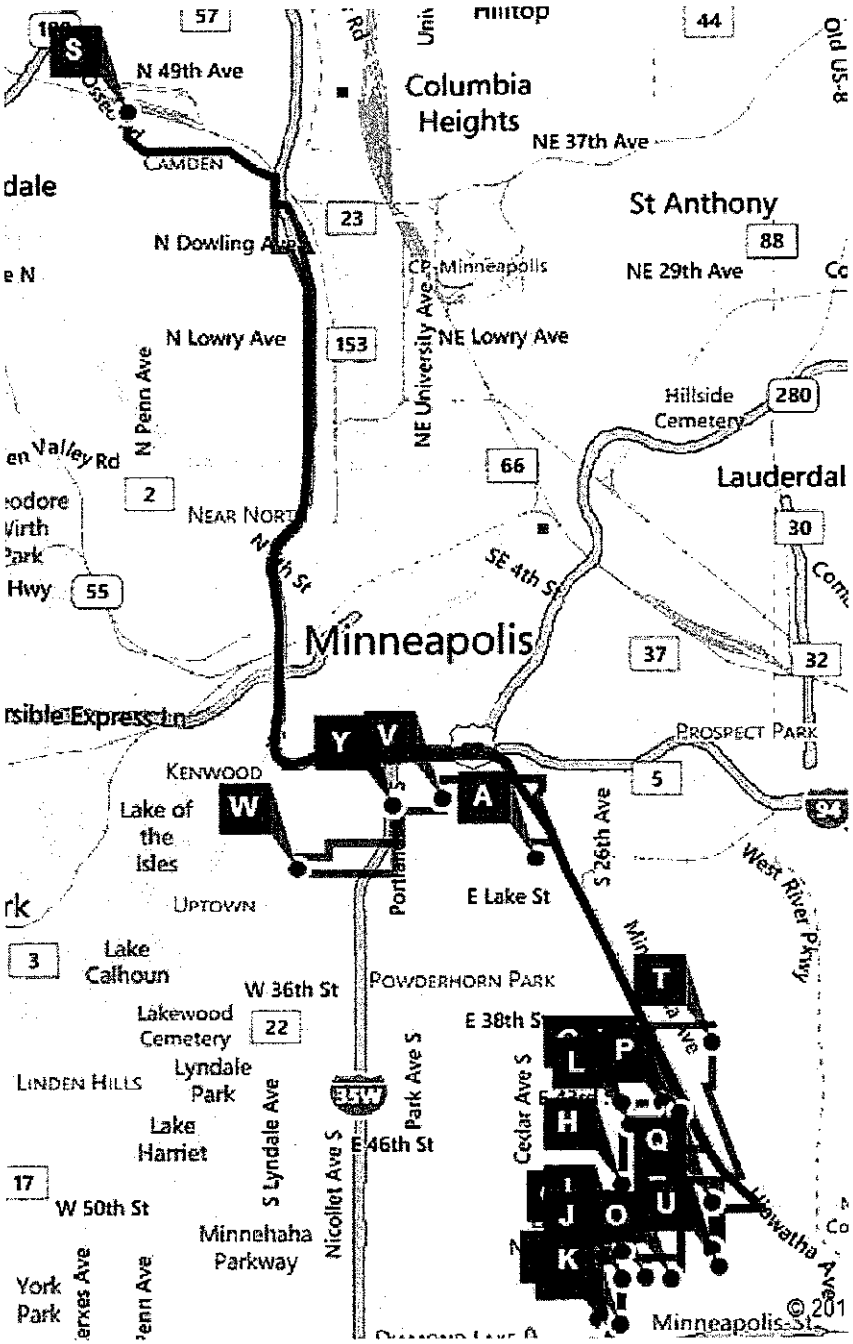
Example:

Assume there are A – Y destinations in a day for a single truck, where A is the starting destination, Y is the ending destination (Fridley or Hiawatha), and B is the first destination of the day. The only distances that are included in my calculation are A to B and X to Y.

$$A \rightarrow \boxed{B} \rightarrow C \rightarrow \cdots \rightarrow W \rightarrow \boxed{X} \rightarrow Y$$

- ☐ Included in distance calculation
- ☐ Excluded in distance calculation

The assumption means that from destination B to destination X, there is no *difference* between the travel paths whether you come from Fridley or Hiawatha. This assumption was posed to a foremen at the eastside yard and was deemed reasonable.



Analysis of Routing Assumption

Key Assumptions (continued):

1. In addition, it is assumed that the previous assumptions discount the total miles travelled slightly due to unaccounted for excursions, travel path error, suboptimal routing, and other miscellaneous travel.

Thus,

$$Dist_{actual} = \{\overrightarrow{AB} + \overrightarrow{XY}\} + \{\overrightarrow{BC} + \cdots + \overrightarrow{WX}\} + e + r + p + m$$

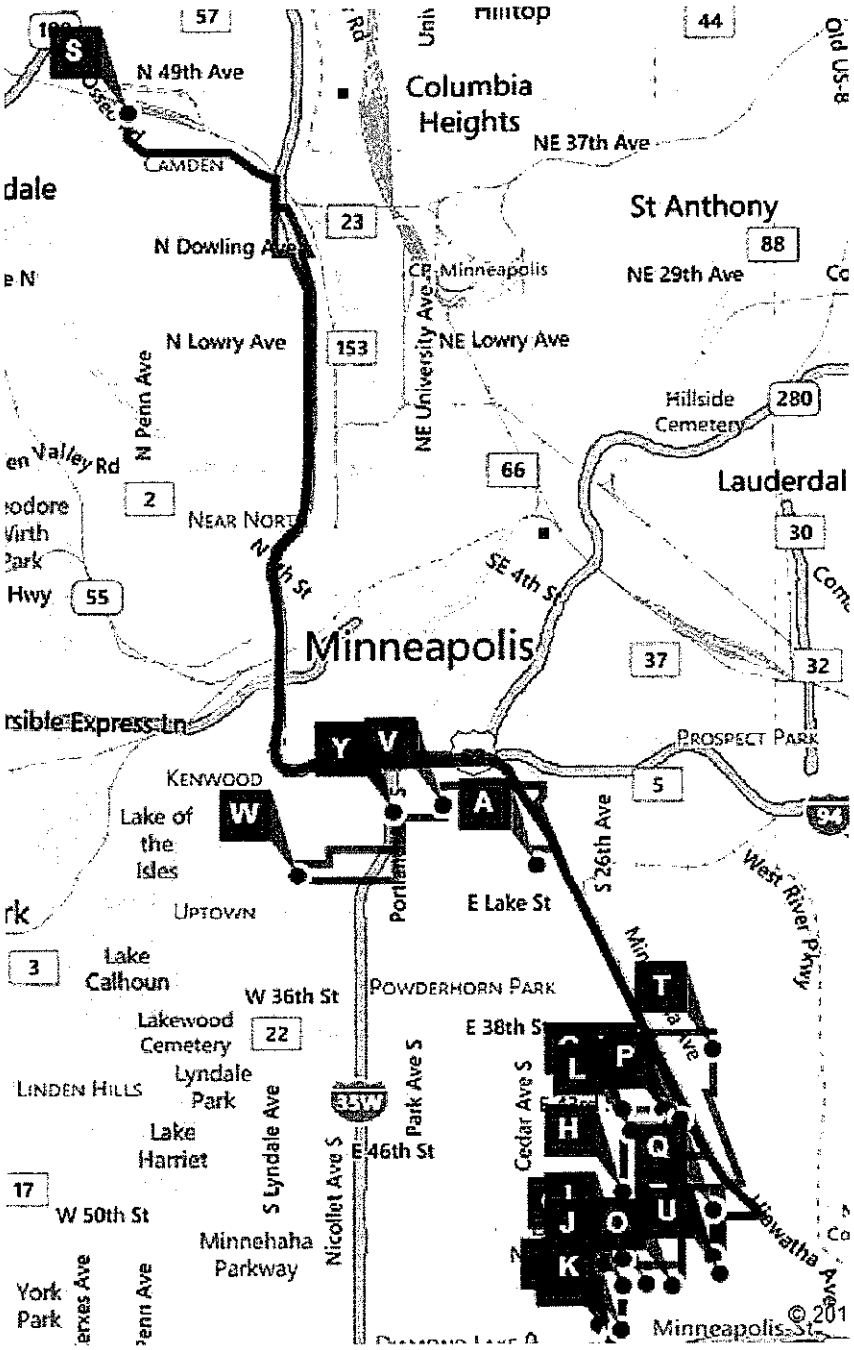
Where,

$$e = unaccounted\ for\ excursions$$
$$r = suboptimal\ routing$$
$$p = path\ error$$
$$m = miscellaneous$$

$$Dist_{study} = \{\overrightarrow{AB} + \overrightarrow{XY}\}$$

$$\frac{Dist_{study}}{Dist_{actual}} = \left\{\underbrace{29.6\%}_{Fridley}, \underbrace{18.3\%}_{Hiawatha}\right\}$$

$$= \frac{\{\overrightarrow{AB} + \overrightarrow{XY}\}}{\left\{\{\overrightarrow{AB} + \overrightarrow{XY}\} + \{\overrightarrow{BC} + \cdots + \overrightarrow{WX}\} + e + r + p + m\right\}}$$



Analysis of Routing Assumption

The Essential Question:

The essential question is, "can we expect the sum of the excluded travel distances to account for the remaining 70.4% - 81.5% of the total?

Sample Data 1:

@ Fridley

$\{\overrightarrow{AB} + \overrightarrow{XY}\} = 9\ mi$

$\{\overrightarrow{BC} + \cdots + \overrightarrow{WX}\} = 19.4\ mi$

$$\frac{\{\overrightarrow{AB} + \overrightarrow{XY}\}}{\{\{\overrightarrow{AB} + \overrightarrow{XY}\} + \{\overrightarrow{BC} + \cdots + \overrightarrow{WX}\} + e + r + p + m\}} = \frac{9}{\{9 + 19.4 + e + r + p + m\}}$$

Is it reasonable that $e + r + p + m = 2\ mi$?

Sample Data 2:

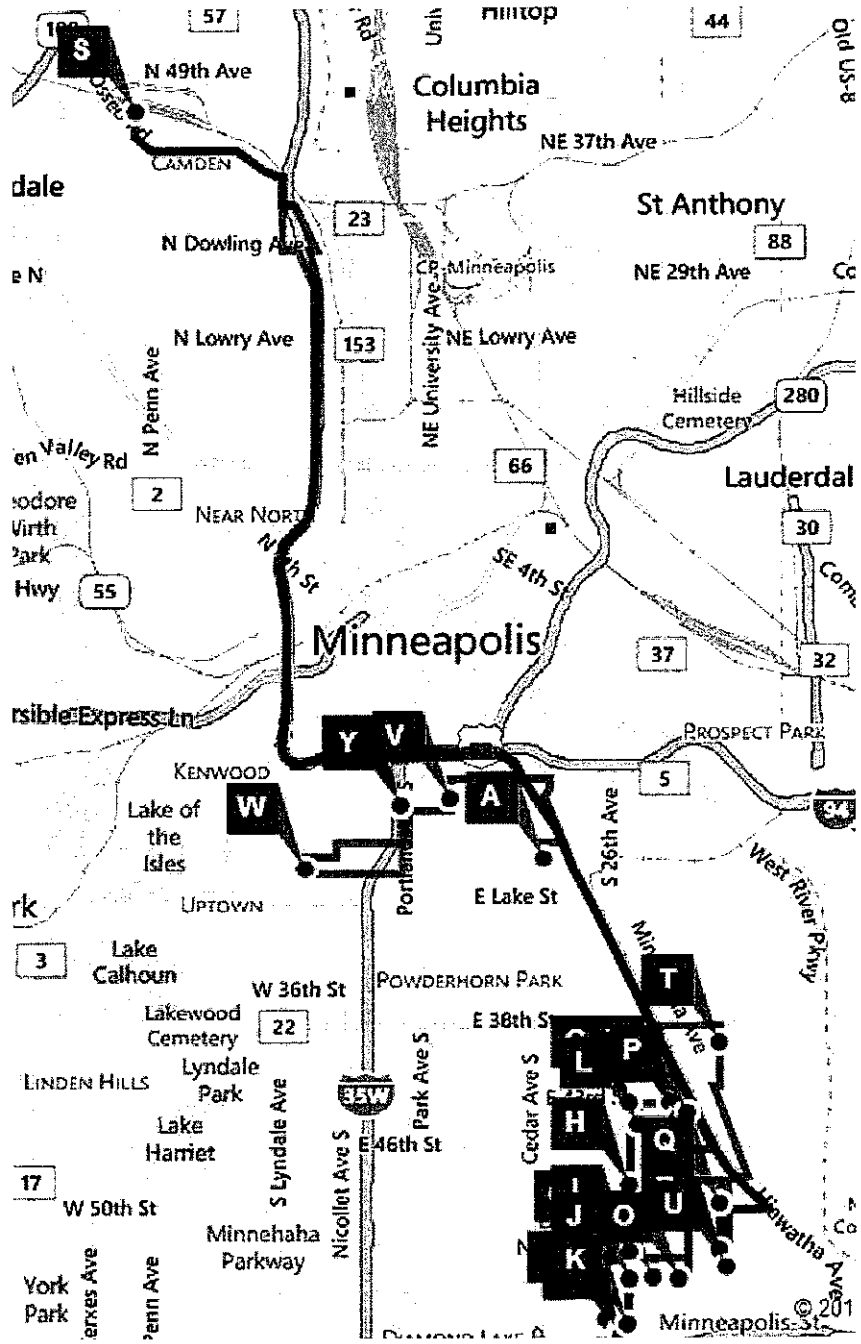
@ Hiawatha

$\{\overrightarrow{AB} + \overrightarrow{XY}\} = 11.8\ mi$

$\{\overrightarrow{BC} + \cdots + \overrightarrow{WX}\} = 22.6\ mi$

$$\frac{\{\overrightarrow{AB} + \overrightarrow{XY}\}}{\{\{\overrightarrow{AB} + \overrightarrow{XY}\} + \{\overrightarrow{BC} + \cdots + \overrightarrow{WX}\} + e + r + p + m\}} = \frac{11.8}{\{11.8 + 22.6 + e + r + p + m\}}$$

Is it reasonable that $e + r + p + m = 5.4\ mi$?



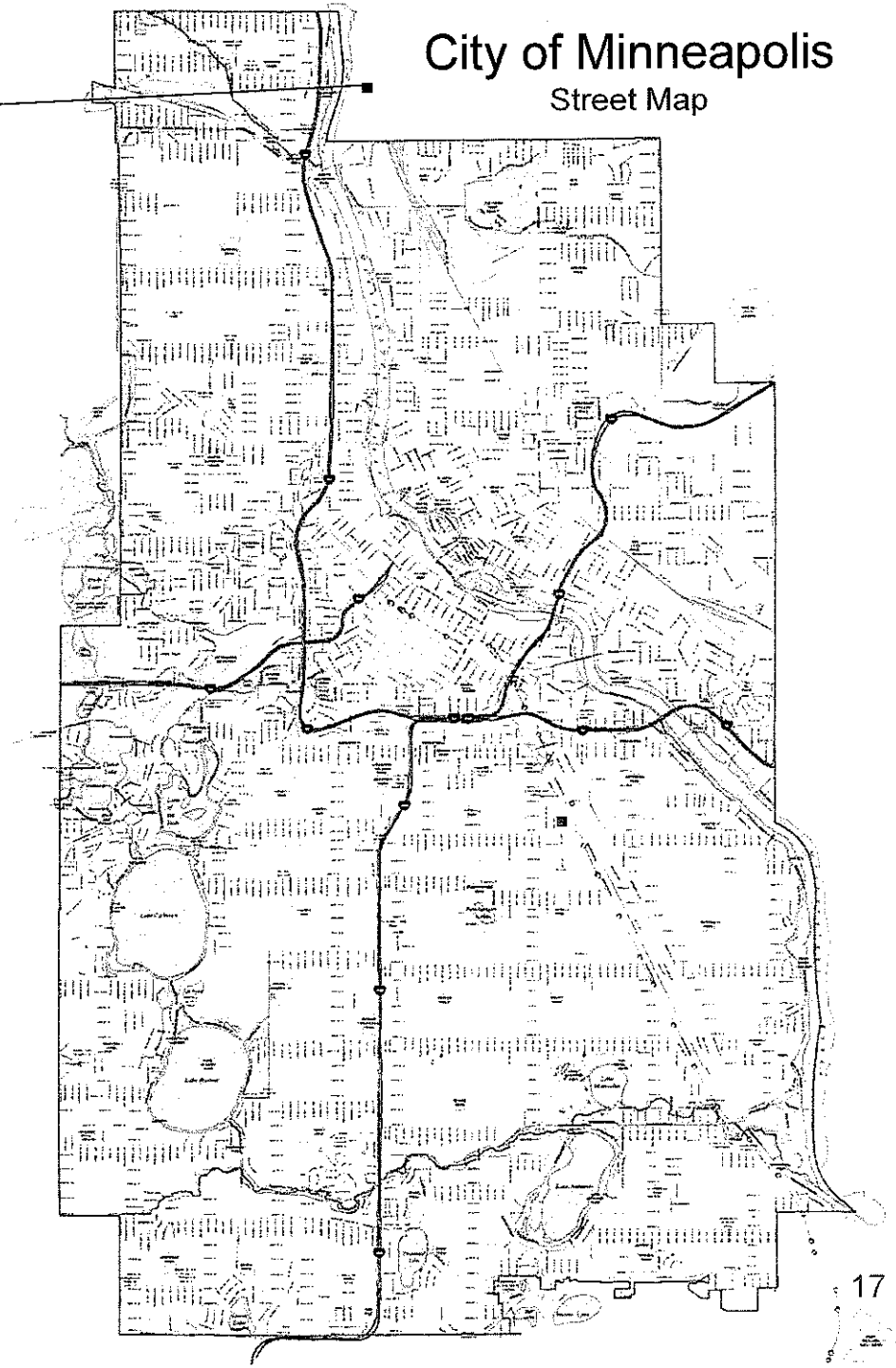
PROJECTED ANNUAL TRAVEL DISTANCE – Leaks, Cleaning and Linings

■ Fridley

ESY	Miles
Leaks, Cleaning, and Lining	25,467
Postings	14,462
318 (Delinquent Turnoffs)	14,462
320 (Turn-ons)	14,126
805 (Turnoff for repair)	7,404
814 (Stopbox repair)	846
95 (Vacant Turnoff)	1,249
	78,016

Meter Shop	Miles
192	27,694
64	8,915
231	10,697
414	5,192
164	4,359
112	4,980
66	2,890
264	2,311
100	2,130
65	1,090
171	1,059
	71,317

TOTAL: **149,333**



WORK ORDER – Leaks, Cleaning & Linings

FROM: Mark Ebert

Work Order Information:

Created a spreadsheet for Mark Ebert to identify the anticipated large structural projects planned for 2013 in addition to anticipated leaks.

Project Type/Location: Leaks

NUMBER OF		UP (days)	DOWN (days)	TRIPS/ DAY				NOTES (itemized line does not necessarily relate to rows)
2	Clam Crew (3FTE)	18	18	1	6	2	144	45 leaks per year, already there have been 15
	Flatbed Boom Truck							
1	Foreman Pick-up	18	18	2	1	1	144	
1	Gate Crew (3FTE)	18	18	2	3	1	144	
	Hose Crews (4FTE)							
	Inspector - C&L (2FTE)							
	Inspector - Van (1FTE)							
	Pick-up							
1	Pick-up + Trailer (2FTE)	18	18	1	2	1	72	<-- this is for the auger
1	Rubber Tire Backhoes	18	18	1	1	1	72	
1	Tri-axle Dump Truck	18	18	5	1	1	360	<-- 5 trips, 1 for equipment to yard, 2 dumps at fridley, 2 fills to yard
	Valve Truck							
1	Leak Investigator	18	18	1	1	1	72	
	Beat Crew (2 FTE)							
8	<-- Total -->				15	8	1008	

Project Type/Location: Shingle Creek

NUMBER OF		UP (days)	DOWN (days)	TRIPS/ DAY				NOTES (itemized line does not necessarily relate to rows)
2	Clam Crew (3FTE)				6	2	0	
1	Flatbed Boom Truck	54		1	1	1	108	
2	Foreman Pick-up	24	12	1	2	2	144	
1	Gate Crew (3FTE)	35		1	3	1	70	
	Hose Crews (4FTE)							
2	Inspector - C&L (2FTE)				4	2	0	
	Inspector - Van (1FTE)							
	Pick-up							
2	Pick-up + Trailer (2FTE)	13	13	1	4	2	104	
2	Rubber Tire Backhoes	24	12	1	2	2	144	
2	Tri-axle Dump Truck	24	12	1	2	2	144	
	Valve Truck							
	Leak Investigator							
	Beat Crew (2 FTE)							
14	<-- Total -->				24	14	714	

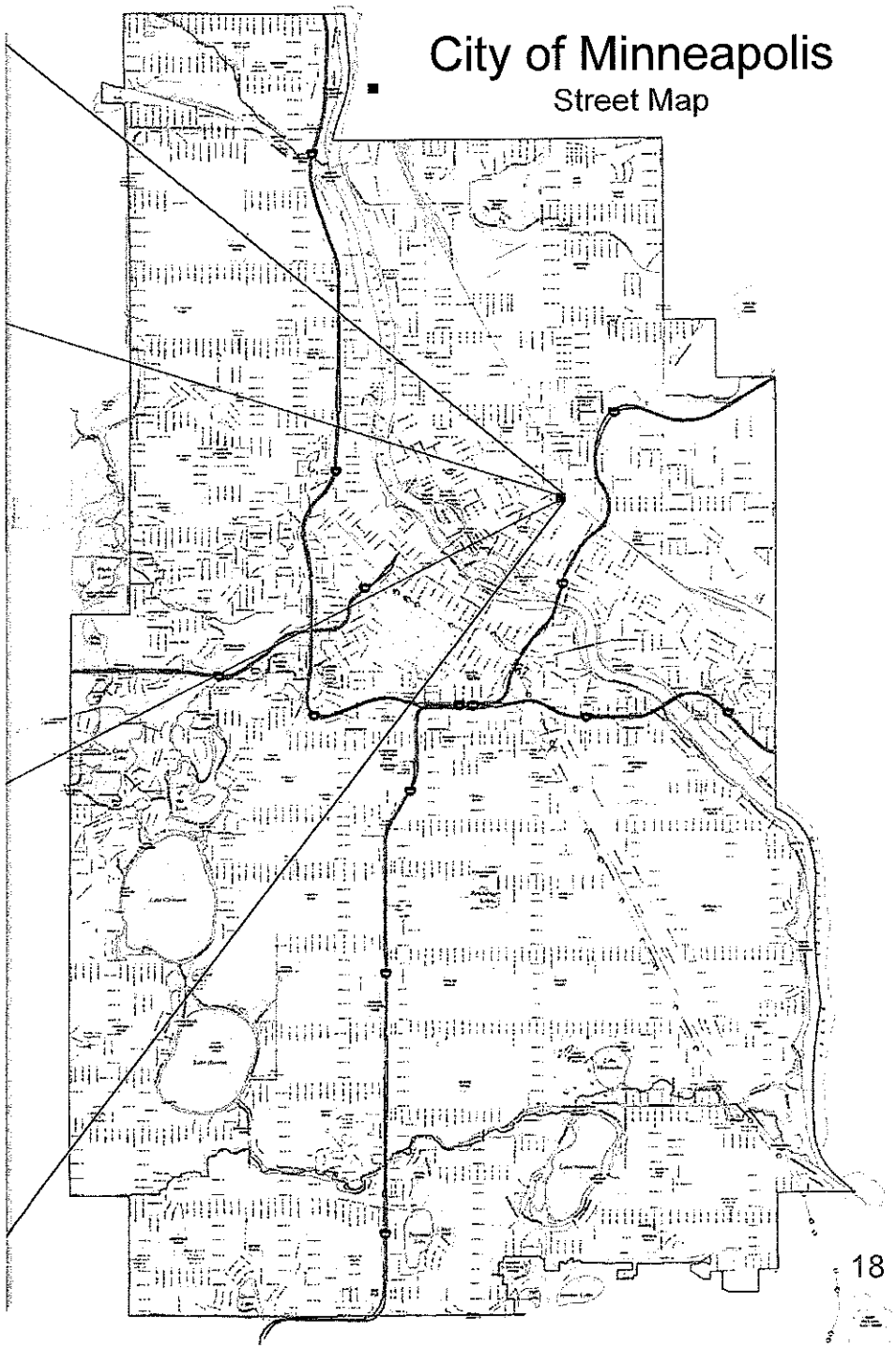
Project Type/Location: Nicollet Ave S: 36th to 40th St E

NUMBER OF		UP (days)	DOWN (days)	TRIPS/ DAY				NOTES (itemized line does not necessarily relate to rows)
	Clam Crew (3FTE)							Vehicle Rental cost is fixed
	Flatbed Boom Truck							Non-freeway vehicles: Backhoe, Auger (hauled with pick-up), Compressor
	Foreman Pick-up							
1	Gate Crew (3FTE)	6		1	3	1	12	
1	Hose Crews (4FTE)	3.5	3	1	4	2	28	
1	Inspector - C&L (2FTE)	4		1	2	1	8	
1	Inspector- Van (1FTE)	10		1	1	1	20	
	Pick-up							
	Pick-up + Trailer (2FTE)							
	Rubber Tire Backhoes							
	Tri-axle Dump Truck							
1	Valve Truck	6		1	1	1	17	
	Leak Investigator							
	Beat Crew (2 FTE)							
5	<-- Total -->				11	6	78	

Data Breakdown

- Number of trips by crew type
- Days spent setting up
- Days spent tearing down
- Number of FTEs per vehicle type

} Leaks, C&L Mileage

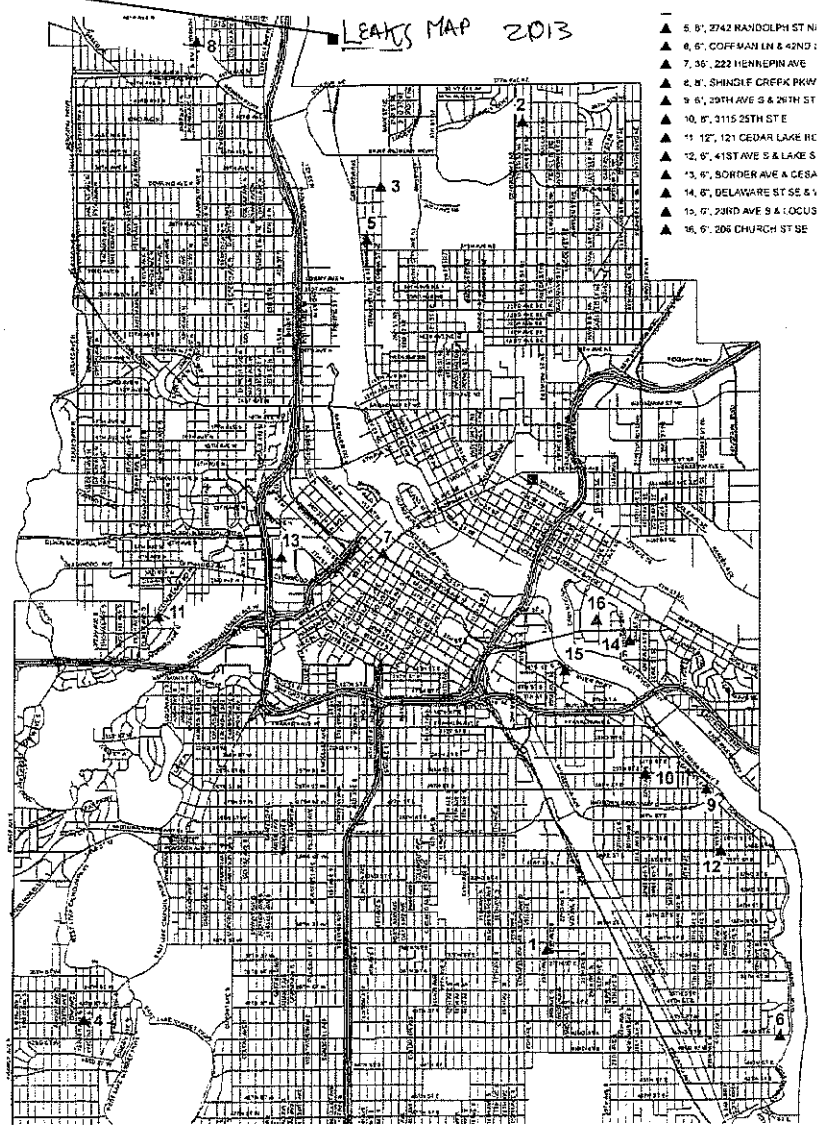


Leaks, Cleaning & Lining Assumptions

Key Assumptions:

1. Because leaks, cleaning and linings often make frequent use of rubber tire backhoes, when the distance to the location is far from the equipment site, it is assumed they are stored near the worksite.

2. Tri-axle dump trucks deploy from both Fridley and the ESY with all full loads being brought only to Fridley.



Cost Calculation

What Factors are Considered in the Calculation of Cost?

- Shortest path travel distance from site to the first and last address in each neighborhood for each day by work order.
- Estimated fuel consumption cost per mile
- Estimated maintenance cost per mile of travel
- Estimated cost in man-hours per trip based on an average travel speed.

Cost Calculation Assumptions

1. The average vehicle travel speed is likely less than or equal to 30 mph (almost entirely back road travel)

2. The average price of fuel is expected to be approximately $3.82 per gallon based on actual average costs of fuel from 2012 fleet statistics.

3. There are approximately 44 leaks occurring each year on average, are random occurrences, and happen typically in clusters occurring primarily near the river according to 75-year incident map. The average travel distance from Fridley is approximately 11 mi, the average travel distance from Hiawatha is 6 mi.

4. Field employee hourly wages are approximately $28 / hr

5. Postings occur at a frequency of approximately 120 posts per week between 7 pick-up trucks on Mondays (15 – 20 properties each).

6. Postings echo roughly the same distance travelled for delinquent turn-offs.

7. Postings require a single FTE.

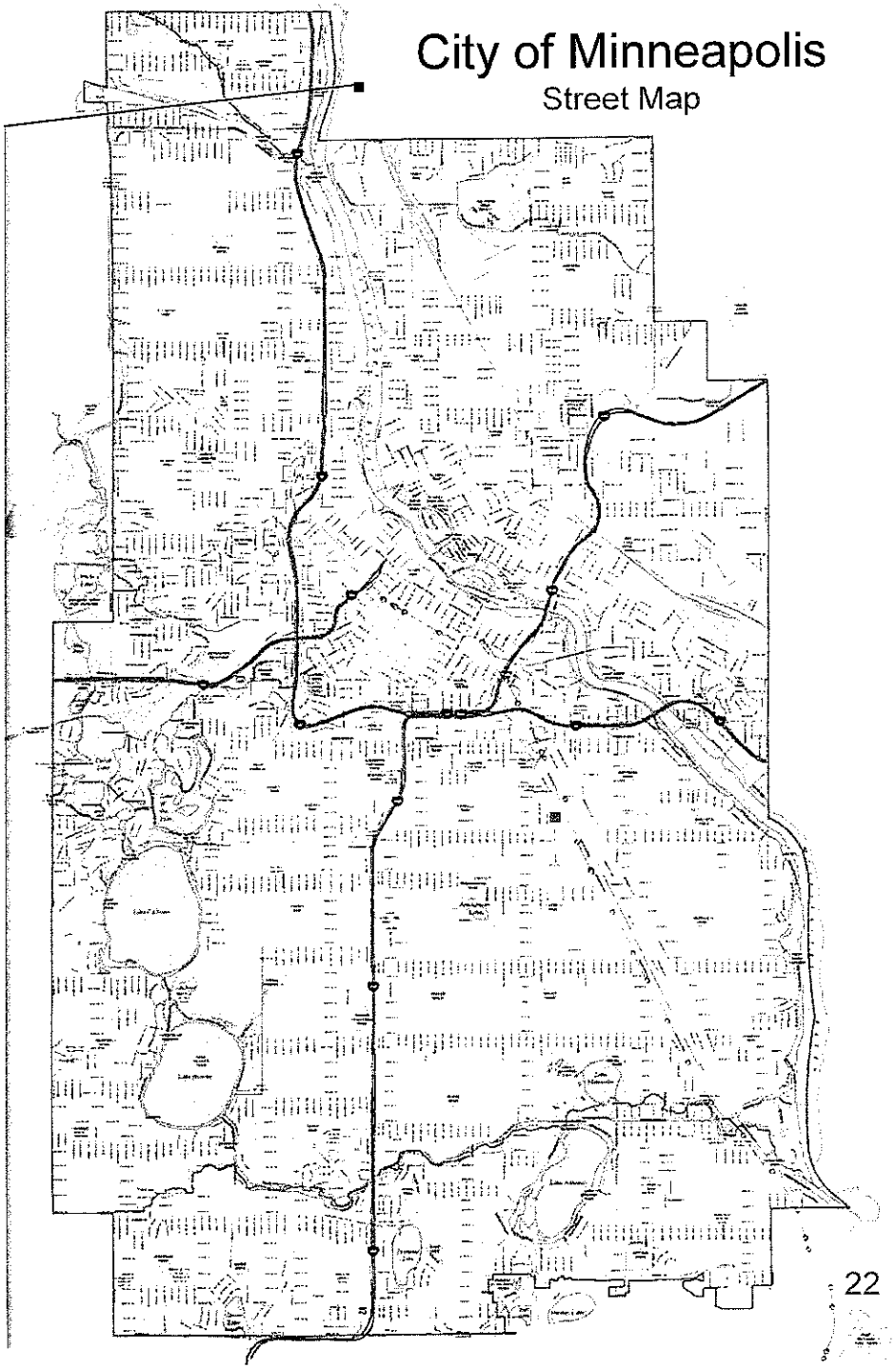
8. The cost of maintenance is approximately $0.26 on average per mile according to 2012 fleet maintenance history, which includes service, parts, and repairs occurring outside the repair shop. This value does not reflect costs incurred by the base lease or depreciation as these values are the same between the sites.

Fridley

ESY	Miles	Fuel	Maint	Man-hrs
Leaks, Cleaning, and Lining	25,467	$20,290	$7,614	$25,249
Postings	14,462	$6,409	$3,760	$12,683
318 (Delinquent Turnoffs)	14,462	$6,409	$3,760	$12,683
320 (Turn-ons)	14,126	$6,260	$3,672	$10,044
805 (Turnoff for repair)	7,404	$3,281	$1,925	$3,268
814 (Stopbox repair)	846	$375	$220	$565
95 (Vacant Turnoff)	1,249	$554	$325	$235
	78,016	**$43,578**	**$21,276**	**$64,726**

Meter Shop	Miles	Fuel	Maint	Man-hrs
192	27,694	$10,579	$7,200	$25,848
64	8,915	$3,406	$2,318	$8,321
231	10,697	$4,086	$2,781	$9,984
414	5,192	$2,301	$1,350	$4,846
164	4,359	$1,665	$1,133	$4,068
112	4,980	$1,902	$1,295	$4,648
66	2,890	$1,104	$752	$2,698
264	2,311	$883	$601	$2,157
100	2,130	$813	$554	$1,988
65	1,090	$416	$283	$1,017
171	1,059	$405	$275	$988
	71,317	**$27,560**	**$18,542**	**$66,562**

TOTAL:	**149,333**	**$71,138**	**$39,818**	**$131,288**



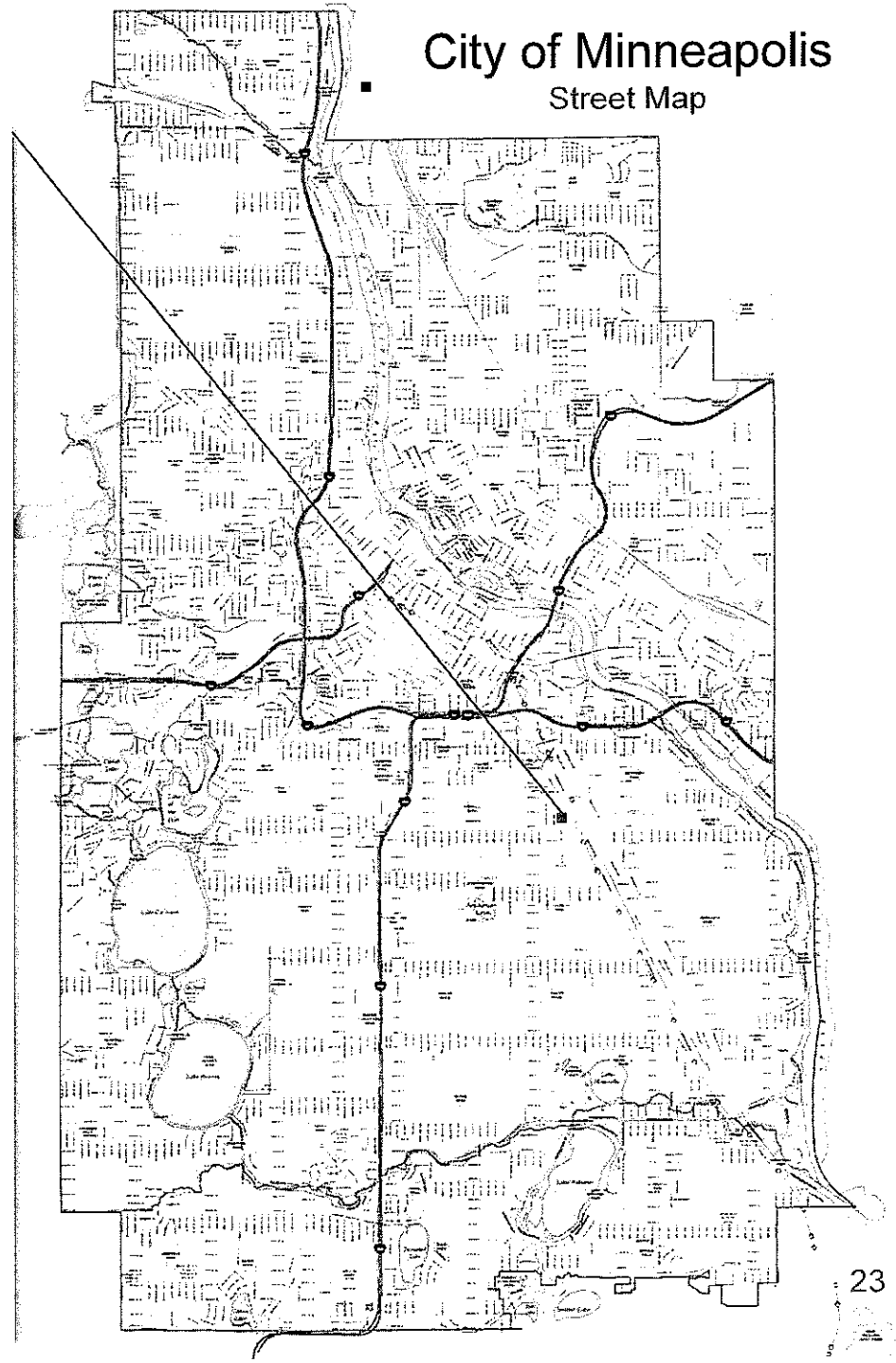
PROJECTED ANNUAL TRAVEL COSTS

■ Hiawatha

ESY	Miles	Fuel	Maint	Man-hrs
Leaks, Cleaning, and Lining	16,875	$15,113	$4,388	$16,726
Postings	9,601	$4,255	$2,496	$8,961
318 (Delinquent Turnoffs)	9,601	$4,255	$2,496	$8,961
320 (Turn-ons)	9,357	$4,146	$2,433	$8,733
805 (Turnoff for repair)	3,974	$1,761	$1,033	$3,709
814 (Stopbox repair)	557	$247	$145	$858
95 (Vacant Turnoff)	919	$407	$238	$520
	50,884	**$30,184**	**$13,229**	**$48,466**

Meter Shop	Miles	Fuel	Maint	Man-hrs
192	15,303	$5,846	$3,978	$14,283
64	5,371	$2,052	$1,396	$5,013
231	5,869	$2,242	$1,526	$5,478
414	3,729	$1,652	$969	$3,480
164	2,897	$1,107	$753	$2,704
112	2,304	$880	$599	$2,150
66	2,185	$835	$568	$2,039
264	1,128	$431	$293	$1,052
100	1,425	$544	$371	$1,330
65	740	$283	$192	$690
171	494	$189	$128	$461
	41,445	**$16,061**	**$10,773**	**$38,680**

TOTAL:	**92,329**	**$46,245**	**$24,002**	**$87,147**
	+38%	+35%	+40%	+34%
Advantage:	**57,004**	**$24,893**	**$15,816**	**$44,141**



Summary of Transportation Costs

	ESY			Meter Shop			TOTAL
	Fuel	Maint	Man-hrs	Fuel	Maint	Man-hrs	
Fridley	$43,578	$21,276	$64,726	$27,560	$18,542	$66,562	$242,244
Hiawatha	$30,184	$13,229	$48,466	$16,061	$10,773	$38,680	$157,394
						Δ =	**$84,850**

The difference in selecting Hiawatha over Fridley may be larger but is at least $85k annually in travel operation costs with respect to fuel consumption, vehicle maintenance, and man-hours. This is based on work order data and projected leaks/cleaning and lining projects from 2011 and 2013, respectively.

Summary of Transportation Costs

	ESY			Meter Shop			TOTAL
	Fuel	Maint	Man-hrs	Fuel	Maint	Man-hrs	
Fridley	$43,578	$21,276	$64,726	$27,560	$18,542	$66,562	$242,244
Fridley + Radio	$32,176	$14,587	$44,272	$27,560	$18,542	$66,562	$203,699
				(Same savings at Hiawatha + Radio)		**Δ =**	**$38,545**

The difference advantage in leveraging radio turnoff/turn-on technology is at best $39k annually in travel operation costs with respect to fuel consumption, vehicle maintenance, and man-hours.

Narratives

What other considerations are there to make the decision?

- Security
- Benefit of consolidating resources.
  - Command Center (Marie, Mark & Bob)
  - Claims
  - Interdepartmental coordination
  - During events provide quick, unified response
  - Craig's water permits
- Storage (operational efficiency)
- Equipment

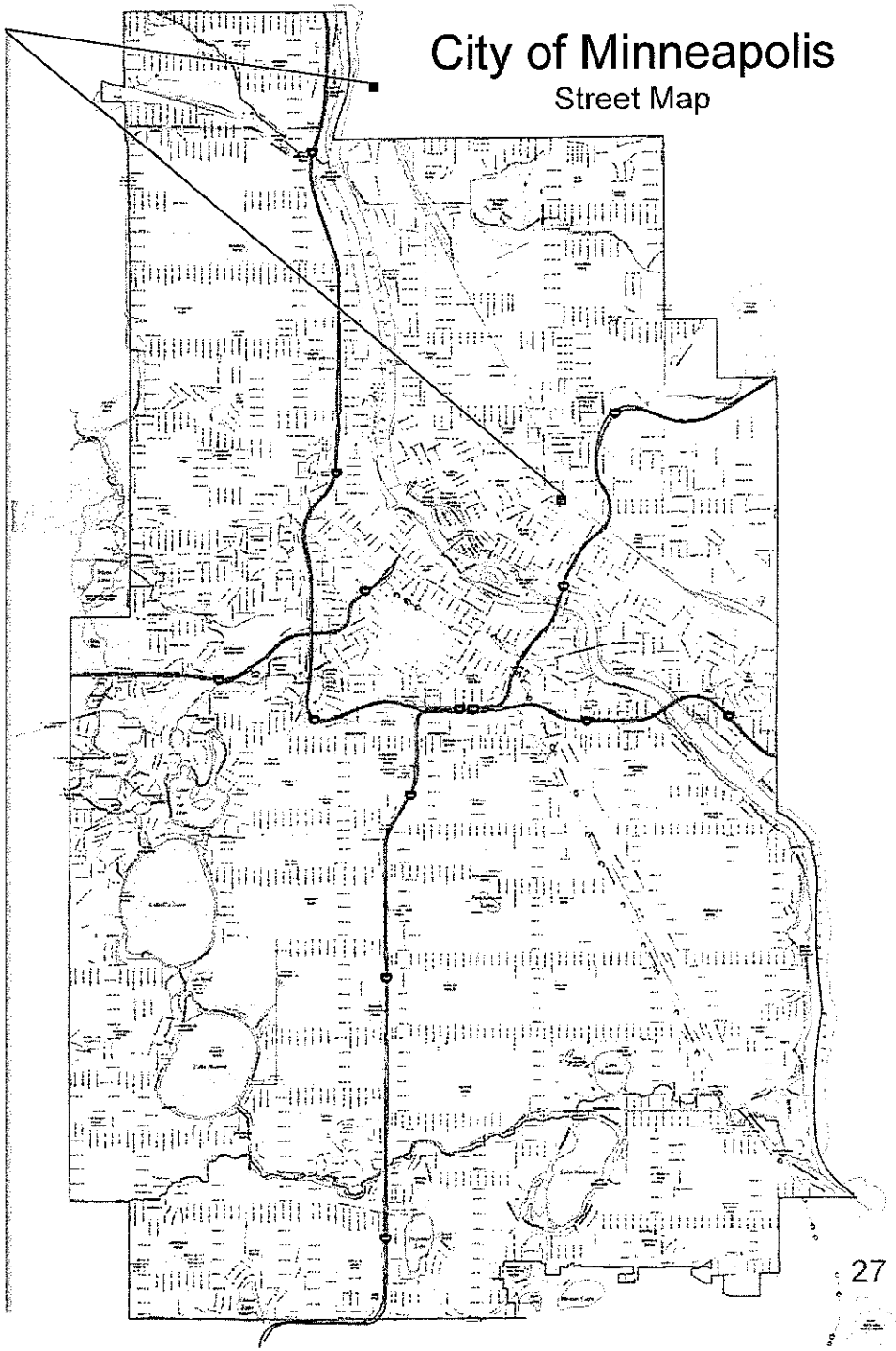
Security

The difference between the Fridley and Hiawatha sites regarding security have programmatic and operational implications, and offer an unique opportunity to incorporate and support the concept of CPTED (Crime Prevention Through Environmental Design) with the site layout.

Programmatic advantages are already available at the Fridley site. A central, secure entry exists to protect the high risk treatment facilities by restricting access. With the new build out of the Fridley campus, it would be possible to enhance the two-tier campus security approach by leveraging the existing infrastructure to minimize public access in the future. Operations would not change significantly from today as visitor and employee parking is already isolated outside the high risk zone. By comparison, a similar two-tier approach is in place at both the St. Paul Water Plant and the Metro Waste Water Plant.

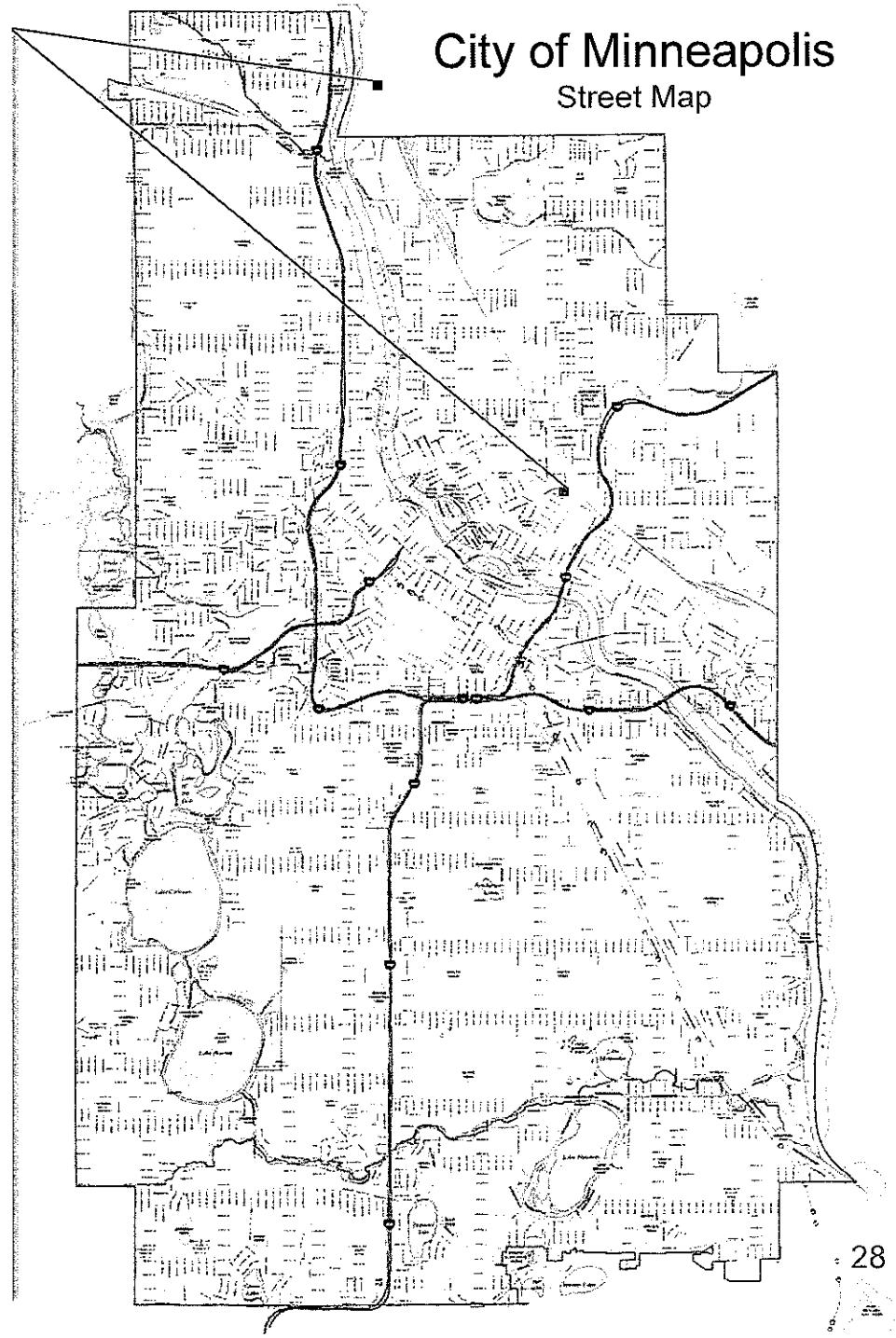
Providing the same security approach at Hiawatha is possible, however, it comes at the cost of significant infrastructure development to achieve the same level of security. If the primary goal is to influence potential offender decisions preceding criminal acts, the future water distribution environment should take advantage of existing infrastructure as is the spirit of CPTED.

Whether the distribution center is located at Fridley or at Hiawatha, the campus will require added cameras and technology upgrades. At Fridley these upgrades will be in *addition* to what exists; at Hiawatha, upgrades will be a complete new installation.



Security (continued)

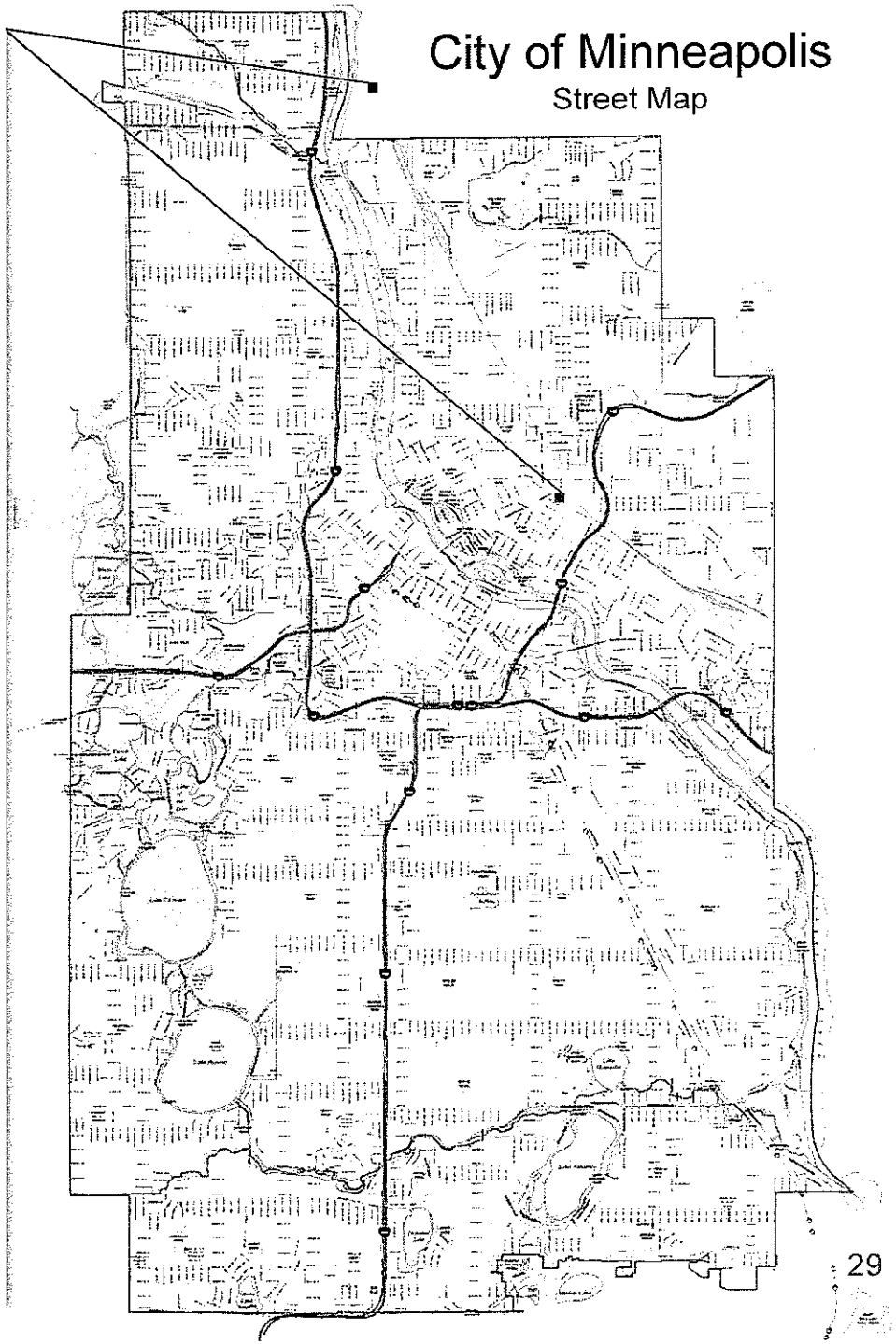
Lastly, for both sites, considerations could be made for not having any security forces on contract by handling the visitors through a new administrative building. Studies show that unarmed security forces contribute very little in cases of serious threats. A more complete security, vulnerability study scheduled for 2014, may reveal additional insight on specific approaches to security that leverage principles of CPTED. It is possible to do the two tier approach without the added buildings but it will be difficult. A more complete security study is scheduled for 2014, which may reveal new information to consideration in planning.



Co-location

Several benefits are evident with respect to co-locating resources to one central site. For example,

1. Consolidating engineering services between the Engineering and Distribution units to a new administrative building will facilitate communication, record keeping, and one less CAD technician. Further, no additional renovations for engineering spaces in the plant would be necessary and by providing meeting space outside of the lab would minimize the need to remodel conference room spaces.
2. IT functions will also benefit from the same advantages as engineering but with no reduction in personnel
3. At Fridley, the meter facility could be renovated in the meter testing area, and meter administration could be consolidated with other administrative personnel. This would require no new construction and minimizes costs to renovating the meter shop specifically for testing functions.
4. A new administrative building would include modern training and conferencing rooms for both the plant and distribution units. All three unit managers would office together and be able to share staff (where applicable). And, it is expected that the employees in the permit section downtown will move to this location once the permit process is automated. A unified administrative area enables a cohesive environment for quick response during emergency situations because of more timely communication between staff.



Storage

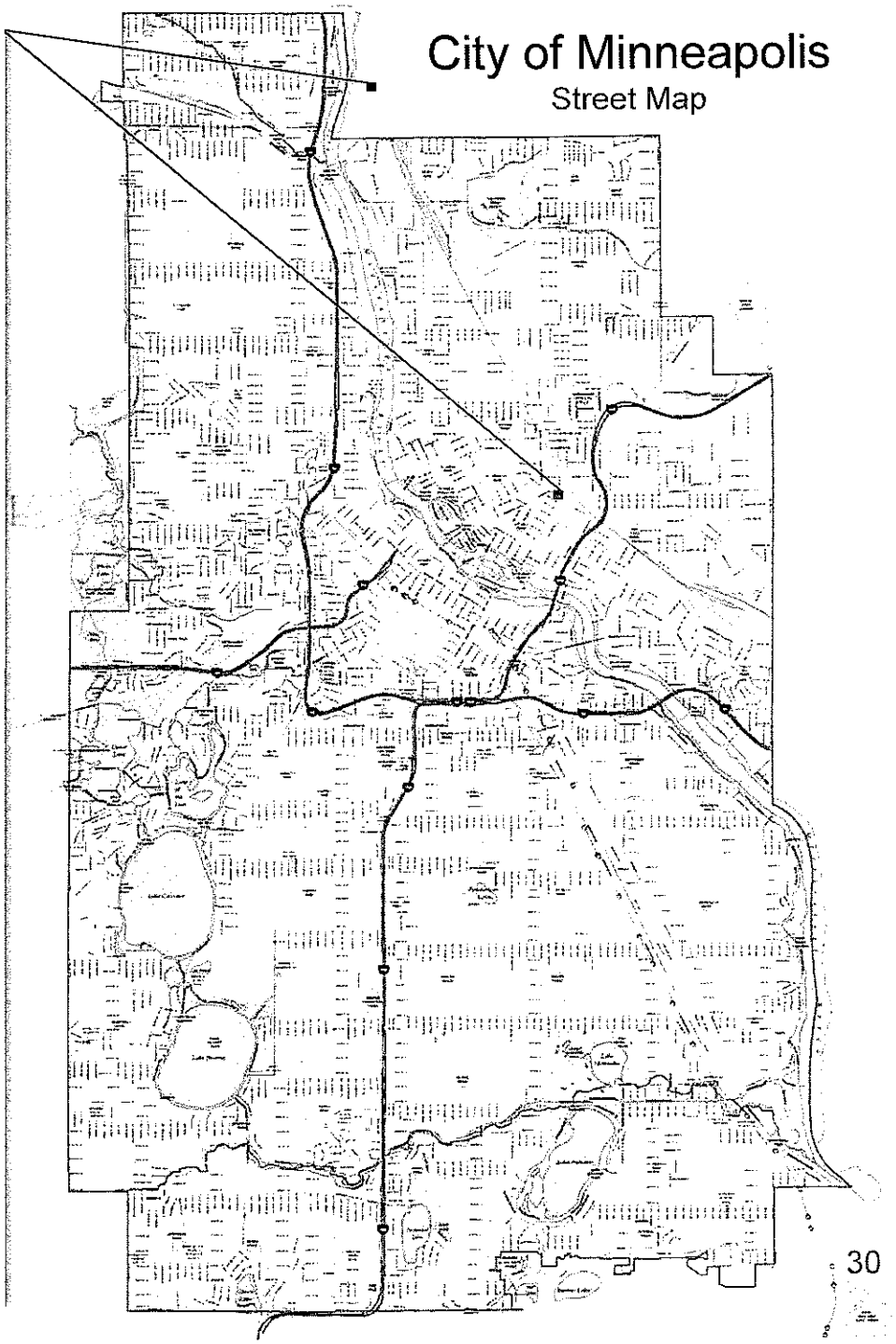
Advantages in storage exist at both proposed sites, and in both cases offer the advantage of reducing demand for overall inventory dollars from the efficiency gains of consolidation (i.e. reduced duplication of inventory management as well as raw inventory dollars). However, these advantages are relative as outlined below.

Those advantages that are specific to Hiawatha include:

1. Existing infrastructure that easily supports storage space for the organization of equipment and supplies in a central warehouse-type fashion.
2. Openness of space leads to high visibility of inventory for ease of management.
3. Loading dock could be refactored to facilitate ease of daily loading and unloading of equipment as well as order replenishment and disposal.

Advantages specific to the Fridley site include:

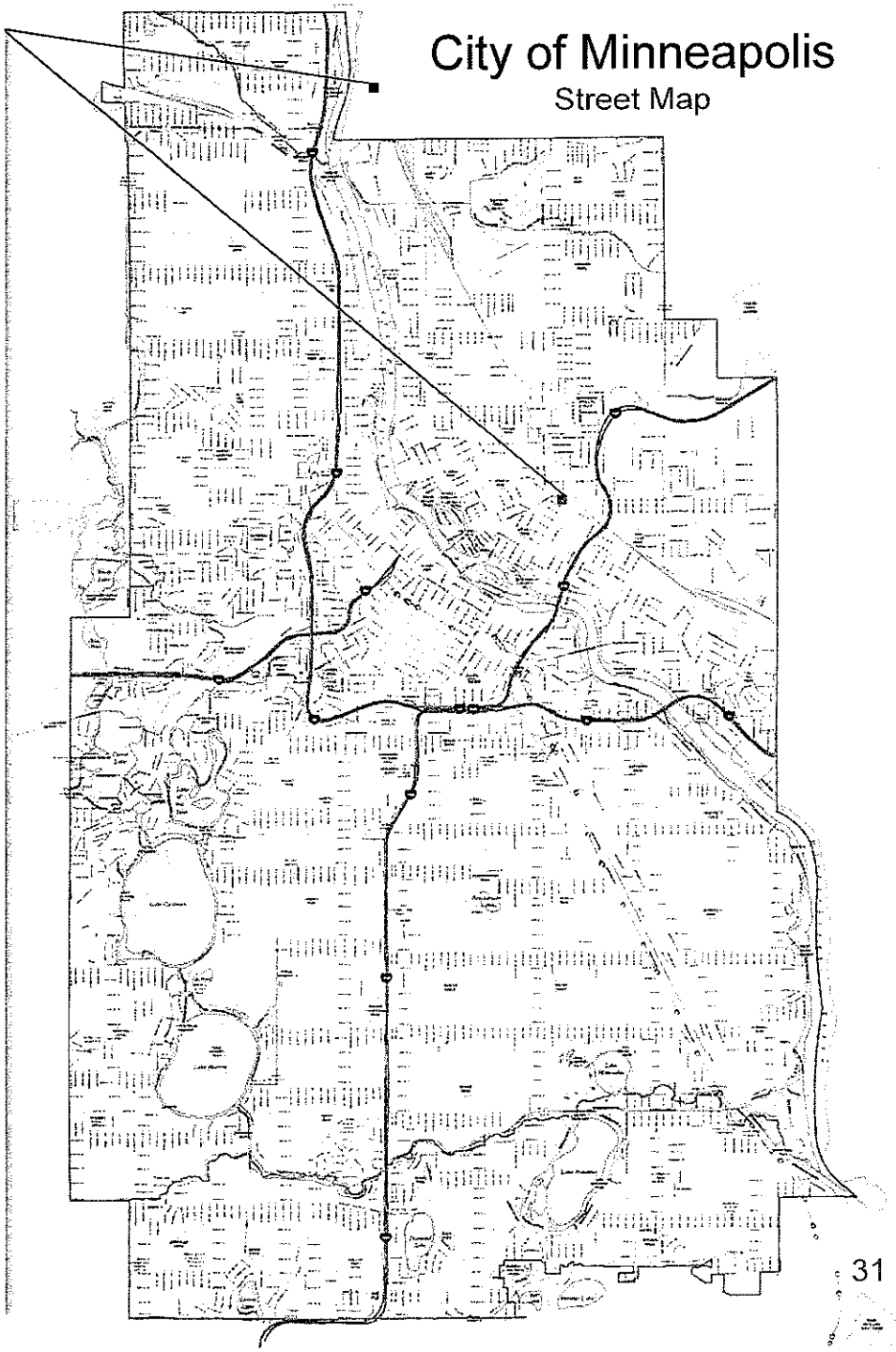
1. The expansion of warehouse operations can be accomplished by building adding space adjacent to existing warehouse infrastructure.
2. Greater consolidation of all inventory to one location. No duplication is necessary as all inventory will be at one central site instead of (potentially) two.



Equipment

The same consolidation advantages exist for equipment as for storage. Consolidation at Fridley means better utilization of equipment among the treatment operations/maintenance, laboratory, distribution, and meter shop work units. Also, there is an advantage from a maintenance perspective (i.e. oil changes and repairs). Maintenance resources could be combined to perform vehicle repairs on all fleet vehicles.

These advantages would be lost at Hiawatha due to duplication, but other advantages do exist. For example, because of its central locality, Hiawatha would generate less demand on vehicle mileage leading to less cost in fuel and vehicle repair. As outlined in the travel cost study, locating to Hiawatha results in 57k less miles travelled annually which equates to approximately $24k and $16k annually in fuel and maintenance savings, respectively. At least $85k annual savings would potentially incur if man-hours costs are included in the total cost savings.



Summary of Narratives

How are the narrative advantages measured?

	Advantages @ Fridley/Disadvantages @ Hiawatha	
• Security	Reduction or elimination of security contract of $400,000 by eliminating 5 FTEs	
• Co-locating	1 FTE (Engineering)	→ Potential for Hiawatha
	1 FTE (Administrative)	→ Potential for Hiawatha
• Storage	2 FTE	
• Equipment	1 FTE	→ Potential for Hiawatha

Conclusions

The overall *advantages* provided through the narratives and travel analysis

	Advantages @ Fridley/Disadvantages @ Hiawatha	
• Security	Reduction or elimination of security contract of $400,000 by eliminating 5 FTEs	
• Co-locating	~~1 FTE (Engineering)~~	~~Potential for Hiawatha~~
	~~1 FTE (Administrative)~~	~~Potential for Hiawatha~~
→ Note: SPRWS experienced unanticipated benefits due to co-locating because of synergies		
• Storage	2 FTE	
• Equipment	~~1 FTE~~	~~Potential for Hiawatha~~
	Advantages @ Hiawatha/Disadvantages @ Fridley	
• Transportation		$85k ~ 1 FTE

TOTAL Fridley: -7 FTE vs Hiawatha: **- 1 FTE**

→ Note: Land cost of the Hiawatha site is not included

To validate the approach, the following questions were posed to the analyst.

1. Were all of the data incorporated?

Yes, all of the work orders that were stored in Enquesta plus the institutional knowledge provided from Karen on postings, Dean on Meter Shop Operations, and Mark Ebert on leaks, cleaning and linings were incorporated into the analysis.

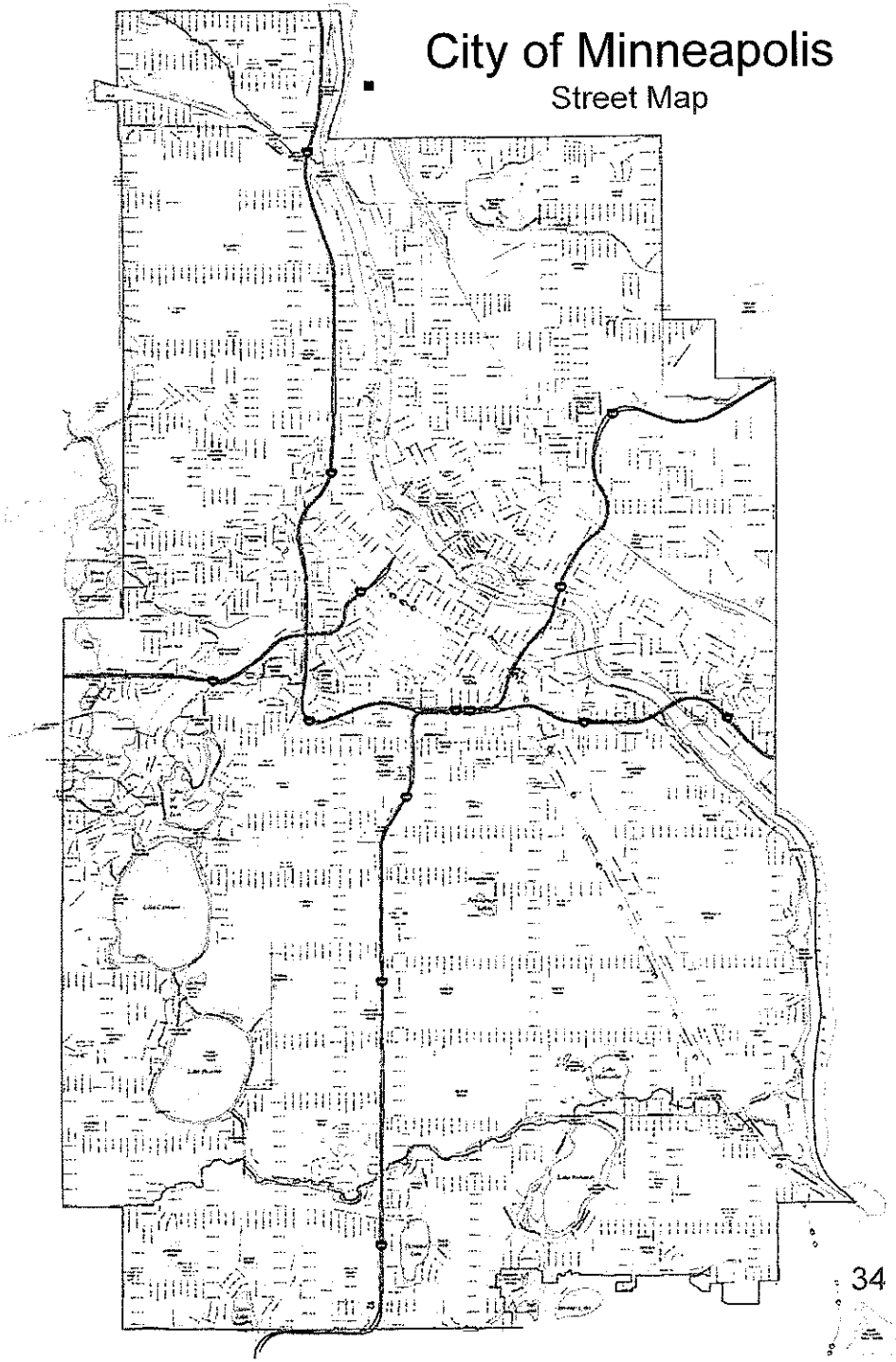
2. Are there any work orders that were forgotten?

Not any that are known, the work orders were validated with Karen and Dean to make sure that volumes that comprise the 95th percentile of the vehicle trips were accounted.

3. Do the miles calculated represent the whole of all travel?

No, there are many variables such as undocumented travel, side excursions, suboptimal routing, and other miscellaneous travel information that are not included in the analysis. However, it is believed that with the data collected, there is a quantitative story that helps to inform the decision of selecting the ideal site.

And, the missing mileage is likely erroneous with respect to both proposed sites and does not contribute to the *difference* in mileage. Further, even if it does make a difference, there is no way to quantitatively account for it that would not introduce more error to the calculations, or would require so much additional cost and effort to achieve only marginal improvement in accuracy.



4. Are the calculated numbers accounting for the majority of the difference in travel between the sites?

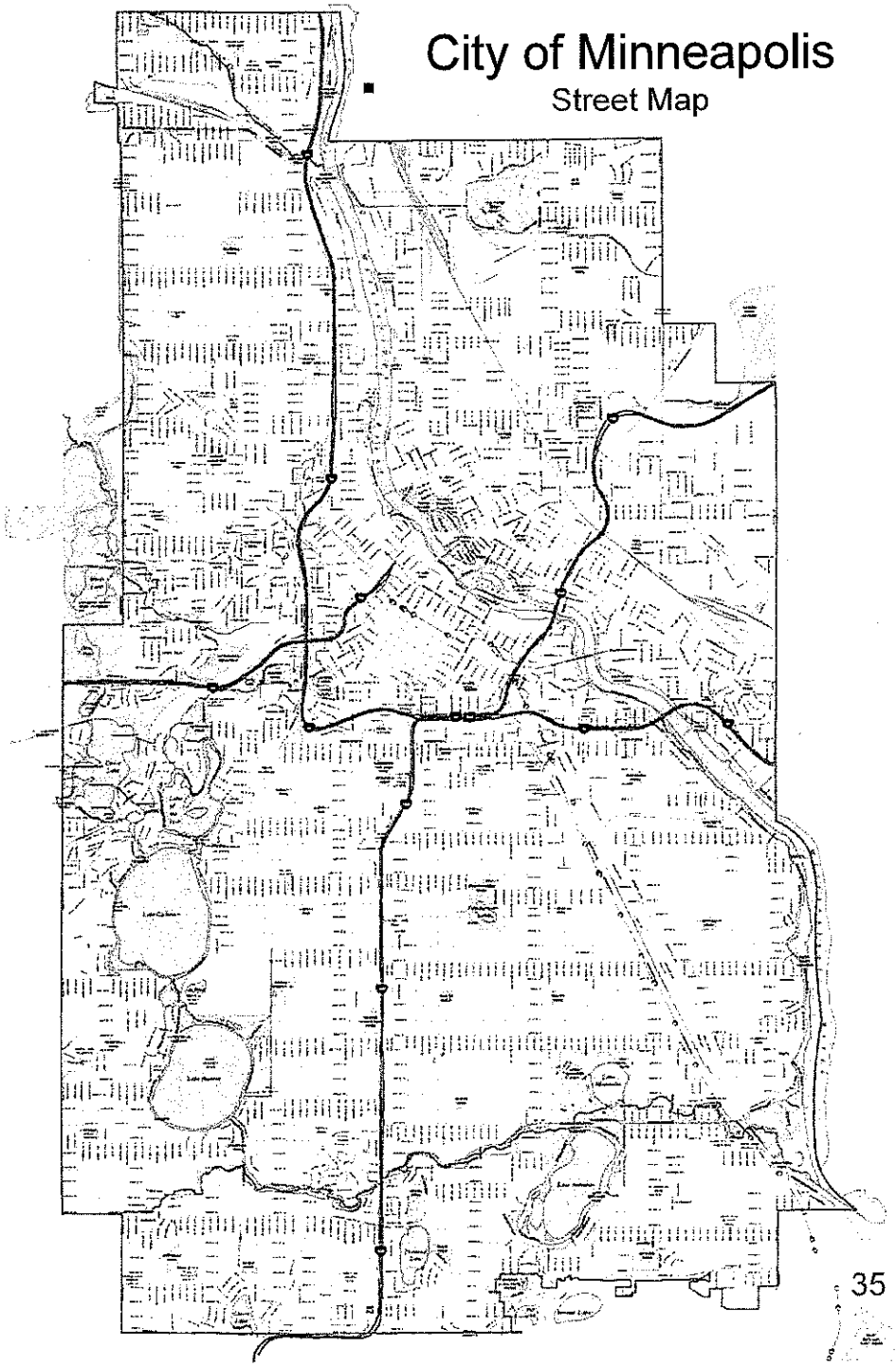
Yes, because the assumptions were validated with sample test data and verified by consulting with the appropriate users to derive the assumption numbers.

5. Are there any mistakes?

It is certainly possible, but it is believed that the problem approach has been tackled by the right questions, the right variables, the right measurements, and in the appropriate amount of time as to justify the effort of the study.

6. In terms of order of magnitude, do the results show the correct range of the difference in cost for transportation?

Yes, the cost of fuel from 2012 for the East Side Yard is approximately $181k, the difference in fuel cost between the proposed sites is roughly $13.5k. By asking if a 7% difference in fuel cost is reasonable, the answer seems to be yes. Why? Because of two reasons (1) even though Fridley is less centralized, the only mileage that contributes to the difference occurs on the first and last trip, <u>not all</u> of the trips, and (2) the calculations for fuel cost are based on current operations that are not expected to significantly change moving forward.

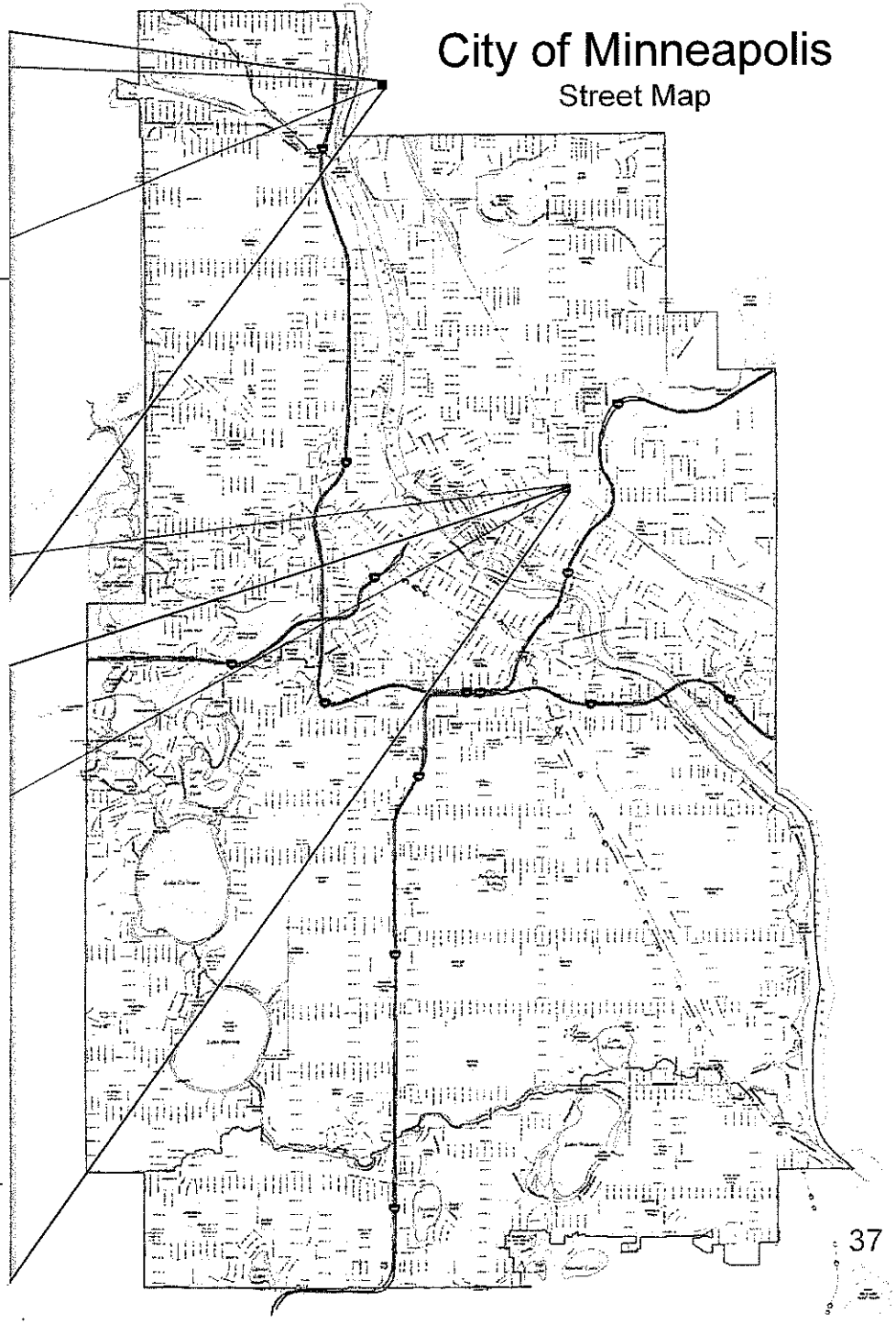


APPENDIX A: 2012 FLEET INVENTORY DATA

Fridley Eastside Yard

Meter Shop	Quantity	Avg MPG	Mileage	Gallons
Gate	1	5.45	11,170	1,600
Tapper	1	12.30	2,693	464
General Use Car	1	21.90	32,007	1,404
Locator Truck	1	10.00	15,766	2,125
Resident Min-vans	12	15.00	13,282	1,230
	16	**65**	**74,918**	**6,823**
TOTAL:	**68**	**8.5**	**429,290**	**58,295**

ESY	Quantity	Avg MPG	Mileage	Gallons
Gate Trucks	6	5.45	47,628	8,739
Tapper Vans	1	12.30	12,700	1,033
General Use Car	2	21.90	2,840	130
Backhoe	3	0.47	3,525	7,712
Tri-axle Dump Truck	2	5.58	16,887	3,026
Boom Truck	1	2.33	2,067	887
1 Ton Dump	1	6.55	7,728	1,180
Beat Truck	15	8.62	142,500	16,531
Clam Truck	3	4.00	4,257	1,064
Pick-up	13	10.00	100,714	10,070
Investigator Van	2	12.30	13,526	1,100
Trailer	3	-	-	-
	52	**90**	**354,372**	**51,472**



APPENDIX B: ADDITIONAL CONSIDERATIONS

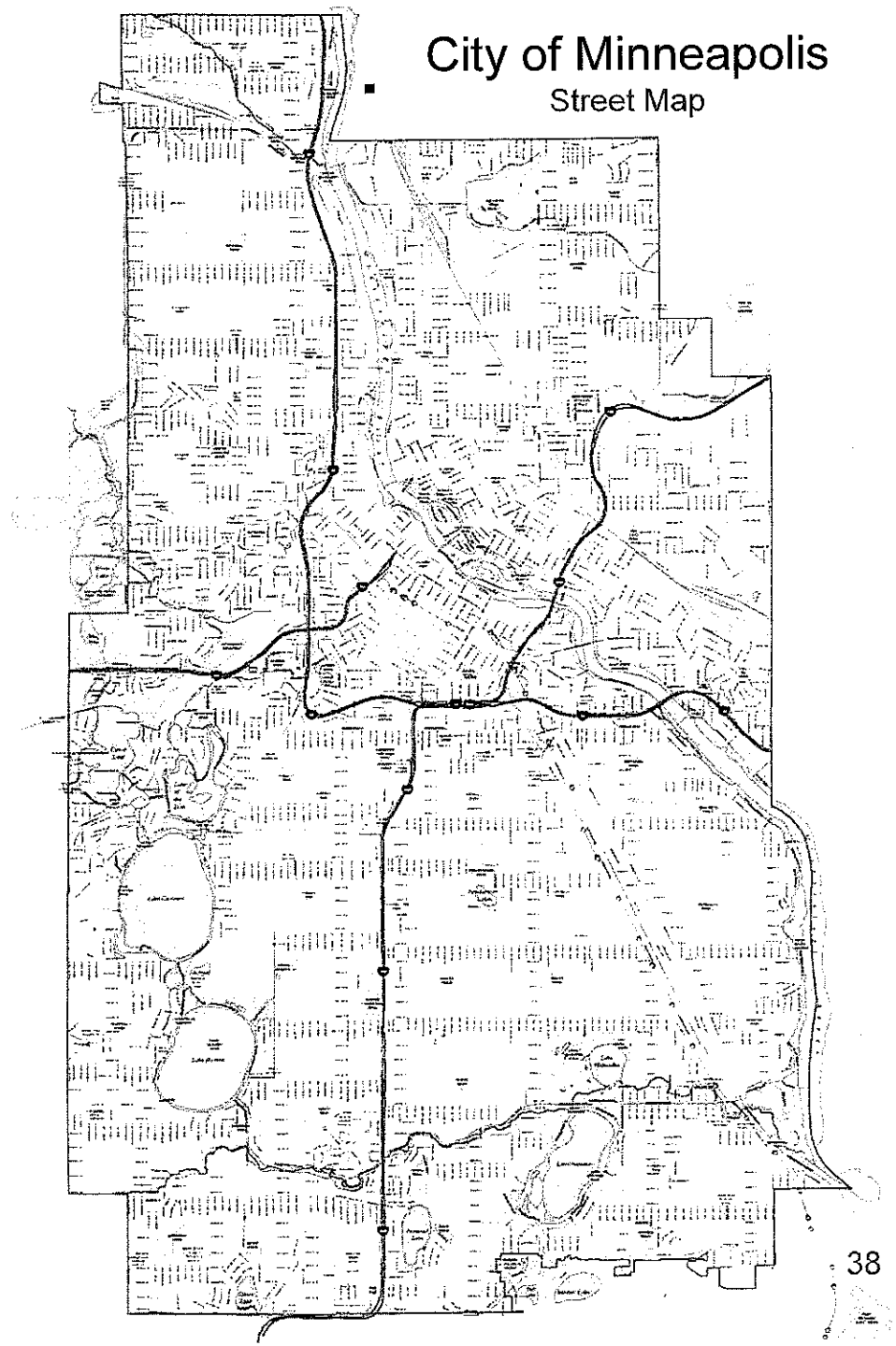
1. Additional Operational Considerations

- Technology – What happens when new equipment and technology is implemented?

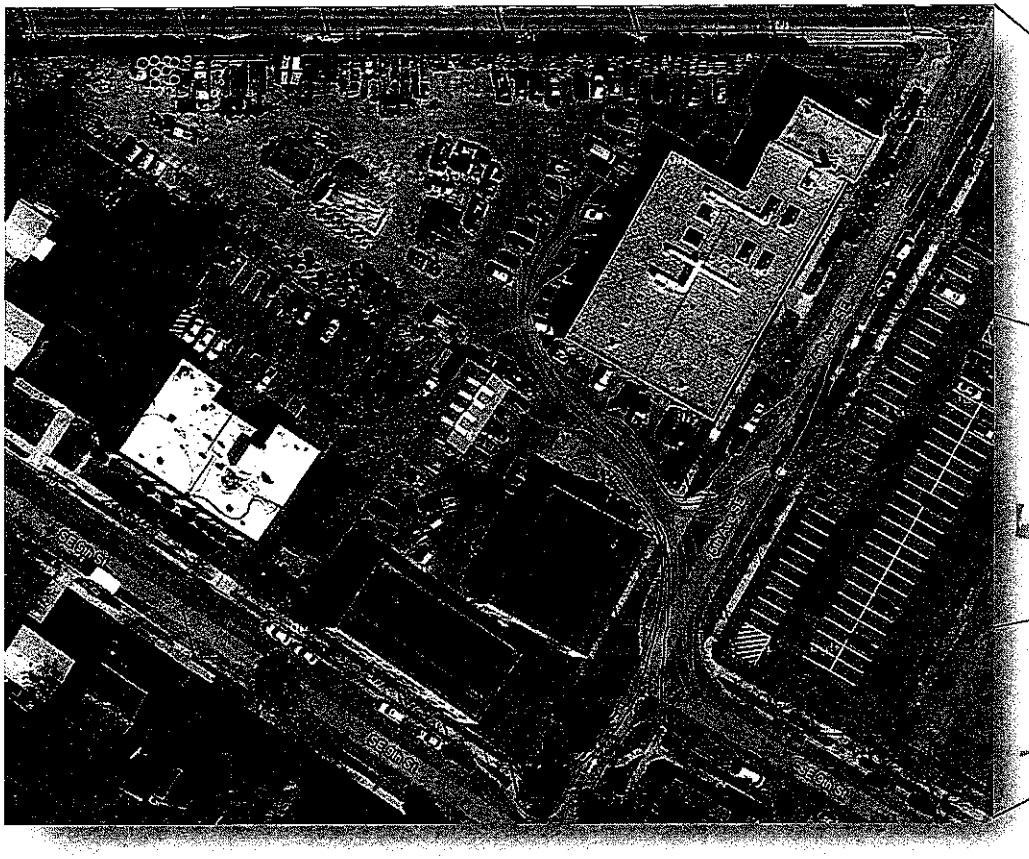
- Event Scenarios – What happens when parts of the city become affected by a major disturbance? For example, a tornado strike or flood?

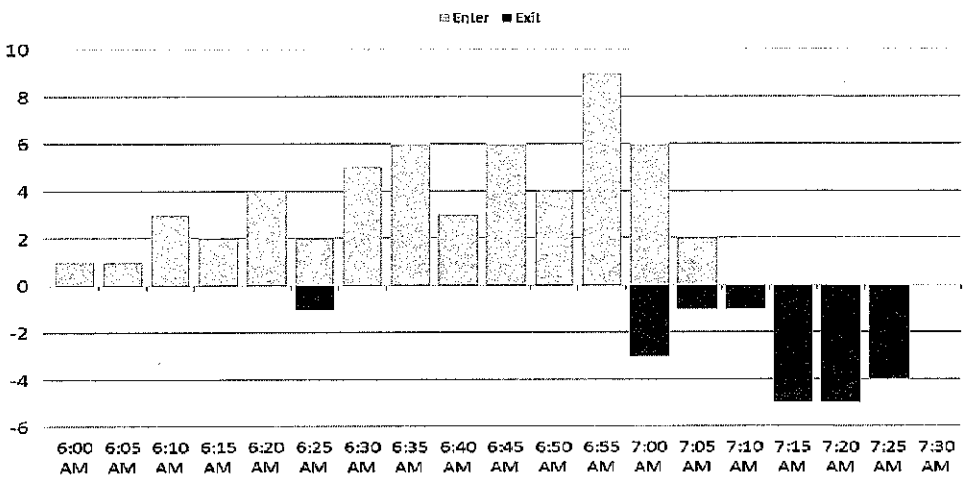
- Demographics – Some parts of town generally require more attention. It may need consideration when evaluating alternatives.

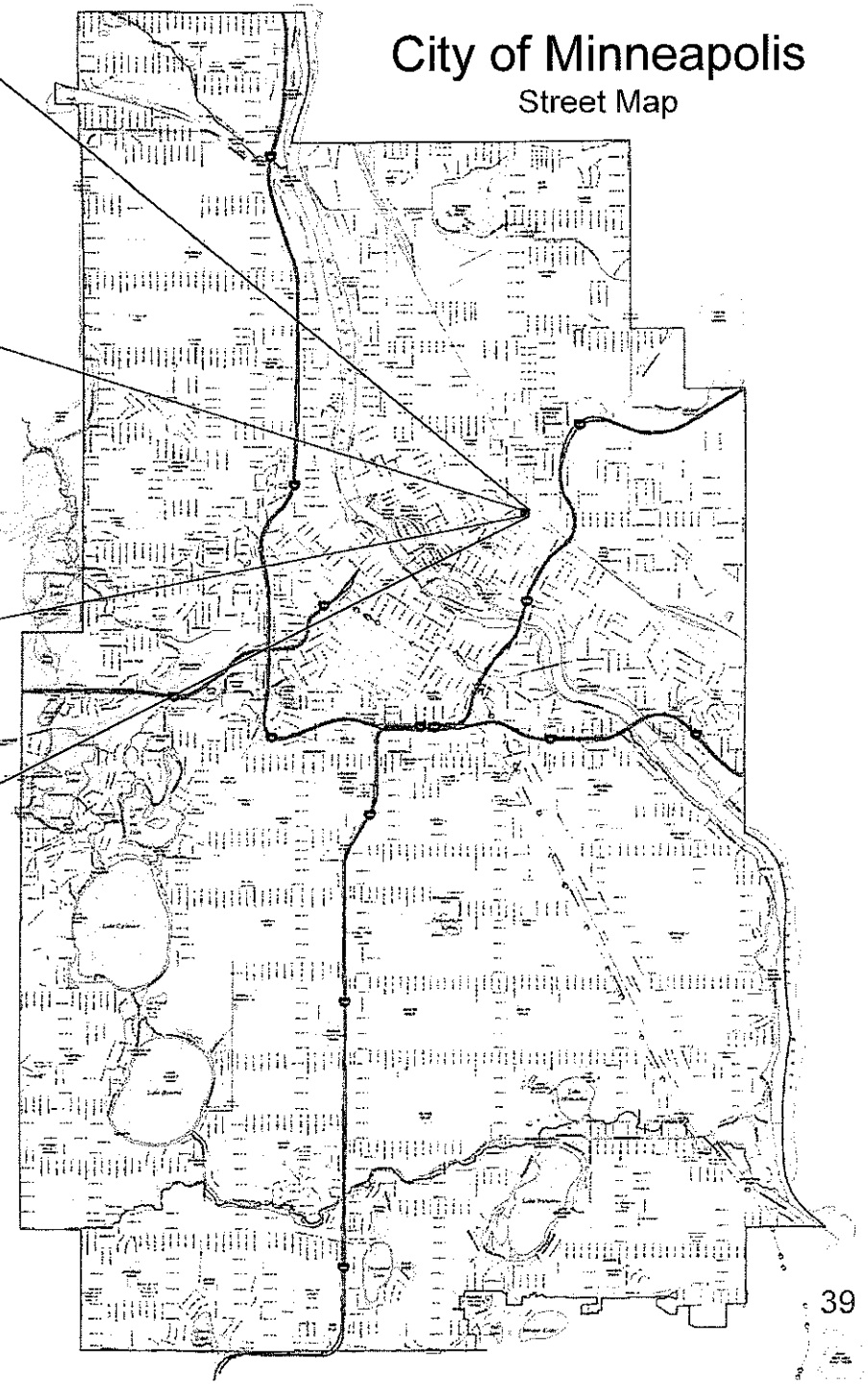
- Process – In the event that we change our internal processes, what about the change could affect the operational efficiency at a given site? For example we stop batching orders and leverage technology to improve efficiency of deployed vehicles.



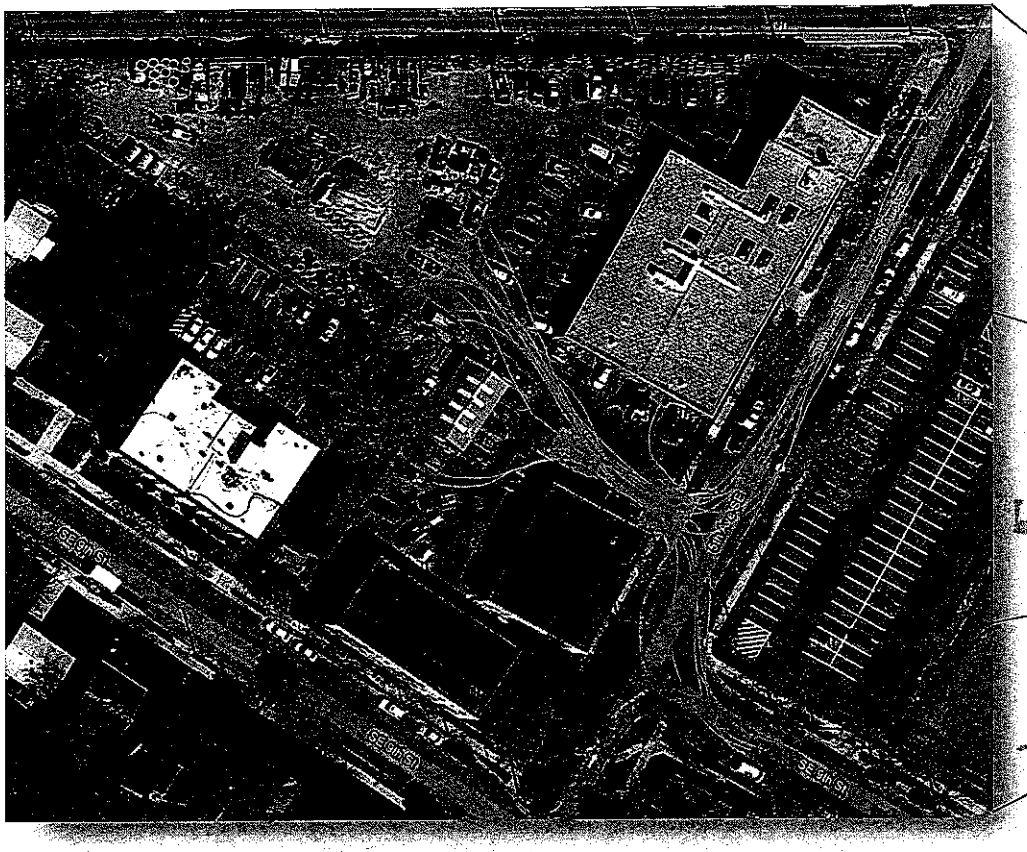
APPENDIX C: SITE OBSERVATIONS - ESY: Morning Employee Arrivals

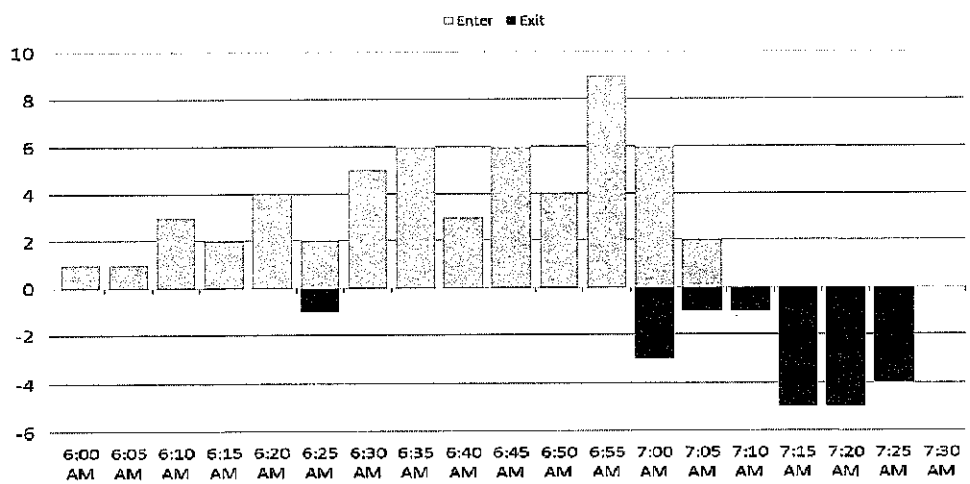


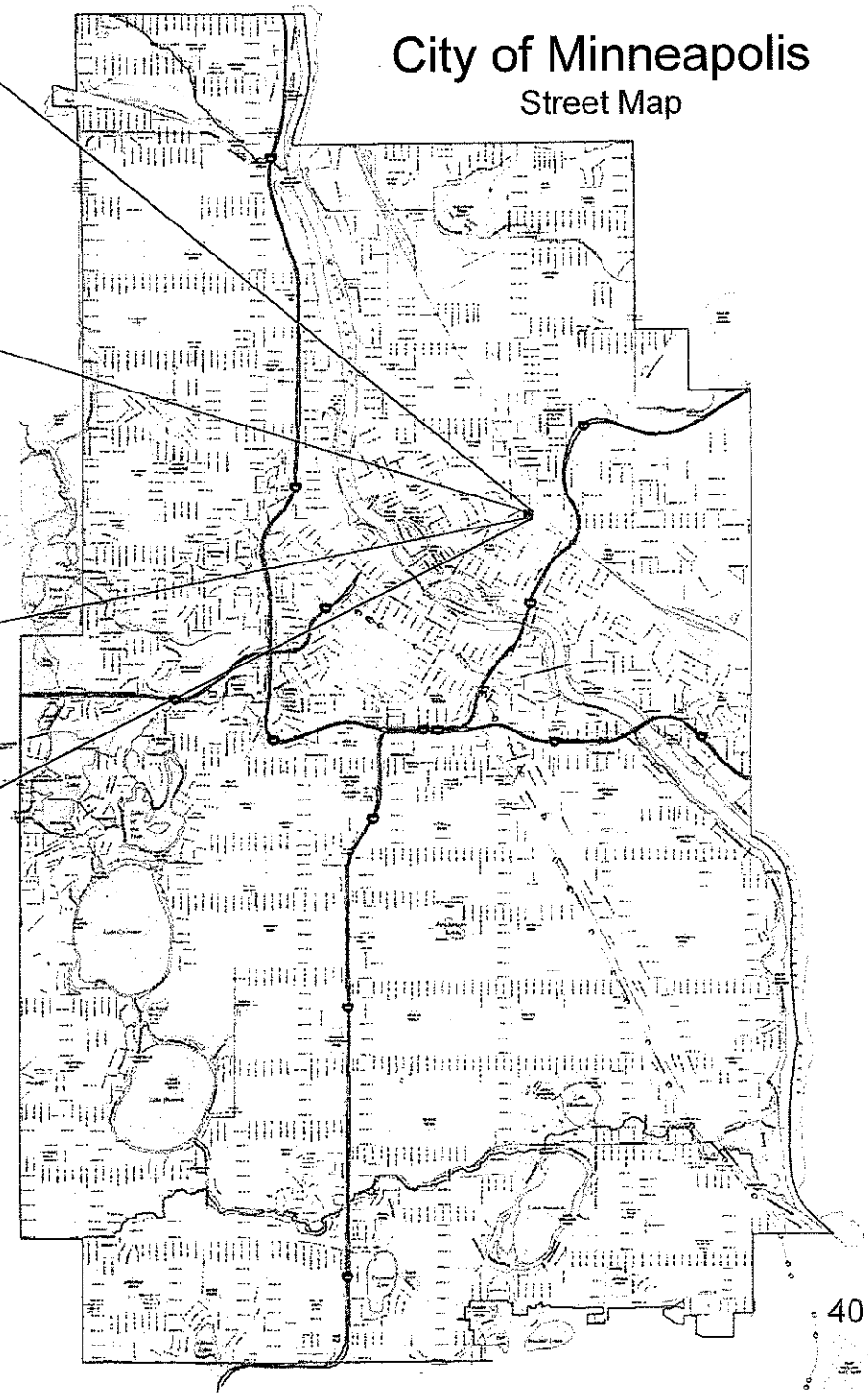




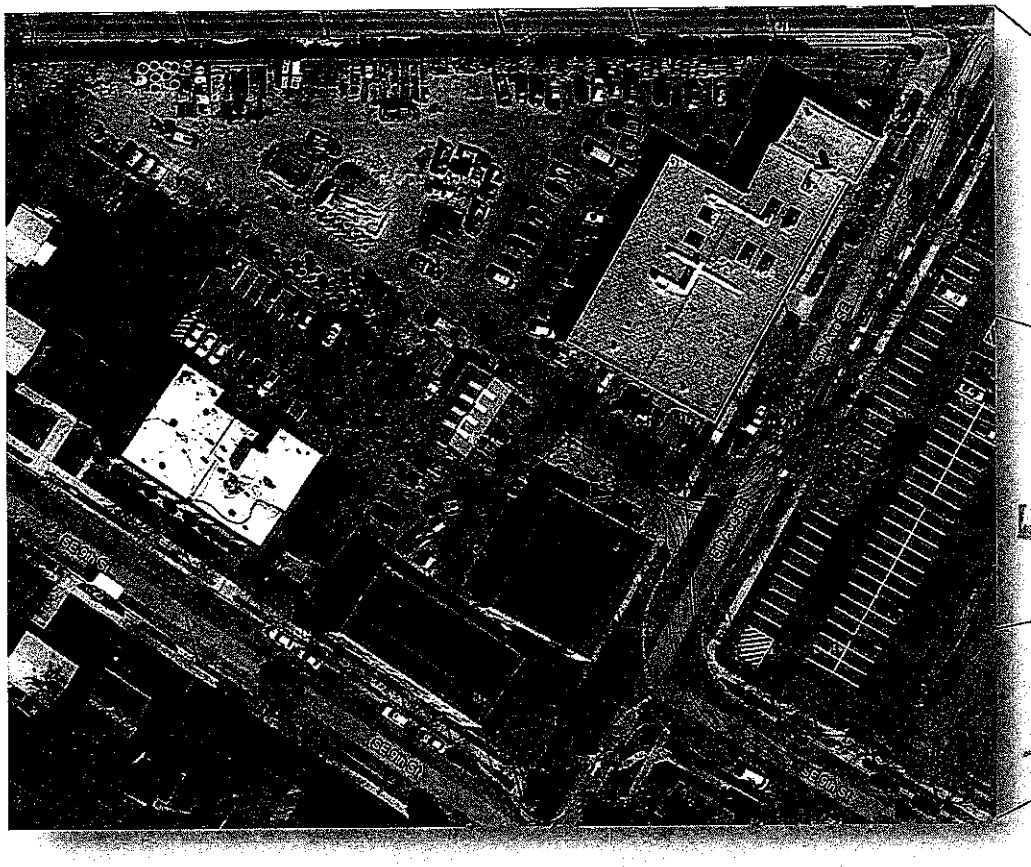
APPENDIX C: SITE OBSERVATIONS - ESY: Morning Work Departures

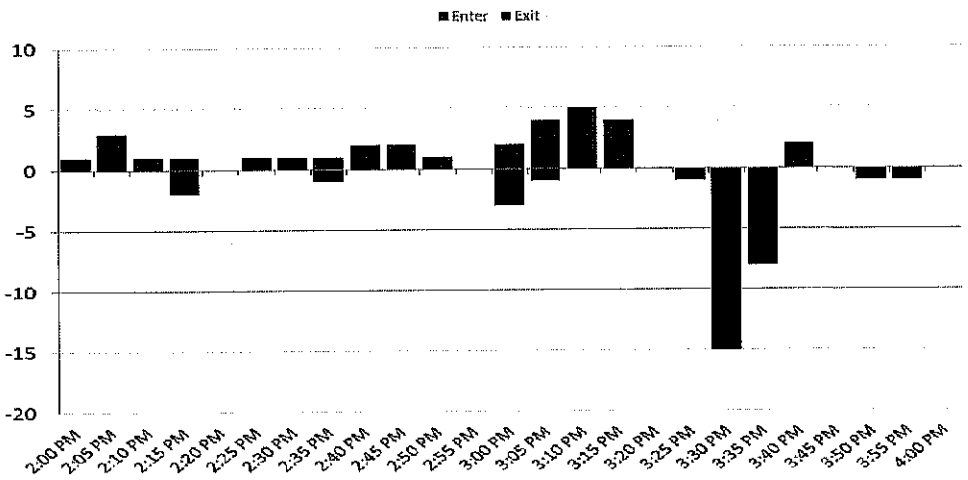


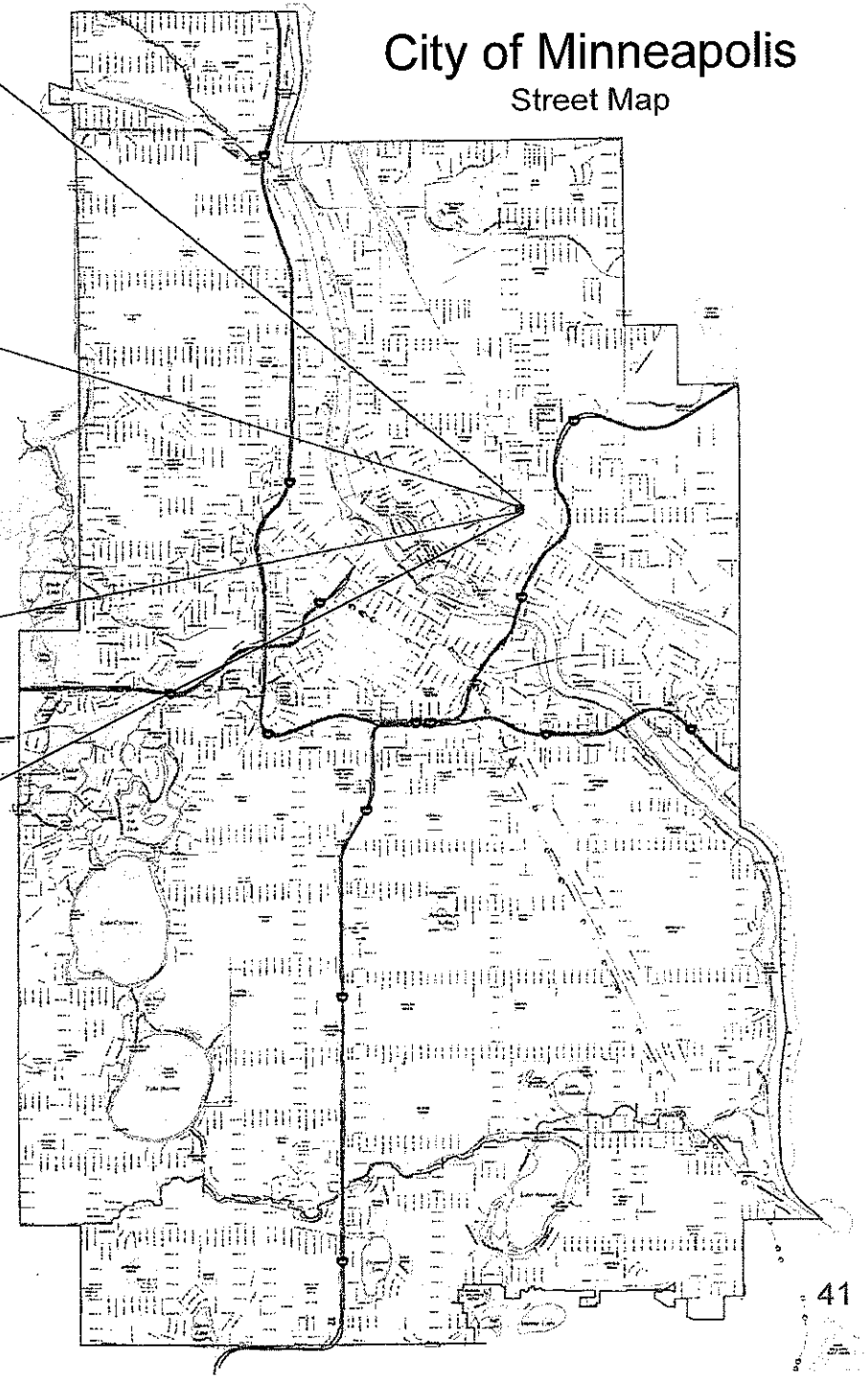




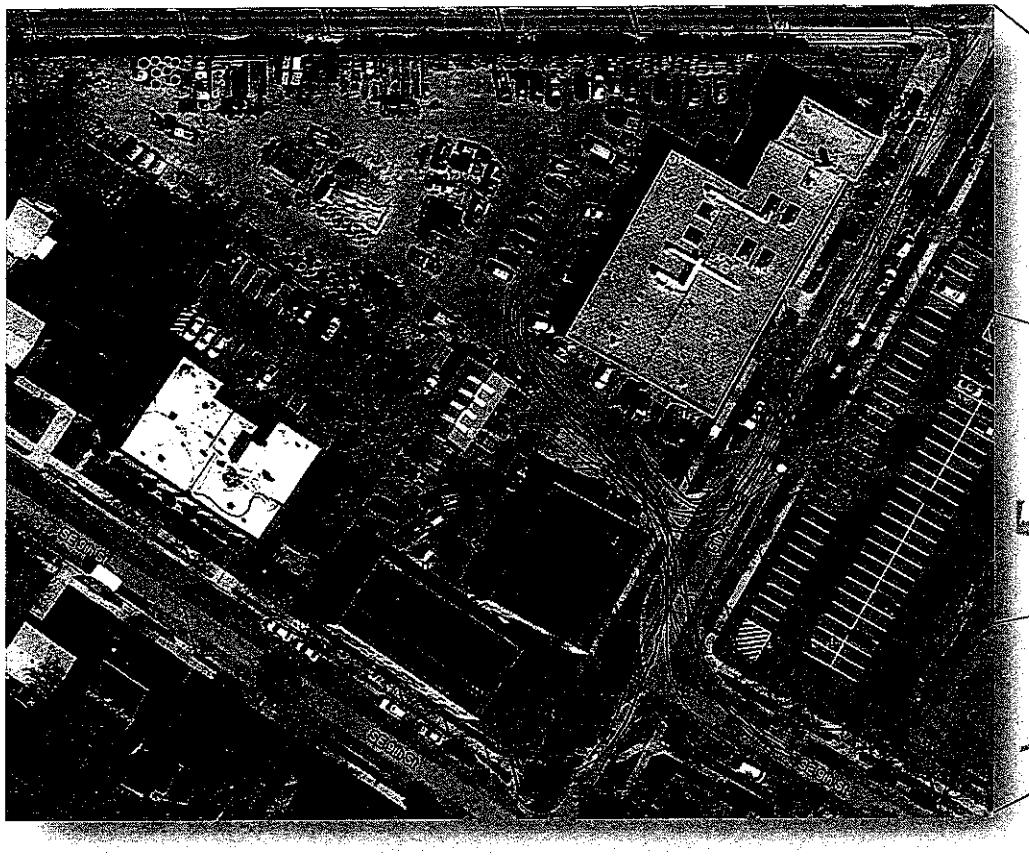
APPENDIX C: SITE OBSERVATIONS - ESY: Afternoon Work Arrivals

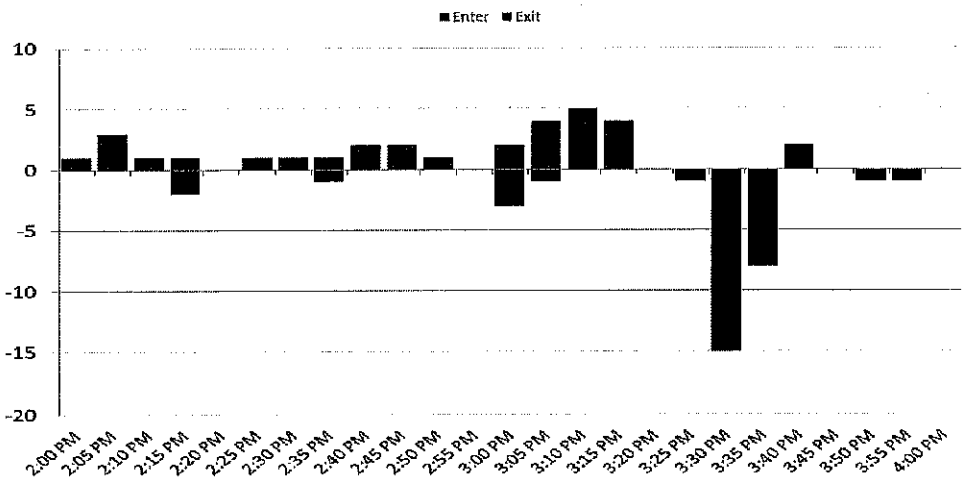


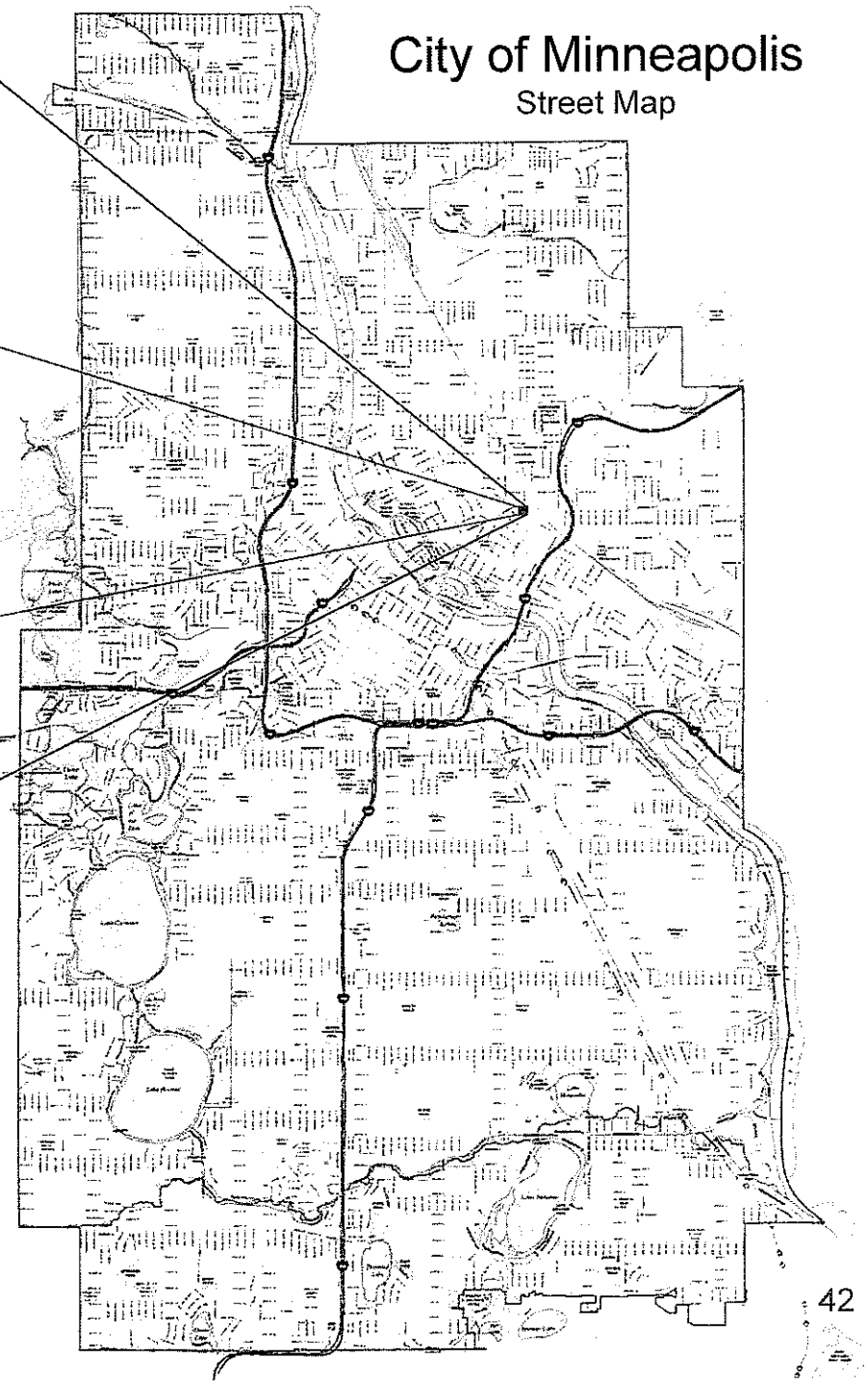




APPENDIX C: SITE OBSERVATIONS - ESY: Afternoon Employee Departures







Travel Demand Management Plan

City of Minneapolis Public Works Hiawatha Yard Maintenance Facility

Minneapolis, MN

Prepared For:

Minneapolis
City of Lakes

Prepared By:

ALLIANT ENGINEERING, INC.

233 Park Avenue S, Suite 300
Minneapolis, MN 55415

May 24, 2007

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1.0 Introduction

The City of Minneapolis is planning the reconstruction of their Hiawatha Yard Public Works Maintenance Facility. Reconstruction will include demolition of the entire existing site, with exception to the Paving Laboratory building, and construction of a new consolidated facility within the same property boundaries. In addition, the existing Street Maintenance Department (currently located at 198 Aldrich Avenue S) will be relocated to the new facility. Currently, the proposed project is scheduled to begin formal site plan design process in 2007, with construction beginning in the fall of 2007 or spring 2008. Completion and full occupancy is expected by year 2009.

As part of the proposed project, the Public Works has completed a Travel Demand Management (TDM) plan. The goal of the TDM plan is to accomplish the following:

- Document the existing and proposed conditions with respect to the transit, parking, bicycle and pedestrian facilities;
- Document the parking impacts associated with the redevelopment;
- Identify and address traffic operations issues; and
- Evaluate future access and provide guidance to the site plan with respect to transportation considerations.

1.1 Site and Development Characteristics

Site Location

The existing facility is located on the southwest corner of Hiawatha Avenue and 26th Street E intersection in the East Phillips Neighborhood of Minneapolis. 27th Street and Longfellow Avenue generally form the southerly and westerly boundaries. Figure 1 illustrates the project location.

Existing Site Characteristics

Several Minneapolis Public Works Departments currently occupy the entirety of the project site within numerous separate building structures. These departments include:

- ***Central Stores***. Central Stores provide supplies, materials and bidding services to most operations and departments within the City of Minneapolis.
- ***Sewer Maintenance and Construction***. The Sewer Department maintains the sewer and storm water system throughout the city.
- ***Engineering Materials and Testing***. The Materials Department provides testing of concrete, asphalt and soils.
- ***Paving Construction***. The Paving Department is a division of the Field Service Department and is responsible for the construction or reconstruction of the City of Minneapolis roadway infrastructure.
- ***Bridge Maintenance and Repair***. The Bridge Department is responsible for the city's bridge structures, retaining walls and provides some construction services.

In addition to the above department buildings, several storage buildings, shop buildings, a fuel island, material storage bins and an asphalt mixing/storage plant exist on site. Based on the data collected as part of the preliminary space planning efforts being conducted by Hagen, Christensen and McIlwain Architects (HCM), the existing project site building characteristics, employees and city vehicle quantities, relevant to traffic and parking generation were determined. Table 1 provides a summary of the existing site characteristics.

Table 1. Existing Land Use Site Characteristics Summary[1]

Department	Space[2]	Employees		City Vehicles[3]
		Summer	Winter	
Central Stores	28,000 SF	7	7	1
Sewer Maintenance and Construction	38,120 SF	105	101	6[4]
Engineering Materials and Testing	11,530 SF	11	11	11
Paving Construction	15, 650 SF	94	21	62
Bridge Maintenance and Repair	19,920 SF	30	23	6
Total	**113,220 SF**	**247**	**163**	**86**

[1] Hagen, Christensen & McIlwain Architects, November 4, 2005 Draft Space Planning

[2] Includes office, shop, interior and exterior storage facilities or space.

[3] Does not include snow blowers,forklifts, bobcats or lawnmowers

[4] The number of existing city vehicles is unknown.

Currently there are three full access points along 26th Street. The easterly most access point is located approximately 160 feet west of Hiawatha Avenue and serves as the main access for entering and exiting trucks or other vehicles. The second access point is located on the westerly side of the existing Sewer Department building and is primarily used by employees. The westerly most access point is a one-way exiting driveway, approximately 20 feet east of a public alley, and is used by department employees. On the southwest corner of the site, 27th Street terminates as the last full access into the project site. Signs are posted along every approach to prohibit trucks from exiting into or entering from the adjacent neighborhood. As such, the 27th Street access is generally used by only employees and customers.

Proposed Site Characteristics

The proposed project will involve razing the existing site and constructing a consolidated facility. Current plans have identified the existing Paving Laboratory as the only structure to be maintained. In addition, the existing Street Maintenance Department (currently located at 198 Aldrich Avenue S) will be relocated to the new facility. The 198 Aldrich Avenue Street Maintenance site will be abandoned. The Street Department is responsible for the ongoing maintenance and repair of streets, city owned plazas and mowing of grass and plowing of streets.

At this time, a proposed site plan has not been developed; however, the general parameters (building space, approximate employees and approximate city vehicles) have been estimated. The number of building structures, parking facility or internal traffic circulation is unknown. However, with respect to traffic generation, enough project data and planning have been completed to formulate reliable estimates. Upon completion of the proposed project, full access to both 27th Street and 26th Street will be maintained. Similar to existing, trucks will be prohibited from using 27th Street, however, physical geometric design of the site circulation must be incorporated to further discourage. Currently there are three access points to 26th Street. The proposed project will consolidate all access to only one location (exact location to be determined). In addition, two options for improving the maintenance vehicles delay in entering

onto southbound Hiawatha Avenue were compared – (1) direct right-out or right-in/right-out access to Hiawatha Avenue via the easterly side of the site or (2) construction of an eastbound right turn lane at the Hiawatha Avenue/26th Street intersection.

The proposed project will maintain its existing I2 (Industrial) zoning classification. Table 2 summarizes the proposed land use characteristics and change from existing.

Table 2. Proposed Land Use Characteristics Summary[1]

	Existing (2005)				Proposed (2009)			
Department	**Space[2]**	**Employees**		**City Vehicles[3]**	**Space[2]**	**Employees**		**City Vehicles[3]**
		Summer	**Winter**			**Summer**	**Winter**	
Hiawatha Yard Facility								
Common Space	5,440 SF	--	--	--	14,500 SF	--	--	--
Central Stores	28,000 SF	7	7	1	18,900 SF	7	7	1
Sewer Maintenance and Construction	38,120 SF	105	101	6[4]	21,275 SF	105	101	6[4]
Engineering Materials and Testing	11,530 SF	11	11	11	8,180 SF	11	11	11
Paving Construction	15, 650 SF	94	21	62	8,840 SF	94	21	62
Bridge Maintenance and Repair	19,920 SF	30	23	6	12,320 SF	30	23	6
Street Maintenance	--	--	--	--	12,430 SF	96	78	49
Subtotal	**118,660 SF**	**247**	**163**	**86**	**96,450 SF**	**343**	**241**	**135**
198 Aldrich Avenue Facility								
Street Maintenace	20,000 SF	96	78	49	--	--	--	--
Total	**138,660 SF**	**343**	**241**	**135**	**96,450 SF**	**343**	**241**	**135**

[1] Hagen, Christensen & McIlwain Architects, November 4, 2005 Draft Space Planning
[2] Includes office, shop, interior and exterior storage facilities or space.
[3] Does not include snow blowers,forklifts, bobcats or lawnmowers
[4] The number of existing city vehicles is unknown or has not been determined.

As shown in Table 2, the overall facility space required is decreased under the proposed project (efficiency gained by consolidating). Furthermore, the current plans identify the both the staffing and the city vehicles to be the same. In essence, the only net change expected to impact the parking and traffic characteristics at the Hiawatha Yard is the relocation of the Street Department. All other external characteristics are expected to remain the same.

1.2 Parking Characteristics

The proposed project intends to provide adequate parking for its employees and city vehicle needs. Refer to Section 2.0 Parking Analysis for further discussion.

1.3 Pedestrian, Bicycle, and Transit Characteristics

The project site is located on the southwest quadrant of Hiawatha Avenue and 26th Street. Its location in proximity to a major destination and adjacent to arterial roadways provides employees with access to other modes of transportation, such as walking or bicycling. Concrete sidewalks are currently provided on both the north and south sides of 26th Street and along the westerly side of Hiawatha Avenue. Pedestrian crossing signals are provided at the signalized intersection of Hiawatha Avenue and 26th Street. Furthermore, the project site is located two blocks from the Midtown Greenway Trail, which could provide employees with access from many of Minneapolis designated bicycle routes.

Unfortunately, the project site is poorly suited for transit access. The Hiawatha Light Rail Transit (LRT) line runs on the easterly side of Hiawatha Avenue; however, the nearest stations are located at Lake Street, south of the project site, and Franklin Avenue, north of the project site.

Both transit stations are a considerable walking distance. The Hiawatha LRT runs at seven minute headways during AM and PM peak rush periods and 15 minute headways the remainder of the day. No other bus service is provided along Hiawatha Avenue or 26th Street (between Minnehaha Avenue and Cedar Avenue). However, there are three bus routes maintaining frequent service along Cedar Avenue – Metro Transit Route 111, Route 19 and Route 27. Service along these routes provide approximately 15 minute headways during the AM and PM peak periods and 20 minute headways during the mid-day. Route 111 provides limited local service with three to four trips during the rush periods and no service off-peak. Each route provides access to nearby transit hubs where transfers to other routes could be made.

Hiawath Yard Maintenance Facility
Travel Demand Management Plan

ALLIANT ENGINEERING, INC.

Figure 1
Project Location

2.0 Parking Analysis

A preliminary parking analysis has been completed for the proposed project. The analysis methodology used to estimate the required parking stalls included a comparison of the following:

- Existing on-site parked vehicle occupancy survey;
- A review of the *Institute of Transportation Parking Generation Manual, Third Edition;* and
- The space planning data developed by HCM Architects.

2.1 Existing Parking Occupancy Survey

A parking survey of the existing Hiawatha Yard and the 198 Aldrich Avenue S facilities was conducted in November 2006 (represents only one observation). A summary of the existing surface lot parking usage for three different time periods of a weekday is provided in Table 3.

Table 3. Existing Parking Occupancy Survey

Location	Occupancy		
	Weekday 7 AM	Weekday 11:30 AM	Weekday 3 PM
	Occupied Stalls	Occupied Stalls	Occupied Stalls
Hiawatha Yard Facility	173	142	131
198 Aldrich Avenue S (Street Department)	102	69	74
TOTAL	**275**	**211**	**205**

The parking survey found the peak parking demand to be around 7AM with a total of 275 parked vehicles (including city maintenance vehicles and employee personal vehicles). The peak demand of 275 parked vehicles results in an estimated rate of 0.80 stalls per employee (includes parked city vehicles).

2.2 Parking Generation Computation

The second method involves the application of parking generation rates from the *Institute of Transportation Engineers (ITE) Parking Generation Manual, Third Edition.* This resource documents numerical trends in parking demand for a variety of land uses based upon the day of the week, time of day, size of the development, and whether the site is urban or suburban. A maintenance facility is not provided in the *Parking Generation Manual*; however, a few related uses were reviewed as a comparison. For comparison, Table 4 documents the estimated parking demand with respect to an Industrial Park and a Government Office Building.

Table 4. Estimated Parking Demand – Parking Generation Method

Land Use/ITE Code	Total Employees[1]	Parking Rate/ Employee	Estimated Parking Demand
Industrial Park / 130	343	0.89	**305**
Government Office Building / 730	343	0.83	**285**

[1] Refer to Table 2. Total employees includes the Hiawatha Yard and the 198 Aldrich facilities during the summer.

Based on related land use types, the parking generation method found the estimated parking demand to be approximately 285 to 305 vehicles.

2.3 Space Planning Data

HCM Architects had completed a spacing planning analysis with respect to both the building(s)/storage needs and the vehicle parking needs. Table 5 provides a summary of their analysis.

Table 5. Estimated Parking Demand – Space Planning Analysis[1]

Department	City Vehicle Parking Stalls	Employee Parking Stalls	Total Parking Stalls
Hiawatha Yard Facility			
Common Space	--	--	--
Central Stores	3	7	**10**
Sewer Maintenance and Construction[1]	6	49	**55**
Engineering Materials and Testing	11	11	**22**
Paving Construction	62	93	**155**
Bridge Maintenance and Repair	15	30	**45**
Street Maintenance	15	30	**45**
Total	**112**	**220**	**332**

[1] The number of existing city vehicles is unknown or has not been determined.

Based on the space planning analysis, the parking requirements were found to be approximately 332 vehicles. The demand of 332 parked vehicles results in an estimated rate of 0.97 stalls per employee (includes parked city vehicles).

A comparison of the three methodologies found a reasonable correlation. The provision of off-street parking stalls between the range of 275 and 332 would be expected to provide sufficient supply for employees and city vehicles. However, it should be noted this does not include other types of equipment (e.g., bobcats, forklifts, snowplows, lawnmowers, trailers, or etc.), as covered storage facilities would likely be used.

Further analysis and evaluation of actual parking needs may be necessary as the site plan is being developed.

3.0 Transportation Impact Analysis

This section of the TDM describes impacts to the transportation system resulting from the proposed Hiawatha Yard reconstruction project. A traffic study was conducted that included a review of the existing conditions, forecasting of site generated traffic volumes based on the proposed characteristics, and a traffic operations assessment.

Concern has been raised by the current Hiawatha Yard Directors that the eastbound vehicle queue (shared through/right turn lane) on the approach to Hiawatha Avenue can incur delays to employees and city vehicles when exiting eastbound onto 26th Street. Specifically when light rail transit (LRT) vehicles are present, longer eastbound delays are inevitable. Because there is not an exclusive right turn lane, city vehicles ultimately destined southbound on Hiawatha Avenue are forced to wait. To address the queuing and delay concern, the following traffic study evaluated the existing traffic operations (e.g., queue length and delay) on the eastbound approach to the Hiawatha Avneue/26th Street intersection. Two options were identified to address the eastbound delay – (1) a dedicated right-out access onto Hiawatha Avenue (located just south of 26th Street) or (2) evaluation of an exclusive right turn lane on the 26th Street eastbound approach to Hiawatha Avenue.

3.1 Analysis Scenarios

To identify or quantify traffic impacts incurred by the proposed project, the following scenarios were evaluated:

- *Year 2006 existing*
- *Year 2010 Build*

  Proposed land use includes reconstructing the existing Hiawatha Yard Maintenance Facility and incorporation of the 198 Aldrich Avenue Facility (Street Department). One full access is provided on 26th Street and access is maintained to 27th Street. No other roadway or access improvements are assumed.
- *Year 2010 Build (comparison of dedicated right-out access or exclusive right turn lane)*

  Proposed land use includes reconstructing the existing Hiawatha Yard Maintenance Facility and incorporation of the 198 Aldrich Avenue Facility (Street Department). One full access is provided on 26th Street, access is maintained to 27th Street and a comparison of a dedicated right-out access located on Hiawatha Avenue or an exclusive eastbound right turn lane is made.

3.2 Existing Traffic Characteristics

The following summarizes key characteristics of the surrounding roadway network:

- Trunk Highway (TH) 55 or Hiawatha Avenue is a north/south "Principal Arterial." Hiawatha Avenue consists of three through travel lanes with exclusive left turn and right turn lanes at all intersections. The year 2005 average daily traffic (ADT) along Hiawatha Avenue, just north of 26th Street is 44,300 vehicles.
- 26th Street is an east/west four lane undivided roadway and is classified as a "B Minor Arterial." West of Cedar Avenue, 26th Street becomes a one-way westbound roadway. At Hiawatha Avenue, eastbound 26th Street consists of one exclusive left turn lane (extends

the full length of roadway) and one shared through/right turn lane. The year 2006 ADT along 26th Street, between Hiawatha Avenue and Cedar Avenue is 9,100 vehicles.

- 27th Street is an east/west "local" street, which terminates at the Hiawatha Yard on its eastern limits. 27th Street provides local access to the adjacent neighborhood, to Longfellow Avenue and provides access to Cedar Avenue.

The Hiawatha Avenue/26th Street intersection is controlled by a traffic signal system, tied into the Minneapolis Central Control Center. Pedestrian crossing intervals are provided on each intersection approach. The TH 55 LRT line crosses the westbound approach at-grade, and is given a "preemption" treatment (LRT vehicle is given immediate right-of-way).

3.3 Existing Traffic Volumes

Existing bi-directional classification or turning movement classification traffic volumes were collected at each of the site access points into both the Hiawatha Yard and 198 Aldrich Avenue facilities during the months of July and October 2006. Existing truck traffic and operations with respect to the asphalt operations were included in the data collected. This data provides the existing entering/exiting traffic volumes by general vehicle type, which also yields the trip generation for the maintenance facilities. In addition, turning movement traffic counts were collected at the Hiawatha Avenue/26th Street intersection (November 2006) and hourly tube counts were collected along 26th Street (July 2006), in the vicinity of Longfellow Avenue. Table 6 documents the existing traffic volume by classification at the 198 Aldrich Avenue facility.

Table 6. Existing Traffic Volumes (Site Trip Generation) – 198 Aldrich Avenue Facility

	Entering			Exiting					
Begin Time	Cars/ Pick-ups	1-ton	Semi	Cars/ Pick-ups	1-ton	Semi	Total Entering	Total Exiting	Total Trips
198 Aldrich Avenue Facility (Street Department)									
06:00	13	2	2	32	1	5	16	37	53
07:00	**29**	**4**	**9**	**29**	**4**	**3**	**42**	**35**	**77**
08:00	19	4	8	23	2	10	30	35	65
09:00	29	3	3	32	1	5	34	37	71
10:00	30	3	4	18	3	5	36	25	61
11:00	27	3	1	21	5	4	31	30	61
12:00	27	2	4	24	3	6	33	32	64
13:00	**37**	**1**	**3**	**32**	**5**	**2**	**41**	**39**	**79**
14:00	24	2	3	25	3	4	29	31	60
15:00	37	2	1	19	3	3	39	24	63
16:00	23	1	0	4	2	1	24	7	31
17:00	7	0	0	4	0	0	7	4	11
Daily	**300**	**24**	**35**	**260**	**29**	**45**	**359**	**333**	**692**

As shown, the Street Department currently generates approximately 692 daily vehicle trips, with 70 total trips occurring during the peak afternoon period (1:00 to 2:00 PM) and 77 occurring during the AM peak hour (7:00 to 8:00). On average, approximately 81 percent of the trips are passenger cars or pick-up trucks, 8 percent are 1-ton vehicles and the remaining 11 percent are single-unit or semi-tractor trailer trucks.

Table 7 documents the existing traffic volume by classification at the Hiawatha Yard facility.

Table 7. Existing Traffic Volumes (Site Trip Generation) – Hiawatha Yard Facility

Begin Time	Entering								Exiting								Total Entering	Total Exiting	Total Trips
	27th Street				26th Street[1]				27th Street				26th Street[1]						
	Cars/ Pick-ups	1-ton	Semi	Total	Cars/ Pick-ups	1-ton	Semi	Total	Cars/ Pick-ups	1-ton	Semi	Total	Cars/ Pick-ups	1-ton	Semi	Total			
Hiawatha Yard Facility																			
06:00	20	0	1	21	42	5	1	48	4	0	0	4	8	13	0	21	69	25	93
07:00	**19**	**1**	**2**	**21**	**24**	**24**	**0**	**48**	**8**	**1**	**2**	**11**	**10**	**42**	**0**	**52**	**69**	**63**	**132**
08:00	11	1	1	13	15	6	0	21	7	0	0	7	17	13	0	30	34	37	71
09:00	14	2	1	17	26	24	0	50	8	1	0	9	9	10	0	19	67	28	95
10:00	15	2	1	17	32	19	2	53	5	1	1	6	20	10	2	32	70	38	108
11:00	14	4	2	20	12	15	2	29	8	1	1	10	12	9	0	21	49	31	79
12:00	11	2	1	14	17	5	6	28	9	0	1	9	12	8	4	24	42	33	75
13:00	15	0	2	16	26	4	0	30	6	1	0	7	7	0	2	9	46	16	62
14:00	20	3	4	26	28	1	2	31	11	1	1	12	14	0	1	15	57	27	84
15:00	**17**	**1**	**1**	**19**	**41**	**1**	**2**	**44**	**15**	**0**	**1**	**16**	**36**	**4**	**5**	**45**	**63**	**61**	**123**
16:00	3	0	2	5	7	0	0	7	4	0	0	4	7	0	1	8	12	12	23
17:00	2	0	0	2	3	0	0	3	1	0	0	1	2	0	0	2	5	3	8
Daily	**158**	**15**	**15**	**188**	**273**	**104**	**15**	**392**	**83**	**5**	**5**	**93**	**154**	**109**	**15**	**278**	**580**	**371**	**950**

[1] Includes total of all 3 existing access points onto 26th Street

As shown, the existing Hiawatha Yard currently generates approximately 950 daily vehicle trips, with 123 total trips occurring during the peak afternoon period (3:00 to 4:00 PM) and 132 occurring during the AM peak hour (7:00 to 8:00). On average, approximately 70 percent of the trips are passenger cars or pick-up trucks, 25 percent are 1-ton vehicles and the remaining 5 percent are single-unit or semi-tractor trailer trucks.

Table 8 documents the existing turning movement traffic volumes at the 26th Street/Hiawatha Yard Main Access, which corresponds to the peak hour of exiting and total trip generation. (AM is 7:00 to 8:00 and PM is 3:00 to 4:00). Table 9 documents the existing turning movement traffic volumes at the Hiawatha Avenue/26th Street intersection, corresponding to the Hiawatha Yard peak hour of exiting and total trip generation.

Table 8. AM and PM Peak Hour Turning Movement Volumes – 26th Street at Hiawatha Yard Main Access

	26th Street - WB			Main Access - NB			26th Street - EB		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
7:00-8:00 AM	27	1031	0	11	0	41	0	26	21
3:00-4:00 PM	13	951	0	12	0	33	0	79	31

Table 9. AM and PM Peak Hour Turning Movement Volumes – Hiawatha Avenue at 26th Street

	Hiawatha Avenue - SB			26th Street - WB			Hiawatha Avenue - NB			26th Street - EB		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
7:00-8:00 AM	429	1393	625	44	269	638	137	2141	163	20	29	18
3:00-4:00 PM	460	1983	357	127	465	685	129	2185	173	32	43	34

As shown, the total peak hour 26th Street eastbound traffic volume (includes existing Hiawatha Yard generated traffic) is 67 and 109 during the AM and PM peak hours, respectively.

3.4 Year 2010 Forecast Traffic Volumes

Forecast traffic volumes were developed for the year 2010 build scenarios. The proposed project includes the reconstruction of the existing Hiawatha Yard facility and the incorporation of the existing Street Department. Current plans identify that both the existing staffing and the city vehicle usage are expected to remain the same; but, housed within the same site. ***In essence, the only net change expected to impact traffic characteristics at the Hiawatha Yard is the incorporation of the Street Department. All other external characteristics are expected to remain the same.***

Trip Generation

Trip generation for the proposed project was estimated based upon the field collected hourly site trip generation and roadway/intersection turning movement counts at both the Hiawatha Yard and 198 Aldrich Avenue facilities. The resulting forecast trip generation upon completion of the project is estimated to be the sum of the existing Hiawatha Yard plus the existing 198 Aldrich Avenue facility. Table 10 summarizes the estimated hourly site trip generation.

Based on the proposed project land use, 208 and 186 vehicle trips are expected to be generated during the sites AM (7:00 to 8:00) and PM (3:00 to 4:00) peak hours, respectively. The total daily trip generation is estimated to be approximately 1,642 vehicles. The resulting average vehicle type is expected to be approximately 75 percent cars or pick-up trucks, 17 percent 1-ton vehicles and the remaining 8 percent to be single-unit or semi-tractor trailer trucks.

Table 10. Proposed Project Forecast Trip Generation

Begin Time	Entering								Exiting								Total Entering	Total Exiting	Total Trips
	27th Street				26th Street[1]				27th Street				26th Street[1]						
	Cars/ Pick-ups	1-ton	Semi	Total	Cars/ Pick-ups	1-ton	Semi	Total	Cars/ Pick-ups	1-ton	Semi	Total	Cars/ Pick-ups	1-ton	Semi	Total			
Hiawatha Yard Facility																			
06:00	23	0	1	24	51	7	3	60	13	0	0	13	30	14	5	48	85	62	146
07:00	**32**	**1**	**2**	**34**	**40**	**28**	**9**	**77**	**21**	**1**	**2**	**23**	**26**	**45**	**3**	**74**	**111**	**98**	**208**
08:00	18	2	1	21	26	9	8	43	14	0	0	14	33	15	10	58	64	72	135
09:00	24	2	1	27	45	26	3	73	22	1	0	23	26	11	5	42	101	65	165
10:00	**24**	**2**	**1**	**26**	**52**	**22**	**6**	**80**	**8**	**1**	**1**	**9**	**34**	**12**	**7**	**53**	**106**	**63**	**169**
11:00	29	5	2	35	24	17	3	44	16	2	1	18	25	14	4	42	79	61	140
12:00	21	3	1	24	34	6	10	50	18	0	1	19	26	11	10	46	74	65	139
13:00	28	0	2	29	50	5	3	57	21	6	0	27	24	0	4	28	87	55	141
14:00	29	4	4	37	42	1	5	49	21	3	1	25	28	0	5	33	86	58	143
15:00	**28**	**2**	**1**	**30**	**67**	**2**	**3**	**71**	**20**	**0**	**1**	**21**	**49**	**7**	**8**	**63**	**102**	**84**	**186**
16:00	10	0	2	11	23	1	0	24	5	0	0	5	10	2	2	13	36	18	54
17:00	4	0	0	4	8	0	0	8	2	0	0	2	4	0	0	4	12	7	18
Daily	**269**	**19**	**15**	**303**	**461**	**124**	**50**	**635**	**181**	**13**	**5**	**199**	**315**	**129**	**60**	**504**	**939**	**703**	**1642**

[1] Only 1 access point onto 26th Street

It should be reiterated that the existing trips generated by the Hiawatha Yard are currently within the existing system and are represented in the existing data collection. Therefore, only the trip generation associated with the Street Department is expected to be additional vehicles added to 26th Street, 27th Street and Hiawatha Avenue. As such, the new external trip generation expected upon completion of the project is expected to be 692 daily vehicle trips, with 70 total trips occurring during the peak afternoon period (1:00 to 2:00 PM) and 77 occurring during the AM peak hour (7:00 to 8:00).

Trip Distribution

The trip distribution refers to the geographic orientation of the entering and exiting vehicle trips. Based on the turning movement traffic counts collected at each of the existing site access points and at the Hiawatha Avenue/26th Street intersection, Table 11 summarizes the directional distribution percentages found.

Table 11. Directional Distribution of Entering/Exiting Trips

	Entering			Exiting				
						Eastbound 26th Street		
Start Time	27th Street	Westbound 26th Street	Eastbound 26th Street	27th Street	Westbound 26th Street	Northbound Hiawatha Avenue	East of Hiawatha Avenue	Southbound Hiawatha Avenue
06:00	30%	61%	9%	14%	33%	--	--	--
07:00	**30%**	**39%**	**30%**	**17%**	**18%**	**20%**	**29%**	**17%**
08:00	37%	48%	15%	19%	30%	15%	33%	4%
09:00	25%	58%	16%	31%	22%	14%	24%	9%
10:00	24%	54%	21%	16%	11%	22%	47%	5%
11:00	40%	41%	19%	31%	16%	6%	32%	14%
12:00	33%	43%	24%	27%	6%	21%	38%	8%
13:00	35%	48%	17%	44%	0%	20%	29%	8%
14:00	46%	39%	16%	43%	19%	6%	26%	6%
15:00	**30%**	**21%**	**50%**	**26%**	**20%**	**16%**	**21%**	**17%**
16:00	39%	52%	9%	30%	9%	7%	37%	17%
17:00	33%	22%	44%	33%	0%	4%	47%	16%
Average	**32%**	**46%**	**22%**	**25%**	**18%**	**14%**	**33%**	**11%**

Trip Assignment/Forecast Volumes

The proposed project forecast trip generation was assigned to the access points and the eastbound approach to the Hiawatha Avenue/26th Street intersection based upon the previously documented trip distribution percentages. In addition, to account for growth in traffic due to other external development or infrastructure changes in the region, a one-percent background growth rate is assumed. The one-percent per year factor is applied to only the background traffic volumes along 26th Street (i.e., is not applied to the trip generation volumes).

Table 12 shows the forecast year 2010 Build traffic volumes for the eastbound approach to the Hiawatha Avenue/26th Street intersection. Table 13 and Table 14 show the forecast year 2010 Build peak hour intersection turning movement volumes at the 26th Street/Hiawatha Yard Main Access and the Hiawatha Avenue/26th Street intersections, respectively.

Table 12. Forecast Eastbound 26th Street Approach Volumes – Eastbound Approach to Hiawatha Avenue/26th Street

	Hiawatha Avenue at 26th Street (Eastbound Approach)									Hiawatha Avenue at Right-Out Access (Eastbound Approach)		
Scenario	2006 Exist			2010 Build			2010 Build (RO)			2006 Exist	2010 Build	2010 Build (RO)
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Right	Right	Right
6:00	10	23	8	14	33	11	14	33	8	--	--	3
7:00	**20**	**29**	**18**	**25**	**37**	**22**	**25**	**37**	**12**	--	--	**10**
8:00	14	30	4	19	42	5	19	42	3	--	--	1
9:00	12	19	7	17	28	10	17	28	8	--	--	3
10:00	21	46	5	27	59	7	27	59	4	--	--	3
11:00	7	38	17	10	49	22	10	49	17	--	--	5
12:00	20	35	7	27	47	10	27	47	6	--	--	3
13:00	22	32	9	30	43	12	30	43	9	--	--	2
14:00	12	50	11	15	60	14	15	60	12	--	--	1
15:00	**32**	**43**	**34**	**37**	**49**	**39**	**37**	**49**	**32**	--	--	**8**
16:00	20	102	47	21	109	50	21	109	48	--	--	2
17:00	3	34	11	3	37	12	3	37	11	--	--	1
Total	**183**	**458**	**170**	**230**	**559**	**203**	**230**	**559**	**165**	**0**	**0**	**38**

(RO) Right Out Acess to Hiawatha Avenue, located just south of 26th Street

Table 13. Year 2010 AM and PM Peak Hour Turning Movement Volumes – 26th Street at Hiawatha Yard Main Access

	26th Street - WB			Main Access - NB			26th Street - EB		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Build									
7:00-8:00 AM	43	1072	0	16	0	58	0	27	34
3:00-4:00 PM	21	989	0	17	0	46	0	82	50
Build (With Right-out Access)									
7:00-8:00 AM	43	1072	0	16	0	48	0	27	34
3:00-4:00 PM	21	989	0	17	0	38	0	82	50

Table 14. Year 2010 AM and PM Peak Hour Turning Movement Volumes –Hiawatha Avenue at 26th Street

	Hiawatha Avenue - SB			26th Street - WB			Hiawatha Avenue - NB			26th Street - EB		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Build												
7:00-8:00 AM	446	1449	630	46	276	664	141	2227	170	25	37	22
3:00-4:00 PM	478	2062	360	132	467	712	132	2272	180	36	48	39
Build (With Right-out Access)												
7:00-8:00 AM	446	1449	630	46	276	664	141	2227	170	25	37	12
3:00-4:00 PM	478	2062	360	132	467	712	132	2272	180	36	48	31

Not shown in the above tables, but based on the estimated proposed project trip generation, the daily traffic volume along 27th Street is expected to increase by 222 vehicles. During the AM and PM peak hours, the traffic volume along 27th Street is expected to increase by 26 and 17 vehicles, respectively.

3.5 Traffic Operations Analysis

A traffic operation analysis was conducted to determine the expected transportation system impacts as a result of the proposed project. Key concerns include the site access to 26th Street and the operation of the eastbound approach to the Hiawatha Avenue/26th Street intersection. To evaluate these concerns, a traffic analysis was completed for the 26th Street/Hiawatha Yard Main Access, and a vehicle queue analysis was conducted for the eastbound approach to the Hiawatha Avneue/26th Street intersection. The queue length analysis will help identify the best location of the new site access along 26th Street, assess the benefit of the proposed right out access alternative and/or support the evaluation of other improvement options.

Queue Length Definition

A queue is defined as a line of one or more vehicles waiting to be serviced by the system. Queuing analyses are typically completed to determine if adequate storage length for left and right turn lanes is available and if the spacing of intersections is sufficient. Quantifying queue lengths for particular movements also helps put in perspective whether the reported vehicle delay/LOS has a significant impact to the transportation system or is simply a longer wait.

Level of Service Definition

The results of the traffic analysis included approximating the intersection delay. This capacity analysis, or measure of delay, is reported in the terms of Level of Service (LOS), which is the qualitative indicator of traffic impact. By definition, LOS A conditions represent high quality of traffic flow (i.e., little delay) and LOS F conditions represent poor quality of traffic flow (i.e., extreme traffic delays and congestion). The LOS D/E boundary is typically used as the indicator of congestion in an urban area.

26th Street at Hiawatha Yard Main Access

The 26th Street/Hiawatha Yard Main Access was evaluated with respect to the documented Methodologies of the *Highway Capacity Manual, 2000 Edition*, (using the Synchro6.0 traffic analysis software package) and the intersection turning movement volumes presented previously. An existing through-stop controlled condition is assumed (i.e., northbound exit is stop controlled and eastbound/westbound is given right-of-way). In addition, the exiting approach is assumed to consist of a dedicated left and right turn lane. The results of the AM (7:00 to 8:00) and PM peak hour (3:00 to 4:00) LOS analysis in each of the three scenarios are presented in Table 15.

Table 15. LOS Results Summary – 26th Street at Hiawatha Yard Main Access

Time Period	Year 2006 Existing	Year 2010 Build	Year 2010 Build (RO)
AM Peak Hour (7:00 - 8:00 AM)	13.8/0.7 B/A	15.1/0.9 C/A	15.1/0.9 C/A
PM Peak Hour (3:00 - 4:00 PM)	12.7/0.5 B/A	13.6/0.7 C/A	13.6/0.6 C/A

/ ## = Delay (LOS) of critical stop controlled movement / Overall intersection delay (LOS)

The results of the analysis indicate that a single full access intersection to 26th Street is expected to operate at an acceptable level of service under the proposed project. The provision of a dedicated right-out access onto Hiawatha Avenue is expected to result in a negligible benefit to the operations of the 26th Street/Hiawatha Yard Main Access intersection.

Hiawatha Avenue at 26th Street – Eastbound Approach

Based on the trip generation estimates, the new vehicle trips added to the transportation system and traveling through the Hiawatha Avenue/26th Street intersection is less than 0.5-percent of the total existing intersection volume. As such, a discernable or measurable traffic impact is not expected at this intersection. Therefore, an overall intersection LOS and capacity analysis was not conducted. However, with the additional vehicles exiting the new Hiawatha Yard Maintenance Facility and arriving on the eastbound approach to the Hiawatha Avenue/26th Street intersection an impact may be perceived. To evaluate the specific eastbound 26th Street impact and to

address/mitigate vehicle queue and/or excessive vehicle delays on this approach a queue length study and analysis was completed.

With the presence of LRT vehicles and numerous signal preemption events occurring during peak periods, a regular cycle length does not occur. To estimate the existing and future queue lengths on this approach, data pertaining to the signal operations were field collected. A field observation was conducted on December 8, 2006 between 3:00 and 4:00 PM. The following information pertaining to the existing peak hour signal operations and approach queue lengths were collected:

- 13 separate LRT preemption events were recorded.
- Only 14 full signal cycles occurred. Over the hour, the average cycle length was 257 seconds. (Normal operation is a 150 second cycle)
- The average effective green time per cycle for eastbound 26th Street was 23 seconds, resulting in only 4.9 minutes of green time over the entire hour.
- The total eastbound shared through/right turn lane volume recorded over the hour was 57 vehicles.
- The maximum eastbound queue length observed (shared through/right turn lane) was 8 vehicles (200 feet).
- The average eastbound queue length observed (shared through/right turn lane) was 4 vehicles (100 feet).
- The existing Hiawatha Yard Main Access was partially blocked during 2 of the 14 cycles (approximately less than 10 minutes).

Utilizing the field recorded signal operation information, intersection hourly approach volumes and in accordance with the *Highway Capacity Manual, 2000 Edition, Appendix G* queue length analysis procedures, the estimated average and 95th percentile queue length for the eastbound approach (shared through/right turn lane) were tabulated. Table 16 presents the results of the eastbound queue length analysis completed for the shared through/right turn lane for the existing, and forecast 2010 Build scenarios.

Table 16. Estimated Queue Length Analysis Summary – Eastbound Shared Through/Right Turn Lane at Hiawatha Avenue/26th Street

Scenario	2006 Existing			2010 Build		
	Volume[1] (vph)	$Q_{average}$ (No. Veh.)	$Q_{95th\text{-}percentile}$ (No. Veh.)	Volume[1] (vph)	$Q_{average}$ (No. Veh.)	$Q_{95th\text{-}percentile}$ (No. Veh.)
5:00	22	1.4	2.9	23	1.5	3.0
6:00	28	1.8	3.7	41	2.6	5.3
7:00	**47**	**3.0**	**6.1**	**60**	**3.9**	**7.7**
8:00	34	2.2	4.5	47	3.1	6.2
9:00	26	1.8	3.6	38	2.5	5.1
10:00	51	3.4	6.9	65	4.4	8.7
11:00	55	3.8	7.5	71	4.9	9.5
12:00	42	2.9	5.9	57	3.9	7.8
13:00	41	2.8	5.7	54	3.8	7.6
14:00	62	4.4	8.6	74	5.3	10.2
15:00	**77**	**5.6**	**10.8**	**89**	**6.4**	**12.3**
16:00	149	11.1	20.3	159	11.9	21.5
17:00	45	3.3	6.6	49	3.6	7.1

[1] Volume is the combined through and right turn movements, which occur in the same lane.

Source: Highway Capacity Manual, 2000 Edition, Appendix G

The results of the queue length analysis found the peak 95th percentile queue length to occur during the 4:00 to 5:00 hour. However, during the peak Hiawatha Maintenance Facility operations, the peak 95th percentile queue length occurs from 3:00 to 4:00 and is expected to only increase from 9 vehicles to 10 with the proposed project. Throughout the day, the average queue length is expected to be less than six vehicles, with a maximum vehicle queue length increase of only two vehicles.

Dedicated Right-Out Access versus Eastbound Right Turn Lane

A traffic operation comparison between providing a dedicated right-out access to Hiawatha Avenue (south of 26th Street); or as an alternative option, providing an exclusive right turn lane on the eastbound approach to the Hiawatha Avenue/26th Street intersection was conducted. Table 17 provides a comparison of the expected average and 95th percentile hourly eastbound vehicle queue lengths over the day.

Table 17. Estimated Queue Length Comparison – Eastbound Through/Right Turn Lane at Hiawatha Avenue/26th Street

Scenario	2010 Build			2006 Build (Direct Right Out Access)			2010 Build (W/ Right Turn Lane)		
	Volume[1] (vph)	$Q_{average}$ (No. Veh.)	percentile (No. Veh.)	Volume[1] (vph)	$Q_{average}$ (No. Veh.)	$Q_{95th\text{-}percentile}$ (No. Veh.)	Volume[2] (vph)	$Q_{average}$ (No. Veh.)	$Q_{95th\text{-}percentile}$ (No. Veh.)
6:00	41	2.6	5.3	37	2.4	4.9	33	2.1	4.3
7:00	**60**	**3.9**	**7.7**	**49**	**3.2**	**6.5**	**37**	**2.4**	**4.9**
8:00	47	3.1	6.2	45	3.0	6.0	42	2.8	5.6
9:00	38	2.5	5.1	35	2.4	4.8	28	1.8	3.8
10:00	65	4.4	8.7	63	4.3	8.4	59	4.0	7.9
11:00	71	4.9	9.5	66	4.5	8.9	49	3.3	6.7
12:00	57	3.9	7.8	54	3.7	7.4	47	3.3	6.5
13:00	54	3.8	7.6	52	3.6	7.3	43	3.0	6.0
14:00	74	5.3	10.2	73	5.2	10.1	60	4.3	8.4
15:00	**89**	**6.4**	**12.3**	**81**	**5.8**	**11.3**	**49**	**3.5**	**7.0**
16:00	159	11.9	21.5	157	11.7	21.3	109	8.0	15.0
17:00	49	3.6	7.1	48	3.5	7.0	37	2.7	5.4

[1] Volume is the combined through and right turn movements, which occur in the same lane.

[2] Volume is the through lane volume.

Source: Highway Capacity Manual, 2000 Edition, Appendix G

Table 18 provides a comparison of the estimated average right turn movement stopped delay expected for the exiting Hiawatha Yard maintenance vehicles destined to southbound Hiawatha Avenue under each scenario. Under the 2010 Build and 2010 Build (w/right turn lane) the delay is on the eastbound approach to the traffic signal. Under the 2010 Build (RO Access), the delay is for the dedicated right out access approach.

Table 18. Estimated Average Eastbound Right Turn Delay Comparison[1] (seconds/vehicle)

Time Period	Year 2006 Existing	Year 2010 Build	Year 2010 Build (W/RT Lane)	Year 2010 Build (RO Access)
AM Peak Hour (7:00 - 8:00 AM)	46.2 D	48.2 D	15.1 C/A	9.4 A
PM Peak Hour (3:00 - 4:00 PM)	50.5 D	51.7 D	11.7 B	10.5 B

[1] Reported delay is for the right turn movement only.

The average vehicle delay to make an eastbound right turn movement is shown to be approximately 50 seconds under the existing and future build scenarios and the existing shared through/right turn lane geometry. It should be noted this delay is the average over the hour. It is

possible for a right turning motorist to experience a maximum delay up to four minutes, depending on their arrival time with respect to an LRT preemption event.

3.6 Traffic Operation Analysis Conclusions

In general, the traffic operation analysis found the additional traffic generated as a result of the proposed project is expected to have a minimal impact on 26th Street, 27th Street or Hiawatha Avenue. Key findings include:

- The proposed project will maintain the existing Hiawatha Yard facilities plus incorporate the Street Department (currently housed at 198 Aldrich Avenue). The estimated new additional vehicle trips expected upon completion of the project are 692 daily, 77 AM peak hour and 70 PM peak hour total vehicle trips.
- The traffic operation analysis found acceptable LOS C operations or better at the 26th Street/Hiawatha Yard Main Access intersection under each scenario evaluated.
- The results of the queue length analysis found the peak 95th percentile queue length (during the peak Hiawatha Maintenance Facility operations) occurs from 3:00 to 4:00 PM. The estimated vehicle queue length on the shared through/right turn lane is expected to increase from 9 vehicles to 10 with the proposed project. Throughout the day, the average queue length is expected to be less than six vehicles, with a maximum vehicle queue length increase of only two vehicles. The estimated queue length analysis concurs with field observations conducted. During the peak queue length periods, the existing Hiawatha Yard Main Access can become periodically blocked.

Field reviews, traffic data collection and the traffic operation analysis found the request for a dedicated right-out access to be on the basis of convenience as opposed to an operational deficiency. However, the review and analysis does concur with the potential for excessive delays (due to the LRT preemption) on the eastbound approach. Although the delays do not impact the overall system or cause a deficiency, it is an annoyance and in some respects is unnecessary. As such, the construction of an exclusive right turn lane would also appropriately address this concern, provide a benefit to other public motorists and meet current agency standards for intersection and roadway access. The traffic analysis found the following operational improvements expected with the exclusive eastbound right turn lane:

- Improve the eastbound right turn movement at Hiawatha Avenue/26th Street from an average delay of 48 seconds to 15 seconds. (This delay improvement is comparable to the provision of a dedicated right out access).
- Improve the peak 95th percentile vehicle queue length along eastbound 26th Street from 22 vehicles (shared through/right turn lane) to 15 (through lane). During the Hiawatha Yard Maintenance Facility peak operations (3:00 to 4:00 PM), the queue length is expected to improve from 12 vehicles to 7. The exclusive right turn lane queue length would be far less than the 15 or 7 vehicles as the right turn volume is less than the through lane and a right turn on red movement would be allowed.

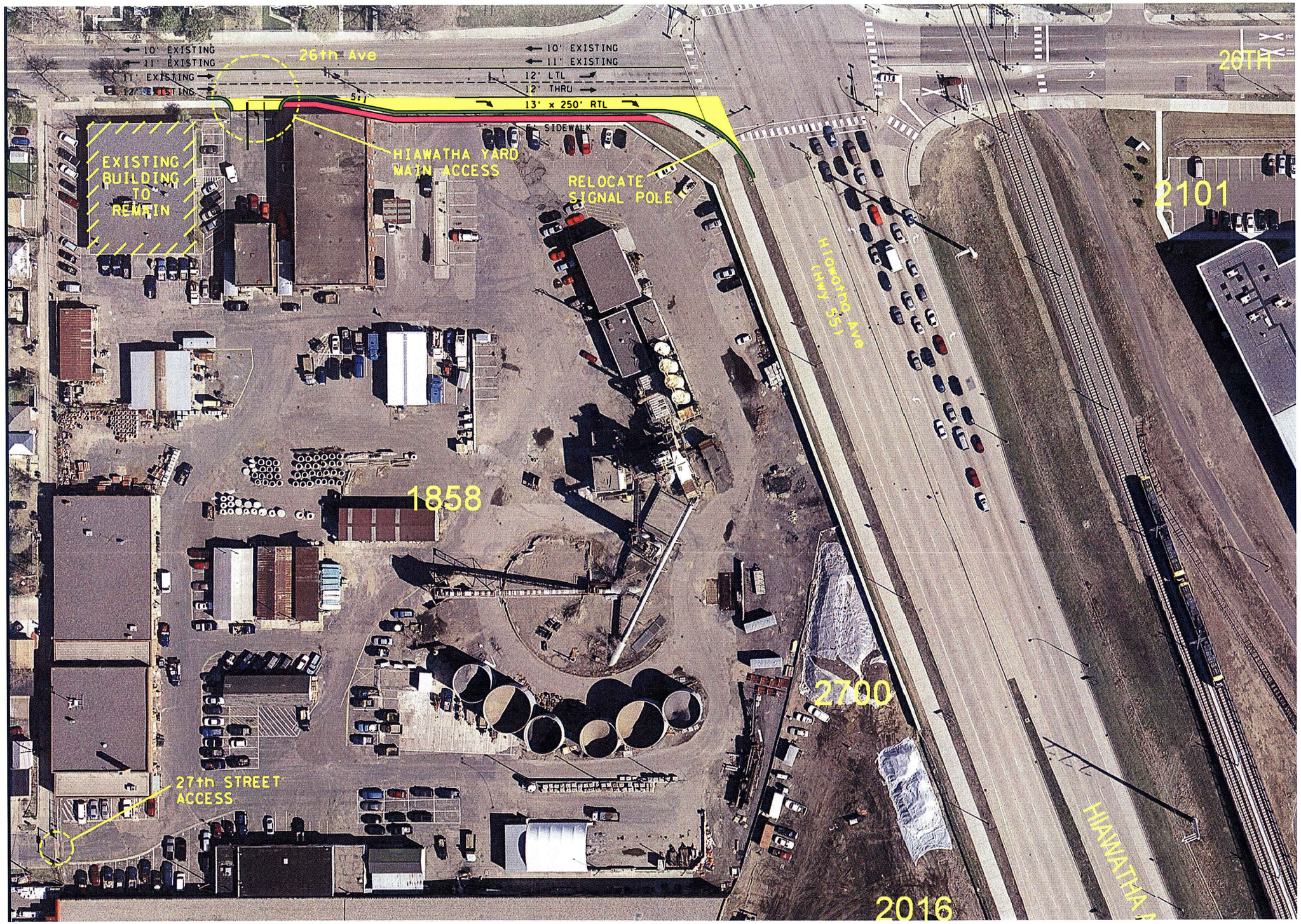
4.0 Travel Demand Management Plan

The following TDM Plan for the proposed Hiawatha Yard Maintenance Facility project identifies the recommended site access locations and supporting infrastructure improvements to address concerns evaluated previously.

Based on results of the traffic evaluation for the existing and forecast scenarios, as presented in the preceding sections, the following minimum improvements are suggested:

- Provide one access point onto 26th Street to be located at approximately 450 feet west of the center of the Hiawatha Avenue/26th Street intersection (at the location of the existing middle driveway). The proposed access location will result in approximately 370 feet of queuing distance for the eastbound approach to the Hiawatha Avenue/26th Street intersection. If as the project moves forward, the Pavement Laboratory building is decided to be removed, then the Hiawatha Yard Main Access should also be moved further to the west.
- The northbound exiting approach at the 26th Street/Hiawatha Yard Main Access should consist of one inbound lane, one exclusive left turn lane and one exclusive right turn lane. The overall driveway width should accommodate the turning movements of a 53 foot semi-tractor trailer.
- Restrict full access to 27th Street. Full access should be maintained for employees, patrons and typical city vehicles; however, the internal circulation design/patterns, the use of supplemental signing and geometric features should be used to force all single unit and semi-trucks to the 26th Street/Hiawatha Yard Main Access. The purpose is to eliminate the ability for trucks to enter the adjacent neighborhoods.
- Construct an exclusive 250 foot right turn lane plus a 60 foot taper (5:1) on the eastbound approach to the Hiawatha Avenue/26th Street intersection. A 310 foot turn lane (including taper length) is expected to be of sufficient length to prevent right turning vehicles from being blocked by the through lane queue. A right turn on red movement should continue to be allowed.
- Provide sufficient off-street parking to meet the demand of the employees and the city vehicle needs. Based on the results of three parking analysis methodologies, the provision of off-street parking stalls between the range of 275 and 332 would be expected to provide sufficient supply for employees and city vehicles. However, it should be noted this does not include other types of equipment (e.g., bobcats, forklifts, snowplows, lawnmowers, trailers, or etc.), as covered storage facilities would likely be used. Further demand estimates should be made as the site plan is being prepared.

Figure 2 conceptually illustrates the suggested improvements, including the site access location and the exclusive eastbound right turn lane.



Hiawatha Yard Maintenance Facility
Travel Demand Management Plan

ALLIANT ENGINEERING, INC.

Figure 2
Conceptual Site Acces
and Proposed Roadway Improvements

Signatures

Minneapolis Community and Economic Development Department

By_____ Dated:_____

Director of Community and
Economic Development

Minneapolis Public Works Department

By_____ Dated:_____

Director of Traffic and
Parking Services