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Supplemental Phase II - Exterior Investigation Report

Twin Cities Assembly Plant (TCAP)

St. Paul, Minnesota

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Supplemental Phase II – Exterior Investigation Report

Twin Cities Assembly Plant
(TCAP)
966 South Mississippi Boulevard
St. Paul, Minnesota 55166

Ryan Oesterreich
Staff Engineer, PE, PG

Robert J. Ellis
Principal in Charge

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Geologist under the laws of the State of Minnesota.

Print Name: Ryan Christopher Oesterreich

Signature:

Date: 5-31-12 License # 47974

Prepared for:
Ford Motor Company

Prepared by:
ARCADIS
430 First Avenue North, Suite 720
Minneapolis
Minnesota 55401
Tel 612.339.9434
Fax 612.336.4538

Our Ref.:
DE000440

Date:
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ARCADIS

Supplemental Phase II - Exterior Investigation Report

Twin Cities Assembly Plant (TCAP)
966 South Mississippi River Boulevard
St. Paul, Minnesota

Executive Summary

A total of 86 direct push soil borings, nine temporary wells and eight permanent wells were completed to investigate 19 Features for soil and groundwater impacts during the Supplemental Phase II Exterior Investigation completed in August through November 2011 at the Ford Twin Cities Assembly Plant (TCAP). Four areas (Feature 7, Feature 23, Feature 49 and Feature 121) were not investigated due to utility interference or other obstructions. The following nine Features had exceedances of Soil Reference Values (SRVs) or groundwater Maximum Contaminant Limits (MCLs) or Health Risk Limits (HRLs) detected during the Supplemental Phase II Exterior Investigation.

Feature Name	Feature Number	SRV Exceedances			HRL/MCL Exceedances	Analytes
		Industrial	Residential	Recreational		
North Parking Area	NPA	Yes	Yes	Yes	Yes	• VOCs • Metals
Former Area of Impacted Soil – Leak #10700	4	No	No	No	Yes	• VOCs
Former Location of Gasoline and Diesel Fuel Underground Piping	5	Yes	Yes	Yes	Yes	• VOCs • SVOCs
Former Disposal Area A	9	Yes	Yes	Yes	NA	• VOCs • Metals
Former Hazardous Waste Storage Area	10	Yes	Yes	Yes	Yes	• SVOCs • Metals
Former Disposal Area B	11	Yes	Yes	Yes	NA	• VOCs • Metals
Former Gasoline, Sunoco Spirits, and Pryoxlin USTs	16	Yes	Yes	Yes	Yes	• VOCs • SVOCs • Metals
Former Fuel Oil AST	152	No	No	No	Yes	• VOCs • Metals
Former Coal Gasification Plant	153	Yes	Yes	Yes	NA	• SVOCs

Note:
NPA = North Parking Area
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound

1. Introduction

This Supplemental Phase II Exterior Investigation was conducted by ARCADIS on behalf of Ford Motor Company (Ford) for the Twin Cities Assembly Plant (TCAP) (Site). The Supplemental Phase II Exterior Investigation was conducted in accordance with the Supplemental Phase II – Exterior Investigation Work Plan (ARCADIS 2008a) that was submitted to the Minnesota Pollution Control Agency (MPCA) on May 13, 2008 and the Addendum to the work plan that was submitted to the MPCA on May 19, 2008 (ARCADIS 2008b). The supplemental work plan and addendum to the work plan were approved by the MPCA in letters dated March 15, 2010 and July 8, 2009 respectively.

The Supplemental Phase II Exterior Investigation was conducted in August through November 2011 to provide delineation of impacts that were observed during the Initial Phase II Exterior Investigation and to investigate additional Features not addressed during the initial mobilization. The Features that were investigated were identified during the Phase I Environmental Site Assessment (ESA) (ARCADIS 2007a) completed in June 2007.

The scope of services performed by ARCADIS during this Supplemental Phase II Exterior Investigation is described below.

- Utility clearance consisting of a public utility locate, private utility locate and review of Ford utility drawings was conducted prior to initiating any subsurface work. All boring locations were also manually cleared using a hand auger or hydro-vacuum to a depth of five feet below ground surface (bgs).

- A total of 86 soil borings (ASB-115 through ASB-200) were completed to delineate impacts observed during the Initial Phase II Exterior Investigation using a direct push geoprobe drill rig. Soil borings were logged by an ARCADIS geologist using the United Soil Classification System (USCS) and field screened using a photo-ionization detector (PID). Soil samples from up to three depth intervals at each soil boring were submitted for laboratory analysis. Groundwater samples were collected from temporary wells installed in nine of the 86 boreholes. All soil borings and temporary wells were abandoned in accordance with Minnesota Department of Health (MDH) regulations upon completion of sample collection.

- Eight permanent groundwater monitoring wells were installed in the unconsolidated materials above bedrock using a hollow stem auger to evaluate long term groundwater quality. The wells were installed, developed and sampled according

to the Supplemental Phase II Exterior Investigation Work Plan submitted in May 2008 (ARCADIS 2008a and 2008b).

- All monitoring well and soil boring locations were surveyed by Sunde Land Surveyors.
- Soils, drilling water, and monitoring well purge and development water were analyzed and characterized as investigative-derived waste (IDW) for disposal.

2. Site Background

This section provides a description of the Site, a summary of the site history, and a description of the site geology and hydrogeology.

2.1 Property Location and Description

The TCAP is located at 966 South Mississippi River Boulevard in St. Paul, Ramsey County, Minnesota at approximate Latitude (north) 44^{o} 54' 50.8" and Longitude (west) 93^{o} 11' 31.9". The Site is located in a mixed industrial, commercial and residential use area on the eastern shore of the Mississippi River, along the east side of South Mississippi River Boulevard, south of Ford Parkway and west of South Cleveland Avenue in St. Paul, Minnesota. The Site is accessed from the west via two entrances on South Mississippi River Boulevard and from the north via three entrances on Ford Parkway.

Operations at the TCAP formerly consisted of the assembly and painting of light duty trucks (Ford Ranger) using parts that are manufactured elsewhere. Assembly processes included welding, metal cleaning, painting and curing, windshield and trim installation and preparation of the vehicles for final delivery. In addition, a wastewater treatment plant and steam plant are still in operation at the TCAP and were associated with the current assembly operations, which were all investigated during the Phase I ESA. The TCAP was shutdown on December 16, 2011.

The property location and layout are depicted on Figure 1. The exterior Features are depicted on Figures 2 through 5 and are summarized in Table 1.

2.2 Site History

The subject property was vacant undeveloped land prior to construction of the assembly plant. Construction of the original portion of the main assembly building (MAB) began in 1923 and several additions to the MAB have occurred throughout the years, mainly between 1960 and 1978, which added 300,000 square feet to the original building. The paint building was constructed in 1985 and is connected to the main assembly building via a 625-foot bridge. The steam plant was constructed in 1923 and is approximately 10,400 square feet. A historical structure with unknown use was located near the southeastern corner of the steam plant, but was demolished prior to 1974. The wastewater treatment plant is located adjacent to the steam plant, and was

constructed in 1984. Additional details on the history of the property are available in the Phase I ESA (ARCADIS 2007a).

2.3 Site Geology and Hydrogeology

The general geology and hydrogeology of the Site, based on information identified during the Phase I ESA (ARCADIS 2007a), and Initial and Supplemental Phase II Exterior Investigations, is outlined in the following sections.

2.3.1 Geology

At the surface of the Site, a thin mantle of unconsolidated sediments exists over bedrock terraces. Underlying the unconsolidated material are sedimentary bedrock units which were deposited during the middle of the Ordovician geologic period. The sedimentary units are, in descending order, Decorah Shale, Platteville Limestone/Dolostone, Glenwood Shale and St. Peter Sandstone.

The soil mantle consists of predominately sandy clay and clayey sand. Weathered shale cobbles are common and in some areas there is two to five feet of peat. In some of the areas investigated at the Site much of the native material has been disturbed and is mixed with fill material such as building rubble, glass, scrap metal and ash. The Platteville formation lies on top of the Glenwood Shale formation and the contact is gradational. The Glenwood Shale is composed of dark green to gray shale and sandy shale. The formation is thinly laminated and moderately fissile (cleavable) and is approximately seven feet thick in the areas investigated. The St. Peter Sandstone outcrops along the bluffs of the Mississippi River and continues below the elevation of the river bed. The sandstone is composed of medium-grained, well-sorted and well-rounded quartzite. It is white to buff in color and is medium to weakly indurated (hardened). The St. Peter formation is as much as 150 feet thick in the Twin Cities area.

2.3.2 Hydrogeology

Perched groundwater is found in the highly heterogeneous unconsolidated sediments overlying bedrock. Groundwater is encountered in the St. Peter formation which is a high yielding aquifer. The perched groundwater is generally isolated from the groundwater by the Decorah/Platteville/Glenwood Formation which is an aquitard/aquiclude.

The apparent groundwater flow direction at the Site is generally to the southwest towards the Mississippi River but can be locally variable particularly in the unconsolidated sediments and close to the river.

Additional information on the geology and hydrogeology of the Site can be found in the Phase I ESA (ARCADIS 2007a) and the Initial Phase II – Exterior Investigation Report (ARCADIS 2007b).

2.4 Previous Investigations

Several site investigations and reports have been completed for the Ford TCAP. The following is a brief summary of previous investigations.

On June 26, 1990 the MPCA issued a Request for Response Action (RFRA) due to the historical waste handling and disposal practices at the Site. In accordance with the RFRA, a Remedial Investigation/Feasibility Study (RI/FS) was completed by Conestoga-Rovers & Associates Limited (CRA), which included a Remedial Investigation/Alternatives Analysis (RI/AA) of three areas designated by the MPCA adjacent to the paint building and main assembly building (Area A, Area B and a UST site), that was completed in May 1992 (CRA 1992).

A Phase I ESA was completed by ARCADIS in 2007 to identify Features and obtain information regarding environmental activities and conditions at the Site (ARCADIS 2007a). An Initial Exterior Phase II Investigation was completed in June and July 2007 and the Initial Phase II – Exterior Investigation Report was submitted to the MPCA in October 2007 (ARCADIS 2007b). An Initial Interior Phase II Investigation was completed in August 2010 and the Initial Phase II – Interior Investigation Report was submitted to the MPCA in March 2011 (ARCADIS 2011a).

3. Supplemental Phase II Exterior Investigation

The following sections detail the work that was completed as part of the Supplemental Phase II Exterior Investigation. Any deviations from the approved work plan are noted.

3.1 Methods

3.1.1 Utility Clearance

A utility clearance consisting of a public utility locate, private utility locate and a review of utility drawings with Ford personnel was performed prior to initiating any subsurface work at the Site. Gopher One Call was notified to mark all public utility lines servicing the Site. Additionally, a private utility locator, Hance Utility Service, Inc. of Buffalo, Minnesota was retained to locate private utilities in the area of subsurface work. Finally, a surface inspection was completed and Ford personnel with access to Ford utility maps were consulted for each specific boring location. After removing any surficial debris such as asphalt or concrete a hydro-vacuum unit was used to excavate the upper five feet of the subsurface and manually clear the area.

3.1.2 Soil Borings and Temporary Wells

Eighty six soil borings (ASB-115 through ASB-200) were completed using a direct push geoprobe® rig. Each boring was logged continuously by an ARCADIS field geologist and screened using a PID with an 11.7 electron-volt (eV) lamp. A summary of all PID readings collected in the field is available in Table 2. Soil boring logs were created in the field and all soils were classified using the USCS. Soil borings logs are provided in Appendix A. Samples were collected in accordance with the Field Sampling Plan (ARCADIS 2007c) and Supplemental Phase II – Exterior Investigation Work Plan (ARCADIS 2008a). Borings were advanced until the target depth was reached or refusal due to shallow bedrock was encountered. When the boring was complete it was sealed with a bentonite grout. If the borehole was classified as a regulated hole according to MDH guidelines, a Borehole Sealing Record was prepared, see Appendix B. The surface disturbance of each borehole was repaired to match surrounding materials.

Water samples were collected from temporary wells installed at nine of the 86 soil borings. Groundwater samples were collected using either a stainless steel check valve or a peristaltic pump with disposable polyethylene tubing. The temporary wells were purged to clear the wells and tubing before collecting samples.

3.1.3 Permanent Monitoring Wells

Eight permanent monitoring wells (AMW-11 through AMW-18) were installed using a hollow stem auger rig with 4 ¼-inch inner diameter and 8 ¼ inch outer diameter

augers. Well construction details are included in Table 3 and MDH Well Logs are included in Appendix B. Monitoring wells were constructed with two-inch diameter five foot long slotted polyvinyl chloride (PVC) screens and sufficient PVC riser to reach ground surface (for flush mount wells) or above ground surface (for stickup wells) . Each well had a filter sand pack extended approximately one to 2.5 feet above the top of the screened interval. A two foot bentonite seal was placed over the sand pack and the remaining well annulus was sealed with a cement grout to the surface.

Each new permanent monitoring well was developed using over-pumping techniques and a whale pump. Between 11 and 33 well volumes of water were removed from each monitoring well during development to remove sediment and ensure the well was hydraulically connected with the surrounding aquifer.

The newly installed monitoring wells were sampled on October 31 and November 7 of 2011. Prior to performing sampling activities, depth to water measurements were collected from all the wells on-site. The recorded water elevations are shown in Table 4. Monitoring wells were purged of a minimum of three well volumes using a disposable polyethylene bailer prior to sample collection. After the wells were purged, field parameters (pH, conductivity, turbidity, temperature, dissolved oxygen and oxidation reduction potential [ORP]) were collected by submerging the sensors of a Horiba U-52 in a cup of purged groundwater. The monitoring well field parameters that were collected are included in Table 5. All groundwater sampling logs are included in Appendix C. Bailers were utilized to collect samples. Readings for dissolved oxygen and ORP from bailed groundwater samples are not considered reliable and are not included in Table 5 but are reported on the sampling logs in Appendix C. All groundwater samples analyzed for metals were field filtered using a 0.45 micron disposable filter prior to sample collection.

3.1.4 Surveying

All borings and monitoring wells were surveyed for X, Y and Z coordinates. The repaired ground surface was surveyed for soil borings and ground surface and top of casing was surveyed for new monitoring wells. Surveying was completed by Sunde Land Surveying, LLC of Bloomington, Minnesota and referenced the National Geodetic Vertical Datum of 1929 (NGVD 29).

3.1.5 Background Metals Analysis and Petroleum Impacts

Several of the metals (arsenic, copper, iron and lead) detected at the Site are elements that are naturally present in Minnesota soils. For those metals, Site specific data collected during this Supplemental Phase II Exterior Investigation were compared to both the SRV standards and to Minnesota-representative background data sets to determine whether the concentrations present at the Site are consistent with ubiquitous and naturally occurring conditions or if they are indicative of an impacted area. If detections exceeded both the SRV standards and background data sets, that data is discussed below. The full data set for determining background values was published by the United States Geological Survey (USGS) (Boerngen and Shacklette 1981) and included in the Additional Soil Investigation and Surface Soil Risk Assessment Report – Baseball Fields – Feature 139 (ARCADIS 2007d). If detections of the metals listed above fall outside the range of naturally occurring concentrations in Minnesota the Features where they were detected were retained for additional investigation.

Soil samples collected from several of the Features described below were analyzed for Gasoline Range Organics (GRO) and Diesel Range Organics (DRO). Any detected concentrations of GRO and DRO are discussed below as well. There are no SRVs for those constituents; however, they are used as indicator parameters to determine if a more focused compound specific delineation is required. Additionally, the remedial action required to address soil impacted with petroleum compounds such as GRO and DRO is dependent on the future re-use of the impacted property. Therefore, recommendations on further investigation and delineation of the petroleum impacts detected at the Site will be withheld until future land use has been determined.

3.2 Summary of Investigation Results

The following is a summary of all Features investigated during the Supplemental Phase II Exterior Investigation. Feature 13 – Former Disposal Area C will be analyzed in a separate report. Analytical results for soil and groundwater from this investigation are discussed in the following sections, and are included in Table 6 and Table 7. Historical analytical results, although referenced, are not discussed in the text below. Soil and groundwater exceedances are illustrated on Figures 2 and 3, respectively, and contain detections from this investigation and from historical investigations as well. A summary of all PID readings collected are included in Table 2. Laboratory reports are included in Appendix D. A summary of the borings completed and samples collected at each Feature is shown in Table 1.

3.2.1 North Parking Area

3.2.1.1 History

The North Parking Area consists of approximately 29 acres of paved parking lot and was mainly used for employee parking, as well as storage for newly built Ford Ranger and Mazda B-series trucks prior to shipment off-site. An addendum to the *Supplemental Phase II – Exterior Investigation Work Plan* that covered the work to be completed in the North Parking Area was submitted to the MPCA on May 19, 2008 (ARCADIS 2008b).

3.2.1.2 Supplemental Investigation

Soil

The North Parking Area was divided into 1-acre grids and one boring was installed in each grid with the exception of those grids that already had a boring or well installed or where a boring or well was already planned per the Supplemental Phase II - Exterior Investigation Work Plan. In total, 19 borings (ASB-115 to -118, ASB-123 to -126, ASB-128 to -132, ASB-134, ASB-136 to -137 and ASB 141 to -143) were completed to depths ranging from three to 13 feet bgs before encountering refusal due to bedrock. One or two samples were collected from each borehole with the exception of ASB-130, where no sample was collected because soils were saturated immediately below the ground surface. Each sample was analyzed for Resource Conservation and Recovery Act (RCRA) metals, Polynuclear Aromatic Hydrocarbons (PAHs) and DRO. Additionally, if PID readings at a borehole were greater than 10 parts per million (ppm) the samples were analyzed for GRO and VOCs. Soil borings completed in the North Parking Area and exceedances of any SRVs are shown on Figure 2.

PID readings above 10 ppm were noted in ASB-115, ASB-116, ASB-118, ASB-123 and ASB-136. As stipulated in the Supplemental Phase II – Exterior Investigation Workplan, soil samples were collected from the locations with the highest PID readings unless the soil at that location was saturated. Additional samples were collected from just above the saturated zone.

Samples collected at 17 of the 19 borings ASB-115 to 118, ASB-124 to 126, ASB-129, ASB-131 and 132, ASB-134, ASB-136 and 137, and ASB-141 to 143 did not detect any constituents at or above any SRVs. GRO was detected in three of the five samples it was analyzed for at a maximum concentration of 12 milligrams per kilogram

(mg/kg). DRO was detected in six of 19 samples it was analyzed for at a maximum concentration of 550 mg/kg. There is no SRV for DRO or GRO.

Samples were collected from ASB-123 at depths of 2 to 4 feet bgs and 6 to 8 feet bgs. The sample collected from 2 to 4 feet bgs did not have any constituents detected at or above any SRVs, but the sample collected from 6 to 8 feet bgs detected benzene and xylenes at concentrations above the Residential SRV, 1,3,5-trimethylbenzene (1,3,5-TMB) above the Recreational SRV and 1,2,4-TMB above the Industrial SRV. GRO was detected at 390 mg/kg and DRO was detected at 46 mg/kg, although there is no SRV for those constituents.

Samples were collected from ASB-128 at depths of 0 to 2 feet bgs and 6 to 8 feet bgs. The sample collected from 6 to 8 feet bgs did not have any constituents detected above any SRVs, but the sample collected from 0 to 2 feet bgs contained arsenic at an estimated concentration of 17 mg/kg which is above the Recreational SRV and slightly above the range of arsenic concentrations found in naturally in soil (Table 8). GRO was not analyzed in either sample and DRO was not detected at or above method detection limits in both samples.

Groundwater

Groundwater samples were collected from six temporary wells set at ASB-115, ASB-118, ASB-128, ASB-129, ASB-130 and ASB-137. Samples were analyzed for VOCs, PAHs, GRO, DRO, RCRA metals and polychlorinated biphenyls (PCBs). Groundwater sample locations collected in the North Parking Area and exceedances of any HRLs or MCLs are shown on Figure 3.

ASB-115 had two VOCs (benzene and ethylbenzene) detected at concentrations over their respective MCLs and HRLs. No other constituents were detected above either set of standards. DRO was detected at 3,400 ug/L but there are no MCLs or HRLs for those constituents.

ASB-118 had benzene detected at a concentration over both the MCL and HRLs. No other constituents were detected above either set of standards. GRO was detected at 770 ug/L and DRO was detected at 450 ug/L.

ASB-128 had arsenic detected at a concentration greater than the MCL, but there is not HRL for that constituent. No other constituents were detected above either set of

standards. GRO was less than the method detection limit and DRO was detected at 380 ug/L.

ASB-129 and ASB-130 did not have any constituents detected above either set of standards. GRO was less than the method detection limit in both water samples and DRO was detected at 410 ug/L and 270 ug/L in both samples.

ASB-137 did not have any constituents detected above either set of standards and both GRO and DRO were below method detection limits.

3.2.2 Feature 1 – Former Test Track

3.2.2.1 History

Based on a review of aerial photographs, the former test track was historically used to test vehicles from prior to 1953 until prior to 1974. The test track was sprayed with oil for dust control, based on information provided through interviews with the TCAP personnel. Two borings (ASB-033 and ASB-046) were completed in the area during the Initial Phase II Exterior Investigation. Samples from the initial borings had detected concentrations of DRO; however, no constituents exceeded the Industrial SRVs. No temporary wells were set due to lack of water observed in the boreholes.

3.2.2.2 Supplemental Investigation

Soil

Six additional borings (ASB-127, ASB-133, ASB-144, ASB-178, ASB-184, ASB-187) out of seven planned borings were completed during the Supplemental Phase II Exterior Investigation. One boring was not installed during this investigation due to conflict with ongoing operations at the TCAP at the time of the field investigation activities. In general, borings were completed to a total depth of 12 feet bgs or until refusal due to bedrock was encountered. No boreholes had PID readings above 10 ppm so samples were collected from zero to four feet bgs. Samples were analyzed for VOCs, SVOCs, DRO, RCRA metals and PCBs. Soil borings completed in Feature 1 and exceedances of any SRVs are shown on Figure 2.

No constituents were detected in any of the soil samples above Residential SRVs. The sample from ASB-133 was not analyzed for VOCs because the methanol preservation

was lost during sample shipment due to a leaky container, thereby reducing the preservative-to-soil ratio necessary for proper analysis.

Groundwater

Four temporary monitoring wells were planned for the area but none were installed due to lack of groundwater observed in the boreholes.

3.2.3 Feature 3 – Former Convoy UST

3.2.3.1 History

A confirmed release (Leak #5343) from the former Convoy 2,000 gallon diesel UST was reported during UST removal activities in 1992. Approximately 150 cubic yards of soil was excavated during the remedial action. A soil boring program was implemented at the request of the MPCA to define the extent of impacts. Seven samples were collected from the sidewalls and bottom of the tank excavation and five samples were collected from boreholes completed to delineate the horizontal extent of impacts. Approximately 125 cubic yards of impacted soil were left in place beneath the clean fill used to replace the UST excavation. The release was closed in September 1992 because the impacts were delineated and vertical migration of the impacts was limited by the bedrock approximately 10 feet bgs.

3.2.3.2 Supplemental Investigation

Soil

Three additional borings (ASB-138, ASB-139 and ASB-140) were completed during the Supplemental Phase II Exterior Investigation to validate historical results and confirm that petroleum impacts are limited and delineated. Borings were completed to eight feet bgs where refusal was encountered due to bedrock. A PID reading of 11.3 ppm was detected in ASB-139 from 6 to 8 feet bgs, but all other headspace readings were below 10 ppm. Samples were analyzed for VOCs, DRO, GRO, and lead. No constituents were detected in any of the soil samples above Residential SRVs. Soil borings completed in Feature 3 are shown on Figure 2.

Groundwater

One temporary monitoring well was planned for the area but was not installed due to lack of groundwater observed in the boreholes.

3.2.4 Feature 4 – Former Area of Impacted Soil – Leak 10700

3.2.4.1 History

An area of soil impacted with gasoline and diesel was reported in 1997 during construction of the training center. The impacts were the results of leakage from product lines running to gasoline and diesel USTs that were removed in 1993. The area was entered into the Voluntary Petroleum Investigation and Cleanup program (now called Petroleum Brownfields program) in December 1997. The impacted soils were excavated and the release was closed in February 1998. A Development Response Action Plan (DRAP) was approved in February 1997 for construction of a training center in the area. During construction of the training center a total volume of 3,078 cubic yards of impacted soil was disposed of and 50,693 gallons of groundwater generated from dewatering of the excavation was discharged to the sanitary sewer system via a permit from the City of St. Paul.

A total of 31 soil borings were completed during historical investigations in the area. Twenty soil samples and 11 groundwater samples were collected and submitted to a laboratory for analysis. No investigation of this area was completed during the Initial Phase II Investigation.

3.2.4.2 Supplemental Investigation

Soil

Two additional borings (ASB-119, ASB-120) were completed during the Supplemental Phase II Exterior Investigation to provide additional assessment and delineation of the soil in the area. The boreholes were completed to depths of 12 feet bgs and 11.5 feet bgs, respectively. No PID readings above 10 ppm were observed from either borehole. Two soil samples were collected from each borehole and analyzed for VOCs, lead, GRO and DRO. No constituents were detected in soil samples at or above Residential SRVs. Soil borings completed in Feature 4 are shown on Figure 2.

Groundwater

One temporary well was also installed at ASB-120. A groundwater sample was collected and analyzed for VOCs, dissolved lead and GRO and DRO. Benzene was detected at an estimated concentration of 17 ug/L, which is above the MDH HRL of 2 ug/L and above the EPAMCL of 5 ug/L. GRO and DRO were detected at 88 and 760 ug/L respectively, but there are no HRLs or MCLs for those constituents. No other constituents, including lead, were detected at or above their applicable standards. Groundwater samples collected in Feature 4 and exceedances of any HRLs or MCLs are shown on Figure 3.

3.2.5 Feature 5 – Former Location of Gasoline and Diesel Fuel Underground Piping

3.2.5.1 History

Underground steel piping was formerly utilized in conjunction with former gasoline and diesel fuel USTs in the area, which were removed in 1993. The piping had been in place since approximately 1977. Some piping may still be in place below the ground surface. A release occurred from the piping which impacted subsurface soils. Remedial activities were completed in the area of the piping, which included extensive soil removal. However, in 2004-2005 during a water main repair in the area of the piping, a subsequent release was reported. The releases have been closed per the MPCA; however, based on the recurrent releases identified, impacted soil may still be present in the area of the underground piping. Five hollow stem auger borings (ASB-029, ASB-030, ASB-045, ASB-047, and ASB-048) were completed during the Initial Phase II Exterior Investigation. ASB-047 had slightly elevated PID readings over background concentrations. The sample from ASB-030 had an estimated detectable concentration of GRO and samples from all borings had detectable DRO concentrations. No constituents were detected over Industrial SRVs. Groundwater samples were collected from temporary well locations at ASB-030 and ASB -047. GRO and DRO were detected in samples from both boreholes but there are no HRLs for those constituents.

3.2.5.2 Supplemental Investigation

Soil

Four additional borings (ASB-121, ASB-122, ASB-199 and ASB-200) were completed to collect additional data along the areal extent of the feature for characterization and delineation purposes. One proposed boring could not be completed at the time of the supplemental investigation due to utility interference. The boreholes were completed to depths of seven to 12 feet bgs before encountering refusal due to bedrock. ASB-

121 had elevated PID readings throughout the boring, with a maximum reading of 794 ppm from 2 to 4 feet bgs. ASB-122 also had elevated PID readings throughout the boring with a maximum reading of 495 from 7 to 8 feet bgs. No elevated PID readings were detected in ASB-199 or ASB-200. Two samples were collected from each boring and analyzed for VOCs, PAHs, GRO, DRO and lead. Soil borings completed in Feature 5 and exceedances of any SRVs are shown on Figure 2.

No constituents were detected at or above Residential SRVs in soil samples collected from ASB-199 or ASB-200.

Samples from ASB-121 were collected from 5 to 7 feet bgs and 8 to 10 feet bgs. Both samples had concentrations of VOCs (e.g., 1,2,4-TMB, 1,3,5-TMB, xylenes) that exceeded their respective Industrial SRVs. Additionally, one PAH (benzo(a)pyrene) was detected in the 8 to 10 feet bgs sample above Industrial SRVs. GRO was detected at a concentration of 820 and 4,000 mg/kg for the shallower and deeper sample respectively and DRO was detected at a concentration of 42 and 12 mg/kg respectively, but there are no SRVs for those constituents. Lead was below all the SRVs in both samples collected from ASB-121.

Samples from ASB-122 were collected from 2 to 4 and 6 to 8 feet bgs. The sample from 2 to 4 feet bgs did not have any constituents detected at or above SRVs. GRO was detected at 57 mg/kg and DRO was below method detection limits. The sample from 6 to 8 feet bgs had three VOCs (1,2,4-TMB, 1,3,5-TMB and xylenes) detected above their respective Industrial SRVs. Additionally, benzene was detected above the Residential SRV. No other constituents exceeded SRVs in the sample collected from 6 to 8 feet bgs. GRO was detected at 2,300 mg/kg and DRO was detected at 26 mg/kg respectively but there are no SRVs for those constituents.

Groundwater

Two permanent groundwater monitoring wells (AMW-16 and AMW-17) were installed to further evaluate the groundwater exceedances of benzene, lead and benzo(a)pyrene identified at ASB-030 and ASB-047 during the Initial Phase II Exterior Investigation. The wells were sampled for VOCs, PAHs, GRO, DRO and dissolved lead. The dissolved lead sample was field filtered. Groundwater samples collected Feature 5 and exceedances of any HRLs or MCLs are shown on Figure 3.

AMW-16 had six VOCs (1,2,4-TMB, 1,3,5-TMB, ethylbenzene, m&p-xylene, o-xylene and total xylenes) that were detected above HRLs. Ethylbenzene was also detected

above its respective MCL. There is no MCL for TMB compounds. No other constituents were detected at or above their respective groundwater standards. GRO was detected at 15,000 ug/L and DRO was detected at 1,200 ug/L but there are no MCLs or HRLs for those constituents.

AMW-17 had two VOCs (benzene and ethylbenzene) that were detected above HRLs. Benzene was also detected above its respective MCL. No other constituents were detected at or above their respective groundwater standards. GRO was detected at 3,200 ug/L and DRO was detected at 820 ug/L but there are no MCLs or HRLs for those constituents.

3.2.6 Feature 7 – Railroad Spurs

3.2.6.1 History

Railroad spurs are utilized for the delivery and loading of parts and other items to and from the assembly plant via rail cars. In addition, railcars are used to transfer final products to their retail destinations. Some areas of staining were observed within the vicinity of the railroad spurs. Five borings (ASB-017, ASB-021, ASB-022, ASB-031 and ASB-043) were completed during the Initial Phase II Exterior Investigation. Samples from ASB-022 and ASB-031 had detectable concentrations of DRO, however, no constituents from any of the borings exceeded the Industrial SRVs. No temporary wells were set due to lack of water observed in the boreholes.

3.2.6.2 Supplemental Investigation

Eight borings were planned for further investigation along the railroad spurs to further delineate the detections of DRO, but the borings could not be completed during this phase of investigation due to conflict with ongoing rail operations at the time of the field investigation activities. Three temporary monitoring wells were also not installed during this investigation for the same reason. In preparation for post-plant shutdown investigations, ARCADIS inspected the tracks and Sunde Land Surveying surveyed the locations where surface staining was observed on November 2, 2011.

3.2.7 Feature 8 – Former Hazardous Waste Storage Area

3.2.7.1 History

Based on historical documentation reviewed, a former hazardous waste storage area was identified in the area. The documentation did not include any reported spills; however, based on the general usage of the area to store hazardous waste materials the area was investigated. Two borings (ASB-034 and ASB-044) were completed during the Initial Phase II Exterior Investigation. No constituents from any of the borings exceeded the Industrial SRVs. No temporary wells were installed due to lack of water observed in the boreholes.

3.2.7.2 Supplemental Investigation

Soil

Two additional borings (ASB-179 and ASB-180) were completed during the Supplemental Phase II Exterior Investigation for further investigation of the former hazardous waste storage area. The two borings were completed to a depth of 4.5 and 4 feet bgs respectively before hitting refusal due to bedrock. No elevated PID readings above 10 ppm were detected in either boring. Because refusal was encountered at such a shallow depth only one of the two planned soil samples was collected from each borehole. Soil samples were analyzed for VOCs, SVOCs, Target Analyte List (TAL) metals, PCBs, GRO and DRO. Soil borings completed in Feature 8 and exceedances of any SRVs are shown on Figure 2.

No other constituents were detected at concentrations above any SRVs and GRO and DRO were below method detection limits in both samples.

Groundwater

One temporary monitoring well was planned for the area but was not installed due to lack of water observed in the boreholes.

3.2.8 Feature 9 – Former Disposal Area A

3.2.8.1 History

This area was utilized as a historical disposal site for waste materials along with Former Disposal Area B (Feature 11) generated from the assembly and painting operations. Samples collected from six soil borings completed in 1992 indicated VOCs and metals were present at concentrations that exceeded 1992 remediation criteria. The areas with soil exceedances were excavated from 1992 to 1993 and relocated to Area C. Confirmation samples collected from the excavated areas and confirmed that the cleanup goals had been achieved. The Response Action Final Completion Report that documented the remediation activities was accepted by the MPCA in April 1993 and the area was delisted from the PLP in July 1993.

3.2.8.2 Supplemental Investigation

Soil

Four additional soil borings (ASB-177, ASB-181, ASB-182 and ASB-183) were completed during the Supplemental Phase II Exterior Investigation to provide additional assessment of the former disposal area. Borings were completed to depths of between seven and 11.5 feet bgs before refusal due to bedrock. Elevated PID readings over 10 ppm were measured throughout ASB-181 with a maximum reading of 103 ppm detected from 8 to 9 feet bgs. Elevated PID readings were also detected throughout ASB-182 with a maximum reading of 724 ppm detected from 2 to 4 feet bgs. One soil sample was collected from each borehole and analyzed for VOCs, TAL metals, GRO and DRO. Soil borings completed in Feature 9 and exceedances of any SRVs are shown on Figure 2.

ASB-182 had concentrations of five VOCs (1,2,4-TMB, 1,3,5-TMB, butylbenzene, naphthalene and xylenes) that exceeded Industrial SRVs. . The lead concentration of 700 mg/kg was above the Recreational SRV and outside the range of naturally occurring lead (Table 8). GRO and DRO were detected at 6,200 mg/kg and 3,600 mg/kg respectively but there are no standards for those constituents.

Groundwater

One temporary monitoring well was planned for the area but was not installed due to lack of water observed in the boreholes.

3.2.9 Feature 10 – Former Hazardous Waste Storage Area

3.2.9.1 History

Based on historical documentation reviewed, a former hazardous waste storage area was identified in the area. The documentation did not include any reported spills from this area; however based on the general usage of the area to store hazardous waste materials this area was investigated. Two borings (ASB-013 and ASB-014) were completed during the Initial Phase II Exterior Investigation. Arsenic was detected in ASB-014 above the Industrial SRV. No other constituents from either of the borings exceeded the Industrial SRVs. A groundwater sample was collected from ASB-013 but no constituents were detected above HRLs.

3.2.9.2 Supplemental Investigation

Soil

Six additional borings (ASB-164, ASB-165, ASB-166, ASB-167, ASB-170 and ASB-171) were completed during the Supplemental Phase II Exterior Investigation to further define horizontal and vertical extent of the arsenic impacts detected in ASB-014. The borings were completed to depths of 10.5 to 12.25 feet bgs before hitting refusal due to bedrock. Slightly elevated PID readings up to approximately 20 ppm were detected throughout the unsaturated portion of ASB-166 but were higher (>600 ppm) in the groundwater saturated interval. A similar trend was observed in ASB-167. The rest of the boreholes did not have PID readings greater than 10 ppm. One to three samples were collected from each boring depending on the thickness of the unsaturated layer and sampled for VOCs, SVOCs, TAL metals, PCBs, GRO, DRO, arsenic and Toxicity Characteristic Leaching Procedure (TCLP) arsenic. The TCLP procedure was used when analyzing for arsenic because if arsenic leaches from the soil it can be an indicator that the arsenic impacts are anthropogenic. No samples were collected from ASB-164 because groundwater saturated soils were encountered near the surface. Two of the samples from each boring were submitted to the laboratory for analysis and the additional samples were held pending results of the initial samples and analyzed if additional delineation was needed. Soil borings completed in Feature 10 and exceedances of any SRVs are shown on Figure 2.

ASB-165 detected total arsenic over the Industrial SRV and outside the range of naturally occurring arsenic in Minnesota (Table 8), however, TCLP arsenic was below detection limits. No other constituents were detected above any SRVs. GRO was

detected at an estimated concentration of 2.2 mg/kg and DRO was detected at 100 mg/kg, but there are no SRVs for those constituents.

ASB-166 detected antimony and lead above the Industrial SRV and cadmium above the Recreational SRV. The lead concentration of 720 mg/kg is also above the range for background concentrations detected naturally in the area (Table 8). No other constituents were detected above any SRVs. GRO was detected at 33 mg/kg.

The shallow sample (0 to 2 feet bgs) in ASB-167 detected antimony above the Industrial SRV and lead above both the Recreational SRV and the range for naturally occurring lead (Table 8). No other constituents were detected above any SRVs. Two PCBs (Aroclor 1248 and Aroclor 1260) were detected at concentrations of 84 and 44 micrograms per kilogram (ug/kg) respectively, which are below their respective SRV of 1,200 ug/kg. GRO was detected at an estimated concentration of 6.3 mg/kg and DRO was detected at 170 mg/kg.

The shallow sample (0 to 2 feet bgs) from ASB-170 detected one SVOC (benzo(a)pyrene) above Recreational SRVs. One PCB (Aroclor 1260) was detected at a concentration below its SRV of 1,200 ug/kg. The deep sample (4 to 6 feet bgs) detected no PCBs at or above the method detection limits and GRO and DRO were detected at estimated concentrations of 2.4 mg/kg and 8.2 mg/kg respectively.

ASB-171 detected arsenic above the Industrial SRV and above background concentrations in the naturally occurring range for arsenic (Table 8). No PCBs were detected above the method detection limit. No other constituents were detected above SRVs. GRO and DRO were detected at estimated concentrations of 1.8 mg/kg and 8.2 mg/kg respectively.

Groundwater

One temporary well was installed at ASB-166. A groundwater sample was collected and analyzed for arsenic which was detected at 610 ug/L, above the MCL of 10 ug/L. There is no HRL for arsenic. Groundwater samples collected in Feature 10 and exceedances of any HRLs or MCLs are shown on Figure 3.

3.2.10 Feature 11 – Former Disposal Area B

3.2.10.1 History

This area was utilized as a historical disposal site along with Former Disposal Area A (Feature 9) for waste materials generated from the assembly and painting operations. Samples collected from seventeen soil borings completed in 1992 indicated VOCs and metals were present at concentrations that exceeded remediation criteria. The areas with soil exceedances were excavated from 1992 to 1993 and relocated to Area C. Confirmation samples collected from the excavated areas and confirmed that the cleanup goals had been achieved. The Response Action Final Completion Report that documented the remediation activities was accepted by the MPCA in April 1993 and the area was delisted from the PLP in July 1993.

3.2.10.2 Supplemental Investigation

Soil

Five additional soil borings (ASB-172, ASB-173, ASB-174, ASB-175, ASB-176) were completed to provide additional assessment of Former Disposal Area B. Boreholes were completed to 12 feet bgs before hitting refusal due to bedrock. Elevated PID readings were observed in ASB-172, ASB-173, ASB-175 and ASB-176. The PID readings measured in ASB-172 and ASB-173 (576 ppm and 818 ppm respectively) were below the interval where soils became wet so soil were collected from above the interval with high PID readings. The PID readings measured in ASB-175 and ASB-176 were from the unsaturated portion of the soil so samples were collected from the interval with elevated PID readings. One soil sample was collected from each boring and analyzed for VOCs, TAL metals, GRO and DRO. Soil borings completed in Feature 11 and exceedances of any SRVs are shown on Figure 2.

ASB-172 had concentrations of lead over its Industrial SRV, and antimony over its Recreational SRV. The lead concentration of 3,000 mg/kg is also above the range for background concentrations of lead occurring naturally in the area (Table 8). GRO and DRO were detected at concentrations of 2.9 and 52 mg/kg respectively, but there is no SRV for those constituents. No other constituents were detected over their respective SRVs.

ASB-173 had a concentration of GRO that was below method detection limits and DRO was detected at 25 mg/kg. No other constituents were detected over their respective SRVs.

ASB-175 detected lead and mercury above the Industrial SRV, naphthalene above the Residential SRV, and antimony above the Recreational SRV. The lead concentration of 1,000 mg/kg is above the range for background concentrations of lead occurring naturally in the area (Table 8). GRO and DRO were detected at concentrations of 5,800 and 2,600 mg/kg respectively from four to six ft bgs. No other constituents were detected above any of the SRVs.

ASB-176 had two VOCs (1,2,4-TMB and naphthalene) detected above the Industrial SRVs.

Groundwater

Up to three temporary monitoring wells were planned for the area but were not installed due to lack of water observed in the boreholes at 12 ft bgs.

3.2.11 Feature 12 and 47 – Former Railroad Spur and Former Coal Operations

3.2.11.1 History

Railroad spurs were utilized for the delivery and loading of parts and other items to and from the assembly plant via rail cars. Based on their historic use the former railroad spurs were investigated. Five borings (ASB-005, ASB-035, ASB-036, ASB-037 and ASB-040) were completed during the Initial Phase II Exterior Investigation. Samples from ASB-005 and ASB-037 had detected concentrations of DRO, however, no constituents from any of the borings exceeded the Industrial SRVs. Groundwater samples were collected from ASB-005, ASB-036 and ASB-037. Several metals were detected in samples collected from all three boreholes at concentrations that exceeded their respective HRLs.

3.2.11.2 Supplemental Investigation

Soil

One additional soil boring (ASB-162) was installed during the Supplemental Phase II Exterior Investigation to evaluate the exceedances in soil and groundwater that were

detected during the Initial Supplemental Phase II Exterior Investigation. ASB-162 was completed to a total depth of 12 feet bgs. No PID readings over 10 ppm were observed. One soil sample was collected from 1 to 3 feet bgs in ASB-162 and analyzed for VOCs, PAHs, DRO, PCBs and RCRA metals. Soil borings completed in Feature 12 and 47 and are shown on Figure 2.

No constituents were detected at concentrations exceeding any SRVs. DRO was detected at an estimated concentration of 2 mg/kg, but there is no SRV for that constituent.

Groundwater

Two permanent groundwater wells (AMW-11 and AMW-18) were installed to further evaluate the groundwater exceedances of metals identified at ASB-005, ASB-036 and ASB-037 during the Initial Phase II Exterior Investigation. The wells were sampled for VOCs, PAHs, RCRA metals, GRO and DRO. Permanent wells installed in Feature 12 and 47 and are shown on Figure 3.

AMW-11 and AMW-18 did not have any constituents detected at or above their respective groundwater standards. GRO was detected at 3,000 ug/L and below method detection limits respectively. DRO was detected at 1,200 ug/L and 1,000 ug/L respectively. There are no MCLs or HRLs for GRO or DRO.

3.2.12 Feature 16 – Former Gasoline, Sunoco Spirits and Pryoxlin USTs.

3.2.12.1 History

Two former 20,000 gallon gasoline USTs were located east of the former oil house and eight 6,000 gallon gasoline, Sunoco spirits and pryoxlin thinner USTs were located north of the former oil house, which were utilized in conjunction with the former paint operations that occurred within the main assembly building. Documentation pertaining to the removal and subsequent closure of the USTs was not found in files maintained at the TCAP or the MPCA. Two borings were completed (ASB-001 and ASB-002) during the Initial Phase II Exterior Investigation. Both boreholes also had detections of VOCs (xylenes, 1,2,4-TMB and 1,3,5-TMB) at concentrations above the Industrial SRV. The sample from ASB-001 had a detectable concentration of GRO and both ASB-001 and ASB-002 had detectable concentrations of DRO but there are no SRVs for those constituents. A groundwater sample was collected from a temporary well at ASB-001. Select VOCs and metals were also detected at concentrations greater than

their respective HRLs. GRO and DRO were detected in samples from both boreholes but there are no HRLs for those constituents.

3.2.12.2 Supplemental Investigation

Soil

Five borings (ASB-157, ASB-158, ASB-159, ASB-160 and ASB-161) were completed as part of the Supplemental Phase II Exterior Investigation to confirm and delineate the exceedances detected during the Initial Phase II Exterior Investigation. Two borings were removed from the Supplemental scope because they are located inside the Main Assembly Building, and are covered under a separate scope of work. The borings were completed to 12 feet bgs. Elevated PID readings over 10 ppm were detected in all boreholes. In ASB-157, ASB-158 and ASB-161 the highest PID readings occurred in soils below the saturated zone so samples were collected from above the interval with high PID readings. In ASB-159 and ASB-160 elevated PID readings were detected in the unsaturated zone so soil samples were collected from the interval with high PID readings. One to three samples were collected from each borehole depending on the thickness of unsaturated soil and if the borehole was intended to provide vertical delineation or horizontal delineation of the initial results. One to two samples from each borehole were analyzed for VOCs, PAHs, GRO and DRO and the additional samples were held pending the first round of analysis as described below. Soil borings completed in Feature 16 and exceedances of any SRVs are shown on Figure 2.

Samples analyzed from ASB-157, ASB-158, ASB-160 and ASB-161 did not detect any constituents over any SRVs. GRO was detected in three of six samples at concentrations up to 160 mg/kg and DRO was detected in four of six samples at concentrations up to 150 mg/kg.

Two samples were analyzed from ASB-159 from depths of 2 to 4 and 5 to 7 feet bgs. The shallow samples had detectable concentrations of GRO and DRO (53 mg/kg and 100 mg/kg respectively) as did the deeper sample (790 mg/kg and 290 mg/kg respectively) but there is no SRV for those constituents. The deep sample had a concentration of 1,2,4-TMB that was greater than the Industrial SRV. No other constituents were detected in either borehole above SRVs.

In ASB-159 soil was saturated below the 5 to 7 foot sampling interval so no additional samples were collected to vertically delineate the 1,2,4-TMB impacts that were

observed in that borehole. None of the additional delineation samples were analyzed because there were no SRV exceedances in the other boreholes.

Groundwater

Two permanent groundwater wells (AMW-14 and AMW-15) were installed to further evaluate the groundwater exceedances of VOCs and metals detected at ASB-001 during the Initial Phase II Exterior Investigation. The wells were sampled for VOCs, PAHS, dissolved RCRA metals, GRO and DRO. The sample analyzed for RCRA metals was field filtered. Monitoring well locations in Feature 16 and exceedances of any HRLs or MCLs are shown on Figure 3.

AMW-14 had four VOCs (1,2,4-TMB, ethylbenzene, m&p-xylene, and total xylenes) that were detected above HRLs. No VOCs were detected at or above their respective MCLs, but there is no MCL for trimethylbenzene compounds. GRO was detected at 7,600 ug/L and DRO was detected at 1,100 ug/L but there are no MCLs or HRLs for those constituents.

AMW-15 had seven VOCs (1,2,4-TMB, 1,3,5-TMB, benzene, ethylbenzene, naphthalene, m&p-xylene and total xylenes) that were detected above HRLs. Benzene and ethylbenzene were also detected above their respective MCLs but there is no MCL for trimethylbenzene compounds. Arsenic was detected above the MCL standard but there is no HRL for arsenic. No other constituents were detected over their respective groundwater standards. GRO was detected at 15,000 ug/L and DRO was detected at 640 ug/L but there are no MCLs or HRLs for those constituents.

3.2.13 Feature 20 – Former Oil Fill Area

3.2.13.1 History

A review of historical drawings indicated the presence of a former oil fill location along the eastern portion of the main assembly building. Two borings (ASB-006 and ASB-007) were completed during the Initial Phase II Exterior Investigation. DRO was detected in samples collected from both boreholes, but there is no SRV for that constituent. There were no constituents detected in the soil samples that exceeded their respective SRVs. A groundwater sample was collected from a temporary well at ASB-006. Select metals were detected at concentrations greater than their respective HRLs.

3.2.13.2 Supplemental Investigation

Groundwater

No additional soil borings were planned for the Supplemental Phase II Exterior Investigation, but one permanent monitoring well (AMW-13) was installed near ASB-006 to evaluate the metals exceedances that were detected at that location in the groundwater during the Initial Phase II Exterior Investigation. AMW-13 was sampled for PAHS, RCRA metals, DRO and GRO. Monitoring well location of AMW-13 in Feature 20 is shown on Figure 3.

AMW-13 did not have any constituents detected above MCLs or HRLs. GRO was below method detection limits and DRO was detected at 220 ug/L but there are no MCLs or HRLs for those constituents.

3.2.14 Feature 21 – 1996 Glycol Release from Underground Piping

3.2.14.1 History

In 1996 a leak occurred from underground piping used to transfer glycol along the eastern portion of the main assembly building. Based on available documentation reviewed, remediation activities were completed in the area of the release; however there was no documentation indicating that the release had been adequately remediated per the MPCA. Therefore, the glycol release represents a Feature. Two borings (ASB-008 and ASB-009) were completed during the Initial Phase II Exterior Investigation. A sheen was noted on the soil from ASB-008 and samples were collected for analysis of ethylene glycol. No constituents from either of the borings exceeded the Industrial SRVs. No temporary wells were set due to lack of water observed in the boreholes.

3.2.14.2 Supplemental Investigation

Soil

One additional soil boring (ASB-168) was completed to investigate the sheen observed at two intervals from ASB-008, zero to two feet bgs and four to six feet bgs. The borehole was completed to a depth of 12 feet bgs before hitting refusal due to bedrock. No PID readings greater than 10 ppm were detected. Two soil samples were collected

from the soil boring and analyzed for VOCs, GRO and DRO. The soil boring completed in Feature 21 is shown on Figure 2.

The shallow sample collected from zero to two feet bgs had 1.4 mg/kg of GRO and 110 mg/kg of DRO. The deep sampled collected from four to six feet bgs had 3.9 mg/kg of GRO and 16 mg/kg of DRO. The third sample specified in the work plan was not collected because the soil was saturated below six feet bgs. There is no SRV for DRO or GRO. No VOCs were detected in the soil samples above any SRVs.

3.2.15 Feature 23 – Former Brake Fluid UST

3.2.15.1 History

A former 6,000-gallon brake fluid UST was used in fluid fill operations at the TCAP. The UST was installed in 1968 and removed in 1990. The UST was of steel construction. A review of available documentation indicated that there were no reported releases from this UST; however, no documentation pertaining to removal activities or closure sampling was found in files maintained at the TCAP or the MPCA. No borings were completed during the Initial Phase II Exterior Investigation due to utility interferences.

3.2.15.2 Supplemental Investigation

Four soil borings and two temporary wells were planned to investigate the area but could not be completed due to utility interference. These soil borings and wells will be completed along with the Supplemental Phase II Interior Investigation.

3.2.16 Feature 24 – Unleaded Gasoline USTs

3.2.16.1 History

Two 20,000-gallon unleaded gasoline USTs were utilized in conjunction with the fluid fill operations on the assembly line. The USTs were of STI-P3 construction with cathodic protection. A review of available documentation indicated that there were no reported releases from the USTs. Once these USTs are no longer in use the area will be addressed in accordance with applicable regulations. One boring (ASB-028) was completed during the Initial Phase II Exterior Investigation. No constituents were detected above the Industrial SRVs. No groundwater samples were collected due to a lack of water observed in the borehole.

3.2.16.2 Supplemental Investigation

No additional subsurface investigation was planned for the area. The supplemental investigation will be completed after the tanks have been removed from the ground, following guidance recommended by the Petroleum Remediation Program.

3.2.17 Feature 27 – Oil/Water Separator Trench

3.2.17.1 History

An approximate 3,000-gallon oil/water separator collects an oil/water mixture from a 100-foot long collection trench. Since this subsurface structure collects oil and water mixture and the integrity of the structure could not be inspected it is considered a Feature. Once the oil/water separator has been emptied and cleaned, the integrity of the structure will be evaluated. Three borings (ASB-010, ASB-011 and ASB-012) were completed during the Initial Phase II Exterior Investigation. DRO was detected in ASB-011 and ASB-012 but no constituents were detected at concentrations above the SRVs. No temporary wells were set due to lack of water observed in the boreholes.

3.2.17.2 Supplemental Investigation

Soil

One additional soil boring (ASB-169) was completed during the Supplemental Phase II Exterior Investigation to further investigate potential impacts associated with the oil/water separator trench. The boring was completed to a depth of 12 feet bgs before hitting refusal on bedrock. No PID readings over 10 ppm were observed. One soil sample was collected from three to five feet bgs and analyzed for VOCs, SVOCs, RCRA metals and DRO. The soil boring completed in Feature 27 is shown on Figure 2.

No constituents were detected at or above the relative SRVs. DRO was detected in the sample at 68 mg/kg, but there is no SRV for that constituent.

Groundwater

One temporary well was planned if potential soil impacts appeared to extend to groundwater, but no impacts were observed in the soil boring and no groundwater was encountered before refusal; therefore no temporary well was installed.

3.2.18 Feature 35, 36, 37 and 46 – Waste Solvent USTs

3.2.18.1 History

This feature addresses an area with current and former solvent USTs, underground piping and sumps. Historical releases of solvent have been reported in the area and three monitoring wells were installed in 1989. The wells were sampled annually until 2003 when the MPCA approved discontinuing the sampling program.

Three borings (ASB-018, ASB-019 and ASB-020) were completed during the Initial Phase II Exterior Investigation. Elevated PID readings were detected in ASB-019, but no constituents were detected in any of the samples above the Industrial SRVs. No groundwater samples were collected due to a lack of water observed in the boreholes.

3.2.18.2 Supplemental Investigation

Soil

Two additional soil borings (ASB-185 and ASB-186) were completed to a depth of eight feet bgs before encountering refusal due to bedrock. No elevated PID readings above 10 ppm were detected in either soil boring. Two soil samples were collected from each location and analyzed for VOCs, SVOCs and RCRA metals. Soil borings completed in Feature 35/36/37/46 are shown on Figure 2.

No constituents were detected in either sample above any SRVs.

Groundwater

One temporary well was planned if potential soils impacts appeared to extend to groundwater, but no impacts were observed in the soil boring and no groundwater was encountered before refusal; therefore no temporary well was installed.

3.2.19 Feature 41 – Former Fuel Oil UST

3.2.19.1 History

A 26,500 gallon fuel oil UST was installed near the steam plant in approximately 1950. When it was no longer in use it was determined that it could not be closed without compromising the structural integrity of the steam plant so it was closed in place in

1990. A release from the UST was reported during closure activities (Leak 3262). A subsurface investigation was conducted in 1991 which detected some impacts to both soil and groundwater in the area. Additional groundwater monitoring was conducted until the MPCA issued a closure letter for the release in December 1994.

3.2.19.2 Supplemental Investigation

No additional subsurface investigation was planned for this area as part of the Supplemental Phase II Exterior Investigation. However, the closure of the UST release will be supplemented by investigations in conjunction with samples collected for co-located Features 13, 42 and 153.

3.2.20 Feature 42 – Former Fuel Oil ASTs

3.2.20.1 History

Former fuel oil ASTs were located south of the Steam Plant. The ASTs were removed from service in 2000 and corrective actions including removal of the remaining fuel oil from the in service AST, cleaning of the AST and associated piping and dismantling of the two ASTs for recycling were completed between August 1, 2000 and October 16, 2000. One boring (ASB-026) was completed during the Initial Phase II Exterior Investigation. Iron and copper were detected above Residential SRVs but at concentrations that are typical of other areas of the Site and within the naturally occurring range of those metals. No constituents were detected above Industrial SRVs. No groundwater samples were collected due to a lack of water observed in the borehole.

3.2.20.2 Supplemental Investigation

Soil

Three additional soil borings (ASB-196, ASB-197 and ASB-198) were completed during the Supplemental Phase II Exterior Investigation to provide additional assessment of this feature. The borings were completed to a depth of 15 feet bgs before encountering refusal due to bedrock. No elevated PID readings greater than 10 ppm were detected in the soil borings. One soil sample was collected from each location and analyzed for VOCs, SVOCs, PCBs, TAL metals, DRO and GRO. Soil borings completed in Feature 42 and exceedances of any SRVs are shown on Figure 2.

ASB-198 detected one SVOC (benzo(a)pyrene) above the Industrial SRV.

Groundwater

One temporary well was planned if potential soils impacts appeared to extend to groundwater, but no impacts were observed in the soil boring and no groundwater was encountered before refusal; therefore a temporary well was not installed.

3.2.21 Feature 44, 134 and 140 – Wastewater Collection ASTs, Wastewater Treatment Area, Former Waste Disposal Area

3.2.21.1 History

Wastewater Collection ASTs - Feature 44: Three approximate 139,000-gallon wastewater treatment tanks are utilized to store and treat process wastewater generated by the assembly and painting processes at the TCAP. The phosphate process generates the majority of the wastewater at the TCAP. Since the ASTs contain and hold process industrial wastewater prior to and during treatment, this area was investigated.

Wastewater Treatment Area - Feature 134: The wastewater treatment area houses operations including transferring, containing, storing, and treating process wastewater generated from the assembly process. Based on current and historic use this area was investigated.

Former Waste Disposal Area – Feature 140: In what appears to be an isolated disposal incident in 1966, paint waste solvent and sludge was disposed of north of the Steam Plant. Visibly contaminated soils in the area were excavated and sent to a hazardous waste landfill. The reviewed documentation stated that the waste materials excavated were deemed non-hazardous; however, no analytical data of the material disposed of or description of materials excavated and disposed were included.

Four borings (ASB-023, ASB-024, ASB-025 and ASB-027) were completed during the Initial Phase II Exterior Investigation. Lead was detected at four to six feet bgs in ASB-027 above the SRVs (Industrial, Recreational, and Residential), but no other constituents were detected in any of the samples above those standards. No temporary wells were set due to lack of water observed in the boreholes.

3.2.21.2 Supplemental Investigation

Soil

Five additional soil borings (ASB-188, ASB-189, ASB-190, ASB-191, ASB-192) were completed during the Supplemental Phase II Exterior Investigation to further define the horizontal and vertical extent of lead impacts at ASB-027. Borings were completed to depths of between 12 and 15 feet bgs. No elevated PID readings above 10 ppm were detected in any of the boreholes. Three samples were collected from each boring to delineate lead impacts. The two upper samples from each borehole were analyzed and the third was held at the lab pending results of the initial round of sampling and determination about whether additional delineation was required. Soil borings completed in Feature 44/134/140 are shown on Figure 2.

None of the analyzed samples had lead detected at concentrations greater than the Residential SRV so the additional delineation samples that were collected from deeper soil intervals were not analyzed.

Groundwater

No temporary wells were set due to lack of water observed in the boreholes.

3.2.22 Feature 49 – Former Hazardous Waste Storage Areas

3.2.22.1 History

Based on historical documentation reviewed, a former hazardous waste storage area was identified to have been located east of the main assembly building. Based on the general usage of the area to store hazardous waste materials, the former hazardous storage area was investigated. Two borings (ASB-038 and ASB-039) were completed during the Initial Phase II Exterior Investigation. The sample from ASB-038 contained DRO, but no constituents were detected above SRVs. No temporary wells were set due to lack of water observed in the boreholes.

3.2.22.2 Supplemental Investigation

One additional boring was planned for the Supplemental Phase II Exterior Investigation, but was not completed because it was located in an area over a cave

that had been filled in with expandable concrete. This boring will be completed along with the Supplemental Phase II Interior Investigation.

3.2.23 Feature 121 – Exterior Locations Adjacent to Sludge Pits

3.2.23.1 History

Two waste paint sludge pits are used to store paint sludge generated from the painting process. The pits are of concrete construction. Overspray from the painting process is captured by sheeting action of water in trenches underneath the paint booths, which is transferred into the paint sludge pits for separation. The northern paint sludge pit was observed to be in good condition; however, the southern paint sludge pit was currently full of water and could not be inspected. Since the southern pit could not be inspected, the Feature was investigated. Three borings (ASB-015, ASB-016 and ASB-032) were completed during the Initial Phase II Exterior Investigation. No constituents from the borings exceeded the Industrial SRVs. No temporary wells were set due to lack of water observed in the boreholes.

3.2.23.2 Supplemental Investigation

Two additional borings and one temporary groundwater well were planned for the Supplemental Phase II Exterior Investigation but were not completed due to utility interferences. The area will be investigated during a future investigation after plant shutdown.

3.2.24 Feature 138 – Former 20,000 Gallon Gasoline AST

3.2.24.1 History

A former 20,000-gallon gasoline AST was removed from south of the former oil house as identified during interviews with TCAP personnel. Based on the interviewee, when the AST was removed stained soil and odors were identified. However, actions for remediation of the soil were apparently not completed in the area. It is unknown if the UST stored leaded or unleaded gasoline. Two borings (ASB-041 and ASB-042) were completed during the Initial Phase II Exterior Investigation. GRO was detected in ASB-041 but no constituents were present at concentrations over SRVs. No groundwater samples were collected due to a lack of water observed in the borehole.

3.2.24.2 Supplemental Investigation

Soil

Two additional borings (ASB-145 and ASB-146) were completed to provide additional assessment of the Former 20,000 gallon UST. The boreholes were completed to a depth of 12 feet bgs before encountering refusal due to bedrock. A PID reading over 10 ppm was detected in ASB-145 (31 ppm from 10 to 12 feet bgs) but was below the saturated soil so soil samples were collected from the interval above the elevated PID readings. Elevated PID readings (>900 ppm from 6 to 10 feet bgs) were detected both above and below the saturated soil so one soil sample from ASB-146 (6 to 8 feet bgs) was collected from soil with elevated PID readings. Two soil samples were collected from each borehole and analyzed for VOCs, lead and GRO. Soil borings completed in Feature 138 are shown on Figure 2.

No constituents were detected in the soil samples at or above any SRVs. GRO was detected in the sample from 6 to 8 feet bgs at ASB-146 at a concentration of 780 mg/kg but was below method detection limits in all other samples. There is not SRV for GRO.

Groundwater

One temporary well was installed at ASB-145 but no water was encountered at ASB-146. A groundwater sample was collected and analyzed for VOCs, lead and dissolved GRO. The groundwater sample location in Feature 138 is shown on Figure 3.

No constituents were detected in the groundwater sample above HRLs or MCLs. GRO was detected at 510 ug/L, but there is no HRL or MCL for that constituents.

3.2.25 Feature 152 – Former Fuel Oil AST

3.2.25.1 History

The 27,000-gallon UST may have been utilized to provide fuel as a heating source in the main assembly building. The UST was installed at an unknown date and no documentation pertaining to its removal was found through research activities; therefore, the UST may still be in place at the TCAP. Two borings (ASB-003 and ASB-004) were completed during the Initial Phase II Exterior Investigation. The sample from ASB-003 had detectable concentrations of GRO and samples from both borings had

detectable concentrations of DRO, but there are no SRVs for those constituents. 1,2,4-TMB was detected in ASB-003 above the SRV but no other constituents were detected above their relative standards. A groundwater sample was collected from a temporary well installed at ASB-003. GRO and DRO were both detected in the groundwater sample, but there is no HRL for those constituents. Select VOCs, SVOCs and metals were also detected at concentrations exceeding their respective HRLs.

3.2.25.2 Supplemental Investigation

Soil

Four additional borings (ASB-135, ASB-147, ASB-148 and ASB-163) were completed during the Supplemental Phase II Exterior Investigation to delineate the exceedances of VOCs at ASB-003 and to collect additional data on extent of DRO and GRO impacts. The borings were completed to depths of between nine and 16 feet bgs before encountering refusal due to bedrock. All soil borings detected elevated PID readings greater than 10 ppm. In ASB-135 and ASB-146 intervals with high PID readings were detected above saturated soils so samples were collected from intervals with elevated PID readings. In ASB-148 and ASB-163 the highest PID readings were detected in saturated soils so soil samples were collected from intervals just above the saturated zone. Two to three samples were collected from each of the four borings surrounding ASB-003 depending on the thickness of the unsaturated zone and depth to bedrock. The samples were analyzed for VOCs, PAHs, GRO and DRO. Soil borings completed in Feature 152 are shown on Figure 2.

None of the borings had any constituents detected at concentrations at or above their respective SRVs. GRO and DRO were detected in all the samples at concentrations as high as 3,000 mg/kg and 32 mg/kg respectively but there are no SRVs for those constituents.

No soil samples were collected from the boring that was co-located with ASB-003 and converted to a permanent monitoring well so no additional vertical delineation data for the vadose zone can be provided, however, the samples collected from ASB-003 during the Initial Phase II Exterior Investigation were collected from 6 to 8 feet bgs and 10 to 12 feet bgs and indicate the impacts extend through that full interval.

Groundwater

One permanent monitoring well (AMW-12) was installed to evaluate the VOC, SVOC and metals exceedances that were detected in ASB-003 during the Initial Phase II Exterior Investigation. AMW-12 was sampled for VOCs, PAHs, RCRA metals, GRO and DRO. Groundwater samples collected in Feature 152 and exceedances of any HRLs or MCLs are shown on Figure 3.

AMW-12 had seven VOCs (1,2,4-TMB, 1,3,5-TMB, benzene, ethylbenzene, m&p-xylene, and total xylenes) that were detected above HRLs. Benzene and ethylbenzene were also detected above their MCLs, but there is no MCL for TMB compounds. Arsenic was detected above the MCL, but no HRL exists for that metal. No other compounds were detected over any MCLs or HRLs. GRO was detected at 13,000 ug/L and DRO was detected at 620 ug/L, but there are no MCLs or HRLs for those constituents.

3.2.26 Feature 153 - Former Coal Gasification Plant

3.2.26.1 History

A coal gasification plant was located near the steam plant where coal was used to generate gas. Based on the historical gasification activities in the area, it was considered a Feature and in need of investigation. This feature was added after the Initial Phase II Exterior Investigation was completed.

3.2.26.2 Supplemental Investigation

Soil

Two soil borings (ASB-193 and ASB-195) were completed as part of the Supplemental Phase II Exterior Investigation to evaluate if any residual impacts exist from historic coal gasification issues. Two additional planned boreholes could not be completed due to utility interference. ASB-193 hit refusal at two feet bgs due to what appeared to be large chunks of rubble beneath the existing concrete slab. ASB-195 was completed to ten feet bgs before hitting refusal. No elevated PID readings above 10 ppm were detected in either borehole. One sample was collected from ASB-193 and two samples were collected from ASB-195 and analyzed for VOCS, SVOCs, RCRA metals and free cyanide. Soil borings completed in Feature 153 and exceedances of any SRVs are shown on Figure 2.

No constituents were detected above their relative SRVs in the sample collected from ASB-193. Benzo(a)pyrene was detected above the Industrial standard in the shallow sample collected from 6 to 8 feet bgs in ASB-195, but no other constituents were detected above any SRV in either sample collected from that borehole.

Groundwater

Due to a lack of groundwater, no temporary wells were installed.

3.2.27 Feature 154 – Former Tar Decantor Building

3.2.27.1 History

A tar decanter house was present along with the coal gasification plant investigated in Feature 153. Based on the historical gasification activities in the area, it was considered a Feature and in need of investigation. This feature was added after the Initial Phase II Exterior Investigation was completed.

3.2.27.2 Supplemental Investigation

Soil

One soil borings (ASB-194) was completed as part of the Supplemental Phase II Exterior Investigation to evaluate if any residual impacts exist from historic coal gasification issues. Three additional planned boreholes could not be completed due to utility interference. ASB-194 was completed to a total depth of 15 feet bgs. No elevated PID readings were detected. Two samples were collected from ASB-194 and analyzed for VOCs, SVOCs, RCRA metals and free cyanide. Soil borings completed in Feature 154 are shown on Figure 2.

No constituents were detected at or above any SRVs.

Groundwater

No temporary well was set due to lack of water observed in the borehole.

4. Summary of Findings

A total of 86 direct push soil borings, nine temporary wells and eight permanent wells were completed to investigate 21 Features for soil and groundwater impacts during the Supplemental Phase II Exterior Investigation. Four areas (Feature 7, 23, 49 and 121) were not investigated due to utility interferences or other obstructions, but are planned to be completed along with the Supplemental Phase II Interior Investigation. As shown in the summary table below eight Features had soil exceedances of at least one SRV (excluding naturally occurring elements when they were they were detected at concentrations within the range of naturally occurring concentrations) and six Features had groundwater exceedances of at least one groundwater standard. Additionally, 15 of the 16 Features analyzed for petroleum impacts had detectable concentrations of GRO or DRO. An evaluation of the petroleum impacts will be made after future land use has been determined.

Feature Name	Feature	Frequency of Exceedances		SRV Exceedances			HRL/MCL Exceedances	Analytes
		Soil	Groundwater	Residential	Recreational	Industrial		
North Parking Area	NPA	2/19	3/6	Yes	Yes	Yes	Yes	• VOCs • Metals
Former Test Track	1	0/6	NA	No	No	No	NA	
Former Convoy UST	3	0/3	NA	No	No	No	NA	
Former Area of Impacted Soil – Leak #10700	4	0/2	1/1	No	No	No	Yes	• VOCs
Former Location of Gasoline and Diesel Fuel Underground Piping	5	2/4	2/2	Yes	Yes	Yes	Yes	• VOCs • SVOCs
Former Hazardous Waste Storage Area	8	0/2	NA	No	No	No	NA	
Former Disposal Area A	9	1/4	NA	Yes	Yes	Yes	NA	• VOCs • Metals
Former Hazardous Waste Storage Area	10	5/5	1/1	Yes	Yes	Yes	Yes	• SVOCs • Metals
Former Disposal Area B	11	3/5	NA	Yes	Yes	Yes	NA	• VOCs • Metals
Former Railroad Spur & Former Coal Operations	12/47	0/1	0/2	No	No	No	No	
Former Gasoline, Sunoco Spirits, and Pryoxlin USTs	16	1/5	2/2	Yes	Yes	Yes	Yes	• VOCs • SVOCs • Metals
Former Oil Fill Area	20	NA	0/1	NA	NA	NA	No	
1996 Glycol Release from Underground Piping	21	0/1	NA	No	No	No	NA	
Oil/Water Separator and Trench	27	0/1	NA	No	No	No	NA	
Waste Solvent USTs	35/36/37/46	0/2	NA	No	No	No	NA	
Former Fuel Oil ASTs	42	1/3	NA	Yes	Yes	Yes	NA	• SVOCs • Metals
Wastewater Collections ASTs, Wastewater Treatment Area, Former Waste Disposal Area	44/134/140	0/5	NA	No	No	No	No	
Former 20,000 Gallon Gasoline AST	138	0/2	0/1	No	No	No	No	
Former Fuel Oil AST	152	0/4	1/1	No	No	No	Yes	• VOCs • Metals
Former Coal Gasification Plant	153	1/2	NA	Yes	Yes	Yes	NA	• SVOCs
Former Tar Decanter Building	154	0/1	NA	No	No	No	No	

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Tables

Table 1. Summary of Supplemental Phase II-Exterior Investigation Activities
Twin Cities Assembly Plant, St. Paul, Minnesota

	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
North Parking Area	The North Parking Area consists of approximately 29 acres and is mainly used for employee parking, as well as storage for newly built Ford Ranger and Mazda Series trucks prior to shipment off-site. Initial Investigation: None.	Complete **nineteen soil borings** in the north parking area to further investigate the area. The area was divided into 1-acre grids, and one boring will be installed within each grid except for those grid locations in which either a well or boring is currently installed or a well or boring will be installed. Two soil samples will be collected from each boring. If potential impacts extend to the water table, convert a maximum of four soil borings to temporary monitoring wells and sample groundwater, if encountered.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): ASB-115, ASB-116, ASB-118, ASB-123, ASB-136 PID Exceedances (above 10 ppm), entire boring: ASB-115, ASB-123,	Nineteen Geoprobe borings (ASB-115, ASB-116, ASB-117, ASB-118, ASB-123, ASB-124, ASB-125, ASB-126, ASB-128, ASB-129, ASB-130, ASB-131, ASB-132, ASB-134, ASB-136, ASB-137, ASB-141, ABS-142, ASB-143) Soils were continuously logged from the surface to the bottom of each bore hole.	Six temporary groundwater well set and sampled from ASB-115, ASB-118, ASB-128, ASB-129, ASB-130, ASB-137.	Soil: DRO (Wisconsin Modified Method) RCRA Metals (Method 6010) PAHs (Method 8270C) Soil (Provisional): VOCs (Method 8260B) GRO (Wisconsin Modified Method) PCBs (Method 8082) Groundwater (Provisional): VOCs (Method 8260) PAHs (Method 8270) DRO (Wisconsin Modified Method) GRO (Wisconsin Modified Method) RCRA Metals (Method 6010),Dissolved PCBs (Method 8082)
Former Test Track Feature 1 Eastern Portion of TCAP Property	Based on a review of aerial photographs, the former test track was historically used to test vehicles from prior to 1953 until prior to 1974. The test track was sprayed with oil for dust control based on information provided through interviews with TCAP personnel. Initial Investigation: Two Hollow Stem Auger borings (ASB-033, ASB-046).	Complete **seven soil borings** in the area of the former test track to further investigate the area. Eight borings will be located approximately 660 feet apart along the track. If potential impacts extend to the water table, convert a maximum of four soil borings to temporary monitoring wells and sample groundwater, if encountered.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	Six Geoprobe borings (ASB-127, ASB-133, ASB-144, ASB-178, ASB-184, ABS-187) Soils were continuously logged from the surface to the bottom of each bore hole.	No temporary wells set.	Soil: VOCs (Method 8260B) SVOCs (Method 8270C) DRO (Wisconsin Modified Method) RCRA Metals (Method 6010) PCBs (Method 8082) Groundwater (Provisional): VOCs (Method 8260B) SVOCs (Method 8270C) DRO (Wisconsin Modified Method) RCRA Metals (Method 6010),Dissolved PCBs (Method 8082)
Former Convoy UST Feature 3 Located Approximately 200 feet East of the Training Facility	A confirmed release (Leak #5343) from the former Convoy 2,000 gallon diesel UST was reported during UST removal activities in 1992. Approximately 150 cubic yards of soil was excavated during the remedial action. A soil boring program was implemented at the request of the MPCA to define the extent of impacts. Seven samples were collected from the sidewalls and bottom of the tank excavation and five samples were collected from boreholes completed to delineate the horizontal extent of impacts. Approximately 125 cubic yards of impacted soil were left in place beneath the clean fill used to replace the UST excavation. The release was closed in September 1992 because the impacts were delineated and vertical migration of the impacts was limited by the bedrock approximately 10 ft bgs.	Complete **three soil borings** in the area of the former Convoy UST to provide additional assessment of this feature. Convert one boring to a temporary monitoring well and sample groundwater, if soil impacts extend to groundwater table.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): ASB-139	Three Geoprobe borings (ASB-136, ASB-137, ASB-140) Soils were continuously logged from the surface to the bottom of each bore hole.	No temporary wells set.	Soil: VOCs (Method 8260B) Lead (Method 6010) GRO and DRO (Wisconsin Modified Method) Groundwater (Provisional): VOCs (Method 8260B) Lead (Method 6010), Dissolved GRO and DRO (Wisconsin Modified Method)

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Twin Cities Assembly Plant, St. Paul, Minnesota

	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
Former Area of Impacted Soil - Leak #10700 Feature 4 Located in the Area Beneath the Westernmost Portion of the Current Training Center	An area of soil impacted with gasoline and diesel was reported in 1997. The impacts were the results of leakage from product lines running to gasoline and diesel USTs that were removed in 1993. The area was entered into the VPIC program in December 1997. The impacted soils were excavated and the release was closed in February 1998. A Development Response Action Plan (DRAP) was approved in February 1997 for construction of a training center in the area. During construction of the training center a total volume of 3,078 CY of impacted soil was disposed of and 50,693 gallons of groundwater generated from dewatering of the excavation was discharged to the sanitary sewer system via a permit from the City of St. Paul. A total of 31 soil borings were completed during historical investigations in the area. Twenty soil samples and 11 groundwater samples were collected and submitted to a laboratory for analysis.	Complete **two soil borings** north and west of the former leak to provide additional assessment of this feature. Convert one boring to a temporary monitoring well and sample groundwater, if soil impacts extend to groundwater table.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	Two Geoprobe borings (ASB-119, ASB-120) Soils were continuously logged from the surface to the bottom of each bore hole.	Temporary groundwater well set and sampled from ASB-120.	Soil: VOCs (Method 8260B) Lead (Method 6010) GRO and DRO (Wisconsin Modified Method) Groundwater (Provisional): VOCs (Method 8260B) Lead (Method 6010), Dissolved GRO and DRO (Wisconsin Modified Method)
Former Location of Gasoline and Diesel Fuel Underground Piping Feature 5 Along northern potion of main assembly building beneath the current training center and employee parking lot	Underground steel piping was formerly utilized in conjunction with former gasoline and diesel fuel USTs in the area, which were removed in 1993. The piping had been in place since approximately 1977. Some piping may still be in place below the ground surface. The piping is estimated to be present approximately 4 to 8 feet bgs. A release occurred from the piping which impacted subsurface soils. Remedial activities were completed in the area of the piping, which included soil removal. However, in 2004-2005 during a water main repair in the area of the piping, a subsequent release was reported. The releases have been closed per the MPCA; however, based on the recurrent releases identified, impacted soil may still be present in the area of the underground piping. <u>Initial Investigation:</u> Five Hollow Stem Auger borings (ASB-029, ASB-030, ASB-045, ASB-047 and ASB-048). Temporary groundwater wells set and sampled from ASB-030 and ASB-047.	Complete **five soil borings** along the former underground piping route. Borings will be placed approximately every 150 feet along the former piping route. **Two monitoring wells** will be installed to confirm the exceedances identified at boring locations ASB-030 and ASB-047. A groundwater sample from each well will be collected for analysis.	Organic Vapors using a PID. PID Exceedances (above 10 ppm), entire boring: ASB-121, ASB-122	Four Geoprobe borings (ASB-121, ASB-122, ASB-199, ASB-200) Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	Two permanent groundwater wells set and sampled from AMW-16 and AMW-17.	Soil: VOCs (Method 8260B) PAHs (Method 8270C) GRO (Wisconsin Modified Method) DRO (Wisconsin Modified Method) Lead (Pb) (Method 6010) Groundwater: VOCs (Method 8260B) PAHs (Method 8270C) Lead (Method 6010), Dissolved GRO (Wisconsin Modified Method) DRO (Wisconsin Modified Method)

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Table 1. Summary of Supplemental Phase II-Exterior Investigation Activities
Twin Cities Assembly Plant, St. Paul, Minnesota

	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
Railroad Spurs Feature 7 Central and southern portions of property	Railroad spurs are utilized for the delivery and loading of parts and other items to and from the assembly plant via rail cars. In addition, railcars are used to transfer final products to their retail destinations. Some areas of staining were observed within the vicinity of the railroad spurs. Initial Investigation: Five Hollow Stem Augers borings (ASB-017, ASB-021, ASB-022, ASB-031, ASB-043).	Complete **eight soil borings** in the area of the railroad spurs to further investigate potential impacts. Four borings will be located in the rail yard at the center of the site not previously investigated. The other four borings will be completed near the three sets of railroad spurs at the south portion of the plant. If potential impacts extend to the water table, convert soil borings (a maximum of three) to temporary monitoring wells and sample groundwater, if encountered.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	Eight Geoprobe borings will be installed after plant closure. Soil assessment and sampling will be conducted utilizing the same methodology described in Feature 1 above.	No temporary wells set.	Soil: VOCs (Method 8260B) SVOCs (Method 8270C) DRO (Wisconsin Modified Method) PCBs (Method 8082) If staining is present from the 0-2 foot interval, a minimum of two samples will be analyzed for PCBs. RCRA Metals (Method 6010) Groundwater (Provisional): VOCs (Method 8260B) SVOCs (Method 8270C) DRO (Wisconsin Modified Method) PCBs (Method 8082) RCRA Metals (Method 6010), Dissolved
Former Hazardous Waste Storage Area Feature 8 Southwest of the paint building	Based on historical documentation reviewed, a former hazardous waste storage area was identified. The documentation did not include any reported spills from this area; however, based on the general usage of the area to store hazardous waste materials this area was investigated. Initial Investigation: Two Hollow Stem Auger borings (ASB-034, ASB-044).	Complete **three soil borings** in the area of the former hazardous waste storage area to provide additional information. Three borings will be located approximately 130 feet apart. If potential impacts extend to the water table, convert soil borings to temporary monitoring wells and sample groundwater, if encountered.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	Two Geoprobe borings (ASB-179, ASB-180). Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	No temporary wells set.	Soil: VOCs (Method 8260B) SVOCs (Method 8270C) TAL Metals (Method 6010) PCBs (Method 8082) GRO (Wisconsin Modified Method) DRO (Wisconsin Modified Method) Groundwater (Provisional): VOCs (Method 8260B) SVOCs (Method 8270C) TAL Metals (Method 6010), Dissolved PCBs (Method 8082) GRO (Wisconsin Modified Method) DRO (Wisconsin Modified Method)
Former Disposal Area A Feature 9 Southwest of the Paint Building	This area was utilized as a historical disposal site for waste materials along with Former Disposal Area B (Feature 11) generated from the assembly and painting operations. Samples collected from six soil borings completed in 1992 indicated VOCs and metals were present at concentrations that exceeded remediation criteria. The areas with soil exceedances were excavated from 1992 to 1993 and relocated to Area C. Confirmation samples collected from the excavated areas and confirmed that the cleanup goals had been achieved. The Response Action Final Completion Report that documented the remediation activities was accepted by the MPCA in April 1993 and the area was delisted from the PLP in July 1993.	Complete **four soil borings** at Former Disposal Area A to provide additional assessment of this feature. Convert one boring to a temporary monitoring well and sample groundwater, if soil impacts extend to groundwater table.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): ASB-181, ASB-182 PID Exceedances (above 10 ppm), entire boring: ASB-182	Four Geoprobe borings (ASB-177, ASB-181, ASB-182, ASB-183). Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	No temporary wells set.	Soil: VOCs (Method 8260B) TAL Metals (Method 6010) GRO and DRO (Wisconsin Modified Method) Groundwater (Provisional): VOCs (Method 8260B) TAL Metals (Method 6010), Dissolved GRO and DRO (Wisconsin Modified Method)

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Table 1. Summary of Supplemental Phase II-Exterior Investigation Activities
Twin Cities Assembly Plant, St. Paul, Minnesota

	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
Former Hazardous Waste Storage Area Feature 10 Near Packer Building	Based on historical documentation reviewed, a former hazardous waste storage area was identified in the area. The documentation did not include any reported spills from this area; however based on the general usage of the area to store hazardous waste materials this area was investigated. Initial Investigation: Two Hollow Stem Auger borings (ASB-013, ASB-014). Temporary groundwater well set and sampled from ASB-013.	Complete **six soil borings** in the area of the former hazardous waste storage area. Three step-out borings will be positioned in a manner to delineate the exceedances from ASB-014. In addition, one boring will be positioned near the location of ASB-014 location to provide vertical delineation of the exceedance. Also, two borings will be installed in the area of the former hazardous waste storage area to provide additional information. Convert boring near ASB-014 to a temporary monitoring well and sample groundwater, if sufficient groundwater is present.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): ASB-166, ASB-167	Six Geoprobe borings (ASB-164, ASB-165, ASB-166, ASB-167, ASB-170, ASB-171) Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	Temporary groundwater well set and sampled from ASB-166.	Soil: VOCs (Method 8260B) SVOCs (Method 8270C) TAL Metals (Method 6010) PCBs (Method 8082) GRO (Wisconsin Modified Method) DRO (Wisconsin Modified Method) Arsenic (Method 6010) TCLP – Arsenic See other considerations for individual boring analytical requirements. Groundwater (Provisional): Arsenic (Method 6010), Dissolved
Former Disposal Area B Feature 11 Southeast of Main Assembly Building	This area was utilized as a historical disposal site along with Former Disposal Area A (Feature 9) for waste materials generated from the assembly and painting operations. Twenty-six (26) samples collected from seventeen soil borings completed in 1992 indicated VOCs and metals were present at concentrations that exceeded remediation criteria. In addition, groundwater samples were collected from 10 monitoring wells at Former Disposal Area B and verification samples were collected from the sidewalls and bottom of excavations. The areas with soil exceedances were excavated from 1992 to 1993 and relocated to Area C. Confirmation samples collected from the excavated areas and confirmed that the cleanup goals had been achieved. The Response Action Final Completion Report that documented the remediation activities was accepted by the MPCA in April 1993 and the area was delisted from the PLP in July 1993.	Complete **five soil borings** at Former Disposal Area B to provide additional assessment of this feature. Convert up to three borings to temporary monitoring wells and sample groundwater, if soil impacts extend to groundwater table.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): ASB-172, ASB-173, ASB-175, ASB-176	Five Geoprobe borings (ASB-172, ASB-173, ASB-174, ASB-175, ASB-176) Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	No temporary wells were set.	Soil: VOCs (Method 8260B) TAL Metals (Method 6010) GRO and DRO (Wisconsin Modified Method) Groundwater (Provisional): VOCs (Method 8260B) TAL Metals (Method 6010), Dissolved GRO and DRO (Wisconsin Modified Method)

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Table 1. Summary of Supplemental Phase II-Exterior Investigation Activities
Twin Cities Assembly Plant, St. Paul, Minnesota

	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
Former Railroad Spurs Feature 12 Along eastern portion of main assembly building **Former Coal Operations** Feature 47 East of main assembly	**Former Railroad Spurs** Feature 12 Railroad spurs were utilized for the delivery and loading of parts and other items to and from the assembly plant via rail cars. Based on their historic use the former railroad spurs were investigated. **Former Coal Operations** Feature 47 The coal hopper building was utilized to store coal for use at the Steam Plant. Coal was delivered via rail and was transferred into the coal hopper building for storage. A tunnel connecting the coal hopper building and the steam plant runs beneath the main assembly plant, which was utilized to transfer the coal from the hopper to the steam plant. . The estimated depth to the base of the coal hopper building is approximately 10 to12 feet bgs. <u>Initial Investigation:</u> Four Hollow Stem Auger borings (Feature 12: ASB-037, ASB-040; Feature 47: (ASB-005 and ASB-036). Temporary groundwater wells set and sampled from ASB-005, ASB-036 and ASB-037.	Complete **one soil boring and install two monitoring wells** in the area to provide additional information. **Two monitoring wells** will be installed to further evaluate the exceedances identified at boring locations ASB-005, ASB-036, and ASB-037.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	One Geoprobe boring (ASB-162) Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	No temporary wells were set.	Soil: VOCs (Method 8260B) PAHs (Method 8270C) DRO (Wisconsin Modified Method) PCBs (Method 8082) RCRA Metals (Method 6010) Groundwater: VOCs (Method 8260B) PAHs (Method 8270C) RCRA Metals (Method 6010), Dissolved DRO (Wisconsin Modified Method) GRO (Wisconsin Modified Method)

Table 1. Summary of Supplemental Phase II-Exterior Investigation Activities
Twin Cities Assembly Plant, St. Paul, Minnesota

	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
Outfall 001 Feature 15 Southwest of TCAP property in Hidden Fall Regional Park	Outfall 001 is regulated under the Site's NPDES permit and discharges into Hidden Falls Regional Park. According to documentation maintained at the MPCA, three separate spill events occurred at the Hidden Falls storm drain Outfall 001 in July, August and September of 1989. Samples were taken from the outfall area by MPCA representatives, which indicated the presence of MIBK and other solvents. During a meeting with MPCA representatives, Ford indicated that the suspected source of the spill was most likely a catch basin around four USTs containing solvents. Ford agreed to complete the requirements to define the extent of contamination surrounding the waste solvent tanks and proposed remediation addressed in the RFRA issued by the MPCA in June 1990. However, documentation pertaining to additional closure sampling at Outfall 001, following the identification of the presence of MIBK, was not found at files maintained at the TCAP or the MPCA. A site reconnaissance was conducted of the area and no visual impacts were observed.	Outfall 001 is regulated under the Site's NPDES permit and discharges into Hidden Falls Regional Park. According to documentation maintained at the MPCA, three separate spill events occurred at the Hidden Falls storm drain outfall (001) in July, August and September of 1989. Samples were collected from the outfall area by MPCA representatives, which indicated the presence of MIBK and other solvents. During a meeting with MPCA representatives, Ford indicated that the suspected source of the spill was most likely a catch basin around four USTs containing solvents. Ford agreed to complete the requirements to define the extent of contamination surrounding the waste solvent tanks and proposed remediation addressed in the RFRA issued by the MPCA in June 1990. However, documentation pertaining to additional closure sampling at Outfall 001, following the identification of the presence of MIBK, was not found at files maintained at TCAP or the MPCA.	None. Considerations: Outfall 001 will be sampled as part of the Mississippi River Sampling activities and is described in the work plan titled *Groundwater Seep and Mississippi River Sampling Work Plan* dated April 11, 2008.	None.	None.	None.
Former Gasoline, Sunoco Spirits, and Pryoxlin Thinner USTs Feature 16 East of Central Engineering Office	Two former 20,000 gallon gasoline USTs were located east of the former oil house and eight 6,000 gallon gasoline, Sunoco spirits and pryoxlin thinner USTs were located north of the former oil house, which were utilized in conjunction with the former paint operations that occurred within the main assembly building. The estimated depth to the base of the former USTs is approximately 10 to12 feet bgs. Documentation pertaining to the removal and subsequent closure of the USTs was not found in files maintained at TCAP or the MPCA. <u>Initial Investigation</u>: Two Hollow Stem Auger borings (ASB-001, and ASB-002). Temporary groundwater well set and sampled from ASB-001.	Complete **seven soil borings** in the area of the former gasoline, Sunoco spirits, and pryoxlin USTs to delineate exceedances of criteria at ASB-001 and ASB-002. Seven step-out borings will be positioned in a manner to delineate the exceedances. Install **two permanent monitoring wells** and collect a groundwater sample for analysis. The wells will be co-located with the original ASB-001 and ASB-002 locations to provide vertical delineation of the exceedances.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): ASB-157, ASB-158, ASB-159, ASB-160, ASB-161	Five Geoprobe borings (ASB-157, ASB-158, ASB-159, ASB-160, ASB-161) Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	Two permanent groundwater wells set and sampled from AMW-14 and AMW-15.	Soil: VOCs (Method 8260B) PAHs (Method 8270C) GRO (Wisconsin Modified Method) DRO (Wisconsin Modified Method) Groundwater: VOCs (Method 8260B) PAHs (Method 8270C) RCRA Metals (Method 6010), Dissolved GRO (Wisconsin Modified Method) DRO (Wisconsin Modified Method)

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Table 1. Summary of Supplemental Phase II-Exterior Investigation Activities
Twin Cities Assembly Plant, St. Paul, Minnesota

	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
Former Oil Fill Area Feature 20 Northeast of the Coal Hopper House	A review of historical drawings indicated the presence of a former oil fill location. Based on the former use of the area the oil fill location was investigated. Initial Investigation: Hollow Stem Auger borings (ASB-006, ASB-007). Temporary groundwater well set and sampled from ASB-006.	**One monitoring well** will be installed to evaluate the exceedances identified at boring location ASB-006. Install **one monitoring well** and collect a groundwater sample for analysis.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	Soil assessment was not conducted.	One permanent groundwater well set and sampled from AMW-13.	Groundwater: PAHs (Method 8270C) RCRA Metals (Method 6010), Dissolved DRO (Wisconsin Modified Method) GRO (Wisconsin Modified Method)
1996 Glycol Release From Underground Piping Feature 21 Along eastern portion of main assembly building	In 1996 a leak occurred from underground piping used to transfer glycol along the eastern portion of the main assembly building. The piping is estimated to be present approximately 4 to 8 feet bgs. Based on available documentation reviewed, remediation activities were completed in the area of the release; however there was no documentation indicating that the release had been adequately remediated per the MPCA. Therefore, the glycol release represents a Feature. Initial Investigation: Two Hollow Stem Auger borings (ASB-008, ASB-009).	Complete **one soil boring** near ASB-008 to provide additional information.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	One Geoprobe boring (ASB-168). Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	None.	Soil: VOCs (Method 8260B) GRO (Wisconsin Modified Method) DRO (Wisconsin Modified Method)
Former Brake Fluid UST Feature 23 Near southwest corner of main assembly building	A former 6,000-gallon brake fluid UST was used in fluid fill operations at TCAP. The UST was installed in 1968 and removed in 1990. The UST was of steel construction. The estimated depth to the base of the former UST is approximately 8 to 10 feet bgs. A review of available documentation indicated that there were no reported releases from this UST; however, no documentation pertaining to removal activities or closure sampling was found in files maintained at TCAP or the MPCA. Initial Investigation: No borings installed due to utilities.	Investigation will be completed during the interior investigation. Complete **four soil borings** in the area of the former brake fluid UST area to investigate potential impacts.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	These soil borings will be completed along with the Supplemental Phase II Interior Investigation after plant shutdown occurs.	These wells will be completed along with the Supplemental Phase II Interior Investigation after plant shutdown occurs.	Soil: VOCs (Method 8260B) SVOCs (Method 8270C) GRO (Wisconsin Modified Method) DRO (Wisconsin Modified Method) Groundwater (Provisional): VOCs (Method 8260B) SVOCs (Method 8270C) GRO (Wisconsin Modified Method) DRO (Wisconsin Modified Method)

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Table 1. Summary of Supplemental Phase II-Exterior Investigation Activities
Twin Cities Assembly Plant, St. Paul, Minnesota

	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
Unleaded Gasoline USTs Feature 24 West of the warehouse	Two 20,000-gallon unleaded gasoline USTs (Figure 19) are currently utilized in conjunction with the fluid fill operations on the assembly line. The USTs are of STI-P3 construction with cathodic protection. The estimated depth to the base of the USTs is approximately 10 to12 feet bgs. A review of available documentation indicated that there were no reported releases from the USTs. Initial Investigation: One Hollow Stem Auger boring (ASB-028).	None.	None.	None.	None.	None.
Oil/Water Separator and Trench Feature 27 North of packer building	An approximate 3,000-gallon oil/water separator collects an oil/water mixture from a 100-foot long collection trench. Since this subsurface structure collects oil and water mixture and the integrity of the structure could not be inspected it is considered a Feature. Once the oil/water separator has been emptied and cleaned, the integrity of the structure will be evaluated. The depth of this Feature is still being researched. Initial Investigation: Three Hollow Stem Auger borings (ASB-010, ASB-011, ASB-012).	Complete **one soil boring** in the area of the oil/water separator and trench to further investigate potential impacts. If potential impacts extend to the water table, convert soil borings to temporary monitoring wells and sample groundwater, if encountered.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	One Geoprobe boring (ASB-168). Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	No temporary wells set.	Soil: VOCs (Method 8260B) SVOCs (Method 8270C) RCRA Metals (Method 6010) DRO (Wisconsin Modified Method) Groundwater (Provisional): VOCs (Method 8260B) SVOCs (Method 8270C) RCRA Metals (Method 6010), Dissolved DRO (Wisconsin Modified Method)

Table 1. Summary of Supplemental Phase II-Exterior Investigation Activities
Twin Cities Assembly Plant, St. Paul, Minnesota

	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
Waste Solvent USTs Feature 35 West of the Hazardous Waste Storage Building **Former Bulk Solvent and Waste Solvent USTs** Feature 36 West of the Hazardous Waste Storage Building **Solvent UST Underground Piping** Feature 37 South of Paint Building **Sump within Solvent UST Basin** Feature 46 Northwest Corner of the UST Basin	Two 10,000 gallon USTs that store used purge solvent and cleaning solvent generated from the painting process at TCAP. The USTs are located in a basin/bunker which is raised approximately 3 to 4 feet above ground surface. During the fall of 1984 the UST area was constructed and four USTs were installed to store paints, resin and new solvents delivered to TCAP in tanker trucks. The estimated depth to the base of the former USTs is approximately 10 to12 feet bgs. A release was reported from the USTs in 1989 and remedial activities were completed in the area as part of the PRP investigation completed at TCAP. Three monitoring wells were installed in the area and were sampled annually until 2003, when the MPCA deemed the sampling not necessary. MIBK is still present in the area of the former USTs in the sump. Piping is utilized to collect solvent waste generated during the painting process that is then transferred to the used solvent USTs located south of the paint building. The piping is located in a concrete trench which is estimated to be approximately 1 to 2 feet bgs. Additional piping is utilized to transfer the used solvents from the USTs to unloading ports near the southwestern portion of the paint building for removal. Collection of groundwater from solvent UST basin which gets pumped to paint sludge pits. The sump is monitored annually due to a former release which occurred from the former solvent USTs that were removed from the area in 1992. Based on monitoring results MIBK is still detected above the applicable criteria in the sump and the next monitoring event is scheduled in fall of 2008. The base of the sump is estimated to be approximately 2 to 4 ft bgs. <u>Initial Investigation</u>: Three Hollow Stem Auger borings (ASB-018, ASB-019, and ASB-020). No temporary monitoring wells were installed.	Complete **two soil borings** to provide additional assessment of this feature. If potential impacts extend to the water table, convert one soil boring to a temporary monitoring well and a groundwater sample will be collected.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	Two Geoprobe borings (ASB-185, ASB-186) Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	No temporary wells set.	Soil: VOCs (Method 8260B) SVOCs (Method 8270C) RCRA Metals (Method 6010) Groundwater (Provisional): VOCs (Method 8260B) SVOCs (Method 8270C) RCRA Metals (Method 6010), Dissolved

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Table 1. Summary of Supplemental Phase II-Exterior Investigation Activities
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	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
Former Fuel Oil UST Feature 41 South of Steam Plant	The former 26,500 gallon fuel oil UST was installed south of the steam plant in approximately 1950. Based on the location of the UST it could not be removed without possibly compromising the structural integrity of the steam plant; therefore, it was closed in place in 1990. A release was reported from the UST in 1990 during its in place closure (Leak 3262). A subsurface investigation was conducted in 1991 which detected some impacts to both soil and groundwater in the area. Additional groundwater monitoring was conducted until the MPCA issued a closure letter for the release in December 1994.	None.	None.	None.	None.	None.
Former Fuel Oil ASTs Feature 42 South of Steam Plant	Former fuel oil ASTs were located south of the Steam Plant. The ASTs were removed from service in 2000 and corrective actions were completed between August 1, 2000 and October 16, 2000. The corrective actions included removal of the remaining fuel oil from the in service AST, cleaning of the AST and associated piping and dismantling of the two ASTs for recycling. Initial Investigation: One Hollow Stem Auger boring (ASB-026). No temporary monitoring wells were installed.	Complete **up to three soil borings** to the south east and west of the former fuel oil ASTs to provide additional assessment of this feature. Convert one boring to a temporary monitoring well and sample groundwater, if soil impacts extend to groundwater table.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	Three Geoprobe borings (ASB-196, ASB-197, ASB-198) Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	No temporary wells set.	Soil: VOCs (Method 8260B) SVOCs (Method 8270C) PCBs (Method 8082) TAL Metals (Method 6010) DRO (Wisconsin Modified Method) GRO (Wisconsin Modified Method) Groundwater (Provisional): VOCs (Method 8260B) SVOCs (Method 8270C) PCBs (Method 8082) TAL Metals (Method 6010), Dissolved DRO (Wisconsin Modified Method) GRO (Wisconsin Modified Method)

Table 1. Summary of Supplemental Phase II-Exterior Investigation Activities
Twin Cities Assembly Plant, St. Paul, Minnesota

	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
Wastewater Collection ASTs Feature 44 North of the wastewater treatment building **Wastewater Treatment Area** Feature 134 Wastewater treatment plant **Former Waste Disposal Area** Feature 140 North of Steam Plant	<u>Wastewater Collection ASTs - Feature 44</u> Three approximate 139,000-gallon wastewater treatment tanks are utilized to store and treat process wastewater generated by the assembly and painting processes at TCAP. The phosphate process generates the majority of the wastewater. Since the ASTs contain and hold process industrial wastewater prior to and during treatment, this area was investigated. <u>Wastewater Treatment Area - Features 134</u> The wastewater treatment area houses operations including transferring, containing, storing, and treating process wastewater generated from the assembly process. Based on current and historic use this area was investigated. <u>Former Waste Disposal Area – Feature 140</u> In what appears to be an isolated disposal incident in 1966, paint waste solvent and sludge was disposed of north of the Steam Plant. Visibly contaminated soils in the area were excavated and sent to a permitted landfill. The reviewed documentation had no analytical data of the material disposed of or description of materials excavated and disposed. <u>Initial Investigation</u>: Four Hollow Stem Auger borings (ASB-023, ASB-024, ASB-025, ASB-027). No temporary monitoring wells were installed.	Complete five **additional soil borings** in the area of the wastewater treatment area to delineate the exceedance of criteria at ASB-027. Four step-out borings will be located approximately 25 feet from ASB-027 and positioned in a manner to delineate the exceedance. In addition, one boring will be co-located with the original ASB-027 location to provide vertical delineation of the exceedance. Convert ASB-027 to a temporary monitoring well and sample groundwater, if sufficient groundwater is present.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	Five Geoprobe borings (ASB-188, ASB-189, ASB-190, ASB-191, ASB-192) Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	No temporary wells set.	Soil: Lead (Method 6010) TCLP Lead Groundwater (Provisional): Lead (Method 6010), Dissolved
Former Hazardous Waste Storage Area Feature 49 Along Eastern Portion of Main Assembly Building	Based on historical documentation reviewed, a former hazardous waste storage area was identified to have been located east of the main assembly building. Based on the general usage of the area to store hazardous waste materials, the former hazardous storage area was investigated. <u>Initial Investigation:</u> Two Hollow Stem Auger borings (ASB-038 and ASB-039). No temporary monitoring wells were installed.	Complete **one soil boring** to provide additional assessment of this feature.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	No soil assessment or sampling was conducted due to construction interference.	None.	Soil: VOCs (Method 8260B) SVOCs (Method 8270C) PCBs (Method 8082) TAL Metals (Method 6010) DRO (Wisconsin Modified Method) GRO (Wisconsin Modified Method)

Table 1. Summary of Supplemental Phase II-Exterior Investigation Activities
Twin Cities Assembly Plant, St. Paul, Minnesota

	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
Sludge Pits Feature 121 Western Portion of Paint Building	The paint sludge pits separate overspray from the painting process that is captured by sheeting action of water in trenches underneath the paint booths. The northern paint sludge pit was observed to be in good condition; however, the southern paint sludge pit was currently full of water and could not be inspected. Since the southern pit could not be inspected, the Feature was investigated. The base of the sludge pits is an approximate elevation of 822 feet mean sea level. Initial Investigation: Three Hollow Stem Auger borings (ASB-015, ASB-016, and ASB-032). No temporary monitoring wells were installed.	Complete **two soil borings** in the area of the sludge pits to provide additional assessment of this feature. Convert one boring to a temporary monitoring well and sample groundwater, if soil impacts extend to groundwater table	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	No soil assessment or sampling was conducted due to utility interference. The area will be completed during a future investigation after plant shutdown.	No temporary wells were set due to utility interference.	Soil: VOCs (Method 8260B) SVOCs (Method 8270C) TAL Metals (Method 6010) Groundwater (Provisional): VOCs (Method 8260B) SVOCs (Method 8270C) TAL Metals (Method 6010), Dissolved
Former 20,000 Gallon Gasoline AST Feature 138 South of Former Oil House	A former 20,000-gallon gasoline AST was removed from south of the former oil house as identified during interviews with TCAP personnel. Based on the interviewee, when the AST was removed stained soil and odors were identified. However, actions for remediation of the soil were apparently not completed in the area. It is unknown if the AST stored leaded or unleaded gasoline. Initial Investigation: Two Hollow Stem Auger borings (ASB-041 and ASB-042). No temporary monitoring wells were installed.	Complete **two soil borings** in the area of the former 20,000 gallon gasoline AST to provide additional assessment of this feature. Convert one boring to a temporary monitoring well and sample groundwater, if soil impacts extend to groundwater table.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): ASB-145, ASB-146	Two Geoprobe borings (ASB-145, ASB-146) Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	Temporary groundwater well set and sampled from ASB-145.	Soil: VOCs (Method 8260B) Lead (Method 6010) GRO (Wisconsin Modified Method) Groundwater (Provisional): VOCs (Method 8260B) Lead (Method 6010), Dissolved GRO (Wisconsin Modified Method)
Potential Battery Waste Disposal Area Feature 139 Baseball Diamonds	Based on documentation reviewed the area was potentially used for disposal of battery waste. The MPCA requested a geophysical study in the area; however, no documentation pertaining to additional investigations into Feature 139 was found. Initial Investigation: 30 Geoprobe borings (ASB-049 to ASB-054 and ASB-071 to ASB-094). 39 surface soil samples (AGM-SS-001, to AGM-SS039) collected from 0 to 6 inches below ground surface. Temporary groundwater well set and sampled from ASB-076 and ASB-087.	None.	None.	None.	None.	None.

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Table 1. Summary of Supplemental Phase II-Exterior Investigation Activities
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	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
Drums Feature 143 Underground Sand Tunnel 1A South and Sand Tunnel 4A	A total of three drums were observed in the sand tunnels. The floor and walls of the sand tunnels consist of sandstone. Two of three drums were empty all drums were rusted and in poor condition with no lids. Staining was not observed in or near the drums observed in these areas. It appeared that the drums may have been historically utilized to mix concrete or mortar. However, due to the presence of the corroded drums of which the former contents is unknown, the area was investigated. Initial Investigation: Two Hand Augers (HA-055, HA-056).	None.	None.	None.	None.	None.
Utility Tunnel Staining Feature 144 Underground Utility Tunnel	Staining was identified on the concrete floor surface within the utility tunnel. The utility tunnel may have been associated with historical Fluid Fill AST tank farm (UST/AST Feature 52) located in or near the former fuel house which contains product piping. Initial Investigation: Two Hand Augers (HA-069, HA-070).	None.	None.	None.	None.	None.
Flow Stone Feature 149 Underground Easternmost Portion of Gas Tunnel	At the east end of the gas tunnel, water was observed to be leaking in from the main assembly building above. The floor and walls of the gas tunnel consist of sandstone. Flow stone was observed on the walls within the gas tunnel. Initial Investigation: One Hand Auger (HA-068).	None.	None.	None.	None.	None.

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Table 1. Summary of Supplemental Phase II-Exterior Investigation Activities
Twin Cities Assembly Plant, St. Paul, Minnesota

	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
Potential Film/Staining Feature 151 Underground Sand Tunnels	Several of the mined sand tunnels contain railroad ties (with a limited number having rails still attached) which were used to transport the mined sand from the tunnels for use in the glass manufacturing operations in the main assembly building. A number of these tunnels have had or currently had standing water in them, and a film/staining on the standing water was observed in these areas. The staining may have been related to wood preservation residuals. The film/staining was observed to be dark brown to black in color. Initial Investigation: Seven Hand Augers (HA-057, HA-058, HA-059, HA-060, HA-061, HA-062, HA-063).	None.	None.	None.	None.	None.
Former Fuel Oil UST Feature 152 East of Central Engineering Office	The 27,000-gallon UST may have been utilized to provide fuel as a heating source in the main assembly building. The UST was installed at an unknown date and no documentation pertaining to its removal was found through research activities; therefore, the UST may still be in place at TCAP. The estimated depth to the base of the former UST is approximately 10 to12 feet bgs. Initial Investigation: Two Hollow Stem Auger borings (ASB-003, ASB-004). Temporary groundwater well set and sampled from ASB-003.	Complete **four soil borings** in the area of the former fuel oil UST to delineate the exceedances of criteria at ASB-003. Four step-out borings will be positioned in a manner to delineate the exceedance. In addition, one boring will be co-located with the original ASB-003 (and converted to **one monitoring well**) location to provide vertical delineation of the exceedance. A groundwater sample will be collected for analysis.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): ASB-135, ASB-147, ASB-148, ASB-163 PID Exceedances (above 10 ppm), entire boring: ASB-163	Four Geoprobe borings (ASB-135, ASB-147, ASB-148, ASB-163) Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	No temporary wells were set.	Soil: VOCs (Method 8260B) PAHs (Method 8270C) GRO (Wisconsin Modified Method) DRO (Wisconsin Modified Method) Groundwater: VOCs (Method 8260B) PAHs (Method 8270C) RCRA Metals (Method 6010), Dissolved GRO (Wisconsin Modified Method) DRO (Wisconsin Modified Method)
Former Coal Gasification Plant Feature 153 Near Steam Plant	Historically, a coal gasification plant was located near the steam plant where coal was used to generate gas. The gas was then pumped to the main assembly plant through the gas tunnel. Based on aerial photographs the plant was constructed prior to 1937 and was demolished between 1957 and 1974. Initial Investigation: None.	Complete **four soil borings** to assess subsurface conditions. One soil boring will be completed and converted to a temporary monitoring well adjacent to the river down gradient from the Former Coal Gasification Plant if groundwater is present.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	Two Geoprobe borings (ASB-193, ASB-195) Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	No temporary wells were set.	Soil: VOCs (Method 8260B) SVOCs (Method 8270C) RCRA Metals (Method 6010) Free Cyanide Groundwater (Provisional): VOCs (Method 8260B) SVOCs (Method 8270C) RCRA Metals (Method 6010), Dissolved Free Cyanide

Table 1. Summary of Supplemental Phase II-Exterior Investigation Activities
Twin Cities Assembly Plant, St. Paul, Minnesota

	Environmental Concern					
Area of Concern	**Background**	**Supplemental Scope**	**Field Measurements**	**Investigation Activities Conducted**	**Groundwater Assessment**	**Analytical Requirements**
Former Tar Decanter House Feature 154 Near Steam Plant	Historically, a coal gasification plant was located near the steam plant where coal was used to generate gas. The gas was then pumped to the main assembly plant through the gas tunnel. Based on aerial photographs the plant was constructed prior to 1937 and was demolished between 1957 and 1974. Initial Investigation: None.	Complete **four soil borings** to assess subsurface conditions. One soil boring will be completed and converted to a temporary monitoring well adjacent to the river down gradient from the Former Coal Gasification Plant if groundwater is present.	Organic Vapors using a PID. PID Exceedances (above 10 ppm): None.	One Geoprobe borings (ASB-194) Soil assessment and sampling was conducted utilizing the same methodology described in Feature 1 above.	No temporary wells were set.	Soil: VOCs (Method 8260B) SVOCs (Method 8270C) RCRA Metals (Method 6010) Free Cyanide Groundwater (Provisional): VOCs (Method 8260B) SVOCs (Method 8270C) RCRA Metals (Method 6010), Dissolved Free Cyanide

Area of Concern	Environmental Concern	Field Measurements	Investigation Activities Conducted	Groundwater Assessment	Analytical Requirements
Disposal of Investigation-Derived Waste					
Characterization of Investigation-Derived Waste (IDW)	All soil and groundwater IDW were containerized and properly labeled. One composite soil sample was collected from the soil staging roll off box, and one composite soil sample was collected from soil 55-gallon steel drums.		One soil sample collected from the soil staging roll off box. One soil sample collected from the soil 55-gallon steel drums.	Two water samples taken from the 1000 gallon staging poly tanks.	Base Scope SOIL: TCLP VOCs TCLP SVOCs TCLP RCRA Metals PCBs GROUNDWATER: VOCs (Method 8260) SVOCs (Method 8270) RCRA Metals (Method 6010)

Notes:
1. Investigation Derived Wastes (IDWs): IDWs were managed and disposed in accordance with applicable State regulations. As part of the base scope of work, soil cuttings and purge water was containerized as appropriate, temporarily staged at a location authorized by plant personnel, and disposed at an appropriate off-site facility.
2. Features 35, 36, 37, and 46 were co-located during Phase II exterior field investigation.
3. Features 44, 134, and 140 were co-located during Phase II exterior field investigation.

MONITORING WELL INSTALLATION AND DEVELOPMENT:
Monitoring wells and piezometers shall be installed according to MDH well codes.
All wells completed 5 feet or more in limestone or dolomite will be completed as single cased wells with open bore hole or as double cased wells with stainless steel screens.
All wells materials used for well construction will meet the MDH well codes.
The wells shall be secured with a locking expandable cap.
All wells completed in roadway, sidewalk, driveway, or a parking area will be completed at grade with a flush-mount protective cover set inside a 48-inch square 4-inch thick concrete pad. The concrete pad shall be sloped to facilitate runoff drainage away from the well.
All wells completed in areas other than those listed above will be completed as above grade monitoring wells with a steel protective casing and protective posts as required by MDH wells code.
The wells shall be pad-tagged or otherwise permanently labeled to indicate the well identification.
Each monitoring well shall be developed using typical and appropriate methods. Development water shall be considered an IDW and managed appropriately.
Monitoring wells may be sampled only a minimum of 48 hours after development.

ACRONYMS:

ASB	ARCADIS Soil Boring	HSA	Hollow-Stem Auger	PAH	Polycyclic Aromatic Hydrocarbons	TAL	Target Analyte List
AST	Above Ground Storage Tank	HRL	Health Risk Limit	PCB	Polychlorinated Biphenyls	TCAP	Twin Cities Assembly Plant
CRA	Conestoga Rovers & Associates	IDW	Investigative Derived Waste	PID	Photo-Ionization Detector	TMB	Trimethylbenzenes
ft bgs	Feet Below Ground Surface	MDH	Minnesota Department of Health	PLP	Permanent List of Priorities	USCS	United Soil Classification System
DRAP	Development Response Action Plan	MIBK	Methyl Isobutyl Ketone	ppm	Parts per million	VIC	Voluntary Investigation and CleanupProgram
DRO	Diesel Range Organics	MTBE	Methyl Tert-Butyl Ethet	PRP	Potentially Responsible Parties	VOC	Volatile Organic Compound
GRO	Gasoline Range Organics	mg/kg	Milligram per Kilogram	RCRA	Resource Conservation and Recovery Act		
HA	Hand Auger	MPCA	Minnesota Pollution Control Agency	SRV	Soil Reference Value		
HASP	Health and Safety Plan	MS/MSD	Matrix Spike/Matrix Spike Duplicate	SVOC	Semi-Volatile Organic Compound		

Table 2. **Field Screening Headspace Summary**
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature Name	Feature Number	Location	Start Depth (ft)	Finish Depth (ft)	PID Reading (ppm)	DTW (ft)	Sampled Interval	Sample Collection Rationale
North Parking Area	NPA	ASB-115	0	1	28.4			
		ASB-115	1	2	36.3		2-4	Collected per work plan
		ASB-115	5	6	26.7		4-6	Collected unsaturated sample above water table
		ASB-115	6	8	524.1	6.5		Saturated at interval specified in work plan (6' to 8')
		ASB-115	8	10	327.2			
		ASB-115	10	12	98.2			
North Parking Area	NPA	ASB-116	0	1	3			
		ASB-116	1	2	2.8			
		ASB-116	4.5	6	54.8		4-6	Inadequate recovery at interval specified in work plan (2' to 4')
		ASB-116	6	8	1.8		6-8	Collected per work plan
		ASB-116	8	9	2.8	8		
North Parking Area	NPA	ASB-117	0	1	2.7		0-2	Collected unsaturated sample above water table
		ASB-117	1	2.5	3			
		ASB-117	2.5	4	2.4		2-4	Collected per work plan
		ASB-117	5	6	1.4	5		
		ASB-117	6	8	1.9			Saturated at interval specified in work plan (6' to 8')
North Parking Area	NPA	ASB-118	0	2	0			
		ASB-118	2	4	0		2-4	Collected per work plan
		ASB-118	5	6	0.1		5-7	Saturated at interval specified in work plan (6' to 8')
		ASB-118	6	7	0			
		ASB-118	7	8	3.7	7		
		ASB-118	8	10	11.4			
		ASB-118	10	12	0.1			
Former Area of Impacted Soil Leak #10700	4	ASB-119	0	2	0			
		ASB-119	2	4	0			
		ASB-119	5	6	0		5-7	Inadequate recovery at interval specified in work plan (4' to 6')
		ASB-119	6	8	0			
		ASB-119	8	12	0		8-10	Collected per work plan
Former Area of Impacted Soil Leak #10700	4	ASB-120	0	5	---			
		ASB-120	5	6	0.3		4-6	Collected per work plan
		ASB-120	6	8	0.1		6-8	Collected per work plan
		ASB-120	8	10	0.2	8		
		ASB-120	10	11.5	0			
Former Location of Gasoline and Diesel Fuel Underground Piping	5	ASB-121	0	2	---			
		ASB-121	2	4	794			
		ASB-121	5	6	775.6		5-7	Inadequate recovery at interval specified in work plan (highest PID)
		ASB-121	6	8	657.2			
		ASB-121	8	10	515.6		8-10	Collected per work plan
		ASB-121	10	12	400.9	10		
Former Location of Gasoline and Diesel Fuel Underground Piping	5	ASB-122	0	2	---			
		ASB-122	2	4	133.7		2-4	Collected per work plan
		ASB-122	4	6	149.2			
		ASB-122	6	7	166.9		6-8	Collected per work plan
		ASB-122	7	8	494.6	7		
		ASB-122	8	10	454.1			
		ASB-122	10	12	271.8			
North Parking Area	NPA	ASB-123	0	2	180.3			
		ASB-123	2	4	153.2		2-4	Collected per work plan
		ASB-123	5	7	142			
		ASB-123	7	8	600.3		6-8	Collected per work plan
		ASB-123	8	10	627.3	8		
		ASB-123	10	12	676.3			
North Parking Area	NPA	ASB-124	0	1	---			
		ASB-124	1	3	0.4		2-4	Collected per work plan
		ASB-124	3	5	0			
		ASB-124	5	6	0			
		ASB-124	6	8	0		6-8	Collected per work plan
North Parking Area	NPA	ASB-125	0	1	---			
		ASB-125	1	3	0			
		ASB-125	3	5	0		3-5	Inadequate recovery at interval specified in work plan (2' to 4')
		ASB-125	5	6	0			
		ASB-125	6	8	0		6-8	Collected per work plan
North Parking Area	NPA	ASB-126	0	2	0			
		ASB-126	2	4	0		2-4	Collected per work plan
		ASB-126	4	6	0			
		ASB-126	6	8	0		6-8	Collected per work plan
Former Test Track	1	ASB-127	0	2	5		0-2	Collected per work plan
		ASB-127	2	4	1.2			
		ASB-127	5	6	0.3			
		ASB-127	6	8	0			
		ASB-127	8	10	0	8		
		ASB-127	10	12	0			

Table 2. **Field Screening Headspace Summary**
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature Name	Feature Number	Location	Start Depth (ft)	Finish Depth (ft)	PID Reading (ppm)	DTW (ft)	Sampled Interval	Sample Collection Rationale
North Parking Area	NPA	ASB-128	0	2	---		0-2	Inadequate recovery at interval specified in work plan (2' to 4')
		ASB-128	2	4	0			
		ASB-128	4	6	0			
		ASB-128	6	8	0		6-8	Collected per work plan
		ASB-128	8	10.5	0	8		
North Parking Area	NPA	ASB-129	0	2	0.1			
		ASB-129	2	4	0.1		2-4	Collected per work plan
		ASB-129	4	6	0	4		
		ASB-129	6	8	0		NS	Saturated at interval specified in work plan (6' to 8')
		ASB-129	8	10	0			
		ASB-129	10	12	0			
North Parking Area	NPA	ASB-130	0	2	0	0		
		ASB-130	2	4	0		NS	Saturated at interval specified in work plan (2' to 4')
		ASB-130	4	6	0.2			
		ASB-130	6	8	0		NS	Saturated at interval specified in work plan (6' to 8')
North Parking Area	NPA	ASB-131	0	2	0			
		ASB-131	2	4	0		2-4	Collected per work plan
		ASB-131	4	6	0	5		
		ASB-131	6	8	0		NS	Saturated at interval specified in work plan (6' to 8')
North Parking Area	NPA	ASB-132	0	2	0			
		ASB-132	2	4	0		2-4	Collected per work plan
Former Test Track	1	ASB-133	0	2	0			
		ASB-133	2	4	0		2-4	Collected per work plan
		ASB-133	4	6	0			
		ASB-133	6	8	0			
North Parking Area	NPA	ASB-134	0	1	0			
		ASB-134	1	2	0.5			
		ASB-134	2	4	0		2-4	Collected per work plan
		ASB-134	4	5	0	4		
		ASB-134	5	6	0			
		ASB-134	6	8	0		NS	Saturated at interval specified in work plan (6' to 8')
Former Fuel Oil UST	152	ASB-135	0	2	7			
		ASB-135	2	4	329.3		2-4	Inadequate recovery at intervals specified in work plan (0' to 2')
		ASB-135	4	6	14			
		ASB-135	6	8	694.4		6-8	Collected per work plan
		ASB-135	8	9	393.2		8-9	Refusal before interval specified in work plan (10' to 12')
North Parking Area and Former Convoy UST	NPA and 3	ASB-136	0	2	2		1-3	Collected per work plan
		ASB-136	2	4	0.4			
		ASB-136	4	5	8.2			
		ASB-136	5	6	5.3			
		ASB-136	6	8	14.5	6	NS	Saturated at interval specified in work plan (6' to 8')
		ASB-136	8	10	1.7			
		ASB-136	10	11	0.7			
North Parking Area and Former Convoy UST	NPA and 3	ASB-137	0	2	0.2			
		ASB-137	2	4	0.3		2-4	Collected per work plan
		ASB-137	4	6	0	5		
		ASB-137	6	8	0		NS	Saturated at interval specified in work plan (6' to 8')
		ASB-137	8	9	0.3			
		ASB-137	9	11	0.4			
Former Convoy UST	3	ASB-138	0	2	0			
		ASB-138	2	4	0		2-4	Collected per work plan
		ASB-138	4	8	---			
Former Convoy UST	3	ASB-139	0	2	0			
		ASB-139	2	4	2.1			
		ASB-139	4	6	3.1			
		ASB-139	6	8	11.3		6-8	Collected per work plan
Former Convoy UST	3	ASB-140	0	2	2.8			
		ASB-140	2	4	1.6			
		ASB-140	4	6	2			
		ASB-140	6	8	2.2		6-8	Collected per work plan
North Parking Area	NPA	ASB-141	0	2	1			
		ASB-141	2	4	1.8		2-4	Collected per work plan
		ASB-141	4	6	2.8			
		ASB-141	6	8	5.9		6-8	Collected per work plan
North Parking Area	NPA	ASB-142	0	2	2.2			
		ASB-142	2	4	3.2		2-4	Collected per work plan
North Parking Area	NPA	ASB-143	0	1	4		1-3	Inadequate recovery at interval specified in work plan (2' to 4')
		ASB-143	1	2	4.7			
		ASB-143	2	3	4.8			

Table 2. **Field Screening Headspace Summary**
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature Name	Feature Number	Location	Start Depth (ft)	Finish Depth (ft)	PID Reading (ppm)	DTW (ft)	Sampled Interval	Sample Collection Rationale
Former Test Track	1	ASB-144	0	2	3.7			
		ASB-144	2	4	4.1		2-4	Collected per work plan
		ASB-144	4	6	3.6			
		ASB-144	6	8	1.6			
Former 20,000 Gallon Gasoline AST	138	ASB-145	0	2	2.1		0-2	Collected per work plan
		ASB-145	2	4	2.8			
		ASB-145	4	5	2.9	4.5		
		ASB-145	5	6	4.8			
		ASB-145	6	8	4.1		NS	Saturated at interval specified in work plan (6' to 8')
		ASB-145	8	10	4.5			
		ASB-145	10	12	31.1			
Former 20,000 Gallon Gasoline AST	138	ASB-146	0	2	3		0-2	Collected per work plan
		ASB-146	2	4	4.4			
		ASB-146	4	6	3.5			
		ASB-146	6	8	973.1		6-8	Collected per work plan
		ASB-146	8	10	940.8	8		
		ASB-146	10	11	99.8			
		ASB-146	11	12	18.2			
Former Fuel Oil UST	152	ASB-147	0	2	13.6		0-2	Collected per work plan
		ASB-147	2	4	5.3			
		ASB-147	4	6	14.8			
		ASB-147	6	8	427.4		6-8	Collected per work plan
		ASB-147	8	9	421.3	8		
		ASB-147	9	11	849.9		NS	Saturated at interval specified in work plan (10' to 12')
		ASB-147	11	12	24.8			
Former Fuel Oil UST	152	ASB-148	0	2	2.4		0-2	Collected per work plan
		ASB-148	2	4	2.3			
		ASB-148	4	6	3.2		4-6	Saturated at interval specified in work plan (6' to 8')
		ASB-148	6	8	1060	7		
		ASB-148	8	12	1651		NS	Saturated at interval specified in work plan (10' to 12')
		ASB-148	12	14	138			
		ASB-148	14	16	301.9			
Former Gasoline Sunoco Spirits, and Pryoxlin Thinner USTs	16	ASB-157	0	2	0		0-2	Collected per work plan
		ASB-157	2	4	0			
		ASB-157	4	6	0			
		ASB-157	6	8	0	6		
		ASB-157	8	10	0		NS	Saturated at interval specified in work plan (8' to 10')
		ASB-157	10	11	33.4		NS	Saturated at interval specified in work plan (10' to 12')
		ASB-157	11	12	473.3			
Former Gasoline Sunoco Spirits, and Pryoxlin Thinner USTs	16	ASB-158	0	2	0		0-2	Collected per work plan
		ASB-158	2	4	0			
		ASB-158	4	6	187.4		4-6	Saturated at interval specified in work plan (6' to 8')
		ASB-158	6	8	490.5	6		
		ASB-158	8	9	631.5			
		ASB-158	9	10	25.8			
		ASB-158	10	11	2.1		NS	Saturated at interval specified in work plan (10' to 12')
		ASB-158	11	12	10.7			
Former Gasoline Sunoco Spirits, and Pryoxlin Thinner USTs	16	ASB-159	0	2	1.2			
		ASB-159	2	4	92.4		2-4	Inadequate recovery at intervals specified in work plan (0' to 2')
		ASB-159	4	6	1057		5-7	Saturated at interval specified in work plan (8' to 10')
		ASB-159	6	8	842.5	7.5		
		ASB-159	8	10	1264			
		ASB-159	10	12	77		NS	Saturated at interval specified in work plan (10' to 12')
Former Gasoline Sunoco Spirits, and Pryoxlin Thinner USTs	16	ASB-160	0	2	2.4			
		ASB-160	2	4	13.8		2-4	Inadequate recovery at intervals specified in work plan (0' to 2')
		ASB-160	4	6	534.3		5-7	Saturated at interval specified in work plan (8' to 10')
		ASB-160	6	8	1363	7		
		ASB-160	8	10	1200			
		ASB-160	10	12	51.4		NS	Saturated at interval specified in work plan (10' to 12')
Former Gasoline Sunoco Spirits, and Pryoxlin Thinner USTs	16	ASB-161	0	2	1.4		1-3	Inadequate recovery at intervals specified in work plan (0' to 2')
		ASB-161	2	4	0.5			
		ASB-161	4	6	178.4	4		
		ASB-161	6	8	---		NS	Saturated at interval specified in work plan (6' to 8')
		ASB-161	8	10	---			
		ASB-161	10	12	---		NS	Saturated at interval specified in work plan (10' to 12')
Former Railroad Spurs and Former Coal Operations	12 and 47	ASB-162	0	2	6.8		1-3	Inadequate recovery at intervals specified in work plan (0' to 2' or 2' to 4')
		ASB-162	2	4	0.3			
		ASB-162	4	6	0.5			
		ASB-162	6	8	0.4	6		
		ASB-162	8	9	0.7			
		ASB-162	9	10	0.3			
		ASB-162	10	12	0.4			

Table 2. **Field Screening Headspace Summary**
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature Name	Feature Number	Location	Start Depth (ft)	Finish Depth (ft)	PID Reading (ppm)	DTW (ft)	Sampled Interval	Sample Collection Rationale
Former Fuel Oil UST	152	ASB-163	0	2	21.6			
		ASB-163	2	4	177.8		2-4	Inadequate recovery at intervals specified in work plan (0' to 2')
		ASB-163	4	6	143.7		4-6	Saturated at interval specified in work plan (6' to 8')
		ASB-163	6	7	668.2	6		
		ASB-163	7	8	920.7			
		ASB-163	8	10	862.1			
		ASB-163	10	12	70.2		NS	Saturated at interval specified in work plan (10' to 12')
Former Hazardous Waste Storage Area	10	ASB-164	0	4	0	0.5	NS	Saturated at interval specified in work plan (0' to 2')
		ASB-164	4	8	0.1		NS	Saturated at interval specified in work plan (4' to 6')
		ASB-164	8	10	0		NS	Saturated at interval specified in work plan (8' to 10')
		ASB-164	10	11.5	0			
Former Hazardous Waste Storage Area	10	ASB-165	0	1	0.6		0-2	Collected per work plan
		ASB-165	1	2	0			
		ASB-165	2	4	0	2		
		ASB-165	4	6	4		NS	Saturated at interval specified in work plan (4' to 6')
		ASB-165	6	8	0.4		NS	Saturated at interval specified in work plan (6' to 8')
		ASB-165	8	10.5	0.1		NS	Saturated at interval specified in work plan (8' to 10')
Former Hazardous Waste Storage Area	10	ASB-166	0	2	2.7			
		ASB-166	2	4	19.5		2-4	Inadequate recovery at intervals specified in work plan (0' to 2')
		ASB-166	4	6	5.8	4	NS	Saturated at interval specified in work plan (4' to 6')
		ASB-166	6	8	19.8		NS	Saturated at interval specified in work plan (6' to 8')
		ASB-166	8	10	632.6		NS	Saturated at interval specified in work plan (8' to 10')
		ASB-166	10	12	636.6			
Former Hazardous Waste Storage Area	10	ASB-167	0	2	3.8		0-2	Collected per work plan
		ASB-167	2	4	10.4			
		ASB-167	4	6	2.3			
		ASB-167	6	8	10.4		6-8	Collected per work plan
		ASB-167	8	10	656.7		8-10	Collected per work plan
		ASB-167	10	12	480.1	10		
1996 Glycol Release From Underground Piping and Oil/Water Separator and Trench	21 and 27	ASB-168	0	2	1.3		0-2	Collected per work plan
		ASB-168	2	4	0.7			
		ASB-168	4	6	0.9		4-6	Collected per work plan
		ASB-168	6	8	0.2			Inadequate recovery at interval specified in work plan (6' to 8')
		ASB-168	8	9	0.2	8		
		ASB-168	9	10	0			
		ASB-168	10	12	0			
Oil/Water Separator and Trench	27	ASB-169	0	2	0			
		ASB-169	2	4	0		3-5	Saturated at interval indicated in work plan
		ASB-169	4	5	0			(below oil/water separator)
		ASB-169	5	6	0	5		
		ASB-169	6	8	0			
		ASB-169	8	10	0			
		ASB-169	10	12	0			
Former Hazardous Waste Storage Area	10	ASB-170	0	1	---		0-2	Collected per work plan
		ASB-170	1	2	1.4			
		ASB-170	2	4	0.8			
		ASB-170	4	6	1.6		4-6	Collected per work plan
		ASB-170	6	8	1.4	6		
		ASB-170	8	10	0.8		NS	Saturated at interval specified in work plan (8' to 10')
		ASB-170	10	12	1			
Former Hazardous Waste Storage Area	10	ASB-171	0	2	0.8		1-3	Inadequate recovery at intervals specified in work plan (0' to 2')
		ASB-171	2	4	0.6			
		ASB-171	4	6	0.7	5	NS	Saturated at interval specified in work plan (4' to 6')
		ASB-171	6	8	0.5		NS	Saturated at interval specified in work plan (6' to 8')
		ASB-171	8	10	0.7		NS	Saturated at interval specified in work plan (8' to 10')
		ASB-171	10	12	0.3			
Former Disposal Area B	11	ASB-172	0	2	4.5		1-3	Collected per work plan
		ASB-172	2	4	14.9	3		
		ASB-172	4	8	212			
		ASB-172	8	10	575.7			
		ASB-172	10	12	0			
Former Disposal Area B	11	ASB-173	0	2	1		1-3	Collected per work plan
		ASB-173	2	4	2.5	3		
		ASB-173	4	6	386.2			
		ASB-173	6	8	398.3			
		ASB-173	8	10	817.6			
		ASB-173	10	12	373.7			
Former Disposal Area B	11	ASB-174	0	4	1			
		ASB-174	4	6	1.1		4-6	Collected per work plan
		ASB-174	6	8	1	6		
		ASB-174	8	12	0.4			

Table 2. **Field Screening Headspace Summary**
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature Name	Feature Number	Location	Start Depth (ft)	Finish Depth (ft)	PID Reading (ppm)	DTW (ft)	Sampled Interval	Sample Collection Rationale
Former Disposal Area B	11	ASB-175	0	2	5.3			
		ASB-175	2	4	730.5			
		ASB-175	4	6	902.8		4-6	Collected per work plan
		ASB-175	6	8	18.1			
		ASB-175	8	10	70.8			
		ASB-175	10	12	7			
Former Disposal Area B	11	ASB-176	0	4	1.5			
		ASB-176	4	8	1.6			
		ASB-176	8	10	861.6		8-10	Collected per work plan
		ASB-176	10	12	840.5	10		
Former Disposal Area A	9	ASB-177	0	4	0.9			
		ASB-177	4	6	0.9		4-6	Collected per work plan
		ASB-177	6	7	1.4	6		
Former Test Track	1	ASB-178	0	2	0		0-2	Collected per work plan
		ASB-178	2	4	0			
Former Hazardous Waste Storage Area	8	ASB-179	0	2	0		0-2	Collected per work plan
		ASB-179	2	4	0			
Former Hazardous Waste Storage Area	8	ASB-180	0	2	0		0-2	Collected per work plan
		ASB-180	2	4	0		2-4	Collected per work plan
Former Disposal Area A	9	ASB-181	0	2	0.7			
		ASB-181	2	4	40.1			
		ASB-181	4	6	28.6			
		ASB-181	6	8	87.6		6-8	Collected per work plan
		ASB-181	8	9	102.6	8		
		ASB-181	9	11	5.3			
Former Disposal Area A	9	ASB-182	0	2	29.3			
		ASB-182	2	4	723.9		2-4	Collected per work plan
		ASB-182	4	6	719.3			
		ASB-182	6	8	419			
		ASB-182	8	10	95.2			
		ASB-182	10	11.5	91.8			
Former Disposal Area A	9	ASB-183	0	1	0.3		0-2	Collected per work plan
		ASB-183	1	2	0			
		ASB-183	2	4	0			
		ASB-183	4	6	0			
		ASB-183	6	7	0			
Former Test Track	1	ASB-184	0	2	0			
		ASB-184	2	4	0		2-4	Collected per work plan
		ASB-184	4	6	0			
		ASB-184	6	8	0			
		ASB-184	8	10	0			
Waste Solvent USTs, Former Bulk Solvent and Waste Solvent USTs, Undergound Piping and Sump	35, 36, 37, 46	ASB-185	0	2	0		0-2	Collected per work plan
		ASB-185	2	4	0			
		ASB-185	4	6	0		4-6	Collected per work plan
		ASB-185	6	8	0			
Waste Solvent USTs, Former Bulk Solvent and Waste Solvent USTs, Undergound Piping and Sump	35, 36, 37, 46	ASB-186	0	2	0		0-2	Collected per work plan
		ASB-186	2	4	0			
		ASB-186	4	6	0		4-6	Collected per work plan
		ASB-186	6	8	0			
Former Test Track	1	ASB-187	0	2	0			
		ASB-187	2	4	0		2-4	Collected per work plan
		ASB-187	4	6	0			
		ASB-187	6	8	0			
		ASB-187	8	9	0	8		
		ASB-187	9	10.5	0			
Waste Collection ASTs, Wastewater Treatment Area, and Former Waste Disposal Area	44, 134, 140	ASB-188	0	2.5	0.4		0-2	Collected per work plan
		ASB-188	2.5	3	0.7			
		ASB-188	3	4	0.8			
		ASB-188	4	6	1.3		4-6	Collected per work plan
		ASB-188	6	8	1.4			
		ASB-188	8	10	0.7			
		ASB-188	10	12	0.3			
		ASB-188	12	14	0.2			

Table 2. **Field Screening Headspace Summary**
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature Name	Feature Number	Location	Start Depth (ft)	Finish Depth (ft)	PID Reading (ppm)	DTW (ft)	Sampled Interval	Sample Collection Rationale
Waste Collection ASTs, Wastewater Treatment Area, and Former Waste Disposal Area	44, 134, 140	ASB-189	0	2	0.6		NS	Inadequate recovery at intervals specified in work plan (0' to 2')
		ASB-189	2	4	0.7			
		ASB-189	4	6	0.5		4-6	Collected per work plan
		ASB-189	6	8	0.8			
		ASB-189	8	10	0.5			
		ASB-189	10	12	0.5			
		ASB-189	12	14	0.3			
		ASB-189	14	15	0.5			
Waste Collection ASTs, Wastewater Treatment Area, and Former Waste Disposal Area	44, 134, 140	ASB-190	0	2	0.5		0-2	Collected per work plan
		ASB-190	2	4	0.2			
		ASB-190	4	6	0.7			
		ASB-190	6	8	0.4			
		ASB-190	8	10	0.2		8-10	Collected per work plan
		ASB-190	10	12	0.3			
		ASB-190	12	14	0.1			
		ASB-190	14	15	0.4			
Waste Collection ASTs, Wastewater Treatment Area, and Former Waste Disposal Area	44, 134, 140	ASB-191	0	2	0.3		0-2	Collected per work plan
		ASB-191	2	4	0.1			
		ASB-191	4	6	1		4-6	Collected per work plan
		ASB-191	6	8	0.8			
		ASB-191	8	10	0.9			
		ASB-191	10	12	0.6			
		ASB-191	12	15	0.2			
Waste Collection ASTs, Wastewater Treatment Area, and Former Waste Disposal Area	44, 134, 140	ASB-192	0	2	0		0-2	Collected per work plan
		ASB-192	2	4	0			
		ASB-192	4	6	0.1		4-6	Collected per work plan
		ASB-192	6	8	0			
		ASB-192	8	10	0			
		ASB-192	10	12	0			
Former Coal Gasification Plant	153	ASB-193	0	2	0.1		1-2	Collected per work plan
Former Tar Decanter House	154	ASB-194	0	2	0.4			
		ASB-194	2	4	0			
		ASB-194	4	6	0			
		ASB-194	6	8	0			
		ASB-194	8	10	0.3			
		ASB-194	10	12	3.1		10-12	Collected per work plan
		ASB-194	12	13	0.1			
		ASB-194	13	15	0.1		13-15	Collected per work plan
Former Coal Gasification Plant	153	ASB-195	0	2	0			
		ASB-195	2	4	0.1			
		ASB-195	4	6	0			
		ASB-195	6	8	3.4		6-8	Collected per work plan
		ASB-195	8	10	0.5		8-10	Collected per work plan
Former Fuel Oil ASTs	42	ASB-196	0	1	---			
		ASB-196	1	4	0.1			
		ASB-196	4	6	0.1		4-6	Collected per work plan
		ASB-196	6	8	0.1			
		ASB-196	8	10	0.1			
		ASB-196	10	12	0.1			
		ASB-196	12	14	0.2			
		ASB-196	14	15	1			
Former Fuel Oil ASTs	42	ASB-197	0	1.5	---			
		ASB-197	1.5	4	0.1			
		ASB-197	4	6	0.1		4-6	Collected per work plan
		ASB-197	6	8	0.1			
		ASB-197	8	10	0.1			
		ASB-197	10	12	0.1			
		ASB-197	12	14	0.1			
		ASB-197	14	15	0.1			
Former Fuel Oil ASTs	42	ASB-198	0	0.5	---			
		ASB-198	0.5	4	0.1			
		ASB-198	4	6	0.5			
		ASB-198	6	8	0.9		6-8	Collected per work plan
		ASB-198	8	10	0.4			
		ASB-198	10	12	0.3			
		ASB-198	12	14	0.6			
		ASB-198	14	15	0.1			
Former Location of Gasoline and Diesel Fuel Underground Piping	5	ASB-199	0	2	0.2		0-2	Collected per work plan
		ASB-199	2	4	0.1		2-4	Collected per work plan
		ASB-199	4	7	0.1			

Table 2. **Field Screening Headspace Summary**
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature Name	Feature Number	Location	Start Depth (ft)	Finish Depth (ft)	PID Reading (ppm)	DTW (ft)	Sampled Interval	Sample Collection Rationale
Former Location of Gasoline and Diesel Fuel Underground Piping	5	ASB-200	0	2	0.1		0-2	Collected per work plan
		ASB-200	2	4	0			
		ASB-200	4	6	0		4-6	Collected per work plan
		ASB-200	6	8	0			

Notes:

ASB	ARCADIS Soil Boring.
AMW	ARCADIS Monitoring Well.
HA	Hand Auger.
NS	Not Sampled
ft	Feet below ground surface.
ppm	Parts per million.
---	Not available or bedrock reading.
PID	Photoionization Detector.

ARCADIS

Table 3. Monitoring Well Construction
Twin Cities Assembly Plant, St. Paul, Minnesota

Well ID	Unique Well Number	Date Installed (2" Diameter)	Well Diameter (inches)	Surface Elevation[1] (ft msl)	Top Of Casing Elevation[1] (ft msl)	Bottom of Well Elevation (ft msl)	Screen Interval (Elev. - Elev.) (ft msl)	Surface Completion Type
AMW-11	784720	13-Sep-11	2	808.99	808.86	799.47	804.47 - 799.47	Flush Mount
AMW-12	784724	13-Sep-11	2	808.83	808.74	797.3	802.30 - 797.30	Flush Mount
AMW-13	784723	14-Sep-11	2	809.93	809.89	797.92	802.92 - 797.92	Flush Mount
AMW-14	784726	14-Sep-11	2	809.57	809.57	797.57	802.57 - 797.57	Flush Mount
AMW-15	784725	14-Sep-11	2	809.91	809.84	796.79	801.79 - 796.79	Flush Mount
AMW-16	784721	14-Sep-11	2	812.157	811.94	801.28	806.28 - 801.28	Flush Mount
AMW-17	784722	14-Sep-11	2	808.898	811.04	801.15	806.15 - 801.15	Above Ground
AMW-18	784719	15-Sep-11	2	812.83	812.7	798.22	803.22 - 798.22	Flush Mount

Notes:
ft msl Feet above mean sea level.
AMW ARCADIS Monitoring Well.
Elev. Elevation.
[1] Surface Elevation and Well Top of Casing Elevation surveyed by Sunde Land Surveying, LLC on November , 2011.

ARCADIS

Table 4. Groundwater Elevation Data
Twin Cities Assembly Plant, St. Paul, Minnesota

Well ID	Date	Top of Casing Elevation (ft msl)	Depth to Water (ft bls)	Groundwater Elevation (ft msl)
AMW-01	31-Oct-11	813.03	26.31	786.72
AMW-02	31-Oct-11	812.86	25.39	787.47
AMW-03A	31-Oct-11	811.80	17.85	793.95
AMW-03B	31-Oct-11	811.72	99.67	712.05
AMW-04	31-Oct-11	829.92	36.74	793.18
AMW-05	31-Oct-11	725.25	Dry	<725.25
AMW-05B	31-Oct-11	723.99	31.76	692.23
AMW-06	31-Oct-11	814.06	26.36	787.70
AMW-07	31-Oct-11	733.48	42.20	691.28
AMW-08	31-Oct-11	830.80	37.63	793.17
AMW-09	31-Oct-11	858.13	79.71	778.42
AMW-10	31-Oct-11	811.27	19.55	791.72
AMW-11	7-Nov-11	808.86	5.79	803.07
AMW-12	7-Nov-11	808.74	6.45	802.29
AMW-13	7-Nov-11	809.89	6.80	803.09
AMW-14	7-Nov-11	809.57	6.72	802.85
AMW-15	7-Nov-11	809.84	6.70	803.14
AMW-16	7-Nov-11	811.94	5.60	806.34
AMW-17	7-Nov-11	811.04	5.85	805.19
AMW-18	7-Nov-11	812.7	10.24	802.46
AMW-19	7-Nov-11	707.84	20.39	687.45
AMW-20	7-Nov-11	710.02	22.60	687.42

Table 4. Groundwater Elevation Data
Twin Cities Assembly Plant, St. Paul, Minnesota

Well ID	Date	Top of Casing Elevation (ft msl)	Depth to Water (ft bls)	Groundwater Elevation (ft msl)
MW-4	31-Oct-11	833.66	7.78	825.88
MW-5	31-Oct-11	827.76	2.90	824.86
MW-6	31-Oct-11	827.76	2.61	825.15

Notes:

AMW	ARCADIS Monitoring Well.
MW	Monitoring Well.
ft msl	Feet above mean sea level.
ft bls	Feet below land surface.
---	Not Applicable.
ft	Feet.

ARCADIS

Table 5. Monitoring Well Field Parameters
Twin Cities Assembly Plant, St. Paul, Minnesota

Well ID	Date	Temperature (°C)	pH	Field Specific Conductivity (mS/cm)	Turbidity (NTU)
AMW-11	31-Oct-11	12.88	6.93	0.855	233
AMW-12	7-Nov-11	14.30	6.70	0.989	782
AMW-13	31-Oct-11	11.64	7.21	1.110	>800
AMW-14	7-Nov-11	15.17	7.58	2.520	>800
AMW-15	7-Nov-11	11.89	7.05	1.270	337
AMW-16	7-Nov-11	15.12	7.59	0.338	>800
AMW-17	7-Nov-11	11.99	7.16	1.080	458
AMW-18	31-Oct-11	12.13	6.89	0.597	>800

Notes:

^{o}C	Degrees Celsius.
mS/cm	milli-Siemens per centimeter.
NTU	Nephelometric Turbidity Units.
AMW	ARCADIS Monitoring Well.

Table 6. Summary of Detected Constituents in Soil Samples
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature						North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-115	ASB-115	ASB-116	ASB-116	ASB-117	ASB-117	ASB-118	ASB-118
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-115_2-4(20110822)	ASB-115_4-6(20110822)	ASB-116_4-6(20110822)	ASB-116_6-8(20110822)	ASB-117_0-2(20110823)	ASB-117_2-4(20110823)	ASB-118_2-4(20110823)	ASB-118_5-7(20110823)
Sample Date	Unit	SRV	SRV	SRV		8/22/2011	8/22/2011	8/22/2011	8/22/2011	8/23/2011	8/23/2011	8/23/2011	8/23/2011
Depth Interval						2-4 ft	4-6 ft	4-6 ft	6-8 ft	0-2 ft	2-4 ft	2-4 ft	5-7 ft
VOCs													
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	24 J	9 J	< 250	< 350	NA	NA	NA	NA
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	< 270	< 270	12 J	< 350	NA	NA	NA	NA
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	10 J	< 270	< 250	< 350	NA	NA	NA	NA
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	< 1100	< 1100	< 990	< 1400	NA	NA	NA	NA
Benzene	ug/kg	6000	14000	10000	NA	< 270	< 270	< 250	< 350	NA	NA	NA	NA
Butylbenzene	ug/kg	30000	70000	92000	NA	< 270	< 270	11 J	< 350	NA	NA	NA	NA
Carbon disulfide	ug/kg	65000	160000	190000	NA	< 270	< 270	< 250	< 350	NA	NA	NA	NA
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	< 270	< 270	< 250	< 350	NA	NA	NA	NA
Cyclohexane	ug/kg	NS	NS	NS	NA	< 540	50 J	55 J	< 690	NA	NA	NA	NA
Ethylbenzene	ug/kg	200000	200000	200000	NA	7.1 J	< 270	12 J	< 350	NA	NA	NA	NA
Isopropylbenzene	ug/kg	30000	74000	87000	NA	< 270	< 270	< 250	< 350	NA	NA	NA	NA
Methyl acetate	ug/kg	NS	NS	NS	NA	69 J	95 J	94 J	< 690	NA	NA	NA	NA
Methylcyclohexane	ug/kg	NS	NS	NS	NA	33 J	32 J	35 J	< 690	NA	NA	NA	NA
Methylene chloride	ug/kg	97000	270000	158000	NA	< 270	< 270	< 250	120 J	NA	NA	NA	NA
Naphthalene	ug/kg	10000	24000	28000	NA	< 270	< 270	< 250	< 350	NA	NA	NA	NA
n-Propylbenzene	ug/kg	30000	70000	93000	NA	< 270	< 270	24 J	< 350	NA	NA	NA	NA
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	< 270	< 270	< 250	< 350	NA	NA	NA	NA
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	< 270	< 270	< 250	< 350	NA	NA	NA	NA
Styrene	ug/kg	210000	500000	600000	NA	< 270	< 270	< 250	< 350	NA	NA	NA	NA
Tetrachloroethene	ug/kg	72000	145000	131000	NA	< 270	< 270	< 250	< 350	NA	NA	NA	NA
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	< 1100	< 1100	< 990	< 1400	NA	NA	NA	NA
Toluene	ug/kg	107000	260000	305000	NA	< 270	< 270	< 250	< 350	NA	NA	NA	NA
Trichloroethene	ug/kg	29000	82000	46000	NA	< 270	< 270	< 250	< 350	NA	NA	NA	NA
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	60 J	22 J	10 J	< 690	NA	NA	NA	NA
Xylene, -o**	ug/kg	45000	110000	110000	NA	14 J	< 270	< 250	< 350	NA	NA	NA	NA
Total Xylenes*	ug/kg	45000	110000	110000	NA	74	22	10	ND	NA	NA	NA	NA
SVOCs													
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	< 1900	< 410	15 J	< 390	65 J	< 400	< 380	< 400
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	< 1900	< 410	< 380	< 390	< 1800	< 400	< 380	< 400
Acenaphthylene	ug/kg	NS	NS	NS	NA	< 1900	< 410	< 380	< 390	24 J	< 400	< 380	< 400
Acetophenone	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	ug/kg	7880000	10000000	45400000	NA	23 J	< 410	< 380	< 390	30 J	< 400	< 380	< 400
Benzaldehyde	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	< 1900	< 410	< 380	< 390	< 1800	< 400	< 380	< 400
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	33 J	< 410	< 380	< 390	70 J	< 400	< 380	8.6 J
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	< 1900	< 410	< 380	< 390	63 J	< 400	< 380	9.3 J
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	25 J	< 410	< 380	< 390	92 J	< 400	< 380	12 J
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	< 1900	< 410	< 380	< 390	50 J	< 400	< 380	6.8 J
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	ug/kg	700000	720000	1310000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	NS	NS	NS	NA	59 J	14 J	< 380	< 390	98 J	< 400	< 380	12 J
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	< 1900	< 410	< 380	< 390	< 1800	< 400 J	< 380	< 400
Dibenzofuran	ug/kg	104000	130000	810000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	93 J	31 J	< 380	< 390	150 J	8.9 J	< 380	18 J
Fluorene	ug/kg	850000	1200000	4120000	NA	< 1900	< 410	< 380	< 390	< 1800	< 400	< 380	< 400
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	< 1900	< 410	< 380	< 390	< 1800	< 400	< 380	< 400
Naphthalene	ug/kg	10000	24000	28000	NA	< 1900	< 410	< 380	< 390	25 J	< 400	< 380	< 400
Phenanthrene	ug/kg	NS	NS	NS	NA	87 J	29 J	< 380	< 390	83 J	< 400	< 380	9.3 J
Pyrene	ug/kg	890000	1060000	5800000	NA	66 J	23 J	< 380	< 390	110 J	6.9 J	< 380	15 J
Metals													
Aluminum	mg/kg	30000	40000	100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	12	16	100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	9	11	20	NA	5.7	3.5	4.4	3.5	4.1	2.5	3.8	4
Barium	mg/kg	1100	1100	18000	NA	51	54	61	25	35	64	69	78

Table 6. Summary of Detected Constituents in Soil Samples
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature						North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area
Location ID		**Tier 1**	**Tier 2**	**Tier 2**	**TCLP**	**ASB-115**	**ASB-115**	**ASB-116**	**ASB-116**	**ASB-117**	**ASB-117**	**ASB-118**	**ASB-118**
Sample ID		**Residential**	**Recreational**	**Industrial**	**Criteria**	**ASB-115_2-4(20110822)**	**ASB-115_4-6(20110822)**	**ASB-116_4-6(20110822)**	**ASB-116_6-8(20110822)**	**ASB-117_0-2(20110823)**	**ASB-117_2-4(20110823)**	**ASB-118_2-4(20110823)**	**ASB-118_5-7(20110823)**
Sample Date	**Unit**	**SRV**	**SRV**	**SRV**		**8/22/2011**	**8/22/2011**	**8/22/2011**	**8/22/2011**	**8/23/2011**	**8/23/2011**	**8/23/2011**	**8/23/2011**
Depth Interval						**2-4 ft**	**4-6 ft**	**4-6 ft**	**6-8 ft**	**0-2 ft**	**2-4 ft**	**2-4 ft**	**5-7 ft**
Beryllium	mg/kg	55	75	230	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	25	35	200	NA	< 0.22	< 0.24	0.097 J	< 0.23	0.1 J	0.079 J	0.039 J	< 0.23
Calcium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	16	18	14	17	15	13	17	15
Cobalt	mg/kg	600	800	2600	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	100	100	9000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	9000	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	300	300	700	NA	5.5	5.5	4.2	5.6	7.1	6.6	5.3	11
Magnesium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	mg/kg	3600	5000	8100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	0.5	1.2	1.5	NA	0.023 J	0.022 J	0.014 J	0.024 J	0.03 J	0.022 J	0.023 J	0.019 J
Nickel	mg/kg	560	800	2500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	160	200	1300	NA	0.55 J	0.69	< 0.56	< 0.57	0.74	0.84	< 0.55	2.2
Silver	mg/kg	160	200	1300	NA	< 0.56	0.27 J	< 0.56	< 0.57	< 0.52	< 0.55	< 0.55	< 0.57
Sodium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	3	3	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	30	40	250	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	8700	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals - TCLP													
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	NA	NA	NA	NA
PCBs													
Aroclor 1248	ug/kg	1200	1400	8000	NA	< 39	< 41	< 38	< 39	< 37	< 40	< 38	< 40
Aroclor 1260	ug/kg	1200	1400	8000	NA	< 39	< 41	< 38	< 39	< 37	< 40	< 38	< 40
Total Detected PCBs	ug/kg	1200	1400	8000	NA	< 39	< 41	< 38	< 39	< 37	< 40	< 38	< 40
Other													
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	2.8 J	12	7.1 J	NA	NA	NA	NA	NA
Diesel Range Organics	mg/kg	NS	NS	NS	NA	< 11	< 11	< 8.8	< 9.9	< 9.5	< 10	< 9.5	< 10

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Table 6. Summary of Detected Constituents in Soil Samples
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature						North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-123	ASB-123	ASB-124	ASB-124	ASB-125	ASB-125	ASB-126	ASB-126
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-123_2-4(20110824)	ASB-123_6-8(20110824)	ASB-124_2-4(20110824)	ASB-124_6-8(20110824)	ASB-125_3-5(20110825)	ASB-125_6-8(20110825)	ASB-126_2-4(20110825)	ASB-126_6-8(20110825)
Sample Date	Unit	SRV	SRV	SRV		8/24/2011	8/24/2011	8/24/2011	8/24/2011	8/25/2011	8/25/2011	8/25/2011	8/25/2011
Depth Interval						2-4 ft	6-8 ft	2-4 ft	6-8 ft	3-5 ft	6-8 ft	2-4 ft	6-8 ft
VOCs													
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	120 J	**31000**	< 330	< 290	NA	NA	NA	NA
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	< 300	< 1300	< 330	< 290	NA	NA	NA	NA
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	110 J	**9500**	< 330	< 290	NA	NA	NA	NA
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	< 1200	< 5400	< 1300	< 1200	NA	NA	NA	NA
Benzene	ug/kg	6000	14000	10000	NA	< 300	**8400**	< 330	< 290	NA	NA	NA	NA
Butylbenzene	ug/kg	30000	70000	92000	NA	13 J	2700	< 330	< 290	NA	NA	NA	NA
Carbon disulfide	ug/kg	65000	160000	190000	NA	< 300	< 1300	83 J	< 290	NA	NA	NA	NA
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	< 300	< 1300	< 330	< 290	NA	NA	NA	NA
Cyclohexane	ug/kg	NS	NS	NS	NA	670	11000	< 660	< 580	NA	NA	NA	NA
Ethylbenzene	ug/kg	200000	200000	200000	NA	150 J	15000	< 330	< 290	NA	NA	NA	NA
Isopropylbenzene	ug/kg	30000	74000	87000	NA	42 J	1200 J	< 330	< 290	NA	NA	NA	NA
Methyl acetate	ug/kg	NS	NS	NS	NA	140 J	< 2700	510 J	< 580	NA	NA	NA	NA
Methylcyclohexane	ug/kg	NS	NS	NS	NA	520 J	6400	< 660	< 580	NA	NA	NA	NA
Methylene chloride	ug/kg	97000	270000	158000	NA	< 300	< 1300	< 330	< 290	NA	NA	NA	NA
Naphthalene	ug/kg	10000	24000	28000	NA	< 300	3600	< 330	< 290	NA	NA	NA	NA
n-Propylbenzene	ug/kg	30000	70000	93000	NA	170 J	6400	< 330	< 290	NA	NA	NA	NA
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	< 300	240 J	< 330	< 290	NA	NA	NA	NA
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	< 300	580 J	< 330	< 290	NA	NA	NA	NA
Styrene	ug/kg	210000	500000	600000	NA	< 300	< 1300	< 330	< 290	NA	NA	NA	NA
Tetrachloroethene	ug/kg	72000	145000	131000	NA	< 300	< 1300	< 330	< 290	NA	NA	NA	NA
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	< 1200	< 5400	< 1300	< 1200	NA	NA	NA	NA
Toluene	ug/kg	107000	260000	305000	NA	41 J	24000	< 330	< 290	NA	NA	NA	NA
Trichloroethene	ug/kg	29000	82000	46000	NA	< 300	< 1300	< 330	< 290	NA	NA	NA	NA
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	150 J	**47000**	< 660	< 580	NA	NA	NA	NA
Xylene, -o**	ug/kg	45000	110000	110000	NA	73 J	16000	< 330	< 290	NA	NA	NA	NA
Total Xylenes*	ug/kg	45000	110000	110000	NA	223	**63000**	ND	ND	NA	NA	NA	NA
SVOCs													
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	5.4 J	1400	22 J	< 440	< 400	< 420	< 420	< 420
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	15 J	< 920	< 420	< 440	< 400	< 420	< 420	< 420
Acenaphthylene	ug/kg	NS	NS	NS	NA	< 420	< 920	4.5 J	< 440	< 400	< 420	< 420	< 420
Acetophenone	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	ug/kg	7880000	10000000	45400000	NA	< 420	< 920	22 J	< 440	< 400	< 420	< 420	< 420
Benzaldehyde	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	< 420	< 920	16 J	< 440	< 400	< 420	< 420	< 420
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	< 420	< 920	18 J	< 440	< 400	< 420	< 420	< 420
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	5.3 J	< 920	15 J	< 440	< 400	< 420	< 420	< 420
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	< 420	< 920	27 J	< 440	< 400	< 420	< 420	< 420
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	< 420	< 920	15 J	< 440	< 400	< 420	< 420	< 420
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	ug/kg	700000	720000	1310000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	NS	NS	NS	NA	< 420	< 920	27 J	< 440	< 400	< 420	< 420	< 420
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	< 420	< 920	< 420	< 440	< 400	< 420	< 420	< 420
Dibenzofuran	ug/kg	104000	130000	810000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	16 J	31 J	55 J	< 440	< 400	< 420	< 420	< 420
Fluorene	ug/kg	850000	1200000	4120000	NA	8.6 J	18 J	5.9 J	< 440	< 400	< 420	< 420	< 420
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	< 420	< 920	14 J	< 440	< 400	< 420	< 420	< 420
Naphthalene	ug/kg	10000	24000	28000	NA	8.8 J	980	16 J	< 440	< 400	< 420	< 420	< 420
Phenanthrene	ug/kg	NS	NS	NS	NA	13 J	41 J	43 J	< 440	< 400	< 420	< 420	< 420
Pyrene	ug/kg	890000	1060000	5800000	NA	11 J	32 J	44 J	< 440	< 400	< 420	< 420	< 420
Metals													
Aluminum	mg/kg	30000	40000	100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	12	16	100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	9	11	20	NA	4	3.4	4.9	1.3	4.7	4.8	5.8	4.7
Barium	mg/kg	1100	1100	18000	NA	99	88	130	45	23	18 J	110	17 J

Feature						North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area
Location ID		**Tier 1**	**Tier 2**	**Tier 2**	**TCLP**	**ASB-123**	**ASB-123**	**ASB-124**	**ASB-124**	**ASB-125**	**ASB-125**	**ASB-126**	**ASB-126**
Sample ID		**Residential**	**Recreational**	**Industrial**	**Criteria**	**ASB-123_2-4(20110824)**	**ASB-123_6-8(20110824)**	**ASB-124_2-4(20110824)**	**ASB-124_6-8(20110824)**	**ASB-125_3-5(20110825)**	**ASB-125_6-8(20110825)**	**ASB-126_2-4(20110825)**	**ASB-126_6-8(20110825)**
Sample Date	**Unit**	**SRV**	**SRV**	**SRV**		**8/24/2011**	**8/24/2011**	**8/24/2011**	**8/24/2011**	**8/25/2011**	**8/25/2011**	**8/25/2011**	**8/25/2011**
Depth Interval						**2-4 ft**	**6-8 ft**	**2-4 ft**	**6-8 ft**	**3-5 ft**	**6-8 ft**	**2-4 ft**	**6-8 ft**
Beryllium	mg/kg	55	75	230	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	25	35	200	NA	0.068 J	0.3	0.26	< 0.25	< 0.22	< 0.24	< 0.23	< 0.22
Calcium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	15	11	17	16	11	14	19	15
Cobalt	mg/kg	600	800	2600	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	100	100	9000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	9000	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	300	300	700	NA	7.6	12	24	2.5	6.9	2.7	4	2.6
Magnesium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	mg/kg	3600	5000	8100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	0.5	1.2	1.5	NA	0.022 J	0.036 J	0.095	0.018 J	< 0.12	0.016 J	0.025 J	0.019 J
Nickel	mg/kg	560	800	2500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	160	200	1300	NA	0.66	0.55 J	0.94	< 0.64	< 0.54	< 0.6	< 0.58	< 0.56
Silver	mg/kg	160	200	1300	NA	< 0.53	< 0.56	< 0.63	< 0.64	< 0.54	< 0.6	< 0.58	< 0.56
Sodium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	3	3	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	30	40	250	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	8700	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals - TCLP													
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	NA	NA	NA	NA
PCBs													
Aroclor 1248	ug/kg	1200	1400	8000	NA	< 42	< 45	NA	< 44	NA	NA	NA	NA
Aroclor 1260	ug/kg	1200	1400	8000	NA	< 42	< 45	NA	< 44	NA	NA	NA	NA
Total Detected PCBs	ug/kg	1200	1400	8000	NA	< 42	< 45	NA	< 44	NA	NA	NA	NA
Other													
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	39	390	< 13	< 13	NA	NA	NA	NA
Diesel Range Organics	mg/kg	NS	NS	NS	NA	< 12	46	29	< 12	< 11	< 10	< 11	< 11

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Table 6. Summary of Detected Constituents in Soil Samples
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature						North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-128	ASB-128	ASB-129	ASB-131	ASB-132	ASB-134	ASB-136
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-128_0-2(20110825)	ASB-128_6-8(20110825)	ASB-129_2-4(20110826)	ASB-131_2-4(20110826)	ASB-132_2-4(20110826)	ASB-134_2-4(20110826)	ASB-136_1-3(20110829)
Sample Date	Unit	SRV	SRV	SRV		8/25/2011	8/25/2011	8/26/2011	8/26/2011	8/26/2011	8/26/2011	8/29/2011
Depth Interval						0-2 ft	6-8 ft	2-4 ft	2-4 ft	2-4 ft	2-4 ft	1-3 ft
VOCs												
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	ug/kg	6000	14000	10000	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzene	ug/kg	30000	70000	92000	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	ug/kg	65000	160000	190000	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	ug/kg	200000	200000	200000	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	ug/kg	30000	74000	87000	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	ug/kg	97000	270000	158000	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	ug/kg	10000	24000	28000	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	ug/kg	30000	70000	93000	NA	NA	NA	NA	NA	NA	NA	NA
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/kg	210000	500000	600000	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	ug/kg	72000	145000	131000	NA	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	ug/kg	107000	260000	305000	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	ug/kg	29000	82000	46000	NA	NA	NA	NA	NA	NA	NA	NA
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	NA	NA	NA	NA	NA	NA	NA
Xylene, -o**	ug/kg	45000	110000	110000	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes*	ug/kg	45000	110000	110000	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs												
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	< 400	< 410	< 410	< 380	< 370	< 2000	190 J
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	< 400	< 410	< 410	< 380	< 370	< 2000	< 7300
Acenaphthylene	ug/kg	NS	NS	NS	NA	< 400	< 410	< 410	< 380	< 370	< 2000	< 7300
Acetophenone	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	ug/kg	7880000	10000000	45400000	NA	< 400	< 410	< 410	< 380	< 370	< 2000	< 7300
Benzaldehyde	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	< 400	< 410	< 410	< 380	13 J	140 J	160 J
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	< 400	< 410	< 410	< 380	12 J	140 J	130 J
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	< 400	< 410	< 410	< 380	12 J	140 J	140 J
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	< 400	< 410	< 410	< 380	17 J	190 J	200 J
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	< 400	< 410	< 410	< 380	9 J	53 J	110 J
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	ug/kg	700000	720000	1310000	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	NS	NS	NS	NA	< 400	< 410	< 410	< 380	16 J	190 J	230 J
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	< 400	< 410	< 410	< 380	< 370	< 2000	< 7300
Dibenzofuran	ug/kg	104000	130000	810000	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	< 400	< 410	< 410	< 380	24 J	280 J	230 J
Fluorene	ug/kg	850000	1200000	4120000	NA	< 400	< 410	< 410	< 380	< 370	< 2000	< 7300
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	< 400	< 410	< 410	< 380	< 370	71 J	< 7300
Naphthalene	ug/kg	10000	24000	28000	NA	< 400	< 410	< 410	< 380	< 370	< 2000	94 J
Phenanthrene	ug/kg	NS	NS	NS	NA	8.7 J	< 410	< 410	< 380	11 J	110 J	270 J
Pyrene	ug/kg	890000	1060000	5800000	NA	< 400	< 410	< 410	< 380	25 J	260 J	210 J
Metals												
Aluminum	mg/kg	30000	40000	100000	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	12	16	100	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	9	11	20	NA	**17 J**	4.3	5.3	5.1	3.4	4.3	4.4
Barium	mg/kg	1100	1100	18000	NA	83 J	100	110	39	47	88	59

Table 6. Summary of Detected Constituents in Soil Samples
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature						North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-128	ASB-128	ASB-129	ASB-131	ASB-132	ASB-134	ASB-136
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-128_0-2(20110825)	ASB-128_6-8(20110825)	ASB-129_2-4(20110826)	ASB-131_2-4(20110826)	ASB-132_2-4(20110826)	ASB-134_2-4(20110826)	ASB-136_1-3(20110829)
Sample Date	Unit	SRV	SRV	SRV		8/25/2011	8/25/2011	8/26/2011	8/26/2011	8/26/2011	8/26/2011	8/29/2011
Depth Interval						0-2 ft	6-8 ft	2-4 ft	2-4 ft	2-4 ft	2-4 ft	1-3 ft
Beryllium	mg/kg	55	75	230	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	25	35	200	NA	< 0.23	0.049 J	0.11 J	< 0.21	< 0.2	0.12 J	0.46
Calcium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	8.5	14	18	8.7	10	14	7.7
Cobalt	mg/kg	600	800	2600	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	100	100	9000	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	9000	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	300	300	700	NA	10 J	9.3	9.4	3.9	4.6	7.8	47
Magnesium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	mg/kg	3600	5000	8100	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	0.5	1.2	1.5	NA	0.019 J	0.042 J	0.029 J	0.025 J	0.024 J	0.019 J	0.065 J
Nickel	mg/kg	560	800	2500	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	160	200	1300	NA	< 0.57	< 0.59	< 0.62	< 0.53	< 0.5	< 0.56	< 0.53
Silver	mg/kg	160	200	1300	NA	< 0.57	< 0.59	< 0.62	< 0.53	< 0.5	< 0.56	< 0.53
Sodium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	3	3	21	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	30	40	250	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	8700	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA
Metals - TCLP												
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	NA	NA	NA
PCBs												
Aroclor 1248	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA
Other												
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics	mg/kg	NS	NS	NS	NA	< 10	< 10	< 10	< 10	< 12	180 J	550

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Feature						North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	1	1	1
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-137	ASB-141	ASB-141	ASB-142	ASB-143	ASB-127	ASB-133	ASB-144
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-137_2-4(20110829)	ASB-141_2-4(20110830)	ASB-141_6-8(20110830)	ASB-142_2-4(20110830)	ASB-143_1-3(20110830)	SB-127_0-2(2011082	ASB-133_2-4(20110901)	ASB-144_2-4(20110830)
Sample Date	Unit	SRV	SRV	SRV		8/29/2011	8/30/2011	8/30/2011	8/30/2011	8/30/2011	8/25/2011	9/1/2011	8/30/2011
Depth Interval						2-4 ft	2-4 ft	6-8 ft	2-4 ft	1-3 ft	0-2 ft	2-4 ft	2-4 ft
VOCs													
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	NA	NA	NA	NA	NA	< 1200	NA	< 1100
Benzene	ug/kg	6000	14000	10000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
Butylbenzene	ug/kg	30000	70000	92000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
Carbon disulfide	ug/kg	65000	160000	190000	NA	NA	NA	NA	NA	NA	56 J	NA	< 280
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
Cyclohexane	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	< 580	NA	< 550
Ethylbenzene	ug/kg	200000	200000	200000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
Isopropylbenzene	ug/kg	30000	74000	87000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
Methyl acetate	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	280 J	NA	31 J
Methylcyclohexane	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	< 580	NA	< 550
Methylene chloride	ug/kg	97000	270000	158000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
Naphthalene	ug/kg	10000	24000	28000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
n-Propylbenzene	ug/kg	30000	70000	93000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
Styrene	ug/kg	210000	500000	600000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
Tetrachloroethene	ug/kg	72000	145000	131000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	< 1200	NA	< 1100
Toluene	ug/kg	107000	260000	305000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
Trichloroethene	ug/kg	29000	82000	46000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	NA	NA	NA	NA	NA	< 580	NA	< 550
Xylene, -o**	ug/kg	45000	110000	110000	NA	NA	NA	NA	NA	NA	< 290	NA	< 280
Total Xylenes*	ug/kg	45000	110000	110000	NA	NA	NA	NA	NA	NA	ND	NA	ND
SVOCs													
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	34 J	< 440	< 410	< 410	< 400	< 430	< 360	< 360
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	< 420	< 440	< 410	< 410	< 400	< 430	< 360	< 360
Acenaphthylene	ug/kg	NS	NS	NS	NA	12 J	< 440	< 410	< 410	< 400	< 430	< 360	< 360
Acetophenone	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	14 J	< 360	< 360
Anthracene	ug/kg	7880000	10000000	45400000	NA	17 J	< 440	< 410	< 410	< 400	< 430	< 360	< 360
Benzaldehyde	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	56 J	< 360	< 360
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	34 J	< 440	< 410	< 410	< 400	8.4 J	< 360	< 360
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	41 J	< 440	< 410	< 410	< 400	8.2 J	< 360	< 360
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	44 J	< 440	< 410	< 410	< 400	6.2 J	< 360	< 360
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	73 J	< 440	< 410	< 410	< 400	12 J	< 360	< 360
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	25 J	< 440	< 410	< 410	< 400	6.3 J	< 360	< 360
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	NA	NA	NA	NA	NA	< 430	< 360	< 360
Carbazole	ug/kg	700000	720000	1310000	NA	NA	NA	NA	NA	NA	< 430	< 360	< 360
Chrysene	ug/kg	NS	NS	NS	NA	55 J	< 440	< 410	< 410	< 400	13 J	< 360	< 360
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	7.7 J	< 440	< 410	< 410	< 400	< 430	< 360	< 360
Dibenzofuran	ug/kg	104000	130000	810000	NA	NA	NA	NA	NA	NA	< 430	< 360	< 360
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	80 J	< 440	< 410	< 410	< 400	22 J	< 360	< 360
Fluorene	ug/kg	850000	1200000	4120000	NA	6 J	< 440	< 410	< 410	< 400	< 430	< 360	< 360
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	32 J	< 440	< 410	< 410	< 400	< 430	< 360	< 360
Naphthalene	ug/kg	10000	24000	28000	NA	20 J	< 440	< 410	< 410	< 400	11 J	< 360	< 360
Phenanthrene	ug/kg	NS	NS	NS	NA	72 J	< 440	< 410	< 410	< 400	12 J	< 360	< 360
Pyrene	ug/kg	890000	1060000	5800000	NA	61 J	< 440	< 410	< 410	< 400	16 J	< 360	< 360
Metals													
Aluminum	mg/kg	30000	40000	100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	12	16	100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	9	11	20	NA	7.2	3.8	7.5	3	2.1	5.4	1.1	7.6
Barium	mg/kg	1100	1100	18000	NA	70	21 J	39	16 J	23	98	14 J	120

Table 6. Summary of Detected Constituents in Soil Samples
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature						North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	1	1	1
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-137	ASB-141	ASB-141	ASB-142	ASB-143	ASB-127	ASB-133	ASB-144
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-137_2-4(20110829)	ASB-141_2-4(20110830)	ASB-141_6-8(20110830)	ASB-142_2-4(20110830)	ASB-143_1-3(20110830)	SB-127_0-2(2011082	ASB-133_2-4(20110901)	ASB-144_2-4(20110830)
Sample Date	Unit	SRV	SRV	SRV		8/29/2011	8/30/2011	8/30/2011	8/30/2011	8/30/2011	8/25/2011	9/1/2011	8/30/2011
Depth Interval						2-4 ft	2-4 ft	6-8 ft	2-4 ft	1-3 ft	0-2 ft	2-4 ft	2-4 ft
Beryllium	mg/kg	55	75	230	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	25	35	200	NA	0.18 J	< 0.26	< 0.21	< 0.22	< 0.21	0.11 J	< 0.18	0.28
Calcium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	12	16	24	14	12	15	4.1	9.1
Cobalt	mg/kg	600	800	2600	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	100	100	9000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	9000	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	300	300	700	NA	14	2.9	4.1	3	3.1	9.7	1.2	4.8
Magnesium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	mg/kg	3600	5000	8100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	0.5	1.2	1.5	NA	0.061 J	< 0.13	0.035 J	0.019 J	0.014 J	0.024 J	0.023 J	< 0.086
Nickel	mg/kg	560	800	2500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	160	200	1300	NA	< 0.62	< 0.65	< 0.52	< 0.55	< 0.53	< 0.6	0.49	< 0.48
Silver	mg/kg	160	200	1300	NA	< 0.62	< 0.65	< 0.52	< 0.55	< 0.53	< 0.6	< 0.44	< 0.48
Sodium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	3	3	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	30	40	250	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	8700	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals - TCLP													
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	NA	NA	NA	NA
PCBs													
Aroclor 1248	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	< 43	< 36	< 36
Aroclor 1260	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	< 43	< 36	< 36
Total Detected PCBs	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	< 43	< 36	< 36
Other													
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics	mg/kg	NS	NS	NS	NA	12	12	< 11	< 11	< 10	< 10	< 9.3	< 9.3

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Feature						1	1	1	3	3	3	4	4
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-178	ASB-184	ASB-187	ASB-138	ASB-139	ASB-140	ASB-119	ASB-119
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-178_0-2(20110908)	ASB-184_2-4(20110909)	ASB-187_2-4(20110909)	ASB-138_2-4(20110829)	ASB-139_6-8(20110829)	ASB-140_6-8(20110829)	ASB-119_5-7(20110823)	ASB-119_8-10(20110823)
Sample Date	Unit	SRV	SRV	SRV		9/8/2011	9/9/2011	9/9/2011	8/29/2011	8/29/2011	8/30/2011	8/23/2011	8/23/2011
Depth Interval						0-2 ft	2-4 ft	2-4 ft	2-4 ft	6-8 ft	6-8 ft	5-7 ft	8-10 ft
VOCs													
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	< 290	< 300	< 260	< 260	150 J	< 290 J	< 280	< 310
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	< 290	< 300	< 260	< 260	< 280 J	< 290 J	< 280	< 310
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	< 290	< 300	< 260	< 260	43 J	< 290 J	< 280	< 310
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	< 1200	< 1200	< 1000	< 1000	< 1100 J	< 1100 J	< 1100	< 1200
Benzene	ug/kg	6000	14000	10000	NA	< 290	< 300	< 260	< 260	< 280 J	< 290 J	< 280	< 310
Butylbenzene	ug/kg	30000	70000	92000	NA	< 290	< 300	< 260	< 260	< 280 J	< 290 J	< 280	< 310
Carbon disulfide	ug/kg	65000	160000	190000	NA	< 290	54 J	< 260	< 260	< 280 J	< 290 J	54 J	< 310
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	< 290	< 300	< 260	< 260	< 280 J	< 290 J	< 280	< 310
Cyclohexane	ug/kg	NS	NS	NS	NA	< 580	< 590	< 510	< 510	< 550 J	< 570 J	< 560	< 620
Ethylbenzene	ug/kg	200000	200000	200000	NA	< 290	< 300	< 260	< 260	< 280 J	< 290 J	< 280	< 310
Isopropylbenzene	ug/kg	30000	74000	87000	NA	< 290	< 300	< 260	< 260	< 280 J	< 290 J	< 280	< 310
Methyl acetate	ug/kg	NS	NS	NS	NA	< 580	420 J	< 510	< 510	< 550 J	< 570 J	110 J	41 J
Methylcyclohexane	ug/kg	NS	NS	NS	NA	< 580	< 590	< 510	< 510	< 550 J	< 570 J	< 560	< 620
Methylene chloride	ug/kg	97000	270000	158000	NA	< 290	< 300	< 260	< 260	< 280 J	< 290 J	< 280	< 310
Naphthalene	ug/kg	10000	24000	28000	NA	< 290	29 J	< 260	< 260	< 820 J	< 290 J	< 280	< 310
n-Propylbenzene	ug/kg	30000	70000	93000	NA	< 290	< 300	< 260	< 260	< 280 J	< 290 J	< 280	< 310
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	< 290	< 300	< 260	< 260	< 280 J	< 290 J	< 280	< 310
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	< 290	< 300	< 260	< 260	< 280 J	< 290 J	< 280	< 310
Styrene	ug/kg	210000	500000	600000	NA	< 290	< 300	< 260	< 260	< 280 J	< 290 J	< 280	< 310
Tetrachloroethene	ug/kg	72000	145000	131000	NA	< 290	< 300	< 260	< 260	< 280 J	< 290 J	< 280	< 310
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	< 1200	< 1200	< 1000	< 1000	< 1100 J	< 1100 J	< 1100	< 1200
Toluene	ug/kg	107000	260000	305000	NA	< 290	< 300	< 260	< 260	< 280 J	< 290 J	< 280	< 310
Trichloroethene	ug/kg	29000	82000	46000	NA	< 290	< 300	< 260	< 260	< 280 J	< 290 J	< 280	< 310
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	< 580	< 590	< 510	< 510	< 550	< 570 J	< 560	< 620
Xylene, -o**	ug/kg	45000	110000	110000	NA	< 290	< 300	< 260	< 260	16 J	< 290 J	< 280	< 310
Total Xylenes*	ug/kg	45000	110000	110000	NA	ND	ND	ND	ND	16	ND	ND	ND
SVOCs													
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	< 390	21 J	< 370	NA	NA	NA	NA	NA
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	< 390	58 J	< 370	NA	NA	NA	NA	NA
Acenaphthylene	ug/kg	NS	NS	NS	NA	< 390	< 450	< 370	NA	NA	NA	NA	NA
Acetophenone	ug/kg	NS	NS	NS	NA	< 390	< 450	< 370	NA	NA	NA	NA	NA
Anthracene	ug/kg	7880000	10000000	45400000	NA	< 390	130 J	< 370	NA	NA	NA	NA	NA
Benzaldehyde	ug/kg	NS	NS	NS	NA	< 390	55 J	< 370	NA	NA	NA	NA	NA
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	< 390	120 J	< 370	NA	NA	NA	NA	NA
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	< 390	220 J	< 370	NA	NA	NA	NA	NA
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	< 390	170 J	< 370	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	< 390	210 J	< 370	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	< 390	97 J	< 370	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	< 390	< 450	< 370	NA	NA	NA	NA	NA
Carbazole	ug/kg	700000	720000	1310000	NA	< 390	39 J	< 370	NA	NA	NA	NA	NA
Chrysene	ug/kg	NS	NS	NS	NA	< 390	200 J	< 370	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	< 390	23 J	< 370	NA	NA	NA	NA	NA
Dibenzofuran	ug/kg	104000	130000	810000	NA	< 390	37 J	< 370	NA	NA	NA	NA	NA
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	< 390	500	< 370	NA	NA	NA	NA	NA
Fluorene	ug/kg	850000	1200000	4120000	NA	< 390	78 J	< 370	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	< 390	90 J	< 370	NA	NA	NA	NA	NA
Naphthalene	ug/kg	10000	24000	28000	NA	< 390	38 J	< 370	NA	NA	NA	NA	NA
Phenanthrene	ug/kg	NS	NS	NS	NA	< 390	440 J	< 370	NA	NA	NA	NA	NA
Pyrene	ug/kg	890000	1060000	5800000	NA	< 390	350 J	< 370	NA	NA	NA	NA	NA
Metals													
Aluminum	mg/kg	30000	40000	100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	12	16	100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	9	11	20	NA	3.3	5.7	4.3	NA	NA	NA	NA	NA
Barium	mg/kg	1100	1100	18000	NA	22	96	54	NA	NA	NA	NA	NA

Feature						1	1	1	3	3	3	4	4
Location ID		**Tier 1**	**Tier 2**	**Tier 2**	**TCLP**	**ASB-178**	**ASB-184**	**ASB-187**	**ASB-138**	**ASB-139**	**ASB-140**	**ASB-119**	**ASB-119**
Sample ID		**Residential**	**Recreational**	**Industrial**	**Criteria**	**ASB-178_0-2(20110908)**	**ASB-184_2-4(20110909)**	**ASB-187_2-4(20110909)**	**ASB-138_2-4(20110829)**	**ASB-139_6-8(20110829)**	**ASB-140_6-8(20110829)**	**ASB-119_5-7(20110823)**	**ASB-119_8-10(20110823)**
Sample Date	**Unit**	**SRV**	**SRV**	**SRV**		**9/8/2011**	**9/9/2011**	**9/9/2011**	**8/29/2011**	**8/29/2011**	**8/30/2011**	**8/23/2011**	**8/23/2011**
Depth Interval						**0-2 ft**	**2-4 ft**	**2-4 ft**	**2-4 ft**	**6-8 ft**	**6-8 ft**	**5-7 ft**	**8-10 ft**
Beryllium	mg/kg	55	75	230	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	25	35	200	NA	< 0.21	0.14 J	0.094 J	NA	NA	NA	NA	NA
Calcium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	15	16	11	NA	NA	NA	NA	NA
Cobalt	mg/kg	600	800	2600	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	100	100	9000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	9000	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	300	300	700	NA	3	8.3	2.8	2.1	4.5	2.6	7.5	3.9
Magnesium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	mg/kg	3600	5000	8100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	0.5	1.2	1.5	NA	< 0.11	< 0.13	< 0.095	NA	NA	NA	NA	NA
Nickel	mg/kg	560	800	2500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	160	200	1300	NA	< 0.53	1.1	< 0.52	NA	NA	NA	NA	NA
Silver	mg/kg	160	200	1300	NA	< 0.53	< 0.64	< 0.52	NA	NA	NA	NA	NA
Sodium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	3	3	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	30	40	250	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	8700	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals - TCLP													
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	NA	NA	NA	NA
PCBs													
Aroclor 1248	ug/kg	1200	1400	8000	NA	< 39	< 45	< 37	NA	NA	NA	NA	NA
Aroclor 1260	ug/kg	1200	1400	8000	NA	< 39	< 45 J	< 37	NA	NA	NA	NA	NA
Total Detected PCBs	ug/kg	1200	1400	8000	NA	< 39	< 45 J	< 37	NA	NA	NA	NA	NA
Other													
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	NA	NA	NA	< 13	8.6 J	< 12	< 13	< 13
Diesel Range Organics	mg/kg	NS	NS	NS	NA	< 9.9 J	20	< 9.8	< 11	1100	< 10	< 11	< 11

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Feature						4	4	5	5	5	5	5	5
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-120	ASB-120	ASB-121	ASB-121	ASB-122	ASB-122	ASB-199	ASB-199
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-120_4-6(20110824)	ASB-120_6-8(20110824)	ASB-121_5-7(20110824)	ASB-121_8-10(20110824)	ASB-122_2-4(20110824)	ASB-122_6-8(20110824)	ASB-199_0-2(20111104)	ASB-199_2-4(20111104)
Sample Date	Unit	SRV	SRV	SRV		8/24/2011	8/24/2011	8/24/2011	8/24/2011	8/24/2011	8/24/2011	11/4/2011	11/4/2011
Depth Interval						4-6 ft	6-8 ft	5-7 ft	8-10 ft	2-4 ft	6-8 ft	0-2 ft	2-4 ft
VOCs													
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	< 320	< 300	**31000**	**110000**	84 J	**64000**	< 260	< 270
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	33 J	99 J	< 1400	< 3400	< 270	< 1600	< 260	< 270
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	< 320	< 300	**9700**	**35000**	59 J	**20000**	< 260	< 270
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	< 1300	< 1200	< 5500	< 14000	< 1100	< 6500	88 J	82 J
Benzene	ug/kg	6000	14000	10000	NA	< 320	< 300	2900	**15000**	1400	**9200**	< 260	< 270
Butylbenzene	ug/kg	30000	70000	92000	NA	< 320	< 300	2200	7200	< 270	4300	< 260	< 270
Carbon disulfide	ug/kg	65000	160000	190000	NA	67 J	55 J	< 1400	< 3400	< 270	< 1600	< 260	< 270
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	< 320	< 300	< 1400	< 3400	< 270	< 1600	< 260	< 270
Cyclohexane	ug/kg	NS	NS	NS	NA	< 650	< 600	11000	35000	820	24000	< 520	< 550
Ethylbenzene	ug/kg	200000	200000	200000	NA	< 320	< 300	18000	70000	51 J	36000	< 260	< 270
Isopropylbenzene	ug/kg	30000	74000	87000	NA	< 320	< 300	1300 J	4800	30 J	2600	< 260	< 270
Methyl acetate	ug/kg	NS	NS	NS	NA	290 J	81 J	< 2800	< 6900	81 J	< 3300	57 J	30 J
Methylcyclohexane	ug/kg	NS	NS	NS	NA	< 650	< 600	12000	36000	590	19000	< 520	< 550
Methylene chloride	ug/kg	97000	270000	158000	NA	< 320	< 300	< 1400	< 3400	100 J	< 1600	< 260	< 270
Naphthalene	ug/kg	10000	24000	28000	NA	< 320	< 300	2900	**11000**	< 270	6300	< 260	< 270
n-Propylbenzene	ug/kg	30000	70000	93000	NA	< 320	< 300	6500	23000	110 J	13000	< 260	< 270
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	< 320	< 300	220 J	740 J	< 270	410 J	< 260	< 270
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	< 320	< 300	570 J	1900 J	< 270	1100 J	< 260	< 270
Styrene	ug/kg	210000	500000	600000	NA	< 320	< 300	< 1400	< 3400	< 270	< 1600	< 260	< 270
Tetrachloroethene	ug/kg	72000	145000	131000	NA	< 320	< 300	< 1400	< 3400	< 270	< 1600	< 260	< 270
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	< 1300	< 1200	< 5500	< 14000	< 1100	< 6500	< 1000	< 1100
Toluene	ug/kg	107000	260000	305000	NA	< 320	< 300	16000	**120000**	36 J	28000	< 260	< 270
Trichloroethene	ug/kg	29000	82000	46000	NA	< 320	< 300	< 1400	< 3400	< 270	< 1600	< 260	< 270
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	< 650	< 600	**61000**	**240000**	620	**120000**	< 520	< 550
Xylene, -o**	ug/kg	45000	110000	110000	NA	< 320	< 300	21000	**87000**	82 J	42000	< 260	< 270
Total Xylenes*	ug/kg	45000	110000	110000	NA	ND	ND	**82000**	**327000**	702	**162000**	ND	ND
SVOCs													
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	NA	NA	1600 J	4200	18 J	2500	< 370	< 360
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	NA	NA	180 J	120 J	35 J	33 J	< 370	< 360
Acenaphthylene	ug/kg	NS	NS	NS	NA	NA	NA	48 J	< 1900	4.2 J	< 860	< 370	< 360
Acetophenone	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	ug/kg	7880000	10000000	45400000	NA	NA	NA	1000 J	160 J	66 J	< 860	< 370	< 360
Benzaldehyde	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	NA	NA	2400	110 J	86 J	< 860	20 J	< 360
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	NA	NA	4500	250 J	170 J	< 860	19 J	< 360
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	NA	NA	**4300**	200 J	150 J	< 860	21 J	< 360
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	NA	NA	5200	250 J	170 J	< 860	34 J	< 360
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	NA	NA	3400	160 J	98 J	< 860	4.9 J	< 360
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	ug/kg	700000	720000	1310000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	NS	NS	NS	NA	NA	NA	4300	220 J	180 J	< 860	24 J	< 360
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	NA	NA	< 1900	< 1900	< 390	< 860	< 370	< 360
Dibenzofuran	ug/kg	104000	130000	810000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	NA	NA	7400	550 J	420	22 J	39 J	< 360
Fluorene	ug/kg	850000	1200000	4120000	NA	NA	NA	280 J	140 J	39 J	45 J	< 370	< 360
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	NA	NA	2400	95 J	72 J	< 860	13 J	< 360
Naphthalene	ug/kg	10000	24000	28000	NA	NA	NA	1200 J	3000	25 J	1900	< 370	< 360
Phenanthrene	ug/kg	NS	NS	NS	NA	NA	NA	3000	510 J	350 J	69 J	14 J	< 360
Pyrene	ug/kg	890000	1060000	5800000	NA	NA	NA	5200	440 J	330 J	25 J	29 J	< 360
Metals													
Aluminum	mg/kg	30000	40000	100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	12	16	100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	9	11	20	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg	1100	1100	18000	NA	NA	NA	NA	NA	NA	NA	NA	NA

Feature						4	4	5	5	5	5	5	5
Location ID		**Tier 1**	**Tier 2**	**Tier 2**	**TCLP**	**ASB-120**	**ASB-120**	**ASB-121**	**ASB-121**	**ASB-122**	**ASB-122**	**ASB-199**	**ASB-199**
Sample ID		**Residential**	**Recreational**	**Industrial**	**Criteria**	**ASB-120_4-6(20110824)**	**ASB-120_6-8(20110824)**	**ASB-121_5-7(20110824)**	**ASB-121_8-10(20110824)**	**ASB-122_2-4(20110824)**	**ASB-122_6-8(20110824)**	**ASB-199_0-2(20111104)**	**ASB-199_2-4(20111104)**
Sample Date	**Unit**	**SRV**	**SRV**	**SRV**		**8/24/2011**	**8/24/2011**	**8/24/2011**	**8/24/2011**	**8/24/2011**	**8/24/2011**	**11/4/2011**	**11/4/2011**
Depth Interval						**4-6 ft**	**6-8 ft**	**5-7 ft**	**8-10 ft**	**2-4 ft**	**6-8 ft**	**0-2 ft**	**2-4 ft**
Beryllium	mg/kg	55	75	230	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	25	35	200	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	600	800	2600	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	100	100	9000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	9000	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	300	300	700	NA	11	5.8	31	32	14	8	9.8	2.8
Magnesium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	mg/kg	3600	5000	8100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	0.5	1.2	1.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	560	800	2500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	160	200	1300	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	160	200	1300	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	3	3	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	30	40	250	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	8700	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals - TCLP													
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	NA	NA	NA	NA
PCBs													
Aroclor 1248	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other													
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	< 13	< 12	820	4000	57	2300	< 11	< 11
Diesel Range Organics	mg/kg	NS	NS	NS	NA	< 12	< 10	42	12	< 10	26	4.3 J	2.3 J

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Table 6. Summary of Detected Constituents in Soil Samples
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature						5	5	8	8	8	9	9	9
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-200	ASB-200	ASB-179	ASB-180	ASB-180	ASB-177	ASB-181	ASB-182
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-200_0-2(20111104)	ASB-200_4-6(20111104)	ASB-179_0-2(20110908)	ASB-180_0-2(20110908)	ASB-180_2-4(20110908)	ASB-177_4-6(20110908)	ASB-181_6-8(20110909)	ASB-182_2-4(20110909)
Sample Date	Unit	SRV	SRV	SRV		11/4/2011	11/4/2011	9/8/2011	9/8/2011	9/8/2011	9/8/2011	9/9/2011	9/9/2011
Depth Interval						0-2 ft	4-6 ft	0-2 ft	0-2 ft	2-4 ft	4-6 ft	6-8 ft	2-4 ft
VOCs													
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	< 250	< 270	< 280	< 300	< 270	13 J	< 290	**170000**
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	*< 15000*
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	**37000**
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	< 1000	< 1100	< 1100	< 1200	< 1100	< 1100	< 1100	< 59000
Benzene	ug/kg	6000	14000	10000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	*< 15000*
Butylbenzene	ug/kg	30000	70000	92000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	**98000**
Carbon disulfide	ug/kg	65000	160000	190000	NA	< 250	< 270	< 280	< 300	< 270	< 270	75 J	< 15000
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	2600 J
Cyclohexane	ug/kg	NS	NS	NS	NA	< 500	< 540	< 560	< 600	< 540	< 540	< 570	< 29000
Ethylbenzene	ug/kg	200000	200000	200000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	120000
Isopropylbenzene	ug/kg	30000	74000	87000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	5500 J
Methyl acetate	ug/kg	NS	NS	NS	NA	28 J	< 540	< 560	< 600	< 540	< 540	500 J	3400 J
Methylcyclohexane	ug/kg	NS	NS	NS	NA	< 500	< 540	< 560	< 600	< 540	< 540	< 570	7100 J
Methylene chloride	ug/kg	97000	270000	158000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	< 15000
Naphthalene	ug/kg	10000	24000	28000	NA	< 250	< 270	< 280	< 300	< 270	< 270	29 J	**380000**
n-Propylbenzene	ug/kg	30000	70000	93000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	16000
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	6600 J
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	8500 J
Styrene	ug/kg	210000	500000	600000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	< 15000
Tetrachloroethene	ug/kg	72000	145000	131000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	< 15000
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	< 1000	< 1100	< 1100	< 1200	< 1100	< 1100	< 1100	< 59000
Toluene	ug/kg	107000	260000	305000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	56000
Trichloroethene	ug/kg	29000	82000	46000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	< 15000
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	< 500	< 540	< 560	< 600	< 540	< 540	< 570	**340000**
Xylene, -o**	ug/kg	45000	110000	110000	NA	< 250	< 270	< 280	< 300	< 270	< 270	< 290	**150000**
Total Xylenes*	ug/kg	45000	110000	110000	NA	ND	ND	ND	ND	ND	ND	ND	**490000**
SVOCs													
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Acenaphthylene	ug/kg	NS	NS	NS	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Acetophenone	ug/kg	NS	NS	NS	NA	NA	NA	< 400	< 400	< 390	NA	NA	NA
Anthracene	ug/kg	7880000	10000000	45400000	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Benzaldehyde	ug/kg	NS	NS	NS	NA	NA	NA	< 400	< 400	< 390	NA	NA	NA
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	NA	NA	< 400	< 400	< 390	NA	NA	NA
Carbazole	ug/kg	700000	720000	1310000	NA	NA	NA	< 400	< 400	< 390	NA	NA	NA
Chrysene	ug/kg	NS	NS	NS	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Dibenzofuran	ug/kg	104000	130000	810000	NA	NA	NA	< 400	< 400	< 390	NA	NA	NA
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Fluorene	ug/kg	850000	1200000	4120000	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Naphthalene	ug/kg	10000	24000	28000	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Phenanthrene	ug/kg	NS	NS	NS	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Pyrene	ug/kg	890000	1060000	5800000	NA	< 350	< 380	< 400	< 400	< 390	NA	NA	NA
Metals													
Aluminum	mg/kg	30000	40000	100000	NA	NA	NA	8900	7700	7300	3500	12000	8800
Antimony	mg/kg	12	16	100	NA	NA	NA	< 0.89	< 1.2	< 1	< 0.98	3.9	7.2 J
Arsenic	mg/kg	9	11	20	NA	NA	NA	3.1	3.1	3	2.2	6.8	7.2
Barium	mg/kg	1100	1100	18000	NA	NA	NA	26	24	21	29	130	900 J

Table 6. Summary of Detected Constituents in Soil Samples
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature						5	5	8	8	8	9	9	9
Location ID		**Tier 1**	**Tier 2**	**Tier 2**	**TCLP**	**ASB-200**	**ASB-200**	**ASB-179**	**ASB-180**	**ASB-180**	**ASB-177**	**ASB-181**	**ASB-182**
Sample ID		**Residential**	**Recreational**	**Industrial**	**Criteria**	**ASB-200_0-2(20111104)**	**ASB-200_4-6(20111104)**	**ASB-179_0-2(20110908)**	**ASB-180_0-2(20110908)**	**ASB-180_2-4(20110908)**	**ASB-177_4-6(20110908)**	**ASB-181_6-8(20110909)**	**ASB-182_2-4(20110909)**
Sample Date	**Unit**	**SRV**	**SRV**	**SRV**		**11/4/2011**	**11/4/2011**	**9/8/2011**	**9/8/2011**	**9/8/2011**	**9/8/2011**	**9/9/2011**	**9/9/2011**
Depth Interval						**0-2 ft**	**4-6 ft**	**0-2 ft**	**0-2 ft**	**2-4 ft**	**4-6 ft**	**6-8 ft**	**2-4 ft**
Beryllium	mg/kg	55	75	230	NA	NA	NA	0.42 J	0.46 J	0.52	< 0.49	0.86	0.68
Cadmium	mg/kg	25	35	200	NA	NA	NA	< 0.18	< 0.23	< 0.21	< 0.2	0.14 J	2.5
Calcium	mg/kg	NS	NS	NS	NA	NA	NA	16000	16000	9200	37000	4600	15000 J
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	NA	NA	18	15	14	9.2	19	86 J
Cobalt	mg/kg	600	800	2600	NA	NA	NA	9.2	11	12	5.7	18	13
Copper	mg/kg	100	100	9000	NA	NA	NA	32	20	19	9.5	16	33
Iron	mg/kg	9000	12000	75000	NA	NA	NA	**13000**	**14000**	**14000**	**9700**	**21000**	**17000**
Lead	mg/kg	300	300	700	NA	1.9	3.5	3	2.6	2.2	5.9	66	**700**
Magnesium	mg/kg	NS	NS	NS	NA	NA	NA	5400	8200	6100	9300	3700	5100
Manganese	mg/kg	3600	5000	8100	NA	NA	NA	170	210	150	300	200	390
Mercury	mg/kg	0.5	1.2	1.5	NA	NA	NA	< 0.1	< 0.1	< 0.12	< 0.11	0.052 J	0.042 J
Nickel	mg/kg	560	800	2500	NA	NA	NA	19	22	25	12	30	25
Potassium	mg/kg	NS	NS	NS	NA	NA	NA	3900	3800	4200	910	2500	3700
Selenium	mg/kg	160	200	1300	NA	NA	NA	< 0.44	< 0.58	< 0.52	< 0.49	0.54 J	1.2
Silver	mg/kg	160	200	1300	NA	NA	NA	< 0.44	< 0.58	< 0.52	< 0.49	< 0.6	< 0.6
Sodium	mg/kg	NS	NS	NS	NA	NA	NA	290 J	330 J	250 J	100 J	300 J	490 J
Thallium	mg/kg	3	3	21	NA	NA	NA	< 0.89	< 1.2	< 1	< 0.98	< 1.2	< 1.2
Vanadium	mg/kg	30	40	250	NA	NA	NA	10	8.2	5.4	13	27	10
Zinc	mg/kg	8700	12000	75000	NA	NA	NA	18	22	19	19	64	670
Metals - TCLP													
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	NA	NA	NA	NA
PCBs													
Aroclor 1248	ug/kg	1200	1400	8000	NA	NA	NA	< 40	< 40	< 39	NA	NA	NA
Aroclor 1260	ug/kg	1200	1400	8000	NA	NA	NA	< 40	< 40	< 39	NA	NA	NA
Total Detected PCBs	ug/kg	1200	1400	8000	NA	NA	NA	< 40	< 40	< 39	NA	NA	NA
Other													
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	< 10	< 11	< 12	< 11	< 12	3 J	190	6200 J
Diesel Range Organics	mg/kg	NS	NS	NS	NA	2 J	2.1 J	< 10 J	< 10 J	< 10 J	20 J	56	3600 J

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Table 6. Summary of Detected Constituents in Soil Samples
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature						9	10	10	10	10	10	10	10
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-183	ASB-165	ASB-166	ASB-167	ASB-167	ASB-167	ASB-170	ASB-170
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-183_0-2(20110909)	ASB-165_0-2(20110906)	ASB-166_2-4(20110906)	ASB-167_0-2(20110906)	ASB-167_6-8(20110906)	ASB-167_8-10(20110906)	ASB-170_0-2(20110907)	ASB-170_4-6(20110907)
Sample Date	Unit	SRV	SRV	SRV		9/9/2011	9/6/2011	9/6/2011	9/6/2011	9/6/2011	9/6/2011	9/7/2011	9/7/2011
Depth Interval						0-2 ft	0-2 ft	2-4 ft	0-2 ft	6-8 ft	8-10 ft	0-2 ft	4-6 ft
VOCs													
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	< 240	7.4 J	250	19 J	< 300	< 3300	24 J	< 280
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	< 240	< 270	< 250	< 260	< 300	< 3300	< 250	< 280
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	< 240	< 270	77 J	< 260	< 300	< 3300	7.9 J	< 280
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	< 960	< 1100	< 1000	< 1000	< 1200	< 13000	< 1000	< 1100
Benzene	ug/kg	6000	14000	10000	NA	< 240	< 270	< 250	< 260	< 300	< 3300	< 250	< 280
Butylbenzene	ug/kg	30000	70000	92000	NA	< 240	< 270	< 250	< 260	< 300	7400 J	< 250	< 280
Carbon disulfide	ug/kg	65000	160000	190000	NA	< 240	< 270	48 J	< 260	< 300	600 J	< 250	< 280
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	< 240	< 270	< 250	< 260	< 300	< 3300	< 250	< 280
Cyclohexane	ug/kg	NS	NS	NS	NA	< 480	< 540	62 J	< 510	< 590	6300 J	< 500	< 560
Ethylbenzene	ug/kg	200000	200000	200000	NA	< 240	< 270	11 J	< 260	< 300	1100 J	9.6 J	< 280
Isopropylbenzene	ug/kg	30000	74000	87000	NA	< 240	< 270	57 J	< 260	36 J	8500 J	< 250	< 280
Methyl acetate	ug/kg	NS	NS	NS	NA	73 J	86 J	140 J	< 510	< 590	< 6500	< 500	230 J
Methylcyclohexane	ug/kg	NS	NS	NS	NA	< 480	< 540	880	24 J	49 J	54000 J	63 J	< 560
Methylene chloride	ug/kg	97000	270000	158000	NA	< 240	< 270	< 250	< 260	< 300	< 3300	< 250	< 280
Naphthalene	ug/kg	10000	24000	28000	NA	10 J	< 270	2100	97 J	< 300	1200 J	150 J	< 280
n-Propylbenzene	ug/kg	30000	70000	93000	NA	< 240	< 270	50 J	< 260	< 300	14000 J	< 250	< 280
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	< 240	< 270	79 J	< 260	< 300	< 3300	< 250	< 280
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	< 240	< 270	110 J	< 260	17 J	7600 J	< 250	< 280
Styrene	ug/kg	210000	500000	600000	NA	< 240	< 270	< 250	< 260	< 300	< 3300	< 250	< 280
Tetrachloroethene	ug/kg	72000	145000	131000	NA	< 240	< 270	< 250	< 260	< 300	< 3300	< 250	< 280
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	< 960	< 1100	< 1000	< 1000	< 1200	< 13000	< 1000	< 1100
Toluene	ug/kg	107000	260000	305000	NA	< 240	< 270	< 250	< 260	< 300	< 3300	27 J	< 280
Trichloroethene	ug/kg	29000	82000	46000	NA	< 240	< 270	< 250	< 260	< 300	< 3300	< 250	< 280
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	6.9 J	< 540	79 J	17 J	< 590	< 6500	41 J	< 560
Xylene, -o**	ug/kg	45000	110000	110000	NA	< 240	< 270	< 250	11 J	< 300	< 3300	24 J	< 280
Total Xylenes*	ug/kg	45000	110000	110000	NA	6.9	ND	79	28	ND	ND	65	ND
SVOCs													
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	NA	96 J	440 J	160 J	< 400	1400 J	110 J	< 410
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	NA	210 J	180 J	< 2000	< 400	59 J	440 J	< 410
Acenaphthylene	ug/kg	NS	NS	NS	NA	NA	160 J	< 1800	< 2000	< 400	< 1900 J	20 J	< 410
Acetophenone	ug/kg	NS	NS	NS	NA	NA	< 2000	< 1800	< 2000	< 400	< 1900 J	< 1800	< 410
Anthracene	ug/kg	7880000	10000000	45400000	NA	NA	540 J	140 J	130 J	< 400	41 J	1000 J	11 J
Benzaldehyde	ug/kg	NS	NS	NS	NA	NA	< 2000	< 1800	< 2000	< 400	< 1900 J	< 1800	< 410
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	NA	720 J	140 J	< 2000	< 400	< 1900 J	1600 J	14 J
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	NA	1400 J	210 J	180 J	< 400	< 1900 J	2800	22 J
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	NA	1100 J	200 J	< 2000	< 400	< 1900 J	**2600**	21 J
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	NA	1400 J	290 J	160 J	< 400	< 1900 J	3300	29 J
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	NA	580 J	150 J	84 J	< 400	< 1900 J	1000 J	11 J
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	NA	< 2000	< 1800	< 2000	33 J	< 1900 J	160 J	28 J
Carbazole	ug/kg	700000	720000	1310000	NA	NA	< 2000	< 1800	< 2000	< 400	< 1900 J	480 J	< 410
Chrysene	ug/kg	NS	NS	NS	NA	NA	1300 J	240 J	180 J	< 400	< 1900 J	2400	23 J
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	NA	220 J	< 1800	< 2000	< 400	< 1900 J	530 J	< 410
Dibenzofuran	ug/kg	104000	130000	810000	NA	NA	120 J	110 J	51 J	< 400	< 1900 J	210 J	< 410
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	NA	2700	420 J	390 J	< 400	< 1900 J	5900	66 J
Fluorene	ug/kg	850000	1200000	4120000	NA	NA	280 J	150 J	77 J	< 400	80 J	370 J	5.4 J
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	NA	600 J	120 J	< 2000	< 400	< 1900 J	1500 J	12 J
Naphthalene	ug/kg	10000	24000	28000	NA	NA	70 J	340 J	150 J	< 400	550 J	110 J	< 410
Phenanthrene	ug/kg	NS	NS	NS	NA	NA	1900 J	610 J	390 J	< 400	150 J	3300	50 J
Pyrene	ug/kg	890000	1060000	5800000	NA	NA	2100	360 J	280 J	< 400	61 J	4400	55 J
Metals													
Aluminum	mg/kg	30000	40000	100000	NA	2400	2700	2900	6600	6700	11000	3700	9700
Antimony	mg/kg	12	16	100	NA	< 1	7.8	**410**	**400**	1.4	< 1.4 J	< 1.4	< 1.2
Arsenic	mg/kg	9	11	20	NA	2.6	**97**	4.5	8.1	7.2	4.4	4.8	5.8
Barium	mg/kg	1100	1100	18000	NA	19 J	120	360	150	22 J	140	57	55

Table 6. Summary of Detected Constituents in Soil Samples
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature						**9**	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Location ID		**Tier 1**	**Tier 2**	**Tier 2**	**TCLP**	**ASB-183**	**ASB-165**	**ASB-166**	**ASB-167**	**ASB-167**	**ASB-167**	**ASB-170**	**ASB-170**
Sample ID		**Residential**	**Recreational**	**Industrial**	**Criteria**	**ASB-183_0-2(20110909)**	**ASB-165_0-2(20110906)**	**ASB-166_2-4(20110906)**	**ASB-167_0-2(20110906)**	**ASB-167_6-8(20110906)**	**ASB-167_8-10(20110906)**	**ASB-170_0-2(20110907)**	**ASB-170_4-6(20110907)**
Sample Date	**Unit**	**SRV**	**SRV**	**SRV**		**9/9/2011**	**9/6/2011**	**9/6/2011**	**9/6/2011**	**9/6/2011**	**9/6/2011**	**9/7/2011**	**9/7/2011**
Depth Interval						**0-2 ft**	**0-2 ft**	**2-4 ft**	**0-2 ft**	**6-8 ft**	**8-10 ft**	**0-2 ft**	**4-6 ft**
Beryllium	mg/kg	55	75	230	NA	0.23 J	< 0.53	< 0.46	0.45 J	0.59	0.82	0.28 J	0.64
Cadmium	mg/kg	25	35	200	NA	0.11 J	0.62	**44**	19 J	< 0.24	0.16 J	0.19 J	< 0.24
Calcium	mg/kg	NS	NS	NS	NA	110000	41000	38000	38000	11000	9000	48000	37000
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	5.5	14	**140**	25 J	13	16	9.2	17
Cobalt	mg/kg	600	800	2600	NA	3.9 J	3.7 J	2.1 J	7.6	13	8.4	4.4 J	14
Copper	mg/kg	100	100	9000	NA	9.5	17	20	19	14	18	13	12
Iron	mg/kg	9000	12000	75000	NA	**10000**	**14000**	6800	**17000**	**13000**	**14000**	**12000**	**17000**
Lead	mg/kg	300	300	700	NA	8.9	83	**720**	**440**	2.6	9.9	53	4.5
Magnesium	mg/kg	NS	NS	NS	NA	59000	5800	3900	11000	5700	3900	24000	11000
Manganese	mg/kg	3600	5000	8100	NA	810	300	190	610	190	290	510	470
Mercury	mg/kg	0.5	1.2	1.5	NA	< 0.096	0.074 J	0.062 J	0.052 J	0.021 J	< 0.14	0.051 J	0.021 J
Nickel	mg/kg	560	800	2500	NA	15	9.1	5.7	17	24	18	10	23
Potassium	mg/kg	NS	NS	NS	NA	620	500 J	340 J	870	3700	2000	680	4000
Selenium	mg/kg	160	200	1300	NA	< 0.51	0.68	14	6.4	< 0.59	1.1	< 0.49	< 0.59
Silver	mg/kg	160	200	1300	NA	0.1 J	0.17 J	< 0.46	0.13 J	< 0.59	< 0.71	< 0.49	< 0.59
Sodium	mg/kg	NS	NS	NS	NA	180 J	470 J	940	80 J	180 J	210 J	< 490	220 J
Thallium	mg/kg	3	3	21	NA	< 1	< 1.1	< 0.93	< 1.1	< 1.2	< 1.4	< 0.98	< 1.2
Vanadium	mg/kg	30	40	250	NA	15	12	9.6	27	6.8	21	17	15
Zinc	mg/kg	8700	12000	75000	NA	31	79	190	75	21	35	71	29
Metals - TCLP													
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	0.0034 J	NA	NA	NA
PCBs													
Aroclor 1248	ug/kg	1200	1400	8000	NA	NA	< 40	< 36	84	< 40	< 47	< 35	< 41
Aroclor 1260	ug/kg	1200	1400	8000	NA	NA	< 40	< 36	44	< 40	< 47	60	< 41
Total Detected PCBs	ug/kg	1200	1400	8000	NA	NA	< 40	< 36	128	< 40	< 47	60	< 41
Other													
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	2.1 J	2.2 J	33	6.3 J	22	3000 J	NA	2.4 J
Diesel Range Organics	mg/kg	NS	NS	NS	NA	190	100	NA	170	3.8 J	1300	NA	8.2 J

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Table 6. Summary of Detected Constituents in Soil Samples
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature						10	11	11	11	11	11	12,47	16
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-171	ASB-172	ASB-173	ASB-174	ASB-175	ASB-176	ASB-162	ASB-157
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-171_1-3(20110907)	ASB-172_1-3(20110907)	ASB-173_1-3(20110907)	ASB-174_4-6(20110907)	ASB-175_4-6(20110908)	ASB-176_8-10(20110908)	ASB-162_1-3(20110906)	ASB-157_0-2(20110901)
Sample Date	Unit	SRV	SRV	SRV		9/7/2011	9/7/2011	9/7/2011	9/7/2011	9/8/2011	9/8/2011	9/6/2011	9/1/2011
Depth Interval						1-3 ft	1-3 ft	1-3 ft	4-6 ft	4-6 ft	8-10 ft	1-3 ft	0-2 ft
VOCs													
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	< 270	14 J	< 270	< 280	< 1000	**440000**	< 290	< 240
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	< 270	< 270	< 270	< 280	< 1000	< *21000*	< 290	< 240
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	< 270	7.4 J	< 270	< 280	< 1000	< *21000*	< 290	< 240
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	< 1100	< 1100	< 1100	< 1100	< 4100	< 83000	< 1200	< 970
Benzene	ug/kg	6000	14000	10000	NA	< 270	< 270	< 270	< 280	< 1000	< *21000*	< 290	< 240
Butylbenzene	ug/kg	30000	70000	92000	NA	< 270	< 270	< 270	< 280	19000	13000 J	< 290	< 240
Carbon disulfide	ug/kg	65000	160000	190000	NA	53 J	< 270	52 J	< 280	200 J	< 21000	54 J	< 240
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	< 270	< 270	< 270	< 280	< 1000	< *21000*	< 290	< 240
Cyclohexane	ug/kg	NS	NS	NS	NA	< 540	< 540	< 550	< 570	430 J	16000 J	< 580	< 480
Ethylbenzene	ug/kg	200000	200000	200000	NA	< 270	< 270	< 270	< 280	< 1000	43000	< 290	< 240
Isopropylbenzene	ug/kg	30000	74000	87000	NA	< 270	< 270	< 270	< 280	3800	28000	< 290	< 240
Methyl acetate	ug/kg	NS	NS	NS	NA	< 540	< 540	< 550	230 J	860 J	< 42000	100 J	35 J
Methylcyclohexane	ug/kg	NS	NS	NS	NA	< 540	< 540	< 550	< 570	14000	83000	< 580	< 480
Methylene chloride	ug/kg	97000	270000	158000	NA	< 270	< 270	< 270	< 280	< 1000	< 21000	< 290	< 240
Naphthalene	ug/kg	10000	24000	28000	NA	< 270	< 270	< 270	12 J	**14000**	**41000**	< 290	< 240
n-Propylbenzene	ug/kg	30000	70000	93000	NA	< 270	< 270	< 270	< 280	8100	29000	< 290	< 240
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	< 270	< 270	< 270	< 280	2100	16000 J	< 290	< 240
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	< 270	< 270	< 270	< 280	9900	24000	< 290	< 240
Styrene	ug/kg	210000	500000	600000	NA	< 270	< 270	< 270	< 280	< 1000	< 21000	< 290	< 240
Tetrachloroethene	ug/kg	72000	145000	131000	NA	< 270	< 270	< 270	< 280	< 1000	< 21000	69 J	< 240
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	< 1100	< 1100	< 1100	< 1100	< 4100	< 83000	< 1200	< 970
Toluene	ug/kg	107000	260000	305000	NA	< 270	< 270	< 270	< 280	< 1000	< 21000	< 290	18 J
Trichloroethene	ug/kg	29000	82000	46000	NA	< 270	< 270	< 270	< 280	< 1000	< 21000	16 J	< 240
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	< 540	13 J	< 550	< 570	< 2000	< 42000	< 580	< 480
Xylene, -o**	ug/kg	45000	110000	110000	NA	< 270	< 270	< 270	< 280	< 1000	< 21000	< 290	< 240
Total Xylenes*	ug/kg	45000	110000	110000	NA	ND	13	ND	ND	ND	ND	ND	ND
SVOCs													
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	10 J	NA	NA	NA	NA	NA	< 410	< 350
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	110 J	NA	NA	NA	NA	NA	< 410	< 350
Acenaphthylene	ug/kg	NS	NS	NS	NA	38 J	NA	NA	NA	NA	NA	< 410	< 350
Acetophenone	ug/kg	NS	NS	NS	NA	< 960	NA	NA	NA	NA	NA	NA	NA
Anthracene	ug/kg	7880000	10000000	45400000	NA	610 J	NA	NA	NA	NA	NA	< 410	< 350
Benzaldehyde	ug/kg	NS	NS	NS	NA	< 960	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	450 J	NA	NA	NA	NA	NA	< 410	16 J
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	1300	NA	NA	NA	NA	NA	< 410	23 J
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	930 J	NA	NA	NA	NA	NA	< 410	22 J
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	1100	NA	NA	NA	NA	NA	< 410	34 J
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	460 J	NA	NA	NA	NA	NA	< 410	12 J
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	< 960	NA	NA	NA	NA	NA	NA	NA
Carbazole	ug/kg	700000	720000	1310000	NA	< 960	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	NS	NS	NS	NA	1200	NA	NA	NA	NA	NA	< 410	27 J
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	150 J	NA	NA	NA	NA	NA	< 410	4.6 J
Dibenzofuran	ug/kg	104000	130000	810000	NA	40 J	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	2900	NA	NA	NA	NA	NA	< 410	43 J
Fluorene	ug/kg	850000	1200000	4120000	NA	200 J	NA	NA	NA	NA	NA	< 410	< 350
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	400 J	NA	NA	NA	NA	NA	< 410	19 J
Naphthalene	ug/kg	10000	24000	28000	NA	< 960	NA	NA	NA	NA	NA	9.4 J	< 350
Phenanthrene	ug/kg	NS	NS	NS	NA	2000	NA	NA	NA	NA	NA	< 410	20 J
Pyrene	ug/kg	890000	1060000	5800000	NA	2300	NA	NA	NA	NA	NA	< 410	32 J
Metals													
Aluminum	mg/kg	30000	40000	100000	NA	7900	4900	5000	6900	2800	8100	NA	NA
Antimony	mg/kg	12	16	100	NA	< 1	**32**	< 1.3	< 0.97	**18 J**	0.62 J	NA	NA
Arsenic	mg/kg	9	11	20	NA	**600**	6.5	4.6	6.8	7.7	2.7	3.3	NA
Barium	mg/kg	1100	1100	18000	NA	92	480	76	29	1100	83	39	NA

Feature						10	11	11	11	11	11	12,47	16
Location ID		**Tier 1**	**Tier 2**	**Tier 2**	**TCLP**	**ASB-171**	**ASB-172**	**ASB-173**	**ASB-174**	**ASB-175**	**ASB-176**	**ASB-162**	**ASB-157**
Sample ID		**Residential**	**Recreational**	**Industrial**	**Criteria**	**ASB-171_1-3(20110907)**	**ASB-172_1-3(20110907)**	**ASB-173_1-3(20110907)**	**ASB-174_4-6(20110907)**	**ASB-175_4-6(20110908)**	**ASB-176_8-10(20110908)**	**ASB-162_1-3(20110906)**	**ASB-157_0-2(20110901)**
Sample Date	**Unit**	**SRV**	**SRV**	**SRV**		**9/7/2011**	**9/7/2011**	**9/7/2011**	**9/7/2011**	**9/8/2011**	**9/8/2011**	**9/6/2011**	**9/1/2011**
Depth Interval						**1-3 ft**	**1-3 ft**	**1-3 ft**	**4-6 ft**	**4-6 ft**	**8-10 ft**	**1-3 ft**	**0-2 ft**
Beryllium	mg/kg	55	75	230	NA	0.43 J	0.4 J	0.41 J	0.59	< 0.59	0.23 J	NA	NA
Cadmium	mg/kg	25	35	200	NA	< 0.2	1.3	0.16 J	< 0.19	0.77	0.15 J	< 0.23	NA
Calcium	mg/kg	NS	NS	NS	NA	6000	34000	30000	21000	16000	9200	NA	NA
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	12	16	12	14	19	13	20	NA
Cobalt	mg/kg	600	800	2600	NA	8.5	6.2	8.6	11	2.6 J	8.3	NA	NA
Copper	mg/kg	100	100	9000	NA	11	40	15	**170**	73 J	10	NA	NA
Iron	mg/kg	9000	12000	75000	NA	**15000**	**16000**	**14000**	**15000**	6600	**11000**	NA	NA
Lead	mg/kg	300	300	700	NA	6.2	**3000**	39	5.3	**1000**	6.4	3.1	NA
Magnesium	mg/kg	NS	NS	NS	NA	1700	12000	7400	6900	4000	3000	NA	NA
Manganese	mg/kg	3600	5000	8100	NA	710	470	530	230	170	470	NA	NA
Mercury	mg/kg	0.5	1.2	1.5	NA	0.062 J	0.079 J	0.017 J	< 0.11	**6.1**	< 0.12	< 0.12	NA
Nickel	mg/kg	560	800	2500	NA	15	15	17	21	6	15	NA	NA
Potassium	mg/kg	NS	NS	NS	NA	1500	1200	1100	3500	490 J	510 J	NA	NA
Selenium	mg/kg	160	200	1300	NA	1	0.59	< 0.54	< 0.48	0.64	< 0.57	< 0.58	NA
Silver	mg/kg	160	200	1300	NA	< 0.51	< 0.51	< 0.54	< 0.48	< 0.59	< 0.57	< 0.58	NA
Sodium	mg/kg	NS	NS	NS	NA	470 J	120 J	< 540	220 J	140 J	86 J	NA	NA
Thallium	mg/kg	3	3	21	NA	0.57 J	< 1	< 1.1	< 0.97	0.71 J	< 1.1	NA	NA
Vanadium	mg/kg	30	40	250	NA	28	16	16	6.9	8.5	21	NA	NA
Zinc	mg/kg	8700	12000	75000	NA	27	400	40	22	390	29	NA	NA
Metals - TCLP													
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	NA	NA	NA	NA
PCBs													
Aroclor 1248	ug/kg	1200	1400	8000	NA	< 38	NA	NA	NA	NA	NA	< 41	NA
Aroclor 1260	ug/kg	1200	1400	8000	NA	< 38	NA	NA	NA	NA	NA	< 41	NA
Total Detected PCBs	ug/kg	1200	1400	8000	NA	< 38	NA	NA	NA	NA	NA	< 41	NA
Other													
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	1.8 J	2.9 J	< 13	< 13	5800	4200	NA	< 10
Diesel Range Organics	mg/kg	NS	NS	NS	NA	8.2 J	52	25	< 9.4	2600 J	500 J	2 J	< 9.2

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Table 6. Summary of Detected Constituents in Soil Samples
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature						16	16	16	16	16	16	16	21
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-158	ASB-158	ASB-159	ASB-159	ASB-160	ASB-160	ASB-161	ASB-168
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-158_02(20110901)	ASB-158_4-6(20110901)	ASB-159_2-4(20110902)	ASB-159_5-7(20110902)	ASB-160_2-4(20110902)	ASB-160_5-7(20110902)	ASB-161_1-3(20110902)	ASB-168_0-2(20110907)
Sample Date	Unit	SRV	SRV	SRV		9/1/2011	9/1/2011	9/2/2011	9/2/2011	9/2/2011	9/2/2011	9/2/2011	9/7/2011
Depth Interval						02 ft	4-6 ft	2-4 ft	5-7 ft	2-4 ft	5-7 ft	1-3 ft	0-2 ft
VOCs													
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	15 J	13 J	67 J	**28000**	28 J	2900	< 270	< 200
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	< 250	< 240	< 290	< 1000	< 270	< 320	< 270	< 200
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	< 250	< 240	16 J	**5000**	< 270	400	< 270	< 200
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	< 1000	< 950	< 1200	< 4100	< 1100	< 1300	< 1100	< 810
Benzene	ug/kg	6000	14000	10000	NA	< 250	< 240	< 290	< 1000	< 270	< 320	< 270	< 200
Butylbenzene	ug/kg	30000	70000	92000	NA	< 250	< 240	< 290	4500	66 J	660	< 270	< 200
Carbon disulfide	ug/kg	65000	160000	190000	NA	< 250	< 240	59 J	190 J	57 J	80 J	< 270	< 200
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	< 250	< 240	< 290	< 1000	< 270	< 320	< 270	< 200
Cyclohexane	ug/kg	NS	NS	NS	NA	< 510	< 480	< 580	2800	< 540	< 630	< 540	< 400
Ethylbenzene	ug/kg	200000	200000	200000	NA	17 J	7.9 J	17 J	1500	16 J	310 J	< 270	< 200
Isopropylbenzene	ug/kg	30000	74000	87000	NA	< 250	< 240	< 290	860 J	28 J	180 J	< 270	< 200
Methyl acetate	ug/kg	NS	NS	NS	NA	79 J	28 J	190 J	210 J	200 J	470 J	60 J	< 400
Methylcyclohexane	ug/kg	NS	NS	NS	NA	39 J	< 480	50 J	6100	< 540	< 630	< 540	< 400
Methylene chloride	ug/kg	97000	270000	158000	NA	< 250	< 240	< 290	< 1000	< 270	< 320	< 270	< 200
Naphthalene	ug/kg	10000	24000	28000	NA	< 250	< 240	< 290	5200	< 270	630	< 270	< 200
n-Propylbenzene	ug/kg	30000	70000	93000	NA	< 250	< 240	30 J	3500	44 J	390	< 270	< 200
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	< 250	< 240	< 290	810 J	< 270	110 J	< 270	< 200
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	< 250	< 240	33 J	910 J	39 J	210 J	< 270	< 200
Styrene	ug/kg	210000	500000	600000	NA	13 J	< 240	< 290	< 1000	< 270	< 320	< 270	< 200
Tetrachloroethene	ug/kg	72000	145000	131000	NA	< 250	< 240	< 290	< 1000	< 270	< 320	< 270	< 200
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	< 1000	< 950	< 1200	< 4100	< 1100	< 1300	< 1100	< 810
Toluene	ug/kg	107000	260000	305000	NA	< 250	< 240	< 290	< 1000	< 270	< 320	< 270	< 200
Trichloroethene	ug/kg	29000	82000	46000	NA	< 250	< 240	< 290	< 1000	< 270	< 320	< 270	< 200
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	90 J	< 480	68 J	4800	36 J	700	< 540	< 400
Xylene, -o**	ug/kg	45000	110000	110000	NA	41 J	< 240	20 J	< 1000	< 270	38 J	< 270	< 200
Total Xylenes*	ug/kg	45000	110000	110000	NA	131	ND	88	4800	36	738	ND	ND
SVOCs													
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	48 J	6.7 J	230 J	1500 J	8.3 J	410 J	12 J	NA
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	23 J	< 360	< 1900	< 1900	12 J	< 960	< 880	NA
Acenaphthylene	ug/kg	NS	NS	NS	NA	12 J	< 360	< 1900	< 1900	< 370	< 960	< 880	NA
Acetophenone	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	ug/kg	7880000	10000000	45400000	NA	66 J	< 360	38 J	28 J	21 J	< 960	20 J	NA
Benzaldehyde	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	200 J	< 360	140 J	< 1900	98 J	< 960	70 J	NA
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	260 J	< 360	190 J	54 J	91 J	< 960	100 J	NA
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	260 J	< 360	230 J	45 J	95 J	< 960	110 J	NA
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	410	< 360	270 J	74 J	140 J	< 960	150 J	NA
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	140 J	< 360	120 J	36 J	96 J	< 960	76 J	NA
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	ug/kg	700000	720000	1310000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	NS	NS	NS	NA	280 J	< 360	200 J	69 J	100 J	< 960	110 J	NA
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	54 J	< 360	< 1900	< 1900	< 370	< 960	< 880	NA
Dibenzofuran	ug/kg	104000	130000	810000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	460	< 360	300 J	170 J	230 J	39 J	160 J	NA
Fluorene	ug/kg	850000	1200000	4120000	NA	21 J	< 360	29 J	25 J	9.8 J	< 960	< 880	NA
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	160 J	< 360	140 J	< 1900	78 J	< 960	66 J	NA
Naphthalene	ug/kg	10000	24000	28000	NA	36 J	< 360	250 J	460 J	6.2 J	290 J	< 880	NA
Phenanthrene	ug/kg	NS	NS	NS	NA	240 J	< 360	130 J	80 J	120 J	< 960	50 J	NA
Pyrene	ug/kg	890000	1060000	5800000	NA	380	< 360	270 J	140 J	170 J	37 J	140 J	NA
Metals													
Aluminum	mg/kg	30000	40000	100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	12	16	100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	9	11	20	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg	1100	1100	18000	NA	NA	NA	NA	NA	NA	NA	NA	NA

Feature						16	16	16	16	16	16	16	21
Location ID		**Tier 1**	**Tier 2**	**Tier 2**	**TCLP**	**ASB-158**	**ASB-158**	**ASB-159**	**ASB-159**	**ASB-160**	**ASB-160**	**ASB-161**	**ASB-168**
Sample ID		**Residential**	**Recreational**	**Industrial**	**Criteria**	**ASB-158_02(20110901)**	**ASB-158_4-6(20110901)**	**ASB-159_2-4(20110902)**	**ASB-159_5-7(20110902)**	**ASB-160_2-4(20110902)**	**ASB-160_5-7(20110902)**	**ASB-161_1-3(20110902)**	**ASB-168_0-2(20110907)**
Sample Date	**Unit**	**SRV**	**SRV**	**SRV**		**9/1/2011**	**9/1/2011**	**9/2/2011**	**9/2/2011**	**9/2/2011**	**9/2/2011**	**9/2/2011**	**9/7/2011**
Depth Interval						**02 ft**	**4-6 ft**	**2-4 ft**	**5-7 ft**	**2-4 ft**	**5-7 ft**	**1-3 ft**	**0-2 ft**
Beryllium	mg/kg	55	75	230	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	25	35	200	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	600	800	2600	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	100	100	9000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	9000	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	300	300	700	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	mg/kg	3600	5000	8100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	0.5	1.2	1.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	560	800	2500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	160	200	1300	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	160	200	1300	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	3	3	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	30	40	250	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	8700	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals - TCLP													
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	NA	NA	NA	NA
PCBs													
Aroclor 1248	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other													
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	< 11	< 11	53 J	790 J	8.6 J	160 J	1.6 J	1.4 J
Diesel Range Organics	mg/kg	NS	NS	NS	NA	49	< 9.1	100	290	18	150	< 8.7	110

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Feature						21	27	35,36,37,46	35,36,37,46	35,36,37,46	35,36,37,46	41,42	41,42
Location ID						ASB-168	ASB-169	ASB-185	ASB-185	ASB-186	ASB-186	ASB-196	ASB-197
Sample ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-168_4-6(20110907)	ASB-169_3-5(20110907)	ASB-185_0-2(20110909)	ASB-185_4-6(20110909)	ASB-186_0-2(20110909)	ASB-186_4-6(20110909)	ASB-196_4-6(20111104)	ASB-197_4-6(20111104)
Sample Date	Unit	Residential SRV	Recreational SRV	Industrial SRV	Criteria	9/7/2011	9/7/2011	9/9/2011	9/9/2011	9/9/2011	9/9/2011	11/4/2011	11/4/2011
Depth Interval						4-6 ft	3-5 ft	0-2 ft	4-6 ft	0-2 ft	4-6 ft	4-6 ft	4-6 ft
VOCs													
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	< 230	< 250	< 230	< 300	< 250	< 300	9.7 J	< 270
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	< 910	< 1000	< 900	< 1200	< 1000	< 1200	< 990	87 J
Benzene	ug/kg	6000	14000	10000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
Butylbenzene	ug/kg	30000	70000	92000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
Carbon disulfide	ug/kg	65000	160000	190000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
Cyclohexane	ug/kg	NS	NS	NS	NA	< 460	< 500	< 450	< 600	< 500	< 590	< 500	< 530
Ethylbenzene	ug/kg	200000	200000	200000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
Isopropylbenzene	ug/kg	30000	74000	87000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
Methyl acetate	ug/kg	NS	NS	NS	NA	< 460	< 500	47 J	< 600	500	< 590	55 J	57 J
Methylcyclohexane	ug/kg	NS	NS	NS	NA	< 460	< 500	< 450	< 600	< 500	< 590	18 J	< 530
Methylene chloride	ug/kg	97000	270000	158000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
Naphthalene	ug/kg	10000	24000	28000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
n-Propylbenzene	ug/kg	30000	70000	93000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
Styrene	ug/kg	210000	500000	600000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
Tetrachloroethene	ug/kg	72000	145000	131000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	< 910	< 1000	< 900	< 1200	< 1000	< 1200	< 990	< 1100
Toluene	ug/kg	107000	260000	305000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
Trichloroethene	ug/kg	29000	82000	46000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	< 460	< 500	< 450	< 600	< 500	< 590	7.6 J	< 530
Xylene, -o**	ug/kg	45000	110000	110000	NA	< 230	< 250	< 230	< 300	< 250	< 300	< 250	< 270
Total Xylenes*	ug/kg	45000	110000	110000	NA	ND	ND	ND	ND	ND	ND	7.6	ND
SVOCs													
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	NA	< 3500	< 350	< 420	< 340	< 420	< 1500	< 390
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	NA	< 3500	< 350	< 420	< 340	< 420	< 1500	< 390
Acenaphthylene	ug/kg	NS	NS	NS	NA	NA	< 3500	< 350	< 420	< 340	< 420	< 1500	< 390
Acetophenone	ug/kg	NS	NS	NS	NA	NA	< 3500	< 350	< 420	< 340	< 420	< 1500	< 390
Anthracene	ug/kg	7880000	10000000	45400000	NA	NA	140 J	< 350	< 420	< 340	< 420	< 1500	< 390
Benzaldehyde	ug/kg	NS	NS	NS	NA	NA	< 3500	< 350	< 420	< 340	< 420	< 1500	< 390
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	NA	190 J	< 350	< 420	< 340	< 420	< 1500	< 390
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	NA	350 J	< 350	< 420	< 340	< 420	< 1500	< 390
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	NA	300 J	< 350	< 420	< 340	< 420	< 1500	< 390
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	NA	450 J	< 350	< 420	< 340	< 420	< 1500	< 390
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	NA	180 J	< 350	< 420	< 340	< 420	< 1500	< 390
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	NA	< 3500	< 350	< 420	< 340	< 420	< 1500	< 390
Carbazole	ug/kg	700000	720000	1310000	NA	NA	< 3500	< 350	< 420	< 340	< 420	< 1500	< 390
Chrysene	ug/kg	NS	NS	NS	NA	NA	330 J	12 J	< 420	< 340	< 420	< 1500	< 390
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	NA	< 3500	< 350	< 420	< 340	< 420	< 1500	< 390
Dibenzofuran	ug/kg	104000	130000	810000	NA	NA	< 3500	< 350	< 420	< 340	< 420	< 1500	< 390
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	NA	910 J	< 350	< 420	< 340	< 420	< 1500	7.4 J
Fluorene	ug/kg	850000	1200000	4120000	NA	NA	43 J	< 350	< 420	< 340	< 420	< 1500	< 390
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	NA	180 J	< 350	< 420	< 340	< 420	< 1500	< 390
Naphthalene	ug/kg	10000	24000	28000	NA	NA	< 3500	< 350	< 420	< 340	< 420	< 1500	< 390
Phenanthrene	ug/kg	NS	NS	NS	NA	NA	540 J	< 350	< 420	< 340	< 420	< 1500	< 390
Pyrene	ug/kg	890000	1060000	5800000	NA	NA	630 J	14 J	< 420	< 340	< 420	26 J	6.2 J
Metals													
Aluminum	mg/kg	30000	40000	100000	NA	NA	NA	NA	NA	NA	NA	7400	8000
Antimony	mg/kg	12	16	100	NA	NA	NA	NA	NA	NA	NA	0.93 J	< 1
Arsenic	mg/kg	9	11	20	NA	NA	2.2	3.2	4.5	2.8	4.7	3.9	4.3
Barium	mg/kg	1100	1100	18000	NA	NA	21	61	27	39	20 J	31	27

Feature						21	27	35,36,37,46	35,36,37,46	35,36,37,46	35,36,37,46	41,42	41,42
Location ID		**Tier 1**	**Tier 2**	**Tier 2**	**TCLP**	**ASB-168**	**ASB-169**	**ASB-185**	**ASB-185**	**ASB-186**	**ASB-186**	**ASB-196**	**ASB-197**
Sample ID		**Residential**	**Recreational**	**Industrial**	**Criteria**	**ASB-168_4-6(20110907)**	**ASB-169_3-5(20110907)**	**ASB-185_0-2(20110909)**	**ASB-185_4-6(20110909)**	**ASB-186_0-2(20110909)**	**ASB-186_4-6(20110909)**	**ASB-196_4-6(20111104)**	**ASB-197_4-6(20111104)**
Sample Date	**Unit**	**SRV**	**SRV**	**SRV**		**9/7/2011**	**9/7/2011**	**9/9/2011**	**9/9/2011**	**9/9/2011**	**9/9/2011**	**11/4/2011**	**11/4/2011**
Depth Interval						**4-6 ft**	**3-5 ft**	**0-2 ft**	**4-6 ft**	**0-2 ft**	**4-6 ft**	**4-6 ft**	**4-6 ft**
Beryllium	mg/kg	55	75	230	NA	NA	NA	NA	NA	NA	NA	0.39 J	0.56
Cadmium	mg/kg	25	35	200	NA	NA	0.045 J	0.066 J	< 0.24	< 0.17	< 0.23	< 0.23	< 0.2
Calcium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	36000	19000
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	NA	8.8	8.9	19	14	15	15	14
Cobalt	mg/kg	600	800	2600	NA	NA	NA	NA	NA	NA	NA	7.8	12
Copper	mg/kg	100	100	9000	NA	NA	NA	NA	NA	NA	NA	14	22
Iron	mg/kg	9000	12000	75000	NA	NA	NA	NA	NA	NA	NA	**16000**	**14000**
Lead	mg/kg	300	300	700	NA	NA	6.6	4.4	2.6	2.7	2.7	9	3.2
Magnesium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	6700	10000
Manganese	mg/kg	3600	5000	8100	NA	NA	NA	NA	NA	NA	NA	220	260
Mercury	mg/kg	0.5	1.2	1.5	NA	NA	< 0.08	0.02 J	0.023 J	< 0.092	< 0.099	< 0.11	< 0.11
Nickel	mg/kg	560	800	2500	NA	NA	NA	NA	NA	NA	NA	18	23
Potassium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	2700	4400
Selenium	mg/kg	160	200	1300	NA	NA	< 0.49	< 0.52	< 0.61	< 0.43	< 0.57	< 0.57	< 0.51
Silver	mg/kg	160	200	1300	NA	NA	< 0.49	< 0.52	< 0.61	< 0.43	< 0.57	< 0.57	< 0.51
Sodium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	< 570	69 J
Thallium	mg/kg	3	3	21	NA	NA	NA	NA	NA	NA	NA	1.1	1.2
Vanadium	mg/kg	30	40	250	NA	NA	NA	NA	NA	NA	NA	12	4.7 J
Zinc	mg/kg	8700	12000	75000	NA	NA	NA	NA	NA	NA	NA	26	22
Metals - TCLP													
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	NA	NA	NA	NA
PCBs													
Aroclor 1248	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other													
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	3.9 J	NA	NA	NA	NA	NA	< 11	< 12
Diesel Range Organics	mg/kg	NS	NS	NS	NA	16	68	NA	NA	NA	NA	38	3.6 J

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Feature						41,42	44,134,140	44,134,140	44,134,140	44,134,140	44,134,140	44,134,140	44,134,140
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-198	ASB-188	ASB-188	ASB-189	ASB-189	ASB-190	ASB-190	ASB-191
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-198_6-8(20111104)	ASB-188_0-2(20110912)	ASB-188_4-6(20110912)	ASB-189_0-2(20110912)	ASB-189_4-6(20110912)	ASB-190_0-2(20110912)	ASB-190_8-10(20110912)	ASB-191_0-2(20110912)
Sample Date	Unit	SRV	SRV	SRV		11/4/2011	9/12/2011	9/12/2011	9/12/2011	9/12/2011	9/12/2011	9/12/2011	9/12/2011
Depth Interval						6-8 ft	0-2 ft	4-6 ft	0-2 ft	4-6 ft	0-2 ft	8-10 ft	0-2 ft
VOCs													
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	20 J	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	< 280	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	< 280	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	120 J	NA	NA	NA	NA	NA	NA	NA
Benzene	ug/kg	6000	14000	10000	NA	< 280	NA	NA	NA	NA	NA	NA	NA
Butylbenzene	ug/kg	30000	70000	92000	NA	< 280	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	ug/kg	65000	160000	190000	NA	54 J	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	< 280	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	ug/kg	NS	NS	NS	NA	< 570	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	ug/kg	200000	200000	200000	NA	10 J	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	ug/kg	30000	74000	87000	NA	< 280	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	ug/kg	NS	NS	NS	NA	220 J	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	ug/kg	NS	NS	NS	NA	91 J	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	ug/kg	97000	270000	158000	NA	< 280	NA	NA	NA	NA	NA	NA	NA
Naphthalene	ug/kg	10000	24000	28000	NA	76 J	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	ug/kg	30000	70000	93000	NA	< 280	NA	NA	NA	NA	NA	NA	NA
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	< 280	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	< 280	NA	NA	NA	NA	NA	NA	NA
Styrene	ug/kg	210000	500000	600000	NA	< 280	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	ug/kg	72000	145000	131000	NA	< 280	NA	NA	NA	NA	NA	NA	NA
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	< 1100	NA	NA	NA	NA	NA	NA	NA
Toluene	ug/kg	107000	260000	305000	NA	34 J	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	ug/kg	29000	82000	46000	NA	< 280	NA	NA	NA	NA	NA	NA	NA
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	38 J	NA	NA	NA	NA	NA	NA	NA
Xylene, -o**	ug/kg	45000	110000	110000	NA	28 J	NA	NA	NA	NA	NA	NA	NA
Total Xylenes*	ug/kg	45000	110000	110000	NA	66	NA	NA	NA	NA	NA	NA	NA
SVOCs													
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	4000 J	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	14000 J	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	ug/kg	NS	NS	NS	NA	< 39000	NA	NA	NA	NA	NA	NA	NA
Acetophenone	ug/kg	NS	NS	NS	NA	< 39000	NA	NA	NA	NA	NA	NA	NA
Anthracene	ug/kg	7880000	10000000	45400000	NA	20000 J	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	ug/kg	NS	NS	NS	NA	< 39000	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	25000 J	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	54000	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	**43000**	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	64000	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	17000 J	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	< 39000	NA	NA	NA	NA	NA	NA	NA
Carbazole	ug/kg	700000	720000	1310000	NA	11000 J	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	NS	NS	NS	NA	50000	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	7600 J	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	ug/kg	104000	130000	810000	NA	6500 J	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	130000	NA	NA	NA	NA	NA	NA	NA
Fluorene	ug/kg	850000	1200000	4120000	NA	14000 J	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	21000 J	NA	NA	NA	NA	NA	NA	NA
Naphthalene	ug/kg	10000	24000	28000	NA	7500 J	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	ug/kg	NS	NS	NS	NA	88000	NA	NA	NA	NA	NA	NA	NA
Pyrene	ug/kg	890000	1060000	5800000	NA	83000	NA	NA	NA	NA	NA	NA	NA
Metals													
Aluminum	mg/kg	30000	40000	100000	NA	4900	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	12	16	100	NA	1.3	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	9	11	20	NA	**11**	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg	1100	1100	18000	NA	170	NA	NA	NA	NA	NA	NA	NA

Table 6. Summary of Detected Constituents in Soil Samples
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature						41,42	44,134,140	44,134,140	44,134,140	44,134,140	44,134,140	44,134,140	44,134,140
Location ID		**Tier 1**	**Tier 2**	**Tier 2**	**TCLP**	**ASB-198**	**ASB-188**	**ASB-188**	**ASB-189**	**ASB-189**	**ASB-190**	**ASB-190**	**ASB-191**
Sample ID		**Residential**	**Recreational**	**Industrial**	**Criteria**	**ASB-198_6-8(20111104)**	**ASB-188_0-2(20110912)**	**ASB-188_4-6(20110912)**	**ASB-189_0-2(20110912)**	**ASB-189_4-6(20110912)**	**ASB-190_0-2(20110912)**	**ASB-190_8-10(20110912)**	**ASB-191_0-2(20110912)**
Sample Date	**Unit**	**SRV**	**SRV**	**SRV**		**11/4/2011**	**9/12/2011**	**9/12/2011**	**9/12/2011**	**9/12/2011**	**9/12/2011**	**9/12/2011**	**9/12/2011**
Depth Interval						**6-8 ft**	**0-2 ft**	**4-6 ft**	**0-2 ft**	**4-6 ft**	**0-2 ft**	**8-10 ft**	**0-2 ft**
Beryllium	mg/kg	55	75	230	NA	0.14 J	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	25	35	200	NA	0.48	NA	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	NS	NS	NS	NA	15000	NA	NA	NA	NA	NA	NA	NA
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	12	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	600	800	2600	NA	4.9 J	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	100	100	9000	NA	19	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	9000	12000	75000	NA	**10000**	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	300	300	700	NA	130	12	8.8	16	2.5	12	4.9	2.5
Magnesium	mg/kg	NS	NS	NS	NA	4200	NA	NA	NA	NA	NA	NA	NA
Manganese	mg/kg	3600	5000	8100	NA	380	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	0.5	1.2	1.5	NA	0.063 J	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	560	800	2500	NA	12	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	NS	NS	NS	NA	670	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	160	200	1300	NA	< 0.57	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	160	200	1300	NA	< 0.57	NA	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	NS	NS	NS	NA	120 J	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	3	3	21	NA	0.99 J	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	30	40	250	NA	15	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	8700	12000	75000	NA	130	NA	NA	NA	NA	NA	NA	NA
Metals - TCLP													
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	NA	NA	NA	NA
PCBs													
Aroclor 1248	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other													
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	< 11	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics	mg/kg	NS	NS	NS	NA	57	NA	NA	NA	NA	NA	NA	NA

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Feature						44,134,140	44,134,140	44,134,140	138	138	138	138	152
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-191	ASB-192	ASB-192	ASB-145	ASB-145	ASB-146	ASB-146	ASB-135
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-191_4-6(20110912)	ASB-192_0-2(20110912)	ASB-192_4-6(20110912)	ASB-145_0-2(20110830)	ASB-145_6-8(20110830)	ASB-146_0-2(20110831)	ASB-146_6-8(20110831)	ASB-135_2-4(20110826)
Sample Date	Unit	SRV	SRV	SRV		9/12/2011	9/12/2011	9/12/2011	8/30/2011	8/30/2011	8/31/2011	8/31/2011	8/26/2011
Depth Interval						4-6 ft	0-2 ft	4-6 ft	0-2 ft	6-8 ft	0-2 ft	6-8 ft	2-4 ft
VOCs													
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	NA	NA	NA	84 J	< 280	< 290	< 1500	33 J
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	NA	NA	NA	< 330	< 280	< 290	< 1500	< 240
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	NA	NA	NA	28 J	< 280	< 290	< 1500	< 240
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	NA	NA	NA	< 1300	< 1100	< 1100	< 5900	< 940
Benzene	ug/kg	6000	14000	10000	NA	NA	NA	NA	< 330	< 280	< 290	< 1500	< 240
Butylbenzene	ug/kg	30000	70000	92000	NA	NA	NA	NA	14 J	< 280	< 290	20000	520
Carbon disulfide	ug/kg	65000	160000	190000	NA	NA	NA	NA	< 330	< 280	< 290	< 1500	44 J
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	NA	NA	NA	< 330	< 280	< 290	< 1500	< 240
Cyclohexane	ug/kg	NS	NS	NS	NA	NA	NA	NA	98 J	< 560	< 570	7800	< 470
Ethylbenzene	ug/kg	200000	200000	200000	NA	NA	NA	NA	29 J	< 280	18 J	< 1500	36 J
Isopropylbenzene	ug/kg	30000	74000	87000	NA	NA	NA	NA	10 J	< 280	< 290	2300	53 J
Methyl acetate	ug/kg	NS	NS	NS	NA	NA	NA	NA	890	63 J	120 J	350 J	130 J
Methylcyclohexane	ug/kg	NS	NS	NS	NA	NA	NA	NA	280 J	< 560	< 570	26000	140 J
Methylene chloride	ug/kg	97000	270000	158000	NA	NA	NA	NA	< 330	< 280	< 290	< 1500	< 240
Naphthalene	ug/kg	10000	24000	28000	NA	NA	NA	NA	230 J	< 280	< 290	2800	150 J
n-Propylbenzene	ug/kg	30000	70000	93000	NA	NA	NA	NA	< 330	< 280	< 290	6200	240
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	NA	NA	NA	7.3 J	< 280	< 290	< 1500	< 240
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	NA	NA	NA	< 330	< 280	< 290	3500	150 J
Styrene	ug/kg	210000	500000	600000	NA	NA	NA	NA	< 330	< 280	< 290	< 1500	< 240
Tetrachloroethene	ug/kg	72000	145000	131000	NA	NA	NA	NA	< 330	< 280	38 J	< 1500	< 240
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	NA	NA	NA	< 1300	< 1100	< 1100	< 5900	< 940
Toluene	ug/kg	107000	260000	305000	NA	NA	NA	NA	170 J	< 280	< 290	< 1500	18 J
Trichloroethene	ug/kg	29000	82000	46000	NA	NA	NA	NA	< 330	< 280	< 290	< 1500	< 240
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	NA	NA	NA	220 J	< 560	49 J	< 2900	35 J
Xylene, -o**	ug/kg	45000	110000	110000	NA	NA	NA	NA	200 J	< 280	27 J	< 1500	< 240
Total Xylenes*	ug/kg	45000	110000	110000	NA	NA	NA	NA	420	ND	76	ND	35
SVOCs													
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	NA	NA	NA	NA	NA	NA	NA	43 J
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	NA	NA	NA	NA	NA	NA	NA	< 920
Acenaphthylene	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	< 920
Acetophenone	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	ug/kg	7880000	10000000	45400000	NA	NA	NA	NA	NA	NA	NA	NA	25 J
Benzaldehyde	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	29 J
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	32 J
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	NA	NA	NA	NA	NA	NA	NA	30 J
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	33 J
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	18 J
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	ug/kg	700000	720000	1310000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	38 J
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	< 920
Dibenzofuran	ug/kg	104000	130000	810000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	NA	NA	NA	NA	NA	NA	NA	88 J
Fluorene	ug/kg	850000	1200000	4120000	NA	NA	NA	NA	NA	NA	NA	NA	13 J
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	32 J
Naphthalene	ug/kg	10000	24000	28000	NA	NA	NA	NA	NA	NA	NA	NA	42 J
Phenanthrene	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	65 J
Pyrene	ug/kg	890000	1060000	5800000	NA	NA	NA	NA	NA	NA	NA	NA	73 J
Metals													
Aluminum	mg/kg	30000	40000	100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	12	16	100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	9	11	20	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg	1100	1100	18000	NA	NA	NA	NA	NA	NA	NA	NA	NA

Feature						44,134,140	44,134,140	44,134,140	138	138	138	138	152
Location ID		**Tier 1**	**Tier 2**	**Tier 2**	**TCLP**	**ASB-191**	**ASB-192**	**ASB-192**	**ASB-145**	**ASB-145**	**ASB-146**	**ASB-146**	**ASB-135**
Sample ID		**Residential**	**Recreational**	**Industrial**	**Criteria**	**ASB-191_4-6(20110912)**	**ASB-192_0-2(20110912)**	**ASB-192_4-6(20110912)**	**ASB-145_0-2(20110830)**	**ASB-145_6-8(20110830)**	**ASB-146_0-2(20110831)**	**ASB-146_6-8(20110831)**	**ASB-135_2-4(20110826)**
Sample Date	**Unit**	**SRV**	**SRV**	**SRV**		**9/12/2011**	**9/12/2011**	**9/12/2011**	**8/30/2011**	**8/30/2011**	**8/31/2011**	**8/31/2011**	**8/26/2011**
Depth Interval						**4-6 ft**	**0-2 ft**	**4-6 ft**	**0-2 ft**	**6-8 ft**	**0-2 ft**	**6-8 ft**	**2-4 ft**
Beryllium	mg/kg	55	75	230	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	25	35	200	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	600	800	2600	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	100	100	9000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	9000	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	300	300	700	NA	9.2	4.4	3.8	51 J	5.8	8.8	7.3	NA
Magnesium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	mg/kg	3600	5000	8100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	0.5	1.2	1.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	560	800	2500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	160	200	1300	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	160	200	1300	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	3	3	21	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	30	40	250	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	8700	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals - TCLP													
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	NA	NA	NA	NA
PCBs													
Aroclor 1248	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other													
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	NA	NA	NA	< 11	< 12	< 13	780	170
Diesel Range Organics	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	100

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Feature						152	152	152	152	152	152	152	152
Location ID						ASB-135	ASB-135	ASB-147	ASB-147	ASB-148	ASB-148	ASB-163	ASB-163
Sample ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-135_6-8(20110826)	ASB-135_8-9(20110826)	ASB-147_0-2(20110831)	ASB-147_6-8(20110831)	ASB-148_0-2(20110831)	ASB-148_4-6(20110831)	ASB-163_2-4(20110906)	ASB-163_4-6(20110906)
Sample Date	Unit	Residential SRV	Recreational SRV	Industrial SRV	Criteria	8/26/2011	8/26/2011	8/31/2011	8/31/2011	8/31/2011	8/31/2011	9/6/2011	9/6/2011
Depth Interval						6-8 ft	8-9 ft	0-2 ft	6-8 ft	0-2 ft	4-6 ft	2-4 ft	4-6 ft
VOCs													
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	< 390	< 240	14 J	< 1300	< 250	< 240	640	220 J
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	< 390	< 240	< 250	< 1300	< 250	< 240	< 280	< 230
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	< 390	< 240	< 250	< 1300	< 250	< 240	120 J	41 J
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	< 1600	< 960	< 1000	< 5400	< 1000	< 970	< 1100	< 930
Benzene	ug/kg	6000	14000	10000	NA	< 390	< 240	< 250	< 1300	< 250	< 240	< 280	< 230
Butylbenzene	ug/kg	30000	70000	92000	NA	540	170 J	14 J	16000	< 250	< 240	600	39 J
Carbon disulfide	ug/kg	65000	160000	190000	NA	75 J	57 J	51 J	260 J	< 250	< 240	60 J	43 J
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	< 390	< 240	< 250	< 1300	< 250	< 240	< 280	< 230
Cyclohexane	ug/kg	NS	NS	NS	NA	610 J	240 J	< 500	800 J	< 500	< 490	< 550	< 470
Ethylbenzene	ug/kg	200000	200000	200000	NA	< 390	< 240	< 250	< 1300	< 250	14 J	670	86 J
Isopropylbenzene	ug/kg	30000	74000	87000	NA	220 J	67 J	< 250	1300	< 250	< 240	190 J	14 J
Methyl acetate	ug/kg	NS	NS	NS	NA	310 J	88 J	250 J	200 J	< 500	24 J	390 J	71 J
Methylcyclohexane	ug/kg	NS	NS	NS	NA	5600	3000	< 500	3400	< 500	< 490	130 J	15 J
Methylene chloride	ug/kg	97000	270000	158000	NA	< 390	< 240	< 250	< 1300	< 250	< 240	< 280	< 230
Naphthalene	ug/kg	10000	24000	28000	NA	170 J	< 240	< 250	< 1300	< 250	< 240	690	83 J
n-Propylbenzene	ug/kg	30000	70000	93000	NA	520	97 J	< 250	3600	< 250	< 240	470	40 J
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	< 390	< 240	< 250	< 1300	< 250	< 240	110 J	8.5 J
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	280 J	110 J	5.3 J	3600	< 250	< 240	170 J	< 230
Styrene	ug/kg	210000	500000	600000	NA	< 390	< 240	< 250	< 1300	< 250	< 240	< 280	< 230
Tetrachloroethene	ug/kg	72000	145000	131000	NA	< 390	< 240	< 250	< 1300	< 250	< 240	< 280	< 230
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	< 1600	< 960	< 1000	< 5400	< 1000	< 970	< 1100	< 930
Toluene	ug/kg	107000	260000	305000	NA	< 390	< 240	< 250	< 1300	< 250	< 240	< 280	< 230
Trichloroethene	ug/kg	29000	82000	46000	NA	< 390	< 240	< 250	< 1300	< 250	< 240	< 280	< 230
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	< 790	< 480	9.6 J	< 2700	< 500	21 J	88 J	210 J
Xylene, -o**	ug/kg	45000	110000	110000	NA	< 390	< 240	< 250	< 1300	< 250	< 240	< 280	19 J
Total Xylenes*	ug/kg	45000	110000	110000	NA	ND	ND	9.6	ND	ND	21	88	229
SVOCs													
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	230 J	35 J	3.7 J	63 J	< 340	< 350	520	23 J
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	< 430	< 380	< 370	41 J	< 340	< 350	< 420	< 350
Acenaphthylene	ug/kg	NS	NS	NS	NA	< 430	< 380	< 370	< 3700	< 340	< 350	< 420	< 350
Acetophenone	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	ug/kg	7880000	10000000	45400000	NA	< 430	< 380	4 J	< 3700	< 340	< 350	< 420	< 350
Benzaldehyde	ug/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	< 430	18 J	9.4 J	< 3700	5.1 J	4.1 J	< 420	< 350
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	< 430	< 380	< 370	< 3700	7.3 J	< 350	< 420	< 350
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	< 430	8.4 J	8.6 J	< 3700	6.2 J	3.8 J	< 420	< 350
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	< 430	< 380	< 370	< 3700	9.8 J	4.9 J	< 420	< 350
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	< 430	< 380	< 370	< 3700	3.7 J	< 350	< 420	< 350
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	ug/kg	700000	720000	1310000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	ug/kg	NS	NS	NS	NA	4.7 J	< 380	< 370	< 3700	7.3 J	< 350	13 J	15 J
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	< 430	< 380	< 370 J	< 3700	< 340	< 350	< 420	< 350
Dibenzofuran	ug/kg	104000	130000	810000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	8.8 J	21 J	25 J	83 J	11 J	4.6 J	22 J	20 J
Fluorene	ug/kg	850000	1200000	4120000	NA	< 430	< 380	< 370	65 J	< 340	< 350	< 420	< 350
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	< 430	12 J	14 J	< 3700	10 J	9.9 J	< 420	< 350
Naphthalene	ug/kg	10000	24000	28000	NA	140 J	19 J	9.1 J	< 3700	< 340	< 350	760	25 J
Phenanthrene	ug/kg	NS	NS	NS	NA	11 J	14 J	16 J	110 J	4.9 J	< 350	15 J	21 J
Pyrene	ug/kg	890000	1060000	5800000	NA	7.9 J	20 J	19 J	110 J	8.5 J	4 J	15 J	19 J
Metals													
Aluminum	mg/kg	30000	40000	100000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	12	16	100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	9	11	20	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	mg/kg	1100	1100	18000	NA	NA	NA	NA	NA	NA	NA	NA	NA

Feature						152	152	152	152	152	152	152	152	152
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-135	ASB-135	ASB-147	ASB-147	ASB-148	ASB-148	ASB-148	ASB-163	ASB-163
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-135_6-8(20110826)	ASB-135_8-9(20110826)	ASB-147_0-2(20110831)	ASB-147_6-8(20110831)	ASB-148_0-2(20110831)	ASB-148_4-6(20110831)	ASB-148_4-6(20110831)	ASB-163_2-4(20110906)	ASB-163_4-6(20110906)
Sample Date	Unit	SRV	SRV	SRV		8/26/2011	8/26/2011	8/31/2011	8/31/2011	8/31/2011	8/31/2011	8/31/2011	9/6/2011	9/6/2011
Depth Interval						6-8 ft	8-9 ft	0-2 ft	6-8 ft	0-2 ft	4-6 ft	4-6 ft	2-4 ft	4-6 ft
Beryllium	mg/kg	55	75	230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	25	35	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	mg/kg	600	800	2600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	100	100	9000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	mg/kg	9000	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	300	300	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	mg/kg	3600	5000	8100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	0.5	1.2	1.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	560	800	2500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	160	200	1300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	160	200	1300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	3	3	21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	30	40	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	8700	12000	75000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals - TCLP														
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs														
Aroclor 1248	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other														
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	450	280	7.3 J	3000	< 10	< 10	82	9.4 J	
Diesel Range Organics	mg/kg	NS	NS	NS	NA	23	32	9.8	29	< 8.7	< 8.5	27	24	

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Feature						153	153,154	153,154	154	154
Location ID		Tier 1	Tier 2	Tier 2	TCLP	ASB-193	ASB-195	ASB-195	ASB-194	ASB-194
Sample ID		Residential	Recreational	Industrial	Criteria	ASB-193_1-2(20110912)	ASB-195_6-8(20110912)	ASB-195_8-10(20110912)	ASB-194_10-12(20110912	ASB-194_13-15(20110912
Sample Date	Unit	SRV	SRV	SRV		9/12/2011	9/12/2011	9/12/2011	9/12/2011	9/12/2011
Depth Interval						1-2 ft	6-8 ft	8-10 ft	10-12 ft	13-15 ft
VOCs										
1,2,4-Trimethylbenzene	ug/kg	8000	20000	25000	NA	< 300	33 J	34 J	91 J	< 330
1,2-Dichloroethane	ug/kg	4000	10000	6000	NA	< 300	< 190	< 250	< 250	< 330
1,3,5-Trimethylbenzene	ug/kg	3000	8000	10000	NA	< 300	12 J	11 J	37 J	< 330
2-Butanone (MEK)	ug/kg	5500000	5500000	19000000	NA	< 1200	< 760	< 1000	< 1000	< 1300
Benzene	ug/kg	6000	14000	10000	NA	< 300	< 190	< 250	< 250	< 330
Butylbenzene	ug/kg	30000	70000	92000	NA	< 300	16 J	< 250	87 J	< 330
Carbon disulfide	ug/kg	65000	160000	190000	NA	< 300	< 190	< 250	55 J	< 330
cis-1,2-Dichloroethene	ug/kg	8000	19000	22000	NA	< 300	< 190	< 250	< 250	< 330
Cyclohexane	ug/kg	NS	NS	NS	NA	< 600	< 380	< 500	< 500	< 660
Ethylbenzene	ug/kg	200000	200000	200000	NA	< 300	5.9 J	< 250	17 J	< 330
Isopropylbenzene	ug/kg	30000	74000	87000	NA	< 300	< 190	< 250	15 J	< 330
Methyl acetate	ug/kg	NS	NS	NS	NA	910	270 J	290 J	600	410 J
Methylcyclohexane	ug/kg	NS	NS	NS	NA	18 J	19 J	55 J	93 J	< 660
Methylene chloride	ug/kg	97000	270000	158000	NA	< 300	< 190	< 250	< 250	< 330
Naphthalene	ug/kg	10000	24000	28000	NA	38 J	290	45 J	270	< 330
n-Propylbenzene	ug/kg	30000	70000	93000	NA	< 300	< 190	< 250	26 J	< 330
p-Isopropyltoluene	ug/kg	NS	NS	NS	NA	< 300	5.3 J	< 250	32 J	< 330
sec-Butylbenzene	ug/kg	25000	55000	70000	NA	< 300	< 190	< 250	45 J	< 330
Styrene	ug/kg	210000	500000	600000	NA	< 300	< 190	< 250	< 250	< 330
Tetrachloroethene	ug/kg	72000	145000	131000	NA	< 300	< 190	< 250	< 250	< 330
Tetrahydrofuran	ug/kg	NS	NS	NS	NA	< 1200	< 760	49 J	< 1000	< 1300
Toluene	ug/kg	107000	260000	305000	NA	< 300	< 190	< 250	35 J	< 330
Trichloroethene	ug/kg	29000	82000	46000	NA	< 300	< 190	< 250	< 250	< 330
m-Xylene & p-Xylene**	ug/kg	45000	110000	110000	NA	13 J	21 J	12 J	60 J	< 660
Xylene, -o**	ug/kg	45000	110000	110000	NA	< 300	11 J	12 J	46 J	< 330
Total Xylenes*	ug/kg	45000	110000	110000	NA	13	32	24	106	ND
SVOCs										
2-Methylnaphthalene	ug/kg	100000	120000	369000	NA	4.5 J	1000 J	< 17000	340 J	< 360
Acenaphthene	ug/kg	1200000	1860000	5260000	NA	< 390	< 8700	< 17000	< 3600	< 360
Acenaphthylene	ug/kg	NS	NS	NS	NA	< 390	< 8700	< 17000	< 3600	< 360
Acetophenone	ug/kg	NS	NS	NS	NA	< 390	< 8700	< 17000	< 3600	< 360
Anthracene	ug/kg	7880000	10000000	45400000	NA	4.3 J	710 J	< 17000	< 3600	< 360
Benzaldehyde	ug/kg	NS	NS	NS	NA	< 390	< 8700	< 17000	< 3600	< 360
Benzo (g,h,i) perylene	ug/kg	NS	NS	NS	NA	24 J	2000 J	< 17000	< 3600	11 J
Benzo(a)anthracene	ug/kg	NS	NS	NS	NA	26 J	3500 J	< 17000	170 J	14 J
Benzo(a)pyrene	ug/kg	2000	2000	3000	NA	31 J	**3500 J**	*< 17000*	630 J	14 J
Benzo(b)fluoranthene	ug/kg	NS	NS	NS	NA	40 J	5000 J	< 17000	< 3600	17 J
Benzo(k)fluoranthene	ug/kg	NS	NS	NS	NA	15 J	900 J	< 17000	< 3600	6.7 J
bis(2-Ethylhexyl)phthalate	ug/kg	570000	690000	2100000	NA	< 390	< 8700	< 17000	< 3600	21 J
Carbazole	ug/kg	700000	720000	1310000	NA	< 390	< 8700	< 17000	< 3600	< 360
Chrysene	ug/kg	NS	NS	NS	NA	34 J	3600 J	< 17000	340 J	16 J
Dibenzo(a,h)anthracene	ug/kg	NS	NS	NS	NA	< 390	720 J	< 17000	< 3600	< 360
Dibenzofuran	ug/kg	104000	130000	810000	NA	< 390	200 J	< 17000	< 3600	< 360
Fluoranthene	ug/kg	1080000	1290000	6800000	NA	55 J	5700 J	210 J	160 J	22 J
Fluorene	ug/kg	850000	1200000	4120000	NA	< 390	350 J	< 17000	100 J	< 360
Indeno(1,2,3-cd)pyrene	ug/kg	NS	NS	NS	NA	15 J	1600 J	< 17000	< 3600	8.4 J
Naphthalene	ug/kg	10000	24000	28000	NA	5.1 J	110 J	*< 17000*	80 J	< 360
Phenanthrene	ug/kg	NS	NS	NS	NA	20 J	2200 J	< 17000	420 J	7.5 J
Pyrene	ug/kg	890000	1060000	5800000	NA	46 J	5100 J	180 J	790 J	25 J
Metals										
Aluminum	mg/kg	30000	40000	100000	NA	NA	NA	NA	NA	NA
Antimony	mg/kg	12	16	100	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	9	11	20	NA	3.9	3.8	2.2	3.1	5.6
Barium	mg/kg	1100	1100	18000	NA	90	47	46	38	53

Table 6. Summary of Detected Constituents in Soil Samples
Twin Cities Assembly Plant, St. Paul, Minnesota

Feature						153	153,154	153,154	154	154
Location ID		**Tier 1**	**Tier 2**	**Tier 2**	**TCLP**	**ASB-193**	**ASB-195**	**ASB-195**	**ASB-194**	**ASB-194**
Sample ID		**Residential**	**Recreational**	**Industrial**	**Criteria**	**ASB-193_1-2(20110912)**	**ASB-195_6-8(20110912)**	**ASB-195_8-10(20110912)**	**ASB-194_10-12(20110912**	**ASB-194_13-15(20110912**
Sample Date	**Unit**	**SRV**	**SRV**	**SRV**		**9/12/2011**	**9/12/2011**	**9/12/2011**	**9/12/2011**	**9/12/2011**
Depth Interval						**1-2 ft**	**6-8 ft**	**8-10 ft**	**10-12 ft**	**13-15 ft**
Beryllium	mg/kg	55	75	230	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	25	35	200	NA	< 0.23	< 0.21	< 0.2	< 0.2	< 0.22
Calcium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA
Chromium, Total***	mg/kg	87/44000	120/60000	650/100000	NA	11	12	9	9.7	12
Cobalt	mg/kg	600	800	2600	NA	NA	NA	NA	NA	NA
Copper	mg/kg	100	100	9000	NA	NA	NA	NA	NA	NA
Iron	mg/kg	9000	12000	75000	NA	NA	NA	NA	NA	NA
Lead	mg/kg	300	300	700	NA	23	31	16	14	4.6
Magnesium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA
Manganese	mg/kg	3600	5000	8100	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	0.5	1.2	1.5	NA	0.065 J	0.016 J	< 0.082	< 0.092	< 0.085
Nickel	mg/kg	560	800	2500	NA	NA	NA	NA	NA	NA
Potassium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	160	200	1300	NA	< 0.59	< 0.52 J	< 0.5 J	< 0.5 J	< 0.54 J
Silver	mg/kg	160	200	1300	NA	< 0.59	< 0.52	< 0.5	< 0.5	< 0.54
Sodium	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	3	3	21	NA	NA	NA	NA	NA	NA
Vanadium	mg/kg	30	40	250	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	8700	12000	75000	NA	NA	NA	NA	NA	NA
Metals - TCLP										
Arsenic	mg/l	NA	NA	NA	5	NA	NA	NA	NA	NA
PCBs										
Aroclor 1248	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA
Aroclor 1260	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA
Total Detected PCBs	ug/kg	1200	1400	8000	NA	NA	NA	NA	NA	NA
Other										
Gasoline Range Organics	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA
Diesel Range Organics	mg/kg	NS	NS	NS	NA	NA	NA	NA	NA	NA

Notes:

ug/kg	Micrograms per kilogram.
mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
<	Not detected.
ASB	ARCADIS Soil Boring.
NA	Not applicable/not analyzed.
ND	Not detected.
NS	No standard.
J	Estimated result.
Bold	Result value is above the MPCA Tier 1 Residential SRV.
Shade	Result value is above the MPCA Tier 2 Recreational SRV.
Box	Result value is above the MPCA Tier 2 Industrial SRV.
Italics	Reporting limit for non detect result exceeds one or more of the SRVs.
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
PCBs	Polychlorinated biphenyls.
SRV	Soil reference value.
MPCA	Minnesota Pollution Control Agency.
TCLP	Toxicity characteristic leaching procedure.
*	Sum of detected xylene results (m,p,o).
**	Criteria for total xylenes used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.

Samples ASB-195_6-8(20110912) (240-3807-26)[25X], ASB-195_8-10(20110912) (240-3807-27)[50X] and ASB-194_10-12(20110912) (240-3807-29)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Table 7. Summary of Detected Constituents in Groundwater Samples
Ford Twin Cities Assembly Plant, St. Paul, Minnesota

Feature or Area				North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	4
Location ID		MDH Health Based Water Guidance		ASB-115	ASB-118	ASB-128	ASB-129	ASB-129	ASB-130	ASB-137	ASB-120
Sample ID	EPA			ASB-115_4-9(20110822)	ASB-118_8-12(20110823)	ASB-128_5-10(20110825)	ASB-129_4.5-9.5(20110826)	DUP-001	ASB-130_0-5(20110826)	ASB-137_6-11(20110829)	ASB-120_6-11(20110823)
Sample Date	MCL	Value	Basis	8/22/2011	8/23/2011	8/25/2011	8/26/2011	8/26/2011	8/26/2011	8/29/2011	8/24/2011
Interval				4-9 ft bgs	8-12 ft bgs	5-10 ft bgs	4.5-9.5 ft bgs	4.5-9.5 ft bgs	0-5 ft bgs	6-11 ft bgs	6-11 ft bgs
VOCs											
1,1-Dichloroethane	NS	100	2009 RAA	*< 250 J*	< 5	< 1	< 1	< 1	< 1	< 1	< 1 J
1,2,4-Trimethylbenzene	NS	100	2010 RAA	30 J	1.8 J	< 1	< 1	< 1	< 1	< 1	< 1 J
1,3,5-Trimethylbenzene	NS	100	2009 HRL	29 J	3.3 J	< 1	< 1	< 1	< 1	< 1	< 1 J
2-Butanone (MEK)	NS	4000	1993/94 HRL	< 2500 J	< 50	< 10	< 10	< 10	< 10	< 10	1.5 J
Acetone	NS	4000	2010 HRL	< 2500 J	< 50	1.6 J	2.3 J	< 10	< 10	3.5 J	8.9 J
Benzene	5	2	2009 HRL	6200 J	120	< 1	< 1	< 1	< 1	< 1	17 J
Butylbenzene	NS	NS	NS	< 250 J	0.91 J	< 1	< 1	< 1	< 1	< 1	< 1 J
Carbon disulfide	NS	700	1993/94 HRL	< 250 J	< 5	< 1	< 1	< 1	< 1	< 1	0.15 J
Cyclohexane	NS	NS	NS	480 J	92	< 1	< 1	< 1	< 1	< 1	16 J
Dichlorodifluoromethane (CFC-12)	NS	700	2009 HBV	< 250 J	< 5	< 1	< 1	< 1	< 1	< 1	< 1 J
Ethylbenzene	700	50	2010 HBV	770 J	< 5	< 1	< 1	< 1	< 1	< 1	< 1 J
Isopropylbenzene	NS	300	1993/94 HRL	79 J	9	< 1	< 1	< 1	< 1	< 1	< 1 J
Methyl isobutyl ketone (MIBK)	NS	300	1993/94 HRL	*< 1300 J*	< 25	< 10	< 10	< 10	< 10	< 10	< 5 J
Methyl tertiary butyl ether (MTBE)	NS	70	2000 HBV	*< 500 J*	< 10	< 5	< 5	< 5	< 5	< 5	19 J
Methylcyclohexane	NS	NS	NS	150 J	15	< 1	< 1	< 1	< 1	< 1	0.27 J
Naphthalene	NS	300	1993/94 HRL	< 250 J	4.2 J	< 1	< 1	< 1	< 1	< 1	< 1 J
n-Propylbenzene	NS	NS	NS	< 360 J	20	< 1	< 1	< 1	< 1	< 1	< 1 J
p-Isopropyltoluene	NS	NS	NS	< 250 J	< 5	< 1	< 1	< 1	< 1	< 1	< 1 J
sec-Butylbenzene	NS	NS	NS	< 250 J	1.3 J	< 1	< 1	< 1	< 1	< 1	< 1 J
Tert-butylbenzene	NS	NS	NS	< 250 J	< 5	< 1	< 1	< 1	< 1	< 1	< 1 J
Tetrahydrofuran	NS	100	1995 HBV	*< 1300 J*	< 25	< 5	< 5	< 5	< 5	< 5	< 5 J
Toluene	1000	200	2009 HBV	*< 250 J*	3.2 J	0.23 J	< 1	< 1	< 1	< 1	0.51 J
m-Xylene & p-Xylene**	10000	300	2010 HBV	140 J	35	< 2	< 2	< 2	< 2	< 2	2 J
Xylene, -o**	10000	300	2010 HBV	< 250 J	< 5	< 1	< 1	< 1	< 1	< 1	0.27 J
Total Xylenes*	10000	300	2010 HBV	140 J	35	ND	ND	ND	ND	ND	2.27 J
SVOCs											
2,4-Dimethylphenol	NS	100	1993/94 HRL	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NS	NS	NS	230	< 10	< 9.8	< 10	< 9.9	< 9.9	< 10	NA
Acenaphthene	NS	400	1993/94 HRL	1.6 J	< 10	< 9.8	< 10	< 9.9	< 9.9	< 10	NA
Anthracene	NS	2000	1993/94 HRL	< 65	< 10	< 9.8	< 10	< 9.9	< 9.9	< 10	NA
Benzo(b)fluoranthene[1]	NS	NS	1995 HBV	< 65	< 10	< 9.8	< 10	< 9.9	< 9.9	< 10	NA
bis(2-Ethylhexyl)phthalate	6	6	2009 HRL/MCL	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NS	300	1993/94 HRL	< 65	< 10	< 9.8	< 10	< 9.9	< 9.9	< 10	NA
Fluorene	NS	300	1993/94 HRL	< 65	< 10	< 9.8	< 10	< 9.9	< 9.9	< 10	NA
Naphthalene	NS	300	1993/94 HRL	130	1.6 J	< 9.8	< 10	< 9.9	< 9.9	< 10	NA
Phenanthrene	NS	NS	NS	1.7 J	< 10	< 9.8	< 10	< 9.9	< 9.9	< 10	NA
Pyrene	NS	200	1993/94 HRL	< 65	< 10	< 9.8	< 10	< 9.9	< 9.9	< 10	NA
Benzo(a)pyrene (BaP) Equivalents	NS	0.05	1995 HBV	ND	ND	ND	ND	ND	ND	ND	ND
Metals											
Antimony	6	6	1993/94 HRL	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	10	NS	NS	7.6 J	8 J	23	< 10	< 10	< 10	< 10	NA
Barium	2000	2000	1993/94 HRL	340	130 J	250	190 J	180 J	180 J	23 J	NA
Calcium	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Chromium***	100	100/20000	1993/94 HRL	2.4 J	< 10	< 10	< 10	< 10	< 10	< 10	NA
Cobalt	NS	30	1995 HBV	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Lead[2]	NS	15	No Basis[2]	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3
Magnesium	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NS	300	2008 RAA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NS	100	1993/94 HRL	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA

Table 7. Summary of Detected Constituents in Groundwater Samples
Ford Twin Cities Assembly Plant, St. Paul, Minnesota

Feature or Area				North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	North Parking Area	4
Location ID		**MDH Health Based Water**		**ASB-115**	**ASB-118**	**ASB-128**	**ASB-129**	**ASB-129**	**ASB-130**	**ASB-137**	**ASB-120**
Sample ID	**EPA**	**Guidance**		**ASB-115_4-9(20110822)**	**ASB-118_8-12(20110823)**	**ASB-128_5-10(20110825)**	**ASB-129_4.5-9.5(20110826)**	**DUP-001**	**ASB-130_0-5(20110826)**	**ASB-137_6-11(20110829)**	**ASB-120_6-11(20110823)**
Sample Date	**MCL**	**Value**	**Basis**	**8/22/2011**	**8/23/2011**	**8/25/2011**	**8/26/2011**	**8/26/2011**	**8/26/2011**	**8/29/2011**	**8/24/2011**
Interval				**4-9 ft bgs**	**8-12 ft bgs**	**5-10 ft bgs**	**4.5-9.5 ft bgs**	**4.5-9.5 ft bgs**	**0-5 ft bgs**	**6-11 ft bgs**	**6-11 ft bgs**
Vanadium	NS	50	1993/94 HRL	NA	NA	NA	NA	NA	NA	NA	NA
Other											
Gasoline Range Organics	NS	NS	NS	< 24000 J	770	< 100	< 100 J	< 100	< 100	< 100	88 J
Diesel Range Organics	NS	NS	NS	3400	450	380	410	410	270	< 97	760

Notes:

Results are reported in micrograms per liter (ug/l).

AMW	ARCADIS Monitoring Well Location.
NA	Not analyzed.
NS	No standard.
ND	Not detected
E	Result exceeded calibration range.
J	Estimated result.
Shaded	Value is above the EPA Maximum Contaminant Level (MCL)
Boxed	Value is above the MDH Health Based Water Guidance
Italic	Reporting limit for non detect result exceeds MDH Health Based Water Guidance Criteria
HBV	Health Based Values
RAA	Risk Assessment Advice
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
MEK	Methyl ethyl ketone.
*	Sum of detected xylene results (m,p,o).
**	Criteria for Total Xylenes Used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.
1	See Benzo(a)pyrene (BaP) Equivalents Action Levels.
2	Lead MDH Health Based Water Guidance Action Level at Tap.
ft bgs	Feet below ground surface.
ft msl	Feet above mean sea level.

Table 7. Summary of Detected Constituents in Groundwater Samples
Ford Twin Cities Assembly Plant, St. Paul, Minnesota

Feature or Area				5	5	10	12,47	12,47	12,47	13	13	13
Location ID		MDH Health Based Water Guidance		AMW-16	AMW-17	ASB-166	AMW-11	AMW-11	AMW-18	AMW-19	AMW-20	AMW-20
Sample ID	EPA			AMW-16(20111107)	AMW-17(20111107)	ASB-166_7-12(20110906)	AMW-11 (10/31/2011)	DUP-002 (10/31/2011)	AMW-18 (10/31/2011)	AMW-19(20111111)	AMW-20(20111111)	DUP-01(20111111)
Sample Date	MCL	Value	Basis	11/7/2011	11/7/2011	9/6/2011	10/31/2011	10/31/2011	10/31/2011	11/11/2011	11/11/2011	11/11/2011
Interval				806.28 - 801.28 ft msl	806.15 - 801.15 ft msl	7-12 ft bgs	804.47 - 799.47 ft msl	804.47 - 799.47 ft msl	803.22 - 798.22 ft msl	691.29 - 681.29 ft msl	694.09 - 684.09 ft msl	694.09 - 684.09 ft msl
VOCs												
1,1-Dichloroethane	NS	100	2009 RAA	< 67	< 14	NA	< 10	< 10	1.2	< 1	< 1	< 1
1,2,4-Trimethylbenzene	NS	100	2010 RAA	1500	< 14	NA	< 10	< 10	< 1	< 1	< 1	< 1
1,3,5-Trimethylbenzene	NS	100	2009 HRL	330	< 14	NA	< 10	< 10	< 1	< 1	< 1	< 1
2-Butanone (MEK)	NS	4000	1993/94 HRL	< 670	23 J	NA	< 100	< 100	< 10	< 10	0.88 J	< 10
Acetone	NS	4000	2010 HRL	430 J	340	NA	< 100	< 100	< 10	< 10	5.4 J	1.9 J
Benzene	5	2	2009 HRL	*< 67*	52	NA	*< 10*	*< 10*	< 1	< 1	0.14 J	< 1
Butylbenzene	NS	NS	NS	39 J	8.4 J	NA	5.4 J	6.1 J	< 1	< 1	< 1	< 1
Carbon disulfide	NS	700	1993/94 HRL	< 67	< 14	NA	< 10	< 10	< 1	< 1	< 1	< 1
Cyclohexane	NS	NS	NS	380	290	NA	45	48	< 1	< 1	< 1	< 1
Dichlorodifluoromethane (CFC-12)	NS	700	2009 HBV	< 67	< 14	NA	< 10	< 10	< 1	< 1	< 1	< 1
Ethylbenzene	700	50	2010 HBV	1400	78	NA	< 10	< 10	< 1	< 1	< 1	< 1
Isopropylbenzene	NS	300	1993/94 HRL	68	49	NA	22	26	< 1	< 1	< 1	< 1
Methyl isobutyl ketone (MIBK)	NS	300	1993/94 HRL	*< 670*	< 140	NA	< 100	< 100	< 10	< 5	< 5	< 5
Methyl tertiary butyl ether (MTBE)	NS	70	2000 HBV	*< 330*	*< 71*	NA	< 50	< 50	< 5	< 2	< 2	< 2
Methylcyclohexane	NS	NS	NS	100	55	NA	170	170	< 1	< 1	0.15 J	< 1
Naphthalene	NS	300	1993/94 HRL	150	28	NA	< 10	< 10	< 1	< 1	< 1	< 1
n-Propylbenzene	NS	NS	NS	230	150	NA	33	35	< 1	< 1	< 1	< 1
p-Isopropyltoluene	NS	NS	NS	< 67	43	NA	< 10	< 10	< 1	< 1	< 1	< 1
sec-Butylbenzene	NS	NS	NS	< 67	5.2 J	NA	11	13	< 1	< 1	< 1	< 1
Tert-butylbenzene	NS	NS	NS	< 67	< 14	NA	1.7 J	< 10	< 1	< 1	< 1	< 1
Tetrahydrofuran	NS	100	1995 HBV	*< 330*	< 71	NA	< 50	< 50	< 5	< 5	0.51 J	< 5
Toluene	1000	200	2009 HBV	73	14	NA	< 10	< 10	< 1	< 1	0.19 J	0.14 J
m-Xylene & p-Xylene**	10000	300	2010 HBV	3000	21 J	NA	< 20	< 20	< 2	< 2	< 2	< 2
Xylene, -o**	10000	300	2010 HBV	900	< 14	NA	< 10	< 10	< 1	< 1	< 1	< 1
Total Xylenes*	10000	300	2010 HBV	3900	21 J	ND	ND	ND	ND	ND	ND	ND
SVOCs												
2,4-Dimethylphenol	NS	100	1993/94 HRL	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NS	NS	NS	27 J	4.3 J	NA	< 10	< 9.9	< 10	< 10	< 10	< 10
Acenaphthene	NS	400	1993/94 HRL	< 42	< 10	NA	< 10	< 9.9	< 10	< 10	< 10	< 10
Anthracene	NS	2000	1993/94 HRL	< 42	< 10	NA	< 10	< 9.9	< 10	< 10	< 10	< 10
Benzo(b)fluoranthene[1]	NS	NS	1995 HBV	< 42	< 10	NA	< 10	< 9.9	0.25 J	< 10 J	< 10	< 10
bis(2-Ethylhexyl)phthalate	6	6	2009 HRL/MCL	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NS	300	1993/94 HRL	< 42	< 10	NA	< 10	< 9.9	0.2 J	< 10	< 10	< 10
Fluorene	NS	300	1993/94 HRL	< 42	0.14 J	NA	0.17 J	0.22 J	< 10	< 10	< 10	< 10
Naphthalene	NS	300	1993/94 HRL	89	14	NA	< 10	< 9.9	< 10	< 10	< 10	< 10
Phenanthrene	NS	NS	NS	< 42	< 10	NA	< 10	< 9.9	< 10	< 10	< 10	< 10
Pyrene	NS	200	1993/94 HRL	< 42	< 10	NA	< 10	< 9.9	0.14 J	< 10	< 10	< 10
Benzo(a)pyrene (BaP) Equivalents	NS	0.05	1995 HBV	ND	ND	ND	ND	ND	0.025	ND	ND	ND
Metals												
Antimony	6	6	1993/94 HRL	NA	NA	NA	NA	NA	NA	2.9 J	3.3 J	*< 10*
Arsenic	10	NS	NS	NA	NA	610	< 10	< 10	4.1 J	< 10	< 10	< 10
Barium	2000	2000	1993/94 HRL	NA	NA	NA	200	200	180 J	240	200	200
Calcium	NS	NS	NS	NA	NA	NA	NA	NA	NA	150000	180000	190000
Chromium***	100	100/20000	1993/94 HRL	NA	NA	NA	< 10	< 10	< 10	< 10	< 10	< 10
Cobalt	NS	30	1995 HBV	NA	NA	NA	NA	NA	NA	4.9 J	5.3 J	9.9
Iron	NS	NS	NS	NA	NA	NA	NA	NA	NA	170	< 100	< 100
Lead[2]	NS	15	No Basis[2]	< 3	< 3	NA	< 3	< 3	< 3	< 3	< 3	< 3
Magnesium	NS	NS	NS	NA	NA	NA	NA	NA	NA	41000	49000	51000
Manganese	NS	300	2008 RAA	NA	NA	NA	NA	NA	NA	2800	1800	1900
Nickel	NS	100	1993/94 HRL	NA	NA	NA	NA	NA	NA	3.4 J	6.9 J	7.6 J
Potassium	NS	NS	NS	NA	NA	NA	NA	NA	NA	4300 J	3500 J	3600 J
Sodium	NS	NS	NS	NA	NA	NA	NA	NA	NA	55000	66000	69000

Table 7. Summary of Detected Constituents in Groundwater Samples
Ford Twin Cities Assembly Plant, St. Paul, Minnesota

Feature or Area				5	5	10	12,47	12,47	12,47	13	13	13
Location ID		**MDH Health Based Water**		**AMW-16**	**AMW-17**	**ASB-166**	**AMW-11**	**AMW-11**	**AMW-18**	**AMW-19**	**AMW-20**	**AMW-20**
Sample ID	**EPA**	**Guidance**		**AMW-16(20111107)**	**AMW-17(20111107)**	**ASB-166_7-12(20110906)**	**AMW-11 (10/31/2011)**	**DUP-002 (10/31/2011)**	**AMW-18 (10/31/2011)**	**AMW-19(20111111)**	**AMW-20(20111111)**	**DUP-01(20111111)**
Sample Date	**MCL**	**Value**	**Basis**	**11/7/2011**	**11/7/2011**	**9/6/2011**	**10/31/2011**	**10/31/2011**	**10/31/2011**	**11/11/2011**	**11/11/2011**	**11/11/2011**
Interval				**806.28 - 801.28 ft msl**	**806.15 - 801.15 ft msl**	**7-12 ft bgs**	**804.47 - 799.47 ft msl**	**804.47 - 799.47 ft msl**	**803.22 - 798.22 ft msl**	**691.29 - 681.29 ft msl**	**694.09 - 684.09 ft msl**	**694.09 - 684.09 ft msl**
Vanadium	NS	50	1993/94 HRL	NA	NA	NA	NA	NA	NA	< 7	0.64 J	< 7
Other												
Gasoline Range Organics	NS	NS	NS	15000	3200	NA	3000	2900	< 100	< 100	< 100	< 100
Diesel Range Organics	NS	NS	NS	1200	820	NA	1200	1600	1000	260	630	280

Notes:

Results are reported in micrograms per liter (ug/l).

AMW	ARCADIS Monitoring Well Location.
NA	Not analyzed.
NS	No standard.
ND	Not detected
E	Result exceeded calibration range.
J	Estimated result.
Shaded	Value is above the EPA Maximum Contaminant Level (MCL)
Boxed	Value is above the MDH Health Based Water Guidance
Italic	Reporting limit for non detect result exceeds MDH Health Based Water Guidance Criteria
HBV	Health Based Values
RAA	Risk Assessment Advice
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
MEK	Methyl ethyl ketone.
*	Sum of detected xylene results (m,p,o).
**	Criteria for Total Xylenes Used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.
1	See Benzo(a)pyrene (BaP) Equivalents Action Levels.
2	Lead MDH Health Based Water Guidance Action Level at Tap.
ft bgs	Feet below ground surface.
ft msl	Feet above mean sea level.

Table 7. Summary of Detected Constituents in Groundwater Samples
Ford Twin Cities Assembly Plant, St. Paul, Minnesota

Feature or Area				16	16	20	138	152
Location ID		MDH Health Based Water Guidance		AMW-14	AMW-15	AMW-13	ASB-145	AMW-12
Sample ID	EPA			AMW-14(20111107)	AMW-15(20111107)	AMW-13 (10/31/2011)	ASB-145_7-12(20110830)	AMW-12(20111107)
Sample Date	MCL	Value	Basis	11/7/2011	11/7/2011	10/31/2011	8/30/2011	11/7/2011
Interval				802.57 - 797.57 ft msl	801.79 - 796.79 ft msl	802.92 - 797.92 ft msl	7-12 ft bgs	802.30 - 797.30 ft msl
VOCs								
1,1-Dichloroethane	NS	100	2009 RAA	< 12	< 67	NA	< 1	< 56
1,2,4-Trimethylbenzene	NS	100	2010 RAA	120	1500 J	NA	< 1	680
1,3,5-Trimethylbenzene	NS	100	2009 HRL	27	200	NA	< 1	110
2-Butanone (MEK)	NS	4000	1993/94 HRL	< 120	< 670	NA	0.59 J	< 560
Acetone	NS	4000	2010 HRL	< 120	< 670	NA	1.7 J	< 560
Benzene	5	2	2009 HRL	*< 12*	690	NA	< 1	32 J
Butylbenzene	NS	NS	NS	19	56 J	NA	0.61 J	84
Carbon disulfide	NS	700	1993/94 HRL	< 12	< 67	NA	< 1	< 56
Cyclohexane	NS	NS	NS	19	340	NA	7.2	120
Dichlorodifluoromethane (CFC-12)	NS	700	2009 HBV	19	190	NA	< 1 J	< 56
Ethylbenzene	700	50	2010 HBV	220	1500 J	NA	0.19 J	1200
Isopropylbenzene	NS	300	1993/94 HRL	19	74	NA	2.5	150
Methyl isobutyl ketone (MIBK)	NS	300	1993/94 HRL	< 120	*< 670*	NA	< 10	*< 560*
Methyl tertiary butyl ether (MTBE)	NS	70	2000 HBV	< 59	*< 330*	NA	< 5	*< 280*
Methylcyclohexane	NS	NS	NS	11 J	110	NA	41 E	73
Naphthalene	NS	300	1993/94 HRL	16	620	NA	< 1	270
n-Propylbenzene	NS	NS	NS	13	210	NA	2.8	150
p-Isopropyltoluene	NS	NS	NS	4.3 J	16 J	NA	< 1	< 56
sec-Butylbenzene	NS	NS	NS	6.3 J	18 J	NA	0.84 J	22 J
Tert-butylbenzene	NS	NS	NS	< 12 J	< 67 J	NA	0.2 J	< 56
Tetrahydrofuran	NS	100	1995 HBV	< 59	*< 330*	NA	< 5	*< 280*
Toluene	1000	200	2009 HBV	< 12	73	NA	< 1	< 56
m-Xylene & p-Xylene**	10000	300	2010 HBV	570	2000	NA	0.37 J	2300
Xylene, -o**	10000	300	2010 HBV	140	110	NA	< 1	260
Total Xylenes*	10000	300	2010 HBV	710	2110	ND	0.37 J	2560
SVOCs								
2,4-Dimethylphenol	NS	100	1993/94 HRL	5.1	NA	NA	NA	NA
2-Methylnaphthalene	NS	NS	NS	3	160	< 10	NA	74
Acenaphthene	NS	400	1993/94 HRL	< 0.2	1 J	< 10	NA	< 67
Anthracene	NS	2000	1993/94 HRL	< 0.2	0.29 J	< 10	NA	< 67
Benzo(b)fluoranthene[1]	NS	NS	1995 HBV	< 0.2 J	< 10	< 10	NA	< 67
bis(2-Ethylhexyl)phthalate	6	6	2009 HRL/MCL	0.8 J	NA	NA	NA	NA
Fluoranthene	NS	300	1993/94 HRL	< 0.2 J	0.47 J	< 10	NA	< 67
Fluorene	NS	300	1993/94 HRL	< 0.2	0.63 J	< 10	NA	< 67
Naphthalene	NS	300	1993/94 HRL	4.1	400	< 10	NA	180
Phenanthrene	NS	NS	NS	< 0.2	1.7 J	< 10	NA	< 67
Pyrene	NS	200	1993/94 HRL	< 0.2 J	0.41 J	< 10	NA	< 67
Benzo(a)pyrene (BaP) Equivalents	NS	0.05	1995 HBV	ND	ND	ND	ND	ND
Metals								
Antimony	6	6	1993/94 HRL	NA	NA	NA	NA	NA
Arsenic	10	NS	NS	7.8 J	12	< 10	NA	16
Barium	2000	2000	1993/94 HRL	280	460	230	NA	460
Calcium	NS	NS	NS	NA	NA	NA	NA	NA
Chromium***	100	100/20000	1993/94 HRL	< 10	< 10	< 10	NA	< 10
Cobalt	NS	30	1995 HBV	NA	NA	NA	NA	NA
Iron	NS	NS	NS	NA	NA	NA	NA	NA
Lead[2]	NS	15	No Basis[2]	< 3	< 3	< 3	< 3	< 3
Magnesium	NS	NS	NS	NA	NA	NA	NA	NA
Manganese	NS	300	2008 RAA	NA	NA	NA	NA	NA
Nickel	NS	100	1993/94 HRL	NA	NA	NA	NA	NA
Potassium	NS	NS	NS	NA	NA	NA	NA	NA
Sodium	NS	NS	NS	NA	NA	NA	NA	NA

Table 7. Summary of Detected Constituents in Groundwater Samples
Ford Twin Cities Assembly Plant, St. Paul, Minnesota

Feature or Area				16	16	20	138	152
Location ID		**MDH Health Based Water**		**AMW-14**	**AMW-15**	**AMW-13**	**ASB-145**	**AMW-12**
Sample ID	**EPA**	**Guidance**		**AMW-14(20111107)**	**AMW-15(20111107)**	**AMW-13 (10/31/2011)**	**ASB-145_7-12(20110830)**	**AMW-12(20111107)**
Sample Date	**MCL**	**Value**	**Basis**	**11/7/2011**	**11/7/2011**	**10/31/2011**	**8/30/2011**	**11/7/2011**
Interval				**802.57 - 797.57 ft msl**	**801.79 - 796.79 ft msl**	**802.92 - 797.92 ft msl**	**7-12 ft bgs**	**802.30 - 797.30 ft msl**
Vanadium	NS	50	1993/94 HRL	NA	NA	NA	NA	NA
Other								
Gasoline Range Organics	NS	NS	NS	7600	15000	< 100	510	13000
Diesel Range Organics	NS	NS	NS	1100 J	640	220	NA	620

Notes:

Results are reported in micrograms per liter (ug/l).

AMW	ARCADIS Monitoring Well Location.
NA	Not analyzed.
NS	No standard.
ND	Not detected
E	Result exceeded calibration range.
J	Estimated result.
Shaded	Value is above the EPA Maximum Contaminant Level (MCL)
Boxed	Value is above the MDH Health Based Water Guidance
Italic	Reporting limit for non detect result exceeds MDH Health Based Water Guidance Criteria
HBV	Health Based Values
RAA	Risk Assessment Advice
VOCs	Volatile organic compounds.
SVOCs	Semi-volatile organic compounds.
MEK	Methyl ethyl ketone.
*	Sum of detected xylene results (m,p,o).
**	Criteria for Total Xylenes Used.
***	SRVs are for Chromium VI and Chromium III respectively, reported data is for total chromium and is therefore compared to the lower of the SRVs.
1	See Benzo(a)pyrene (BaP) Equivalents Action Levels.
2	Lead MDH Health Based Water Guidance Action Level at Tap.
ft bgs	Feet below ground surface.
ft msl	Feet above mean sea level.

Table 8. Summary of Available Background Data, Twin Cities Assembly Plant, St. Paul, Minnesota
Twin Cities Assembly Plant, St. Paul, Minnesota

Metals	Units	Eastern USA								Minnesota					
		Minimum	Maximum	A.Mean	SD	G.Mean	SD	N	Reference	Minimum	Maximum	A.Mean	SD	N	Reference
Arsenic	mg/kg	<1.0	73	7.4	---	4.8	2.56	527	1	0.5	15	5.5	4.6	37	3
Copper	mg/kg	<1.0	700	22	---	13	2.8	533	1	2	700	35	115	36	3
										16	50	26	9	16	54
										3	24	8.6	6.2	11	28 (histosols)
Iron	mg/kg	100	>100,000	25000	---	14000	2.87	540	1	500	50000	19527	---	37	3
Lead	mg/kg	<10	300	17	---	14	1.95	541	1	ND	20	13	4.5	37	3

References:
Data was obtained from "Elements in North America Soils", J. Dragun, A. Chiasson, December 1991.

1 Shacklette, H. T. and J. G. Boerngen. 1984 "Elements concentrations in soil and other surficial materials of the conterminous United States", U.S. Geological Survey Professional Paper 1270, Washington D.C.: U.S. Government Printing Office.

3 Boengen, J.G. and H.T. Shacklette. 1981. "Chemical analyses of soils and other surficial materials of the conterminous United States", U.S. Geological Survey Open-File Report 81-197.

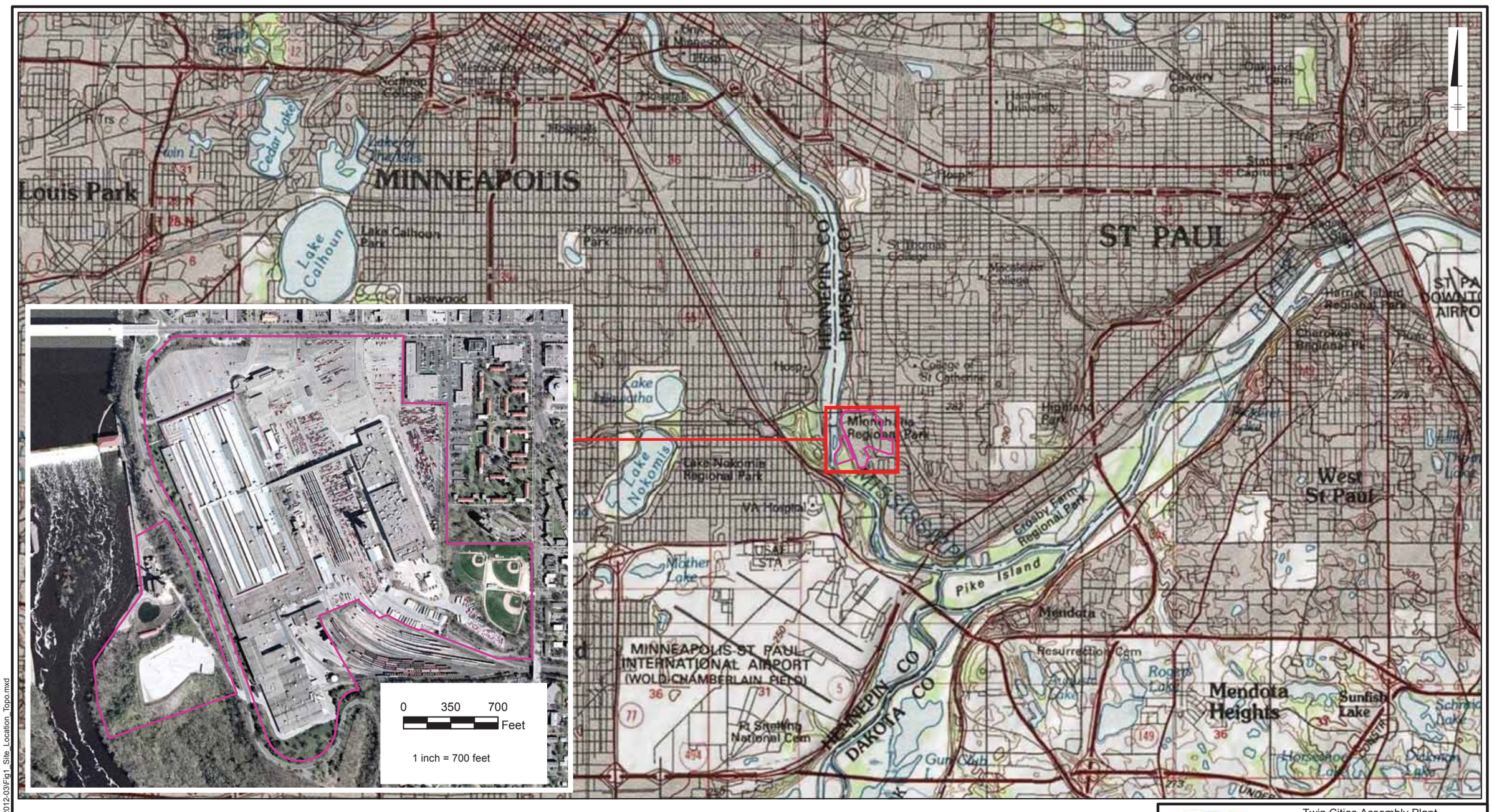
54 Pierce, F. J., R.H. Dowdy, and D.F. Grigal. 1982. "Concentrations of six trace metals in some major Minnesota soil series", *Journal of Environmental Quality,* 11, 3, pp 416-422.

58 Bloom, P.R., W.E. Elder and J. Grava. 1983. "Chemistry and mineralogy of mineral elements in Minnesota histosols", *Papers Presented at the 26th Annual Manitoba Society of Soil Science Meeting.*

Notes:

A.Mean	Arithmetic mean.
G.Mean	Geometric mean.
SD	Standard Deviation.
N	Number of samples.
---	Not given.
ND	Not detected.
mg/kg	Milligrams per kilogram.
<	Less than.
>	Greater than.
USA	United State of America.

Figures



LEGEND:

Ford Property Boundary

NOTES:

Imagery Source: United States Geological Survey
High Resolution Orthoimagery for the Minneapolis-St. Paul, Minnesota Urban Area

Topographic Map Source:
© 2007 National Geographic Society

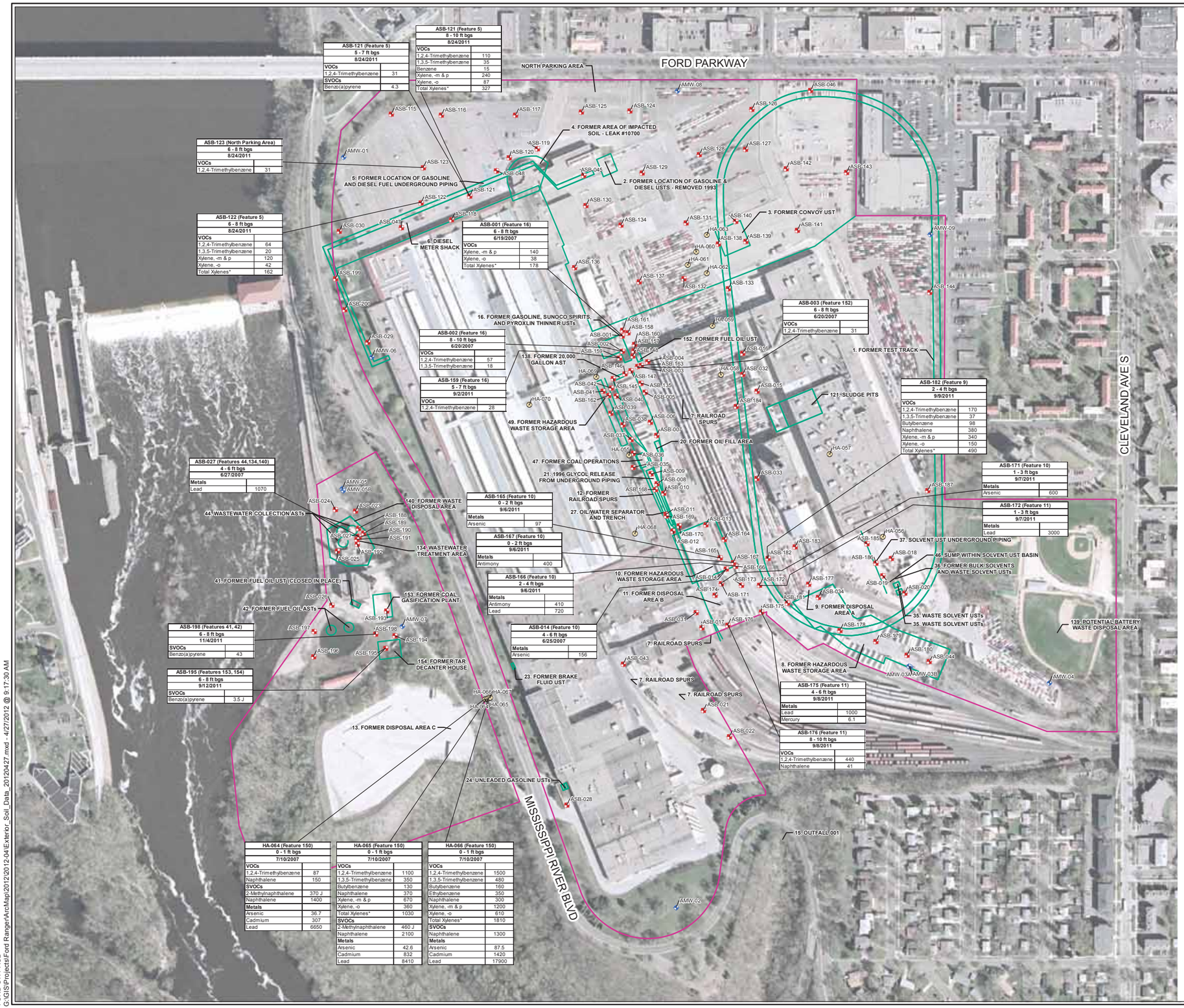
Twin Cities Assembly Plant
Ford Motor Company
St. Paul, Minnesota
Phase II Supplemental Exterior Investigation

Site Location / Property Layout

ARCADIS

FIGURE
1

CITY: Minneapolis, MN DB: MGress PM: BZinda
Project MN000593
G:\GIS\Projects\Ford Ranger\ArcMap\2012\2012-03\Fig1_Site_Location_Topo.mxd



LEGEND:

- Monitoring Well
- Soil Boring
- Hand Auger
- Ford Property Boundary
- Feature

0 180 360 Feet

GRAPHIC SCALE

Location ID (Feature)	
Boring Depth Interval (ft bgs)	
Sample Date	
Chemical	Result

Chemical	Tier 2 Industrial SRV	Units
VOCs		
1,2,4-Trimethylbenzene	25	mg/kg
1,3,5-Trimethylbenzene	10	mg/kg
Benzene	10	mg/kg
Butylbenzene	92	mg/kg
Ethylbenzene	200	mg/kg
Naphthalene	28	mg/kg
Xylene, -m & p*	130	mg/kg
Xylene, -o*	130	mg/kg
Total Xylenes*	130	mg/kg
SVOCs		
2-Methylnaphthalene	369	mg/kg
Benzo(a)pyrene	3	mg/kg
Naphthalene	28	mg/kg
Metals		
Antimony	100	mg/kg
Arsenic	20	mg/kg
Cadmium	200	mg/kg
Lead	700	mg/kg
Mercury	1.5	mg/kg

*Xylenes are added prior to comparing to criteria.

NOTES:

Results reported in milligrams per kilogram (mg/kg).
AMW ARCADIS Monitoring Well
ASB ARCADIS Soil Boring
SVOCs Semi Volatile Organic Compounds
ft bgs Feet Below Ground Surface
J Estimated Result
SRV Soil Reference Value

Imagery Source: United States Geological Survey High Resolution Orthoimagery for the Minneapolis-St. Paul, Minnesota Urban Area

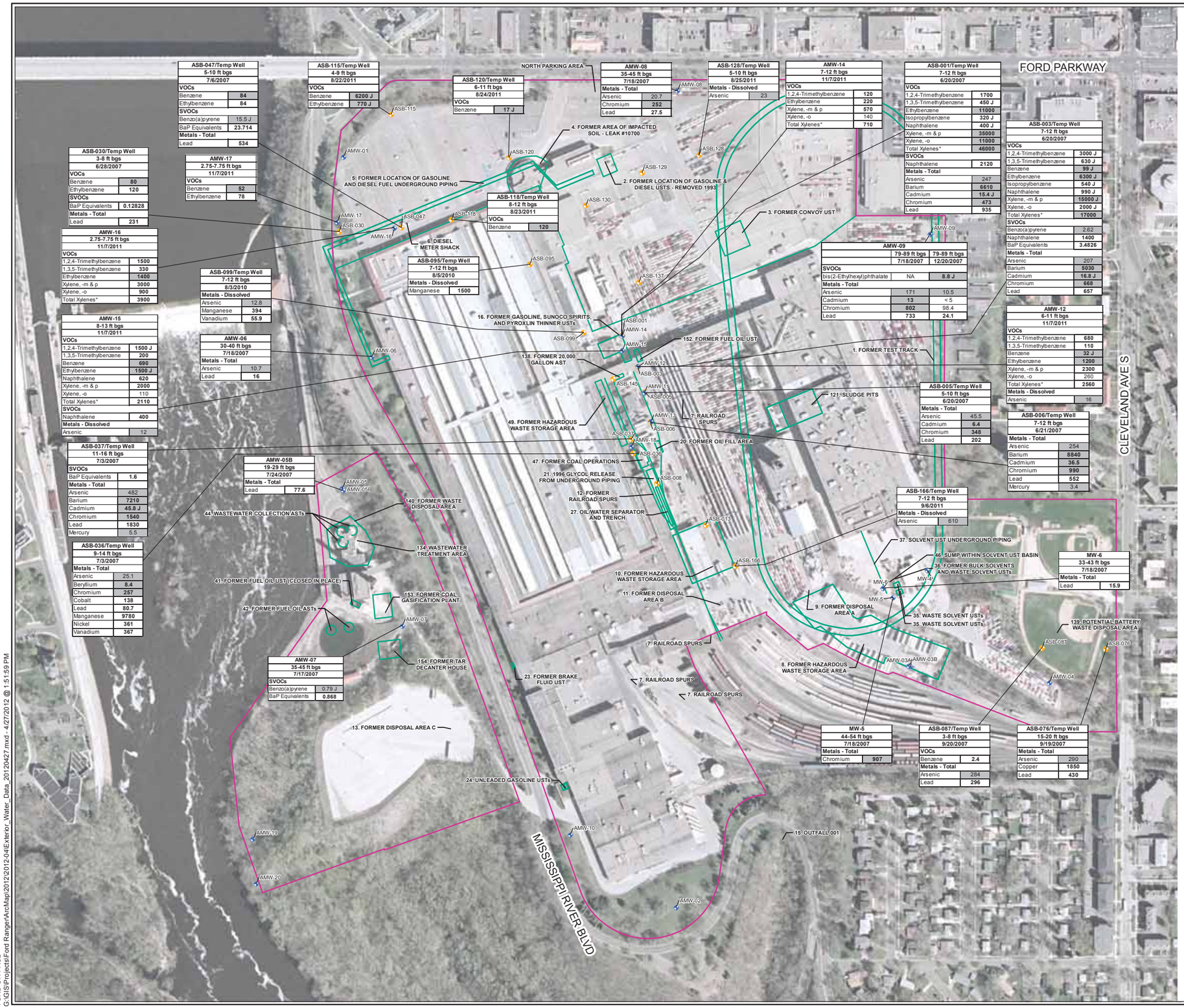
Twin Cities Assembly Plant
Ford Motor Company
St. Paul, Minnesota
Phase II Supplemental Exterior Investigation

Boring Locations and Soil Exceedances Above Industrial SRVs

ARCADIS

FIGURE 2

CITY: MPLS DIV/GROUP: IM DB: MG LD: TW
FORD ST. PAUL
G:\GIS\Projects\Ford Ranger\ArcMap\20122012-04\Exterior_Soil_Data_20120427.mxd - 4/27/2012 @ 9:17:30 AM



LEGEND:

- Monitoring Well
- Temporary Monitoring Well
- Ford Property Boundary
- Feature

0 180 360 Feet

GRAPHIC SCALE

Location ID	
Sample Interval	
Sample Date	
Chemical	Result

Chemical	EPA Maximum Contaminant Level	MDH Health Based Water Guidance	Units
VOCs			
1,2,4-Trimethylbenzene	NS	100	µg/l
1,3,5-Trimethylbenzene	NS	100	µg/l
Benzene	5	2	µg/l
Ethylbenzene	700	50	µg/l
Isopropylbenzene	NS	300	µg/l
Naphthalene	NS	300	µg/l
Xylene, -m & p*	10000	300	µg/l
Xylene, -o*	10000	300	µg/l
Total Xylenes*	10000	300	µg/l
SVOCs			
Benzo(a)pyrene	0.2	NS	µg/l
bis(2-Ethylhexyl)phthalate	6	6	µg/l
Naphthalene	NS	300	µg/l
Benzo(a)pyrene (BaP) Equivalents	NS	0.05	µg/l
Metals - Total			
Arsenic	10	NS	µg/l
Barium	2000	2000	µg/l
Beryllium	4	0.08	µg/l
Cadmium	5	4	µg/l
Chromium	100	100/20000	µg/l
Cobalt	NS	30	µg/l
Copper	NS	1000	µg/l
Lead	NS	15	µg/l
Manganese	NS	300	µg/l
Mercury	2	NS	µg/l
Nickel	NS	100	µg/l
Vanadium	NS	50	µg/l
Metals - Dissolved			
Arsenic	10	NS	µg/l
Manganese	NS	300	µg/l
Thallium	2	0.6	µg/l
Vanadium	NS	50	µg/l

*Xylenes are added prior to comparing to criteria.

Shaded	Value is above the EPA Maximum Contaminant Level (MCL)
Boxed/Bold	Value is above the MDH Health Based Water Guidance

NOTES:

Results reported in micrograms per liter (µg/l).

AMW	ARCADIS Monitoring Well
ASB	ARCADIS Soil Boring
ft bgs	Feet Below Ground Surface
J	Estimated Result
<	Not Detected
NA	Not Analyzed
NS	No Standard

Imagery Source: United States Geological Survey High Resolution Orthoimagery for the Minneapolis-St. Paul, Minnesota Urban Area

Twin Cities Assembly Plant
Ford Motor Company
St. Paul, Minnesota
Phase II Supplemental Exterior Investigation

Groundwater Sample Locations and Exceedances Above EPA Maximum Contaminant Levels and MDH Health Based Water Guidance

ARCADIS

FIGURE 3

CITY: MPLS DIV/GROUP: IM DB: MG LD: TW
FORD ST. PAUL
G:\GIS\Projects\Ford Ranger\ArcMap\2012\2012-04\Exterior_Water_Data_20120427.mxd - 4/27/2012 @ 1:51:59 PM

Appendix A

Soil Boring Logs

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-115
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/22/11
Prepared by	KAH
Start Time and Date	1130 8/22/11
Finish Time and Date	8/22/11 1340
PID or FID with Lamp Size	
Calibration Gas/Time/Results	—

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Don Hunter
Drilling Method	~~macrocore~~ geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 4'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
		0-1	12			0-12 Sand/Gravel, very sandy
		1-2			17.2	
			—			
					28.9	
					36.3	
1212		5-8	27			0-10 CLAY little med-coarse sand tr silt med plasticity v.soft-soft
					26.7	odor mottled green/blue/gray, moist → broken rock
						10-16 SILT some v.f-fine sand, black, moist
					524.1	16-27 SAND silty f-coarse, mostly med cobr-subr little v. coarse-granule, tr med pebble
						strong odor, wet, black, poor sort
						v. mottled green/gray/black
1220		8-12	48			5-3½ SAND f-granule, mostly coarse, odor, poor sort, loose, little silty
					327.2	subr-subr
						3½-8 SILT mottled green/gray/brown hard-v. hard odor
						8-16 broken up rock, sand v.f-coarse, and gravel tr. silt
		—	—		98.2	16-48 SILT v. soft-v. hard (Till) GLEY 1 4/10GY dk greenish gray

Refusal @ 12' → shale

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-116
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/22/11
Prepared by	KAH
Start Time and Date	8/22/11 1545
Finish Time and Date	8/22/11 1634
PID or FID with Lamp Size	
Calibration Gas/Time/Results	—

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	9'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 9'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1634		0-2	22		3.0	0-4 SILT dry, w/sand (vf-~~med~~)
					2.8	4-7.5 pounded rock
						7.5-22 SILT and SAND vf-med tr. ~~coarse~~-granules subr.-suba slightly damp tr. clay, nonplastic, no dilatency med stiff
1550		4.5-8	37		54.8	0-~~12~~ SILT AND SAND (vf-~~fine~~, mostly fine) subr dry-moist, little coarse-fine pebble pounded rock @ 12.5" small-lg pebbles subr mottled yellow/gray brown
						19-24 SILT mottled nonplastic no dilatency slightly damp stiff-v. stiff tr organics
					1.8	24-30 SILTY little sand fine-med-coarse, subr (dry) tr. granule-small pebble crumbly, nonplastic, no dilatency GLEY 1 5/10GY 2.5Y 5/6 lt olive brown
						30-37 SILT mottled, non plastic no dilatency, slightly damp, stiff tr organics
1615		8-9	26		2.0	0-9 SILT with sand (vf-~~fine~~) mostly fine subr wet lose
						9-26 SILT mottled, non plastic, no dilatency, v. stiff dry crumbly 5Y 5/3
						9' refusal - shale

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-117
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/23/11
Prepared by	KAH
Start Time and Date	8/23/11 0800
Finish Time and Date	8/23/11 1020
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1014		0-4	36		2.7	0-1: SAND med-v. coarse, little granule-small pebble poor sort, sub-rnd 1-5.5-7 SILT little f-med sand slight plastic no dilatancy trace clay
					3.6	11-29 SILT little f-med sand tr clay mottled (reworked) tr v. coarse-small pebble
						stiff
					2.4	29-36 SILT mod stiff-stiff black no-little plasticity tr clay little v.f sand
						no dilatancy tr organics
0912		S-8	46		1.4	0-22 SAND f-v. coarse, mostly med-coarse, sub-rnd little granule, tr small pebble
						wet, poor sort, loose
						6-9, 17-20 ~~SAND AND SILT~~ SANDY SILT vf-med grained, wet, v. soft
					1.9	22-39 SAND vf-fine little silt wet, med dense, round, well sort mottled
						GLEY 1 5/10Y 5Y 5/2 GLEY 1 5/5GY
						31-46 SAND v.f-v. coarse mostly med-coarse little granule-med pebble
						poor sort, wet, sub-rnd tr med pebbles, sub-a
0835		S-12				Recovery - Lost vacuum to extract macrocore from casing.
						shale @ bottom of tubing GLEY 1 4/10GY

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-118
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	
Prepared by	KAH
Start Time and Date	8/23/11 1045
Finish Time and Date	8/23/11 1350
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	13'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 13'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1330		0-4	31			0-4 sloughs
					0.0	4-12 SANDY SILT (vf-med) dry no plasticity/dilatency med stiff black
						12-25
					0.0	25-31 SILT little sand (vf-med) no plasticity/dilatency med, black
						moist
1130		5-8	36			0-4 sloughs
					0.1	4-12 SANDY SILT (v.f-fine, round) tr medium v soft moist
						no dilatency, little - no plasticity black
					0.0	12-31 SANDY SILT (vf-med) little coarse-granule, mottled, slightly damp
						no dilatency, no plasticity tr clay (in lenses) med-high plasticity
					3.7	31-38 SILT little sand, organics wet, no plasticity soft little dilatency black wet
1148		8-12	48			0-15 saa wet
					11.4	15-25 SAND med-v. coarse, mostly coarse tr granule-med pebble
						petrol odor, black, mica sheets (2mm)
					0.1	25-48 SHALE, mottled tr organics clay low plasticity
						30-32 coarse sand seam @ ~45° angle little silt
1205		12-13	9			0-9 saa SHALE clay, little silt, sand (vf-coarse) moist, stiff-v stiff
						low plasticity tr organics GLEY 1 5/5G 5Y 6/6 5Y 5/4

13' refusal (bedrock)

ARCADIS

Unconsolidated Boring Log

Boring/Well	MSB-119
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/23/11
Prepared by	KAH
Start Time and Date	8/23/11 1450
Finish Time and Date	8/23/11 1700
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	Geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1625		0-4	39"			0-30.5 SAND
					0.0	0-16 f-med mostly med little silt coarse-granule to small pebble
						pocket rock between 11-12' poor sort, dry subr-subc
						16-30.5 med, tr coarse-granule well sort subr, slightly damp
					0.0	30.5-39 SILT some sand (vf-med, subr-subc) little clay mottled
						dry, crumbly v. stiff-hard
1555		5-8	46			0-6 slough
					0.0	6-27.5 SILT some sand vf-fine soft, med plastic no dilatency
						little clay black moist
						27.5-40 SILT vf sand w/some little clay v. soft med plastic
						no dilatency moist 5Y 5/2
						@ 37" increased sand content SANDY SILT fine
					0.0	40-46 SHALE mottled Clay med plastic v. stiff-hard
						no dilatency, moist tr silt
1610		8-12	43		0.0	0-20 saa
						20-36 CLAY little silt dry low plastic crumbly
						36-43 SHALE hard dry GLEY 1 4/10GY

ARCADIS

Unconsolidated Boring Log

Boring/Well	AJB-120
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/24/11
Prepared by	KAH
Start Time and Date	8/24/11 0900
Finish Time and Date	08/24/11 ~~0900~~ 0950
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	11.5'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 10.5'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
0945		0-4	11			0-2 Pounded pack
						2-8 SAND med ~~fine~~ coarse - v. coarse - granule subr-subr loose dry poor sort
						8-11 CLAYEY SILT some sand f-med, dry crumbly med stiff GLEY 1 5/5GY
838		5-8	42		0.3	0-32 SILT little clay/sand (vf-fine) dry-slightly damp (27") black crumbly low plasticity v. soft-soft color change @ 26.5"
					0.1	32-~~42~~ SANDY SILT (fine subr) slightly dilatent low plasticity moist little med-v coarse, tr granule soft-med stiff 5Y 4/2
						35-37 SAND little silt, f-coarse subr-subr dense moist
0852		8-11.5	45		0.2	0-12 ~~SANDY little silt~~ wet
						SILTY SAND vf-med. mostly fine little coarse subr-subr loose wet
						13-45 CLAY little silt weathered shale mottled v. stiff-hard
						manipulable moist→dry pounded rock @ 30"
						v hard @ 40" 5Y 4/4
						11.5 EOB refusal due to bedrock GLEY 1 5/10GY

ARCADIS

Unconsolidated Boring Log

Boring/Well	BSB-121
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/24/11
Prepared by	KAH
Start Time and Date	8/24/11 1117
Finish Time and Date	8/24/11 1240
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1140 ~~[illegible]~~		0-4	~~[illegible]~~ 8			0-8 Gravel						
1225		0-4	36			0-7 Gravel						
						7-~~[illegible]~~ CLAY	mottled	stiff	low plasticity,	no dilatancy		GLEY 1 4/5G 5Y 4/4
						~~[illegible]~~	tr silt	reworked				GLEY 2 3/10B (Little)
					794	23-36 SANDY SILT	moist-dry	soft-med dense				
						f-med grained sub-sub	little coarse-med pebble	poor sort				
1122		5-8	34			0-3 Sloyl						
					775.6	3-28 SANDY CLAYEY SILT	tr organics,	vf-med	sub-rnd			
						moist, black	tr coarse sand pebbles	strong petrol odor				
						12-15" pounded rock, 24" pounded rock						
					657.4	28-34 SANDY SILT	little clay	vf-med	suba	Stiff-v. stiff		
						nonplastic-little plastic	mottled	slightly moist				
1135		8-12	45		515.6	0-13.5 SANDY SILT	vf-vi coarse	suba-sub	moist,	soft, petrol odor		little clay little-med plastic different
						11-13 SAND	seam med-coarse,	wet tr	strong petrol odor	black		
						13.5-25 SILT	moist, tr organics,	clay	silt pockets	moist	black	
					400.9	25-40 SANDY SILT	vf-fine	v. soft	tr clay	nonplastic,	wet	organics petrol odor GLEY 1 5/5GY
						40-45 SANDY SILT	med sub	soft-med dense	wet	petrol odor		
						tr organics,	mottled	GLEY 1 6/~~[illegible]~~ 5GY				

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-122
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/24/11
Prepared by	KAH
Start Time and Date	8/24/11 1400
Finish Time and Date	8/24/11 1455
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
14												
1408		2-4	24			0-10 Rounded rock, gravel						
					133.7	10-24 CLAY v stiff non plastic no dilatancy mottled						
						~~SILT~~ Silt seam @ 22" (black organic)						
1410		4-8	43			0-7 rounded rock						
					149.2	7-23 CLAY med stiff mottled low plasticity no dilatancy						
						7-11 SILT some sand vf-med tr coarse slightly damp silty						
					166.9	23-33 SILT some sand vf-fine tr med moist tr clay, very silty black						
						Strong petrol odor						
					494.6	33-43 SAND little silt fine-coarse mostly med. wet, strong petrol						
						odor, subr-subr tr v. coarse - small pebble						
1421		8-12	48			0-48 SAND fine med round-subr well sorted med dense, wet						
					454.1	mostly med						
					271-8							

EOB Refusal @ 12'

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-123
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/24/11
Prepared by	KAH
Start Time and Date	8/24/11 1524
Finish Time and Date	8/24/11 1640
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	10.5'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 10.5'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1550		0-4	32			0-11 FILL
						11-20 CLAY mottled v. stiff low plasticity no dilatency tr organics tr sand fine-med slightly moist
					180.3	20-25 SILT tr clay/sand organics dry - slightly damp med stiff black
					153.2	25-32 CLAY mottled tr silt/v.f-fine sand low plasticity no dilatency
						1" pebble @ 27" slightly ~~moist~~ damp
1525		5-8	46		1420	0-36 CLAY mottled tr silt highly plastic moist, no dilatency v. soft - stiff
						slight petrol odor to dry
					600.3	36-46 SILT tr clay little sand slight petrol odor
						organics black crumbly dry - slightly damp
						44-46 color change damp some sand v.f-fine round
						v. soft 2.5 Y 3/1
1538		8-10.5	22			0-12.5 SILT tr clay v. soft wet, tr organics, v.f-fine sand 5Y 4/1
						v. slight odor
					627.3	12.5-19 SILTY SAND wet v.fine - v coarse subangular wet, poor sort
						mostly med black color 12.5-15" strong petrol odor
					676.3	19-22 SANDY SILT dry crumbly no plasticity/dilatency
						1" pebble @ 19" 2.5Y 5/4
						Refusal @ 10.5' Limestone

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-124
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/24/11
Prepared by	KAH
Start Time and Date	8/24/11 1655
Finish Time and Date	8/24/11 1830
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	8'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 8'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1800		~~0-4~~	37			0-7 Fill
		1-5			0.4	7-24 CLAYEY SILT med dense black slightly damp no plasticity/dilatency little sand (vf-med subr)
					0.0	24-37 SAND/GRAVEL f-grained little silt, small-med pebble poor sort slightly damp lsba-subr
1705		5-8	46			0-4 SILTY SAND med-v. coarse tr small-med pebble poor sort dry lsbr-subr
					0.0	4-9 SAND coarse little v. coarse well sort moist subr loose
					0.0	9-17 CLAY mottled vs stiff-hard, damp-dry nonplastic/no dilatency
						17-19" small-med pebbles
						GLEY 1 5/5G 2.5Y 5/6
						GLEY 1 5/5GY @ bsk

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-125
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/25/11
Prepared by	KAH
Start Time and Date	8/25/11 818
Finish Time and Date	8/25/11 920
PID or FID with Lamp Size	/
Calibration Gas/Time/Results	100 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	Geoprobe
Sampling Interval	4'
Hammer Weight	/
Drop Height	/
Total Depth Drilled	8'
Borehole Diameter	2"
Drilling Fluid Used	/
Sample Device	macrocore
Dimensions	2" x 4'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
0850		1-5	33			0-9½ SAND vf-medium little silt, tr coarse-granule dry poor sort loose-med dense tr small-med pebble
						9½-11 powdered rock
					0.0	11-12½ SAND med-v. coarse mostly coarse sub-sub loose dry poor sort tr. granules
						12½-15½ SILTY SAND (fill)
					0.0	15½-19 SAND coarse-granule mostly coarse tr little-med pebble damp poor sort subangular
						19-33 CLAY tr silt dry no plasticity/dilatency hard, v. stiff tr sand vf-fine rock @ 26
0826		5-8	[redacted] 30			0-5 SILTY CLAY Little sand vf-coarse sba-sub, med plasticity, v. soft wet → due to hydrovac
					0.0	5-28 CLAY tr vf-fine sand, silt dry/crumbly no-little plasticity no dilatency med stiff-v stiff
					0.0	28-36 SHALE hard dry [redacted] (clay shale) GLEY 1 4/5 G (dk greenish gray)
						8' EOB refusal due to shale/bedrock

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Unconsolidated Boring Log

Boring/Well	HSB-126
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/25/11
Prepared by	KAH
Start Time and Date	8/25/11 1040
Finish Time and Date	8/25/11 1145
(PID) or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	8
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 8'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1115		0-4	39			0-9 Fill (sand/Gravel angular, v.f sand - lg pebble)
					0.0	9-19½ Clayey SILT damp crumbles black no plasticity/dilatency
						med stiff little sand vf-fine round tr med-granule
					0.0	19½-29 CLAY mottled damp tr sand/silt vf-med subA
						med stiff no-little plasticity, no dilatency
						29-34½ found rock (lg-v. lg pebbles, subA)
						rock flour seams ~~¾~~ white/gray
1052		4-8	46		0.0	0-46 CLAY mottled damp no-little plasticity no dilatency
						med stiff - hard → to dry at base
					0.0	trace lg angular pebbles @ 24-26", 31-33", 44"
						31-36 → little small-lg pebbles angular
						tr organics/rock flour 9"-16"
						8' refusal due to shale/bedrock

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-127
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/25/11
Prepared by	KAH
Start Time and Date	8/25/11 1313
Finish Time and Date	8/25/11 1405
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Don Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2'x42'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1340		0-4	38			0-3 SAND little silt vf-med moist med little coarse & granule damp poor sort subr-subr loose
					5.0	3-25½ SILT little clay damp black med dense little plasticity/no dilatency
						tr organics
					1.2	25½-32 Silty clay little sand (vf-med) damp mottled low plasticity no dilatency
						tr organics
						32-38 SANDY SILT med grained damp med dense
1313		5-8	34		0.3	0-34 CLAY silty tr sand vf-med mottled damp-dry no plasticity/dilatency
					0.0	coarse sand seams @ 7", 11", 20", 23", 29" soft-hard
						lg pebble, angular @ 29"
1325		8-12	37		0.0	0-6½ clayey sandy SILT wet v. soft v.f-coarse subr sand nonplastic
						6½-7½ Silty SAND/GRAVEL v.f-granule little small pebble, tr med-lg pebble
					0.0	subr-subr wet poor sort dense
						15-19 silty CLAY mottled dry stiff-v stiff nonplastic/no dilatency

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Unconsolidated Boring Log

Boring/Well	ASB-123
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/25/11
Prepared by	KAH
Start Time and Date	8/25/11 1420
Finish Time and Date	8/25/11 1730
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	40.5'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	microcore
Dimensions	2" x 40 1/2'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1425		2-4	25			0-8 silty SAND vf-coarse, mostly fine little granule-small pebble tr med pebble-lg pebble, wet (from hydrovac)
					0.0	8-20 silty CLAY no-low plasticity no dilatency stiff-v. stiff little sand vf-med mottled
						12-13½ SILT black some sand vf-f stiff damp-dry
						20-25 SILT some sand vf-fine round-subr damp loose-med stiff tr small-lg pebbles subr very crumbly
1440		4-8	37½			0-8 SANDY SILT wet vf-fine little med-granule tr small-mid pebble vr soft
					0.0	8-22 SAND AND SILT trace very black v. dense vf-med sand subr-round si to up
					0.0	22-34 CLAY little silt tr f-med sand low-med plasticity no dilatency med stiff med sand seam @ 30" tr small-lg pebbles
						34-37½ SAND vf-med mostly med wet med dense tr silt well sort
1450		8-10½	36		0.0	0-12 SAND v.f-med mostly fine little silt wet med dense well sort
					0.0	12-36 clayey SILT mottled slightly dry and stiff-hard little sand vf-med round

GLEY 5/5GY

rust color seams @ 27½, 29, 30, 32, 33½'

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Unconsolidated Boring Log

Boring/Well	ASB-129
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/26/11
Prepared by	KAH
Start Time and Date	8/26/11 0750
Finish Time and Date	8/26/11 1000
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan
Drilling Method	Geoprobe
Sampling Interval	4'
Hammer Weight	/
Drop Height	/
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	/
Sample Device	macrocore
Dimensions	2" x 4'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft) "	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
0800		0-4	31			0-3½ silty sandy FILL little granule-med pebble
					0.1	3½-26 clayey SILT little vf-f-med round-sub-r no plasticity/dilatancy
						slightly damp med stiff-soft black
						27" med pebble subc
					0.1	27-31 SANDY SILT vf-med little v. coarse-granule tr small-med pebble
						dry med stiff black
0803		4-8	40			0-3½ Sleugh
					0.0	3½-25 Silty SAND wet f-vc, mostly med-coarse sub-sub little granule-small pebbles, tr med pebbles poor sort 2.5 Y 4/3
						20-24 sandy SILT vf-coarse sub-sub soft moist
						25-27 rock
					0.0	27-40 ~~silty~~ clayey sandy ~~CLAY~~ vf-coarse little v. coarse-small pebble tr med pebble mottled med stiff slightly moist no-little plasticity no dilatancy GLEY 1 6/5G 2.5 Y 4/3
0818		8-12				* Stuck in core tube
					0.0	8-9 SAND fine-v. coarse mostly med sub-sub tr granule-small pebble poor sort wet
					0.0	10-11 sandy silt little clay med dense moist vf-v. coarse sub-sub tr granule-med pebble
						11-12 SHALE hard weathered rust colors evident dry GLEY 1 4/5G
						12' refusal bedrock/shale

BORLOG.XLS.xls
08/22/2011

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Unconsolidated Boring Log

Boring/Well	ASB-130
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/26/11
Prepared by	KAH
Start Time and Date	8/26/11 1050
Finish Time and Date	8/26/11 1140
(PID) or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan
Drilling Method	Geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	8'
Borehole Diameter	2"
Drilling Fluid Used	
Sample Device	macrocore
Dimensions	2" x 8'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft) "	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1254		0-4	28			0-3 Fill wet						
					0.0	3-7½ Silty SAND/GRAVEL v.f - coarse, mostly fine little granule-small pebbles tr med pebbles wet						
					0.0	7½-25 SILT little v.f sand, clay no-little plasticity no dilatency black moist organics						
						25-28 saa w/ lg pebbles						
1100		4-8	48			0-4 saa wet						
					0.2	4-18 SAND v.f-v. coarse, mostly med subr little granule trace small-med pebble, silt wet poor sort, dense broken lg pebble @ 14-16"						
					0.0	18-48 clayey SILT mottled little v.f sand med stiff-hard GLEY1 5/10GY 10 YR 4/2 little-no plasticity moist-v. dry						
						color change @ 27" 5 Y 5/4 dry @ 32"						
						38" hard @ 41"						
						8' EOB bedrock/shale refusal						mottling v. distinct 19-29" then less pronounced but still evident 29-"

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Unconsolidated Boring Log

Boring/Well	ASB-131
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/26/11 1245
Prepared by	KAH
Start Time and Date	8/26/11 ↓
Finish Time and Date	8/26/11 1340
(PID) or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan
Drilling Method	Geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	8'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 8'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery "	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1255		0-4	40			0-9½ Sandy SILT vf-med subr soft-med stiff no plasticity/dilatency						
						4-6 broken asphalt						
					0.0	9½-18 clayey SILT little sand vf-f, tr medium dry no plasticity/dilatency						
						black med stiff-stiff						
						18-27 CLAY little sand v.f-f trace silt low plasticity no dilatency						
						med stiff slightly damp mottled 10YR 3/3						10YR 4/6
					0.0	28-34 Sandy SILT vf-med mostly med slightly damp tr v. coarse-small pebble						
						med pebbles @ 29" 1 g pebble @ 33"						
						34-39 SAND dry vf-med trace clay little granule-small pebble dry, poor sort sub-subr						
						39-40 broken up sandstone 7.5 YR 7/6						
1310		4-8	45			0-4 SAND coarse, tr v. coarse, subr-round, tr granule wet, well sort						
						loose						
					0.0	4-12 SAND f-med, mostly med, little coarse, tr vc coarse-small pebble						
						subr-subr dry poor sort						
						12-23 SAND f-med, mostly med tr coarse-small pebble, wet, well sort med dense subr-round						
					0.0	23-40 silty CLAY mottled dry weathered v stiff-hard						
						8' refusal due to shale/bedrock						

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Unconsolidated Boring Log

Boring/Well	ASB-132
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/26/11
Prepared by	KAH
Start Time and Date	8/26/11 1405
Finish Time and Date	8/26/11 1435
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	4'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 4'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1408		0-4	39			0-2 SAND tr silt vf-med mostly fine tr coarse-small pebble subr-subang, poor sort dry block
						2-~~3~~ sandy SILT vf sand round tr v coarse-small pebble subr dry poor sort loose-med dense med pebbles @ 57c-6" 10 YR 6/6
						color change @ 6" 5 Y 5/3
					0.0	7-22 sandy SILT vf-fine round trace clay slightly damp med dense no plasticity/dilatency block
						tr coarse-lg pebbles angular-subr
					0.0	22-39 CLAY trace silt, vf-med sand round, mottled
						v low-no plasticity, no dilatency slightly moist (moldable) to dry
						rust seams @ 36, 38, 39" ~~tr granule-small pebble~~ (color)
						4' refusal due to shale/bedrock
						EOB

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-133
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/1/11
Prepared by	KAH
Start Time and Date	9/1/11 1128
Finish Time and Date	9/1/11 1220
PID or FID with Lamp Size	
Calibration Gas/Time/Results	99.7

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	8'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 8'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1142		0-4	29		0.0	0-29 SAND vf-f little med-coarse tr vi coarse-granule round-sub r						
					0.0	slightly moist-moist (19") well sort loose-med dense	10 YR 4/4					
						color change @ 24" to black → asphalt 24-29"						
1154		4-8	46			0-10 slough (concrete powder)						
						10-22 sandy silty clay w/broken up clasts dolomitic? ranging from granule-lg pebble size						
					0.0	22-40 CLAY mottled hard slightly moist-dry no plasticity/dilatancy						
						reworked @ 36"						
					0.0	40-46 Shale GLEY 1 5/5G						
						EOB 8' Shale						

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Unconsolidated Boring Log

Boring/Well	ASB-134
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/26/11
Prepared by	KAH
Start Time and Date	8/26/11 1525
Finish Time and Date	8/26/11 1600
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	43'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 9'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1530		0-4	40		0.0	0-14 SAND f-med little coarse-v coarse tr granules damp
						& round-subr poor sort loose
					0.5	14-20.5 silty SAND vf-fine little med EAH tr med pebble
						poor sort dry subr-subr med dense tr v coarse-med pebble
					0.0	20.5-28 see color change → black
						28-40 SILT some vf-f sand med stiff slightly damp no plasticity/dilatency
						black tr clay
						color change @ 36" "less black"
1545		4-8	44		0.0	0-3 see wet
					0.0	3-9 SAND/GRAVEL vf-v.coarse subr-subround w/granule-med pebbles
						poor sort wet dense
					0.0	9-44 CLAY mottled tr vf-med sand round-subr
						moist to dry @ 21" med stiff
						med → no plasticity
						no dilatency

ARCADIS

Unconsolidated Boring Log

Boring/Well	GSB-135
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/26/11
Prepared by	KAH
Start Time and Date	8/26/11 1625
Finish Time and Date	8/26/11 1740
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Don
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	9'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 9'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft) "	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1630		0-4	3½			0-4 slough/asphalt						
					7.0	4-10 SAND v.f-med mottling med tr silt, v. coarse-small pebble poor sort dry black						
						pounded rock @ 9"						
					329.3	10-3½ sandy SAND v.f-med subr med dense black little coarse-small pebble						
						dry petrol odor pounded rock 12-13½" tr med pebbles						
1635		4-8	22		14.0	0-17 saa [redacted]						
						wet @ 12" color change @ 5½ to brownish						
						1g pebble @ 7-8"						
					694.4	17-22 sandy SILT v.f-fine sand round moist black						
						petrol odor tr-little clay [redacted] plasticity/no dilatency low-med ↑						
						1g pebble @ 20"						
						color change @ 21½: GLEY1 4/10GY						
1650		8-9	12			0-3½ silty SAND dry (sloughs)						
					293.2	3½-9½ sandy SILT v.f-fine sand round moist GLEY1 4/10/GY						
						GLEY 1 7/5G @ 8"						
						strong petrol odor						
						9½-12" pounded bedrock						
						9" EOB due to bedrock						

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-136
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/29/11
Prepared by	KAH
Start Time and Date	8/29/11 0825
Finish Time and Date	8/29/11 0915
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100 - 1

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	11'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 11'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
0830		0-4	44			0-4 sandy SILT slightly damp crumbly no plasticity/dilatency black						
						vf-med sub-subr little v.coarse-granule to small-med pebble slight odor						
						4-6½ pounded rock						
					2.0	6½-13 SAND AND SILT vf-med mostly med little v. coarse med pebble						
						poor sort slightly damp med dense						
					0.4	13-44 CLAY mottled little sand/silt vf-med to coarse-med pebble						
						dry med stiff no plasticity/dilatency						
0840		4-8	24			0-2 SAND coarse-v. coarse mostly coarse subr loose well sort moist						
					8.2	2-8 sandy clay/silt dry nonplastic/dilatent soft-med stiff						
						mottled vf-v.coarse subr-subr petrol odor						
						8-10 pounded rock						
					5.3	10-17 sandy SILT wet strong petrol odor vf-med mostly fine						
						soft no plasticity/dilatency black						
						17-19 silty SAND vf-med mostly fine little coarse-granule subr-subr						
						poor sort wet petrol odor						
					14.5	19-24 CLAY mottled dry no plasticity/dilatency slight petrol odor						
						→to slightly moist soft-med stiff						
0854		8-11	42		0.7	0-18 silty SAND wet vf-fine to med-small pebble subr-subr poor sort						
						13-29 SILT moist low-med plasticity little vf-f sand little clay color change @ 21" black → 5YR 2/1 7/104						
						lg pebble 27-29'						
						29-34 ~~clayey SAND~~ SANDY silt slightly damp vf-med to coarse-med pebble subr-subr						
					0.7	34-42 CLAY v. stiff-hard slightly mottled slightly damp low plasticity 5Y 5/3						
						EOB @ 11' refusal due to bedrock/shale						

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Unconsolidated Boring Log

Boring/Well	ASB-137
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/29/11
Prepared by	KAH
Start Time and Date	8/29/11 1205
Finish Time and Date	8/29/11 1350
(PID) or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	Geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	11'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 11'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft) "	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1215		0-4	30.5			0-4½ SILT sandy v.f-med - v. coarse little granule - small pebble dry						
						no plasticity/dilatency sub-angular loose						
					0.2	4½-22½ CLAY some sand vf-fine sub- low plasticity no dilatency med stiff						
						dry - slightly moist slightly mottled tr v. coarse - med pebbles sub-rnd						
					0.3	22½-30½ CLAY tr silt some sand vf-f mostly v.c little coarse - small pebble						
						med plasticity moist black med stiff lg pebble @ bottom						
1220		4-8	40.5			0-19 same						
					0.0	19-34 SAND v.f-f round wet dense well sorted tr silt						
					0.0	34-40.5 mix of sand above, silt below, and clay below						
1230		8-11	46			0-8 sandy SILT vf wet no plasticity high dilatency v. soft						
					0.3	8-11 CLAY wet high plasticity dilatent soft slightly mottled						
					0.4	11-46 CLAY mottled slightly moist-dry no plasticity/dilatency						
						v stiff - hard						
						28" brownish smear and color change to GLEY 1 4/10GY						

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-138
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/29/11
Prepared by	KAH
Start Time and Date	8/29/11 1505
Finish Time and Date	8/29/11 1640
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	9'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 8'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1513		0-4	30			0-3 pounded concrete						
						3-6 SAND med-coarse mostly med tr v coarse - small pebble round-subr						
						dry-damp poor sort loose						
					0.0	6-15 Sandy SILT (AND SAND) ~~moist~~ damp no plasticity/dilatency f-med, little coarse						
						tr v coarse - lg pebbles soft						
						15-17 pounded rock						
						17-22 SAND tr silt f-d coarse mostly f-med subr-round little granule-med pebble						
						damp-moist poor sort loose beginning to be wet @ 22"						
					0.0	22-30 Clay mottled damp tr silt/vf-f sand no plasticity/dilatency						
						hard rust color laminations @ 24½"						
1554		4-8	40			0-40 saa no laminations, dry GLEY 1 5/5 GY						
						@ 31" shale GLEY 1 4/10 GY						
						@ 19" angular med pebbles (18½-20½")						
						brown lamination @ 15"						

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Unconsolidated Boring Log

Boring/Well	ASB-139
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/29/11
Prepared by	KAH
Start Time and Date	8/29/11 1635
Finish Time and Date	8/29/11 1725
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	8'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 8'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft) "	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1645		0-4	42		0.0	0-15 SAND little silt vf-med little coarse-granule tr small pebble
						dry-slightly damp 4-7" black
						7-15" brown
						15-16½ CLAY little silt some sand vf-f tr med damp no-low plasticity
						no dilatency med stiff
						16½-23 SANDY SILT vf-fine damp tr vi coarse-med pebble
						no plasticity dilatency med stiff
					2.1	23-42 CLAY mottled / no plasticity/dilatency damp soft-med stiff-v. stiff
						tr silt
						rock flour @ 27" (seam) 36"
1700		4-8	48½			0-3½ slough
					3.1	3½-48½ CLAY mottled no plasticity/dilatency slightly damp-dry
						stiff-hard slight odor
					11.3	rock/sand seams @ 11, 17, 20" GLEY 1 5/5G
						v lg pebble @ 39"
						EOB @ 8' due to shale/bedrock

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Unconsolidated Boring Log

Boring/Well	ASB-140
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/30/11
Prepared by	KAH
Start Time and Date	8/30/11 0805
Finish Time and Date	8/30/11 0850
(PID) or FID with Lamp Size	
Calibration Gas/Time/Results	100.0 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 4'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft) in	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
0814		0-4	36			0-2½ pounded concrete						
					2.8	2½-13 SAND AND SILT vf-med little angular-subc coarse-med pebble						
						no plasticity/dilatency med dense black						
						13-15 SAND vf-med little coarse subr-rnd med dense-dense damp						
						poor sort						
						15-20 silty SAND/GRAVEL vf sand - v.lg pebble subc-angular poor sort						
						broken up slightly damp						
					1.6	20-36 CLAY mottled low plasticity no dilatency med stiff - stiff						
						sl. damp						
0825		4-8	45		2.0	0-40 saa damp-dry fr sand/gravel up to med-lg pebble subc-ang						
						@ 30" 37'						
					2.2	40-45 SHALE GLEY1 4/5G						

BORLOG.XLS.xls
08/22/2011

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Unconsolidated Boring Log

Boring/Well	ASB-141
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/30/11
Prepared by	KAH
Start Time and Date	8/30/11 930
Finish Time and Date	8/30/11 1020
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.0

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	8'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 8'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
935		0-4	40		1.0	0-13½ SAND	v.l - wht,	mostly medium		little silt	damp	subr-subr
						fr gravel - med pebble	poor sort	loose - med dense				
					1.8	13½-40 CLAY	mottled	moist - dry		med plasticity		no dilatency
						med stiff - stiff	fr gravel	angular - subr				
0945		4-8	46		2.8	0-34 sloughs						
					5.9	34-46 CLAY	slightly mottled	dry		low-no plasticity		no dilatency
						reworked below 37"		med-stiff → v stiff				
						pounded rock 7-9" → also a rust seam						
						rust seam @ 37", 25"						
						EOB 8' due to shale/bedrock						

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Unconsolidated Boring Log

Boring/Well	ASB-142
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/30/11
Prepared by	KAH
Start Time and Date	8/30/11 1050
Finish Time and Date	8/30/11 1120
(PID) or FID with Lamp Size	
Calibration Gas/Time/Results	100.0

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	41'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 4'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft) "	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1055		0-4	36			0-3 sandy SILT dry blocky vf-f little coarse-sm/med pebble lean no plasticity/dilatency
						3-11 SAND vf-med mostly f-med tr silt little coarse-med pebble
					2.2	subr-subr slightly damp poor sort med dense
						11-17 SAND vf-med mostly med tr coarse-granule damp well sort subr-rnd
						med dense
						17-35½ CLAY mottled low-med plasticity ~~damp~~ moist stiff
					3.2	~~blk~~ ~~silt~~ ~~seam~~ silt seam pockets GLEY1 8/5 GY (between 19-22")
						23" ponded rock seam ↳ parting @ 26" organics
						35½-36 dolomitic limestone
						EOB due to dolomitic limestone (bedrock)

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Unconsolidated Boring Log

Boring/Well	ASB-143
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/30/11
Prepared by	KAH
Start Time and Date	8/30/11 1135
Finish Time and Date	8/30/11 1200
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.0

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	31
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 3'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1140		0-3	30			0-9½ silty SAND vf-coarse mostly med little v. coarse - small pebble
					4.0	to med pebble subr-sbr med dense slightly moist poor sort
						9½-11½ SAND f-coarse mostly med slightly moist med dense subr well sort
					4.7	11½-18 CLAY slightly mottled fr fined sand subr-round
						low-med plasticity slightly moist no dilatency
						med stiff-stiff
					4.8	18-30 shale GLEY 1 4/5G dry

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Unconsolidated Boring Log

Boring/Well	ASB-144
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/30/11
Prepared by	KAH
Start Time and Date	8/30/11 1325
Finish Time and Date	8/30/11 1425
~~PID~~ or FID with Lamp Size	
Calibration Gas/Time/Results	100.0

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geo probe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	8'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 6'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1340		0-4	37			0-5 pounded concrete						
					3.7	5-10 SAND f-med mostly med little coarse-v coarse to granule-small pebble round-sub rnd dense poor sort slightly moist						
						10-25 ~~clay~~ SILT little sand, clay v.f-med moist, stiff no plasticity/dilatancy mostly v.f-f to coarse-small pebbles						
						10 YR 3/2 black @ 21.5-23						
						Sandy silt seam (v.f-f) 20.5-21.5", 23-25"						
					4.1	25-37 SAND to silt v.f-med mostly med to coarse-med pebble						
						poor sort med dense slightly moist						
						rust colored 27-30"						
1355		4-8	46			0-6 Slough						
					3.6	6-15 SAND v.f-med, med → f mostly @ 10" little coarse to vi coarse-granule well sort med dense sub-round @ 15" rust colored, granule-med pebble seam						
					1.0	15-36 CLAY slightly mottled (unworked) slightly moist-dry no plasticity, no dilatancy hard						
						36-40 SHALE GLEY1 4/5G						

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Unconsolidated Boring Log

Boring/Well	ASB-145
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/30/11
Prepared by	KAH
Start Time and Date	8/30/11 1515
Finish Time and Date	8/30/11 1700
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.0

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2"x12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in.)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1520		0-4	30		2.1	0-10 Silty SAND f- to coarse, mostly f-med loose-med dense sub-rnd little v.coarse-fine pebble to med pebble poorly sort dry-damp
					2.8	10-30 sandy SILT tr-little clay vf-med sub-round little coarse-fine pebble low plasticity no dilatancy moist to med pebble
1525		4-6	19		2.9	0-9 sand wet @ 6"
						9-14 pounded rock
					4.8	14-19 SAND f-med mostly med to coarse-v.coarse well sort sub-rounded
						loose wet
1530		6-8	28			0-8 sand
					4.1	8-28 SAND f-med ~~mostly~~ to coarse well sort wet med dense, loose
						color change @ 13.5', 20" 5Y 3/1 → 2.5Y 3/3 → 5Y 3/1
1545		8-12	48	▽ 8.6'	4.5	0-27 soil
						27-38 varved mottled clay, silt, sand from above wet poor sort
					31.1	38-44 busted rock w/SH seam @ 41"
						44-48 CLAY mottled med silt-silt med plastic no dilatancy to med pebbles moist

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Unconsolidated Boring Log

Boring/Well	ASB-146
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/31/11
Prepared by	KAH
Start Time and Date	8/31/11 0755
Finish Time and Date	8/31/11 0915
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.0 ppm

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
0805		0-4	33			0-4 pounded concrete
					3.0	4-15½ SILT tr clay little v.f sand black slightly moist med stiff-stiff
						no plasticity/dilatency
					4.4	15½-30½ SAND
						15½-26 silty sand vf-med y some coarse-granule little small-med pebble sub-sub
						poor sort slightly damp @ 20" pounded rock med dense-dense
						26-30½ sand f-med mostly med round-sub med dense-loose
						tr coarse-small pebble well sort
						30½-33 CLAY mottled slightly moist-dry no plasticity/dilatency hard
0810		4-8	34			0-7 Slough
					3.5	7-12 silty SAND vf-f tr med slightly damp well sort round-sub med dense
						12-18 Sand and Silt, vf-med little v. coarse-granule tr small-med pebble
						dry-wet @ 17"
						18-21 sandy SILT wet black no plasticity dilatent v soft vf-f sand
						@ 20" 1g pebble
					973.1	21-24 CLAY mottled ~~[illegible]~~ dry-moist no plasticity/dilatency soft
						24-34 SILT soft black organic ~~petrol~~ odor slightly moist no plasticity
						no dilatency

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Unconsolidated Boring Log

Boring/Well	ASB-146	Site Location	St Paul, MN
Project Number	DE000440.0001	Date	8/31/11
Client Name	Ford TLAT	Prepared by	KAH

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
0820		8-10	24			0-5 slough						
						5-14.5 SILT some sand vf-f v moist no plasticity dilatent soft petrol odor						
					940.8	14.5 → 21 silty SAND/GRAVEL vf-med sand little coarse - med pebble						
						round - subang poor sort wet dense						
0830		10-12	48		99.8	0-24 silty SAND/SANDY SILT vf-f tr med - v. coarse wet no plasticity						
						vr soft						
					18.2	24-48 CLAY mottled slightly moist - dry no plasticity/dilatancy						
						v. stiff - hard	GLEY 1 8/10GY					
						12' EOB						

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-147
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/31/11
Prepared by	KAH
Start Time and Date	8/31/11 0945
Finish Time and Date	8/31/11 1100
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.0

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
0955		0-4	28			0-4½ pounded concrete
						4½-10 SAND f-coarse mostly med tr v.coarse-small pebble dry, loose poor sort concrete lg pebble size @ 8-10"
					13.6	
						10-18 sandy SILT black dry crumbly no dilatency no plasticity v.f-fine med dense
					5.3	18-28 SAND v.f-med mostly med little coarse-granule tr small pebble-med pebble dry-slightly moist poor sort med dense subr-subr color change @ 25" 10YR 5/6 → 10YR 3/1
1000		4-8	30		1	0-9 slough
					14.8	9-19 SAND f-med mostly med little coarse tr v. coarse-med pebble roma-subr moist med dense poor sort
					427.4	19-30 SAND vf-f-med mostly f-med tr coarse-small pebble organics to silt poor sort med dense wet-moist strong petrol odor black-gray black
1010		8-12	46			0-13.5 saa slight sheen visible wet
					421.3	13.5-18 SILT little clay organic v. moist high plasticity soft color change @ 15"
					849.9	18-32½ SAND AND CLAY, SAND, CLAY mottled varved petrol odor lg med-high plasticity mottled vf-med mostly vf-f no dilatency soft-med with moist SAND wet vf-coarse little v.coarse-small pebble, tr med pebble, poor sort, wet dense

pounded rock: 25½-29

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-147	Site Location	St Paul, MN
Project Number	DE000440.0001	Date	8/31/11
Client Name	Ford TCAP	Prepared by	KAH

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
					24.8	32½-46	CLAY	mottled	v. stiff-hard	no-low plasticity, no dilatancy		
						sl moist						
						remarked @ 44'						

651 485-4819

ARCADIS

Unconsolidated Boring Log

Boring/Well	MSB-148
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	8/31/11
Prepared by	KAH
Start Time and Date	8/31/11 1115
Finish Time and Date	8/31/11 1250
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.0

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	Geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	16'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	Macrocore
Dimensions	2" x 16'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1125		0-4	32			0-2 slough (paved concrete)
					2.4	2-32 SAND vf-med mostly med little coarse - small pebble to med pebble
					2.3	dry-slightly moist med dense poor sort sub-sub
1131		4-8	48		3.2	0-11 slough
						11-36 sea wet @ 33" loose-med dense
					1060	36-48 SAND little silt (seam @ 38") vf-med mostly fine to coarse - small pebble
						wet black slight petrol odor med dense
1138		8-12	23		1651	0-15 slough
						15-23 sea
1148		12-16	48		138.0	0-48 SAND trace little silt vf-fine little med to coarse-grannule
						wet wet poor sort sub-round Sheen visible in water
					301.9	strong petrol odor 10YR 3/2 change @ ~35" 10YR 4/2

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-157
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/1/11
Prepared by	KAH
Start Time and Date	9/1/11 1415
Finish Time and Date	9/1/11 1505
PID or FID with Lamp Size	
Calibration Gas/Time/Results	99.7

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1428		0-4	33			0-4 sloughed (pounded concrete)
					0.0	4-33 SAND vf-med little coarse ~~[illegible]~~ granule to small-med pebble slightly moist
					0.0	poor sort med dense round-sub
1434		4-8	41		0	0-12 sloughed
					0.0	12-41 saa wet @ 26"
					0.0	26-41 SAND med-v. coarse mostly coarse-v. coarse little granule-med pebble
						poor sort wet round-sub med dense ~~[illegible]~~ trace silt
1441		8-12	33			0-11½ sloughed
					0.0	11½-21 saa
					33.4	21-30 sandy silt vf-med trace-little coarse-lg pebble round-sub wet
						dilatent to clay med plasticity petrol odor
					473.3	30-33 SAND med-coarse petrol odor sheen visible wet little v. coarse-granule
						round-sub to small pebble loose poor sort
						EOB 12'

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Unconsolidated Boring Log

Boring/Well	ASB-15B
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/1/11
Prepared by	KAH
Start Time and Date	9/1/11 1537
Finish Time and Date	9/1/11 1640
PID or FID with Lamp Size	
Calibration Gas/Time/Results	99.7

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft) "	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1545		0-4	35			0-6 Slough (pounded concrete)
					0.0	6-17 silty SAND vf-med little coarse-small pebble poor sort slightly moist round-subr med dense
						17-26 Sandy SILT ~~[illegible]~~ tr-little clay mottled vf-f sand round-subr no/little plasticity no dilatency tr vi coarse-med pebbles slightly moist med stiff
					0.0	26-35 SILT some sand vf-f round little clay black moist med dense med plasticity no dilatency organics
1550		4-8	33			0-7½ slough
					187.4	7½-33 SAND vf-med little v. coarse-granule to small-med pebble poor sort round-subr slightly moist-wet @ 20" pumice rock @ 14"
					490.5	color change @ 22" 25"½" brown → 2.5Y 5/1 / 2.5Y 4/1 → black strong petrol odor @ 24"
1600		8-12	46		631.5	0-6 see strong petrol odor
					25.8	6-21 CLAY mottled vi sort wet petrol odor little sand/silt, vf-fine, broken rock @ 11" broken rock/sand seam @ 19"
					2.1	21-39½ CLAY moist-slightly moist vi hard reworked no plasticity dilatency 5Y 5/3
					10.7	39½-46 weathered shale GLEY 1 4/10GY

EOB 12'

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Unconsolidated Boring Log

Boring/Well	ASB-159
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/2/11
Prepared by	KAH
Start Time and Date	9/2/11 0805
Finish Time and Date	9/2/11 0925
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.0

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" X 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft) in	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
0820		0-4	35			0-2½ sloughs
					1.2	2½-35 SAND f-med little coarse-small pebble to med-lg pebble round-sub-a poor sort med dense slightly moist-moist
						odor begins @ 29" petrol odor strong 31-35"
					92.4	color change to black @ 30"
						31-33" CLAY moist
						8-12 ~~sandy~~ silt vf-f little med-granule to small-med pebble little clay low-med plasticity
0826		4-8	38			0-10 sloughs
					1057	10-38 Sandy SILT no plasticity/dilatency black med stiff v.f-f little med to coarse-small pebble ~~wet~~ moist-wet strong petrol odor
					842.5	16-17, 20½-25, 27, 28 30-31 silty SAND f-med to v coarse-small pebble
						28-30 CLAY med stiff moist med-high plasticity
0832		8-12	46			0-4½ sloughs
					1264	4½-10 Sandy SILT vf-med little coarse to v.coarse-small pebble wet
						10-24 SAND to-little silt f-med ~~fine~~ little coarse-v coarse wet
						poor sort sub-a-sub-a some visible black

no plasticity dilatent strong petrol odor

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-159	Site Location	St Paul, MN
Project Number	DE000440.0001	Date	9/2/11
Client Name	Ford TCAP	Prepared by	KLt

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
						24-34 Silty sandy gravel, broken up rock wet - slightly moist petrol odor						
						wtr-bearing mottled clay seam @ 27-29"						
					77.0	34-46 Clay mottled med stiff - vi stiff low plasticity no dilatancy						
						slightly moist						
						Silt-vf sand ~~flowing~~ @ 42"						

BORLOG.XLS.xls
08/31/2011

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-160
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/2/11
Prepared by	KAH
Start Time and Date	9/2/11 1010
Finish Time and Date	9/2/11 1200
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.0

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	12
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1020		0-4	31			0-6 Sandy SILT dry-slight moist loose-med dense vf-f little coarse-granule
					2.4	tr small-med pebble 7.5 Y 2.5/3
						6-31 SAND AND SILT vf-med tr clay slightly moist med stiff
					13.8	little coarse tr vi coarse-med pebble round-sbr rust colorations near 26"
						27-31 black slight petrol odor
1026		4-8	35			0-8 Sloughed
					534.3	8-14½ SILT black moist little vf sand petrol odor no plasticity/dilatancy
						14½-32 SAND f-med little coarse-v. coarse tr granule-med pebble
					1363	round-sbr moist to wet @ 26" black petrol odor
						32-35 SILT black no plasticity/dilatancy organics slightly moist petrol odor
1033		8-12	50			~~SAND vf~~
						8-12 SILT wet trace vf sand, clay gray-black @ 5" organics no plasticity/dilatancy
					1200	12-19 silty sand/gravel med-v coarse petrol odor moist some granule-small pebble tr med pebble poor sort black
					52.4	19-50 CLAY mottled red. stiff-v stiff low plasticity no dilatancy

Numbered top 4"

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-161
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/2/11
Prepared by	KAH
Start Time and Date	9/2/11 1200
Finish Time and Date	9/2/11 1300
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.0

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1205		0-4	23		0	0-23 SAND SILTY vf-med little coarse to v. coarse-med pebble
					1.4	dry-slightly moist med dense round-suba
						lg pebble @ 23" 10 YR 7/2
					.5	0-5 sandy SILT dry vf-fine little med-v. coarse tr granule-small pebble
						loose 10 YR 3/4
1210		4-8	FT			0-3½ slough lg pebble @ 3½
					178.4	3½-11 SAND black petrol odor wet vf-coarse well sort med dense
						round-suba
						11-17 SILT little clay black organic wet-v. moist med dense
						med-high plasticity no dilatancy little vf sand
1300		8-12				Lost rod down borehole
						No recovery
						18" EDB

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-162
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/6/11
Prepared by	KAH
Start Time and Date	9/6/11 0820
Finish Time and Date	9/6/11 0930
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
0834		0-4	36			0-6 slough (broken up concrete)						
					6.8	6-36 CLAY mottled dry-moist little sand vf-fine tr silt med plasticity						
						broken rock @ 23,33" med stiff						
					0.3	10-17 SILT black moist trace-little clay no plasticity/dilatancy loose/soft-med						little vf-f sand
0840		4-8	32			0-19 CLAY mottled, low plasticity dry-moist, med dense						
					0.5	@ 672" med-high plasticity v. moist soft-v. soft						
						19-29 sandy SILT v moist soft to wet						
						vf-med subr-round little coarse to v. coarse-small pebble						lg pebble @ 25,26"
					0.4	29-32 silty SAND med-coarse little v. coarse wet loose round-subr poor sort						
						tr gravel-small pebbles						
0854		8-12	49			0-4 slough						
					0.7	4-8 silty SAND f-coarse v moist tr v coarse-med pebble poor sort round-subr loose						
					0.3	8-15 CLAY mottled slightly moist shale @ 9-10'/2 stiff-med dense						
						v plasticity/dilatancy						
						bagged rock @ 13-15" wet						
					0.4	15-49 SILT, tr-little clay little sand vf v. moist-wet black color change @ 41"						
						@ 41" SILT some SAND vf-fine v. moist-wet soft						GLEY 1 5/5G4

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-163
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/6/11
Prepared by	KAH
Start Time and Date	9/6/11 1100
Finish Time and Date	9/6/11 1210
(PID) or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1109		0-4	31			0-15 silty SAND/GRAVEL dry poor sort round-subr-angular ~~trace~~ v.f-med ~~cobble~~ some coarse-v. coarse little granule-med pebble
					21.6	15-26 SILT black some sand mf moist no plasticity/dilatency soft-med dense crumbly to clay slight odor
					177.8	26-31 SAND f-coarse mostly med round-subr loose slightly moist well sort tr v. coarse small pebble
1114		4-8	23			0-2½ sloughs
					1437	2½-16 SAND f-med mostly med ~~trace~~ coarse-med pebble moist-wet (@ 9") well sort loose-med dense round-subr
					668.2	color change black 10-16" 2.5Y 4/4 5-7" slight-strong petrol odor @ ~10"
					920.7	16-23 SILT organics v. moist petrol odor black tr clay little vf sand med plasticity no dilatency soft-med dense
1120		8-12	46			0-11½ sloughs
					862.1	11½-14 saa
						14-16 CLAY mottled
					70.2	14-18 SAND AND CLAY crumbled moist-wet non plastic/dilatent
						18-46 moist-dry mod stiff hard (@ 42") no plasticity/dilatency green-~~orange~~ brown @ 32" thin sand/silt lamination

remarked @ 42"

EOB Refusal @ 12'

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Unconsolidated Boring Log

Boring/Well	ASB-164
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/6/11
Prepared by	KAH
Start Time and Date	9/6/11 1231
Finish Time and Date	9/6/11 1305
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	11.5'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 10.5'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft) in	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1239		0-4	29			0-3 SAND AND SILT slightly moist - dry v.f-f little med-coarse tr v. coarse sand pebble						
						tr clay non plastic / dilatent						
					0.0	3-29 SAND v.f wet round med dense dilatent well sorted						
						tr silt slightly mottled tr f-med grained color change @ 19"						
1244		4-8	26			0-6 sea (sloughs)						
						6-11 SANDY SILT mottled v.f-f little med - small pebble soft no plasticity						
						dilatent						
					0.1	11-26 CLAY dry no plasticity / dilatency hard						
						pound rock @ 24" GLEY 1 5/10GY						
		8-11.5	34			0-3½ slough						
						3½-7½ sea						
					0.0	7½-17½ SILT some v.f-f sand organics tr moist soft-med stiff little clay						
						med-high plasticity black-dk gray (@ 15")						
					0.0	17½-27½ CLAY some sand moist med plasticity no dilatency						
						tr gravel-small pebble mostly v.f-fine, little med slightly mottled						
						GLEY 1 5/10 GY						
						27½-34 pounded rock wet little silt						
					—	11½' EOB refusal						

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Unconsolidated Boring Log

Boring/Well	ASB-105
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/6/11
Prepared by	KAH
Start Time and Date	9/6/11 1405
Finish Time and Date	9/6/11 1455
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	10.5'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 10.5'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1410		0-4	38		0.6	0-10 SILT dry little sand vf-f tr clay black soft no plasticity/dilatancy						
						10-24 SAND vf little silt wet dilatant tr coarse-granule well sort						
					0.0	med dense				Color change @ 13"		
					0.0	24-38 SILT some sand vf-f black moist tr med-coarse						
						nonplastic/dilatant						
1415		4-8	27		4.0	0-7 see						
					0.4	7-27 CLAY dry reworked no plasticity/dilatancy crumbly GLEY 1 4/5GY						
						hard broken rock/slate @27"						
1420		8-10.5	15		0.1	0-15 SILT wet some sand, tr clay soft mottled black mtl ~6"						
						vf-coarse little small-lg pebbles, moist broken						
						10.5' EOB due to refusal (rocks)						

BORLOG.XLS.xls
08/31/2011

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-166
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/6/11
Prepared by	KAH
Start Time and Date	9/6/11 1525
Finish Time and Date	9/6/11 1640
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 12

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft) "	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1531		0-4	21			0-1½ pounded concrete
						1½-5½ SAND f-med little coarse tr v. coarse moist loose poor sort round-subr
					2.7	5½-9 SILTY SAND f-med little coarse pounded rock @ 8½"
					19.5	9-21 SAND f-med tr coarse-v. coarse pounded/broken rock @ 11, 15, 18-20"
						moist-dry fill material – brown glass (especially 19-21")
						decaying substance @ 13" GLEY 1 3/10GY @ 9-11"
1538		4-8	28			0-5 slough
					5.8	5-11 broken glass, rock wet
					19.8	11-28 CLAY slightly mottled, reworked little silt, vf-f sand
						med plasticity no dilatency soft-med stiff tr broken rock, gravels small pebble
1545		8-12	28			0-7½ SILT some vf-f sand v. wet v. soft no plasticity/dilatency
					632.6	7½-11 CLAY slightly mottled reworked slightly moist w/dry no plasticity/dilatency
						11-20 CLAY little silt block med plasticity no dilatency moist med dense
						petrol odor trace organics @ 19-20"
						20-27 CLAY AND SAND mottled reworked vf-med little granules-med pebbles
					1836.6	round-subr med dense v. moist & petrol odor GLEY 2 4/10GG
						27-28 sandstone
						12' EOB bedrock refusal

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-167
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/6/11
Prepared by	KAH
Start Time and Date	9/6/11 1645
Finish Time and Date	9/6/11 1850
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	/
Drop Height	/
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1648		0-4	28			0-8 SAND/GRAVEL vf-m coarse poor sort loose dry round-angular little silt						
					3.8	8-13 CLAY AND SAND mottled reworked vf-f little med med stiff-stiff little silt no plasticity/dilatency						
					10.4	13-22½ SAND/GRAVEL vf-m coarse poor sort dry round-angular little silt broken rock						
						22½-26 SILT moist black little clay organics little sand vf soft med plasticity no dilatency						
1654		4-8	44		2.3	0-6 see						
					10.4	6-44 CLAY slightly moist-dry reworked slightly mottled no-little plasticity no dilatency med stiff little silt, vf-f sand						
1700		8-12	31			0-3 see						
					656.7	3-18 CLAY little silt black med plasticity no dilatency moist med dense petrol odor trace organics						
						18-19 red sandstone						
						19-28 SAND AND CLAY wet mottled little lg pebbles, broken rock little silt						
					480.1	soft-v. soft no plasticity/dilatency						
						28-31 vf sand sandstone crumbles dry-slightly moist						

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-168
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/7/11
Prepared by	KAH
Start Time and Date	9/7/11 0750
Finish Time and Date	9/7/11 0850
(PID) or FID with Lamp Size	
Calibration Gas/Time/Results	100.4

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
0756		0-4	24			0-6 SAND vf-med little silt, v. coarse - med pebble suba-subr poor sort dry loose black
					1.3	6-11 SAND v.f-f little silt, vi coarse broken rocks tr small pebble
						round-suba loose slightly moist poor sort
					0.7	11-24 SAND f-med little coarse - v coarse tr granule - med pebble slightly moist - moist
						poor sort loose-med dense suba - round
0802		4-8	28		0.9	0-20 SAND f-v. coarse (gradually graded) some granule, little small pebble tr silt
						poor sort moist round-subr
					0.2	20-28 SILT mottled little clay some sand v.f. coarse wet
						med plastic no dilatency med stiff
0807		8-12	38		0.2	0-10 SAND f-v. coarse tr vf-silt mostly med-coarse poor sort wet suba-rnd
						med dense little granule tr small-med pebble
						10-23½ SILT tr clay low-no plasticity moist little v.f sand no dilatency
					0.0	black organics
						23½-27 CLAY vi moist soft little sand vf tr med tr silt med plasticity
						no dilatency GLEY 1 6/N
					0.0	27-38 CLAY med stiff-stiff moist mottled low-moplasticity no dilatency

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-169
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/7/11
Prepared by	KAH
Start Time and Date	9/7/11 0918
Finish Time and Date	9/7/11 1010
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.4

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
0923		0-4	2.9			0-2.9 SAND						
					0.0	0-1.7 vf-f little coarse - small pebble tr med pebble dry - slightly moist						
						poor sort loose round angular tr silt						
					0.0	1.7-2.9 f-med mostly med slightly moist little coarse - v. coarse						
						tr granules poor sort round - sub- med dense						
0928		4-8	3.9		0.0	0-2.2 SAND sat						
						[redacted] / wet @ 15"						
					0.0	2.2-2.5 [redacted] SILT wet some sand vf- med no plasticity/dilatency soft						
						2.5-2.9 CLAY mottled v. moist soft little sand vf-fine tr med - v. coarse						
						[redacted] med plasticity no dilatency						
					0.0	2.9-3.9 SILT [redacted] tr clay little vf-f sand organics moist black						
						no plasticity dilatency med stiff - soft						
0934		8-12	3.0			0-3.5 sleugh						
					0.0	3.5-11 sea / low-med plasticity						
					0.0	11-30 CLAY mottled med stiff f sand lamination @ 20"						
						low plasticity no dilatency moist						

12' EOB bedrock (limestone?)

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-170
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/7/11
Prepared by	KAH
Start Time and Date	9/7/11 1018
Finish Time and Date	9/7/11 1130
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.4

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12.25
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 12.25'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1035		0-4	30			0-3 pounded concrete
						3-8 Fill
					1.4	8-17 SAND vf-f little-some silt tr med poor sort slightly moist
						loose-med stiff color change @ 9½" to black
					0.8	17-30 CLAY slightly moist no plasticity/dilatency stiff reworked?
						to dry v. slightly mottled
						22-23½ sand seam vf-med little coarse-granule
1040		4-8	37		1.6	0-37 saa
						wet @ 26"
					1.4	13½-to½, 24½-26 SILT seams little clay med plasticity no dilatency little sand
						moist black
1045		8-12	37			0-6 saa
						6-20 SILT slightly moist organics some sand vf-f med stiff-stiff no plasticity/dilatency
					0.8	black tr clay
						20-31 SILT some clay med-high plasticity dilatent v. stiff-soft v. moist-wet
					1.0	little vf sand reworked below 29"
						31-37 CLAY reworked med plasticity slight mottling, still some sand/silt; vf-f
						tr coarse-med pebble moist
1058		12-12.25				EOB refusal due to bedrock (limestone)

ARCADIS

Unconsolidated Boring Log

Boring/Well	MSB-171
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/7/11
Prepared by	KAH
Start Time and Date	9/7/11 1155
Finish Time and Date	9/7/11 1250
(PID) or FID with Lamp Size	
Calibration Gas/Time/Results	100.4

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1201		0-4	32			0-10 Fill (broken glass, sand)
					0.8	10-19 CLAY mottled slightly med stiff - stiff moist some sand vf-f low-med plasticity no dilatency
					0.6	19-26 SILT moist black little clay vf sand med plasticity no dilatency med stiff
						26-30 CLAY saa
1206		4-8	31			0-6 slough
						6-20 saa wet @ 19" @ 16" lg pebble angular
					0.7	20-31 SAND med-coarse little vf-silt wet little v. coarse round-subr loose poor sort
					0.5	24-25½ sandy SILT wet black vf-f little med soft
						31-34 SILT black moist organics some vf-f sand no plasticity/dilatency soft-med stiff
1211		8-12	34			0-7 slough
					0.7	7-19 SILT saa moist - wet broken rock 19-20"
						19-32 clayey SILT/SAND mottled vf-med little coarse-small pebble round-angular
					0.3	reworked wet med dense/dense poor sort
						32-34 bedrock

12' EOB bedrock (limestone)

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-172
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/7/11
Prepared by	KAH
Start Time and Date	9/7/11 1320
Finish Time and Date	9/7/11 1445
PID or FID with Lamp Size	9
Calibration Gas/Time/Results	100.4

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft) in	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1332		0-4	24			0-2½ pounded concrete
						2½-5½ SAND f-coarse mostly f-med slightly moist med dense ~~poor~~ sort
					4.5	round-sub.
						5½-13 broken rock (med-lg pebbles) oyster some CLAY slightly mottled hard slightly moist no plasticity/dilatency
					14.9	13-24 ~~broken~~ SANDY SILT / SILTY SAND black no plasticity hard @ 19" wet wet dense well sort round
						Wet @ 19" petrol odor dilatent
1339		4-8	19			0-2½ slough
						2½-3½ sand
					212.6	3½-16½ CLAY dry no plasticity/dilatency med dense
						shale @ 16"
						16-19 SILT black moist organics little-some vf-f sand round
						med stiff no plasticity/dilatency tr-little clay
1347		8-12	46			0-5½ sand
					575.7	5½-40½ CLAY med stiff med plasticity moist
						5½-14 black trace silt ~~med plasticity moist~~
						14-40½ slightly mottled GLEY 1 3/10Y, Black
					532.6	40½-46 sand wet
						40½-42½ sandy SILT seam (vf sand) wet soft no plasticity

12' EOB bedrock refusal

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-173
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/7/11
Prepared by	KAH
Start Time and Date	9/7/11 1435
Finish Time and Date	9/7/11 1535
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.4

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Don Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (~~ft~~ in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1445		0-4	30			0-2 pounded concrete
						2-6 SAND f-med little coarse to v. coarse - small pebble poor sort slightly moist
					1.0	round-suba
						6-21 CLAY little silt, v.f-f sand organics · clay mottled / black @ 20"
						dry - slightly moist sand/gravel → vf sand - med pebble subr-suba
					2.5	broken rock @ 10½" FILL
						21-30 sandy SILT/SILTY SAND round med-coarse FILL
						wet @ 25" broken rock @ 25"
1457		4-8	31			0-8½ saw SANDY SILT black broken pieces of glass, organics FILL
					386.2	vf-med sand petrol odor v. moist - wet no plasticity slightly dilatent
						8½-13 SILT black little vf-f sand tr clay no-v low plasticity no dilatency
						moist med stiff
					398.3	13-34 CLAY dry, med stiff no-low plasticity no dilatency
						mottled slightly moist GLEY1 5/10GY GLEY2 2.5/10B
1458		8-12	44			0-6 Sicily
					817.6	6-9½ saw GLEY 2 4/5GB black
					373.7	9½-38 SILT black little clay low-med plasticity no dilatency moist - ~~wet~~ v moist
						med stiff organics petrol odor GLEY2 5/5B mottling 35-75, beige @ 28" broken rock w/in silt grave-lg pebble
						38-44 broken bedrock
						12' EOB bedrock

BORLOG.XLS.xls
08/22/2011

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-174
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/7/11
Prepared by	KAH
Start Time and Date	9/7/11 1350
Finish Time and Date	9/7/11 1650
PID or FID with Lamp Size	PID
Calibration Gas/Time/Results	100.4

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	12'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1600		0-4	28			0-7 FILL						
					1.0	7-8½ SILT some sand vf-f little clay						med low plasticity no dilatency
						med stiff slightly moist black						
						8½-19 CLAY mottled med stiff-stiff med plasticity moist						
						13-14½ SAND seam vf-coarse poor sort subr-subr dry						
						below 14½ reworked?						
						19-22½ SILT some vf-f sand wet black soft-med stiff no plasticity dilatent						
						22½-28 SAND brown little silt vf-med little coarse to vi coarse-med pebble						
						moist poor sort broken rock						
1606		4-8	35		1.1	0-14 CLAY mottled → reworked dry no plasticity/dilatency						
						slightly moist						
						14½-16½ hard						
					1.0	24-35 SAND vf-med tr silt wet little coarse to vi coarse-small pebble						
						poor sort subr-subr						
1614		8-12	22			0-4½ see						
					0.4	4½-20 SILT little clay organics black wet med plasticity dilatent						
						tr-little sand vf						16-20' reworked w/bedrock
						20-22 bedrock						

EOB 12' bedrock refusal (limestone)

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-175
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/8/11
Prepared by	KAH
Start Time and Date	9/8/11 0742
Finish Time and Date	9/8/11 0840
(PID) or FID with Lamp Size	
Calibration Gas/Time/Results	99.9

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
0753		0-4	33			0-2 paved concrete						
					5.3	2-13 SAND f-med mostly med tr coarse-granule round-sub well sort slightly moist						
						med dense broken rock @ 13"						
						13-13½ CLAY med stiff-stiff low-med plasticity slightly moist no dilatency						
						tr vf sand/silt color changes @ 17½" → black						
					730.5	13½-33 SAND little-tr silt vf-f wood pieces @ 26" round-sub petrol odor						
						broken rock @ 27-29" slightly moist-moist @ 29" well sort black						
		4-8	32			0-3½ see ↑						
					902.8	3½-7½ SILT organic black petrol odor little clay med plasticity moist						
						no dilatency little-some sand vf tr f-med sub-rand med stiff						
					18.1	7½-32 CLAY dry med stiff-stiff no plasticity/dilatency						
						GLEY 1 5/5G some spots hard slightly mottled						
0805		8-12	34			0-4½ slough ↑						
						4½-6 see ↑						
					70.8	6-16½ SILT black organic odor no plasticity/dilatency some vf sand						
						tr-little clay slightly moist-moist @ 10½ med plasticity						
						16½-25 SILT little-some clay v. moist med-high plasticity little vf-f sand						
					7.0	mottled little coarse-med pebbles						
						25-28 CLAY mottled vr stiff low-med plasticity no dilatency slightly moist						
						28-34 bedrock						
						EOB 12' bedrock refusal						

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-176
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	09/08/11
Prepared by	KAH
Start Time and Date	9/8/11 0910
Finish Time and Date	9/8/11 1020
PID or FID with Lamp Size	
Calibration Gas/Time/Results	99.7

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	12'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 12'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
0930		0-4	16			0-2½ SAND f-med little coarse round-subrnd moist well sort med dense
					1.5	2½-16 CLAY slightly moist no plasticity/dilatency med stiff Slightly mottled @ 12-14"
						GLEY 1 4/10Y broken rock @ 5-6"
						2½-3 vf sand/silt seam no plasticity/dilatency moist med stiff-Stiff
						13½-15 SILT little sand vf-med, clay moist 10 YR 3/2
0948		4-8	24		1.6	0-24 CLAY moist, but has been dry mottled low plasticity no dilatency
						rounded rock @ 8" shale pieces (med pebble size) throughout, especially 20-24"
						13½-15½ SILT some sand m moist-wet Soft vf-med angular-subro
						block tr coarse-granule
0954		8-12	38			0-5½ CLAY saa
					861.6	5½-27 SILT
						5½-18 black med stiff some vf sand little clay no plasticity/dilatency organics
						little moist
				B3		18-27 m moist-wet tr organics petrol odor tr clay little vf sand Soft
						27-38 SAND AND SILT v.moist mixed *broken bedrock mottled petrol odor
					840.5	reworked organics vf-med-coarse sand little m coarse-small pebble
						black 10 YR 5/6 tr med pebble (broken bedrock fm)
						36-38 bedrock 10 YR 5/6

EOB 12' bedrock refusal

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-177
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/8/11
Prepared by	KAH
Start Time and Date	9/8/11 1050
Finish Time and Date	9/8/11 1120
(PID) or FID with Lamp Size	
Calibration Gas/Time/Results	99.9

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	7'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 7'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (%)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1055		0-4	32			0-6 FILL v.f-coarse sand tr silt little v.coarse-med pebble round-angular
					0.9	6-25½ SAND slightly moist loose-med dense poor sort subr-subr
						6-14 med little coarse-v. coarse tr granule
						14-25½ f-coarse little v. coarse-granule tr small pebbles
						25½-32 CLAY dry-slightly moist no plasticity/dilatency
						GLEY 1 5/5GY med stiff crumbly hard pieces
1103		4-7	26			0-3½ slough
					0.9	3½-10½ CLAY saa
						10½-19 SAND f-med little coarse, tr silt, v. coarse-small pebble
						poor sort round-subr v. moist med dense
				8/11		19-21 GRAVEL little sand (vf-med) tr silt
					1.4	med-lg pebbles subr wet dense poor sort
						21-26 CLAY v. stiff-hard slightly moist-dry no plasticity/dilatency
						GLEY 1 4/5GY crumbly
						EOB 7' SHALE refusal

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-178
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/8/11
Prepared by	KAH
Start Time and Date	9/8/11 1150
Finish Time and Date	9/8/11 1225
(PID) or FID with Lamp Size	
Calibration Gas/Time/Results	99.7

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	4'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 4'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1207		0-4	39			0-1 slough
						1-4 SAND v.f-med mainly med little coarse to m coarse med pebble
					0.0	poor sort v. moist round-subr med dense
						4-39 CLAY moist to dry @ 6 1/2" low-no plasticity med stiff-hard
					0.0	GLEY 1 4/5G
						GLEY 1 7/10GY parted @ 37-38 inches
						4' EOB SHALE refusal

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-179
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/8/11
Prepared by	KAH
Start Time and Date	9/8/11 1340
Finish Time and Date	9/8/11 1410
PID or FID with Lamp Size	
Calibration Gas/Time/Results	99.9

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	4'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 4'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1357		0-4	42		0.0	0-4 SAND fined-coarse little vi coarse to granule-small pebbles round-sub poor sort moist dense
					0.0	4-42 CLAY dry no plasticity/dilatancy med stiff-hard cracked GLEY 1 4/10GY weathered shale →?
		4-4.5				0-6 [redacted] SHALE
						4.5' EOB bedrock refusal (shale)

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-180
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/8/11
Prepared by	KAH
Start Time and Date	9/8/11 1415
Finish Time and Date	9/8/11 1455
PID or FID with Lamp Size	
Calibration Gas/Time/Results	99.9

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	4'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 4'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1427		0-4	37"		0.0	0-4 SAND fined-coarse		little v. coarse-granule	fr small-med gel			
						v. moist poor sort round-subr med dense mostly med						
					0.0	4-37 CLAY/weathered shale dry no plasticity/dilatancy cracked, crumbly						
						med stiff-hard						
						GLEY 1 4/5G						

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-181
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/9/11
Prepared by	KAH
Start Time and Date	9/9/11 1008
Finish Time and Date	9/9/11 1055
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	11'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 11'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1012		0-4	3.4			0-6½ slough (pounded asphalt/concrete)
					0.7	6½-13½ SAND vf - vcoarse little granule - small pebble tr med pebbles poor sort
						tr-little silt v. moist mostly vcoarse sub-suban
						13½-20 CLAY dry v. stiff no plasticity/dilatency GLEY 1 5/10GY
					40.1	slightly mottled
						20-25 SAND f round-subr well sort moist gray med dense
						20-22½ sandy SILT wet black vf-coarse subr-subr
						25-34 SILT black moist organics broken glass low-med plasticity
						little sand vf-f tr med tr clay no dilatency
1017		4-8	2.8			0-4 slough
					28.6	4-12 SILT sand no glass transitioning to CLAY
						12-28 CLAY med stiff med plasticity no dilatency moist
					87.6	black → mottled @ ~22" organics little silt vf sand tr f sand
						lg pebble @ 17½, 24" tr small-med pebbles 12-20"
1025		8-11	4.5	2/3	102.6	0-18 SILT v. moist-wet black little vf-f sand broken glass, organics med-high plasticity
						11-13 sandy silt vf-f sand subr 15-18 reworked w/clay broken rock
					5.3	18-44½ CLAY med stiff-hard moist-slightly moist med-low plasticity no dilatency
						mottled - reworked (@~40")

@40" 5Y 4/2

silt vf sand lamination @ 32" 10YR 4/6

44½-45 bedrock limestone

11' EOB bedrock refusal

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-182
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/9/11
Prepared by	KAH
Start Time and Date	9/9/11 1055
Finish Time and Date	9/9/11 1200
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	11.5'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 11.5

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1102		0-4	41		29.3	0-41 CLAY slightly mottled moist - slightly moist organics (32" ↑)
						trace vf-f sand sub
						black 27-31½" → petrol odor GLEY 1 5/5G black
					723.9	med stiff - v. stiff 5Y 5/3
1108		4-8	49			0-3
						3-49 saa
					719.3	3-11 CLAY slightly mottled slightly moist-dry no plasticity/dilatancy crumbly med stiff sharp transition to ↓
						11-20 SILT little clay low-med plasticity moist odor black med stiff organics little v.f sand
					419.0	20-49 CLAY black until 38" then mottled w/ GLEY 1 4/10Y moist med-high plasticity no dilatancy med stiff - stiff
1114		8-11.5	46			0-4½ slough
					75.2	4½-46 CLAY mottled organics @ 10" moist - slightly moist (23½) odor med stiff - stiff (17") - v stiff/hard (33")
					91.8	10-13½ reworked v. moist v. coarse - med pebbles silty mottled ↓ wet hard clay pieces

11.5' EOB refusal bedrock (limestone).

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-193
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/9/11
Prepared by	KAH
Start Time and Date	9/9/11 1400
Finish Time and Date	9/9/11 1450
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	7'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 7'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1410		0-4	44		0.3	0-10 Fill	SAND	vf-med	little course-granule	fr	moist-med	pebble
						little-fr	silt	dry	poor sort	sbr-ang		
						brown → 10YR 7/6 → black						
					0.0	10-44	CLAY	moist/stiff → dry/crumbly @ ~18½"				
						36" broken weathered shale					GLEY 1 4/5G	
					0.0	no plasticity/dilatency						
						moist seam 32-33" pocket of					GLEY 2 7/10G	
1418		4-7	45		0.0	0-45	saa	dry/crumbly	med stiff-hard			
						no plasticity/dilatency					GLEY 1 4/10GY	
					0.0	0-2	Shale					
						2-41	weathered shale				GLEY 1 5/10 GY	
						41-45"	Shale				GLEY 1 4/10 GY	
						EOB 7'	bedrock refusal					

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-18
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/9/11
Prepared by	KAH
Start Time and Date	9/9/11 1220
Finish Time and Date	9/9/11 1310
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1 ppm

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	10'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" X 10'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1227		0-4	37"			0-2 sloughed
					0.0	2-8½ SAND f-coarse little v. coarse to granules-small pebble slightly moist poor sort sub-sub s
						8-11½ CLAY v. stiff no-low plasticity little v.f-f sand to med GLEY1 2.5/10GY
					0.0	11½-37 SILT black to little clay, vf sand ~~little~~ little-some f sand low-no plasticity moist no dilatency to med
						broken rock @ 18½, 15"
1234		4-8	50			0-4 see transition to 2
					0.0	4-50 CLAY some-to silt some vf-f sand → to sand
						black to dark mottled @ ~ 26" lg pebble @ 26"
					0.0	low-~~high~~ plasticity moist no dilatency med stiff
						brown/green mottled @ 38' GLEY 1 6/5GY 5Y 4/4
						GLEY 1 5/10GY
						40-41" GLEY 1 7/10GY, GLEY 1 6/5GY seam
1240		8-10	45			0-10 sloughed
					0.0	10-44 CLAY mottled mod stiff-stiff moist low-no plasticity
						GLEY 1 5/10GY 5Y 5/4 no dilatency
						22½" dry seam
						44-45 Limestone
						10' EOB bedrock refusal

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-185
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/9/11
Prepared by	KAH
Start Time and Date	9/9/11 1508
Finish Time and Date	9/9/11 1550
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	8'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 8"

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1517		0-4	34			0-3 slough						
					0.0	3-16½ SAND		little silt/clay	vf-f	little md	tr coarse-med pebble	
						poor sort slightly moist round-subr						
						~~[illegible]~~ silt pocket @ 7-8½"				loose-med dense		
						16½-20 old asphalt						
					0.0	20-22½ SAND moist f-med little coarse-granule poor sort						
						round-subr						
						22½-34 CLAY v stiff-hard		some little sand	vf-granule	tr small-med pebble		
						low-no plasticity/dilatency		mottled	organics	slightly moist		
1523		4-8	49		0.0	0-28½ CLAY slightly mottled v stiff				slightly moist-dry	no plasticity/dilatency	10YR 5/6
						mostly GLEY1 5/5GY hard				rust colorations	reworked towards bottom	
					0.0	28½-49 weathered shale → shale				GLEY1 4/10GY		
						16-23½ reworked broken rock pieces worked into clay						
						5Y 5/4 hard						

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-186
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/9/11
Prepared by	KAH
Start Time and Date	9/9/11 1545
Finish Time and Date	9/9/11 1630
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.1

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	9'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 8'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1552		0-4	30			0-3 sloughed						
					0.0	3-8 SAND fr-med little coarse-vcoarse - granule to small-med pebble, silt						
						poor sort slightly moist rnd-suba loose-med dense lg pebble @7-8'						
						8-30 CLAY mottled low plasticity slightly moist						
					0.0	GLEY 1 5/10GY 11-16½ some sand mf-granule to small pebbles						
						10YR 5/6 broken rock @16" rnd-suba						
1600		4-8	46		0.0	0-31 sand slightly moist-dry organic @ 21"						
						beginning reworked @ 22"						
					0.0	31-46 weathered shale GLEY 1 4/10GY						
						9' EOB bedrock refusal (shale)						

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-187
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9/7/11
Prepared by	KAH
Start Time and Date	9/9/11 1700
Finish Time and Date	9/9/11 1800
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.4

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	10.5'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 10.5'

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft in)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
1711		0-4	30			0-3 sloughL
					0.0	3-7 SILT some CLAY no plasticity slightly moist little v.f-med sand
						black organics med stiff
					0.0	7-30 SAND wet f-med little coarse-granule, small-med pebbles moist subr-subA.
						broken rock @ 16½-18½" 13" 20-22" 10"
						12½-16" — SILT some sand v.f-f little med-coarse black
						little-some clay
1721		4-8	43			0-3 sloughL
					0.0	3-12 SAND/GRAVEL med-v.coarse some granule-med pebble & lg pebbles
						poor sort subr-angular moist tr silt/clay
						12-19 CLAY hard reworked slightly moist-dry no plasticity/dilatency
						GLEY 1 5/5GY
					0.0	19-21½ busted rock
						21½-43 CLAY → weathered shale @ ~25"
						CLAY dry reworked no plasticity/dilatency GLEY 1 5/5GY
1732		8-10.5'	46	8 4		0-12 SILT some sand v.f-f little med-v.coarse WET no plasticity/dilatency (SLOP)
					0.0	12-16 SAND wet f-v.coarse little granules tr small-med pebbles
						round-subA poor sort loose-med dense
					0.0	16-46 weathered shale (slightly moist-dry)
						EOB 10.5' bedrock refusal (shale)

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-18B
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9-12-11
Prepared by	~~KAH~~ AO
Start Time and Date	9-12-11 900
Finish Time and Date	
PID or FID with Lamp Size	11.
Calibration Gas/Time/Results	99.3

Boring Location Sketch

FN 44/134/140

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	15
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft) 2.5	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
		0-4	3.2			8" CONCRETE
					6.4	0.7-3.5 SANDY CLAY, MOIST FINE TO COARSE SAND FRACTION TRACE GRAVEL 2.5YR 2.5/2
					0.7	3.5-8 CLAY W TRACE SAND, MOIST, PLASTIC, SOME RELIC FRACTURES LIKE HIGHLY
					0.8	3-4 SAME AS 0.7-3 WEATHERED ROCK GLEY1 5/10Y
						4-8
		4-8	4.5	4-6	1.3	SAA, SOME THIN (~1" SANDY CLAY CLAYEY SAND SEAMS,
				6-8	1.4	AND MINOR IRON STAINING
						8-12.3
						8-8.3 / FINE TO MEDIUM SAND, MOIST 10YR 2/2
						8.3-8.6 / CRUSHED ROCK / GRAVEL / 2.5Y 8/1 LIMESTONE, DRY
						8.6-9.8 ORGANIC CLAY, PEAT LIKE, MOIST, LOW-DENSE GLEY 2 5/10G
				8-10	6.7	8-8.7 SAA
				10-12	6.3	8.7-9 CRUSHED ROCK / SAND, LIMESTONE 2.5Y 8/1, DRY
						9-10.1 SAND, FINE TO COARSE ON TOP GRADING TO FINE W/ DEPTH, MOIST TO WET
						TRACE IRON STAINING,
						10.1-11.3 ORGANIC CLAY, PEAT LIKE, MOIST, LOW-DENSE GLEY 2 8/10G
						11.3-11.6 CRUSHED ROCK / GRAVEL, LIMESTONE, DRY, 2.5Y 8/1
						11.6-12 FINE TO MEDIUM SAND, MOIST 10YR 2/2
		12-15	3	12-14	0.2	12-14.7 SAND, MEDIUM-FINE W/ TRACE CLAY AND SOME GRAVEL, LIGHTLY MOIST 7.5YR 4/1 IN TOP 2.7 FT, BOTTOM
						14.7-15 FINE SAND, LIGHTLY MOIST, SUGAR LIKE 5Y 8/1
						DRILLER SAID IT WAS BROKEN UP ST. PETER SANDSTONE

0-2 940 } LEAD/
4-6 945 } TEFLON
6-10 950

☆ EMPTY BAGS READING 6.7

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-189
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9-12-11
Prepared by	~~KAH~~ ne
Start Time and Date	1600
Finish Time and Date	
PID or FID with Lamp Size	
Calibration Gas/Time/Results	99.3

Boring Location Sketch

EN 44-134-146

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	15
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm) ✱	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
		0-4	2.5	0-2	0.6	6" CONCRETE
				2-4	0.7	CLAY, W GRAVEL, HARD, LOW PLASTICITY, LOTS OF STRUCTURAL FRACTURES, & PIECE OF METAL AT ~2 FT, LARGER SO THIS IS LIKELY FILL
						CLAY 1 5/5G W/ SOME DARK BROWN MOTTLES, WEATHERED LIMESTONE
		4-8	3.0	4-6	0.5	4-6.5 SAA, BECOMING HARDER AND MORE GRAVELLY W/ DEPTH
				6-8	0.8	6.5-6.8 SANDSTONE ROCKS/GRAVEL, DRY
						6.8-8 ~~BLACK~~ ORGANIC CLAY, DRY, LOTS OF ORGANICS/ROOTLETS
						8 TRACE SAND, FINE TO COARSE
		8-12	3.3	8-16	0.5	8-~~12~~ SAA
				16-12	0-5	~~RECOVERY~~
						9.6-11 SAND, FINE TO COARSE, TRACE GRAVEL, MOIST 5YR 3/2
						11-12 CLAYEY SAND, FINE TO MEDIUM, MOIST 5YR 8/1
		12-15	2.5	12-14	0.3	12-12.6 FINE SAND W SOME GRAVEL, SAND 10YR 7/3, GRAVEL IS LIMESTONE, DRY
				14-15	0.5	12.6-13.8 FINE SAND, UNIFORM, 5Y 8/1 LIGHTLY MOIST, SUGARY
						13.8-15 FINE SAND, UNIFORM, SAND STONE ROCK AT 14.5, BANDED LAYERS 1-2mm OF LIGHT BROWN TO DARK BROWN

✱ EMPTY BAGS READING 0.7

G-2 1040
4-6 1045
8-10 1050
} LEAD/FIELD LEAD

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-190
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9-12-11
Prepared by	~~KAH~~ RC
Start Time and Date	1050
Finish Time and Date	
PID or FID with Lamp Size	
Calibration Gas/Time/Results	94.3

Boring Location Sketch

FM 44/134/140

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	15'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
		0-4	3.1	6-7	0.5	8" CONCRETE						
				2-4	0.2	0.7-1.0 SAND, ~~FINE~~ FINE TO COARSE, MOIST, 10YR 4/3						
						1-4 CLAY (FULLY WEATHERED LIMESTONE) DRY, TRACE SAND GLEY2 6/10BG						
						SOME MOTTLING W/ DARK BROWN CLAY, LOOKS CHERT ALL						
		4-8	4.0	4-6	0.7	4-9.5 CLAY W/ SAND (FINE TO COARSE) AND GRAVEL, SOME SMALL ROUNDED						
				6-8	0.4	ROCKS, MOIST LOTS OF MOTTLING BROWN (5YR 4/2) TO BLACK (GLEY2 2.5/10BG)						
						TO GLEY2 6/10BG. PLUS MINOR IRON STAINING,						
			3.6			7.5-8 SAND, MEDIUM, MOIST, 10R 3/2, TRACE ROUNDED ROCKS						
		8-12	~~4.8~~	8-10	0.2	8-10.5 CLAY W/ LIMESTONE GRAVEL (WEATHERED LIMESTONE)						
				10-12	0.3	GLEY2 6/10BG W/ SOME ~~THE~~ MOTTLING						
						10.5-~~12~~ 11.5 CLAY W/ TRACE SAND AND SOME GRAVEL, LOTS OF MOTTLING						
						GLEY2 6/10BG + GLEY2 2.5/10BG + 7.5 YR 5/6, MOIST						
						11.5-12 ~~BROWN~~ ORGANIC CLAY, GLEY2 2.5/10BG, LIGHTLY MOIST, SOME						
						MOTTLING, MICA FLAKES						
		12-15	3.0	12-14	0.1	12-13 CLAYEY SAND W/ ROCKS AND GRAVEL, FINE TO COARSE, MOIST						
				14-15	0.4	7.5YR (3/2						
						13-15 FINE SAND, 5Y 8/1 SOME MINOR STRATIFICATION W/ DARKER						
						BANDS, VERY UNIFORM, LIGHTLY MOIST, SOME IRON STAINING						

~~F~~ EMPTY BAGS REGAIN 6.7

G-2 1115 USED
8-10 ~~8-10~~ 1126 TRIPLICATE
10-12 1125

ARCADIS

Unconsolidated Boring Log

Boring/Well	FSB-191
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9-17-14
Prepared by	KAH RD
Start Time and Date	1120
Finish Time and Date	
PID or FID with Lamp Size	
Calibration Gas/Time/Results	

Boring Location Sketch

FN 44/134/140

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	15
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
		0-4	2.5	0-2	0.3	8" CONCRETE						
				2-4	0.1	0.7-1 SAND w/ GRAVEL, FINE TO COARSE, SUBBASE FOR CONCRETE						
						1-4 CLAY w/ LIMESTONE GRAVEL, (WEATHERED LIMESTONE PARTICLES)						
						MOTTLING w/ DARK BROWN, SOME MINOR IRON STAINING, DRY						
		4-8	2.0	4-6	1.0	4-6 SAA, DRY						
				6-8	0.8	6-8 SAND, MEDIUM TO COARSE, w/ GRAVEL, MOIST, 10YR 4/3						
		8-12	3.5	8-10	0.9	8-8.3 SAA						
				10-12	0.6	8.3-9 SAND, FINE TO MEDIUM, DRY, TRACE COARSE SAND, 10YR 7/1						
						9-11.7 CLAY, MOTTLED COLOR w/ TRACE SAND, MOTTLED COLOR						
						GLEY2 6/10BG + GLEY2 4/5PB + 10YR 6/8, MOIST						
						11.7-12 ORGANIC CLAY, GLEY 2 2.5/10BG, LIGHTLY MOIST, MICA						
						FLAKES						
		12-15	1.0	12-15	0.2	12-13.5 SAA						
						13.5-15 SAND FINE 5Y 8/1, LIGHT GRAY, MINOR STRATIFICATION						
						w/ DARKER BANDS, LIGHTLY MOIST						
						→ PIECE OF METAL, LIKE REBAR, ACROSS SHOE, MAY HAVE LIMITED						
						RECOVERY, BUT WOULD HAVE BEEN ~1 FT INTO NATIVE SAND						

0-2 1150 CLAD/TCLP CLAD

4-6 1155

8-10 NEW

* EMPTY BAGS READING 0.7

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-192
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9-12-11
Prepared by	KH KO
Start Time and Date	1205
Finish Time and Date	
PID or FID with Lamp Size	
Calibration Gas/Time/Results	

Boring Location Sketch

FN 49/134/140

~1 FT OFF BUILDING

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	12
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
		0-4	2.0	0-2	0.0	GRAVELLY SAND, ROUNDED GRAINS, DRY MOIST IN TOP 6" 10YR 5/2 w/ROCKS
				2-4	0.0	CLAYEY SAND LENS FROM 3 TO 3.5 FT CHUNK OF WOOD (ROOT?) AT 3.9 FT
		4-8	3.0	4-6	0.0	SAA, SLIGHTLY MOIST, ROCKS ARE AMIX, NO ONE SINGLE TYPE
				6-8	0.0	
		8-12	4.0	8-10	0.0	SAA, VERY HARD
				10-12	0.0	
						E.O.B. 12 FT BGS, STOPPED BECAUSE GRAVELLY SAND WAS BECOMING VERY VERY HARD AND WE DIDN'T WANT TO GET LINER JAMMED IN SAMPLER

→ NEW BAGS, NO "SANDWICH" PLASTIC TYPE "BAGGIE"

1230 0-2 LEAD/TCLPLEAD
1235 4-6
1240 6-10

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-193
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9-12-11
Prepared by	~~KAH~~
Start Time and Date	145
Finish Time and Date	
PID or FID with Lamp Size	
Calibration Gas/Time/Results	

Boring Location Sketch

FN 153

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	2
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
		0-2	1.0			8" CONCRETE						
				1-2	0.1	0.7 - 2.0 BROWN SANDY CLAY, MOIST, BROWN, FINE TO COARSE SAND						
						HIT REFUSAL AT 2 FT, LVD CONCRETE IN END OF SHOE						
						- TRIED TO ADVANCE DOWN HYDROVAC HOLE, REFUSAL AT 3 FT						
						CONCRETE IN SHOE AGAIN						
						- TRIED TO CORE THROUGH OBSTRUCTION IN ORIGINAL HOLE USING						
						STAR BIT, PUSHED IT FROM 2 TO 3 FT BGS BUT DIDN'T GET PAST						
						- CORED 3RD HOLE W CONCRETE, TRIED TO GEOPROBE BUT HIT						
						REFUSAL AT 3 FT						
						COLLECTED SAMPLE FROM 1-2 FT BGS						

NOTE: FIRST HOLE REFUSAL AT ~2 FT = 8" CONCRETE W/ CLAY FILL, HIT SECOND CONCRETE LAYER AT ~2 FT BGS → Brown SANDY CLAY, MOIST

0.1 ON PID

SECOND HOLE WENT DOWN HYDROVAC HOLE, GOT TO ~3 FT, HIT CONCRETE AGAIN LIKELY BIG CHUNKS RATHER THAN SECOND PAD DUE TO DIFFERENT DEPTHS

ARCADIS

Unconsolidated Boring Log

Boring/Well	~~ASB-~~ 194
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9-12-11
Prepared by	~~KAH~~ RO
Start Time and Date	245
Finish Time and Date	
PID or FID with Lamp Size	
Calibration Gas/Time/Results	99.3

Boring Location Sketch

FN 154

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	15
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
		0-4	3	0-2	0.4	6" ASPHALT / BASE						
				2-4	0.0	0.5-1.5 CLAYEY SAND, 10YR 5/6, SOME ANGULAR ROCK CHUNKS						
						MOIST						
						1.5-4 SANDY CLAY, FINE TO COARSE, MOIST GLEY2 2.5/10BG						
						SOME MINOR ORGANICS, MOTTLING W/ GLEY 2 5/10 BG						
						SMALL ROOTS AND ORGANIC PIECES, ORGANIC ODOR						
		4-8	4	4-6	0.0	4-5 PARTIALLY WEATHERED SHALE GLEY2 5/10 BG, SOME CLAY SOME						
				6-8	0.0	~~KEB~~ CHUNKS W/ PLANAR FEATURES						
						5-5.8 SANDY PEAT, LIGHTLY MOIST GLEY2 2.5/10BG, FINE SAND						
						5.8-7 SAME AS 4-5						
						7-8 CLAY W/ SOME SAND, FINE TO MEDIUM 10YR 3/1 MOTTLED W/						
						DARKER BROWN, MOIST.						
		8-12	4	8-10	0.3	8-12 SAA, SLIGHT DIESEL ODOR SMALL PIECE OF BITUMINOUS AT ~9 FT						
				10-12	3.1	TRANSITIONING TO DARKER BROWN 10YR 2/1						
		12-15	3	12-13	0.1	12-12.5 SAA WET LENS AT 12.3 TO 12.5						
				13-15	0.1	12.5-13 PARTIALLY WEATHERED LIMESTONE, CLAY MATRIX GLEY 2 6/5BG						
						LIMESTONE ROCK AT 13 FT, MOIST						
						13-13.5 CLAY W/ SAND/GRAVEL, 10YR 3/4, MOIST						

⇒ REFUSAL AT 15 FT BGS, LOOKS LIKE CONCRETE
13.5-14.2 ROCK SHARDS, RED SANDSTONE, 10 R 6/4, DRY
14.2-15 SANDY CLAY W/ GRAVEL, ROUNDED GRAVEL, MOIST, 10YR 5/8

1515 SVOC VOC RCRA CHLORIDE 1520

10-12
13-15

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-MT
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	9-12-11
Prepared by	[illegible] RD
Start Time and Date	1530
Finish Time and Date	
PID or FID with Lamp Size	
Calibration Gas/Time/Results	

Boring Location Sketch

LN 154/153

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	10'
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
		0-4	3.5	8-2	0.6	0-1 CLAYEY SAND, w GRAVEL, MOIST, 10YR 5/6, ANGULAR GRAVEL						
				2-4	0.1	1-3 SANDY GRAVELLY CLAY, MOIST, MIX OF GRAVEL TYPES, LOTS OF LIMESTONE						
						GLEY 1 2.5/5G4						
						3-3.5 SANDY ORGANIC CLAY, MOIST, NO GRAVEL, GLEY 2 2.5/10B						
						3.5-4 CLAY, MOIST, GLEY 2 5/10BG w/TAN MOTTLING AND SOME SMALL						
						ROOTS/ORGANICS						
		4-8	4	4-6	0.0	4-7.2 SAA LOTS OF COLOR MOTTLING, LIKE FILL SOIL						
				6-8	3.4	7.2-7.8 GRAVELLY SAND, DRY GLEY 2 2.5/10G, SLIGHT PETROLEUM ODOR						
						7.5-8 CLAYEY SAND, FINE TO COARSE, w/GRAVEL AND ROCKS IMBEDDED						
						LAYERS OF 10YR 2/2 AND GLEY 2 2.5/5PB, DRY						
		8-10	2.6	8-10	0.5	~~8-10 CLAY~~ 8.0 CHUNKS OF CONCRETE IN CORE.						
						8.1 - 10 GRAVELLY SAND w/TRACE CLAY, GLEY 2 3/5PB LOTS OF						
						ANGULAR GRAVEL, LOOKS LIKE BROKEN UP ROCK, BUT GRAVEL IS DIFF						
						TYPES						
						10 FT REFUSAL, NO ROCK IN SHOE SO IT IS UNCLEAR WHAT CAUSED						
						REFUSAL						

6-8 1505 VOC
8-10 1405 SVOC
RCRA
CYANIDE

ARCADIS

Unconsolidated Boring Log

Boring/Well	AS6 - P16
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	11/4/11
Prepared by	KAH
Start Time and Date	11/4/11 0832
Finish Time and Date	11/4/11 0940
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.0 ppm 0755

Boring Location Sketch

Drilling Contractor	Stevens Drilling & Environmental, Inc.
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	15'
Borehole Diameter	2"
Drilling Fluid Used	—
Sample Device	macrocore
Dimensions	2" x 4'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
0855		0-1	14			HA - Retrieved rim to temp. will proceed w/ geoprobe						
0904		1-4	24		0.1	0-10 SAND v.f-med some silt little coarse - granule to small - lg pebble						
						slight clay sub-subr	2.5Y 3/2					
						10-16 SAND f-med with med little granule - small pebble w/ trace						
						slightly moist	2.5Y 6/4					
						16-17 broken rock						
						17-24 fill noted in spoons → fill						
0912		4-8	48		0.1	0-11 SAND sloughed from 0-10 above						
						11-13 SAND sloughed from 10-16 core						
					0.1	13-26 reworked CLAY ~~trace~~ SAND mottled slightly moist low plasticity no dilatancy						
						med stiff-stiff		fine-granule		GLEY 1 5/10G 4		
						26-43 SAND f-coarse mostly medium little v coarse-granule slightly moist						
						sub-subr loose to silt glass, broken sandstone @ 32, 37-41						⇒ Fill
						43-46 CLAY reworked no-low plasticity slightly moist med stiff						
						GLEY 1 6/5G mottled to granules subr						
0925		8-12	48		0.1	0-8½ as 0-10 few 1-4 interval						
						8½-31 SANDY silt little clay v.f-med mottled moist low plasticity no dilatancy						
						10 YR 3/4						

ARCADIS

Unconsolidated Boring Log

Boring/Well: AS8-196 | Site Location:
Project Number: | Date:
Client Name: | Prepared by:

A	B	C	D	E	F	G
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency; 2 Soil Color; 3 Grain Size Modifier; 4 Grain Size; 5 Secondary Characteristics; 6 Moisture Content; 7 to 9 Remarks and Other Characteristics
						31-35 broken rock
					0.1	35-43 SAND f-med fr silt little gravel fr small-med pebbles loose moist Subrd-subr
						43-48 CLAY mottled no-low plasticity moist no dilatancy stiff little f sand fr med GLEY 1 4/10GY
0932		12-15	36		0.2	0-20 SC 0-10% from 1-4'
						20-24 SC 43 46 from 4-8'
						24-30.5 ~~SAND~~ fractured rock
						30.5-32 fractured rock
					1.0	32-36 SAND med sand + moist mod sub- loose fr gravel-small pebbles
						15' EOB

D20 97.52 +28 117
WOC 32.371 11 43
G20 32.351 10 42

BORLOG.XLS.xls
08/05/2011

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-197
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	11/04/11
Prepared by	KAH
Start Time and Date	11/4/11 1000
Finish Time and Date	11/4/11 1050
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.0 ppm

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 4'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1017		0-1.5	18			0-18 HA						
1023		1.5-4	20		0.1	0-13 SAND f-vcoarse mostly med little vcoarse-granule tr small-lg pebble vi loose dry sub-sub-angular						
						13-16 powdered sandstone 2.5Y 7/4						
						16-20 CLAY reworked crumbly slightly moist-dry no plasticity/dilatancy med stiff GLEY 1 4/10GY						
1028		4-8	46			0-0½ sludge						
					0.1	½-24 CLAY saw (weathered shale) GLEY 1 4/5GY tr organics						
						24-33 SILT some sand little clay v. f-med sub-sub- black tr organics no-low plasticity reworked no dilatancy dry weathering coarse crumbly						
					0.1	33-46 SAND f-vcoarse mostly med-coarse trace granules-med pebbles dry→moist @ 41" loose sub-round						
1057		8-12	44			0-7 saw broken shale						
					0.1	7-31 CLAY reworked mottled moist low plasticity no dilatancy med stiff-stiff rust colorations from 11-19" after 26" more like weathered shale						
					0.1	31-34 KH bleached limestone (weak cementation)						

ARCADIS

Unconsolidated Boring Log

Boring/Well: ASB-197 | Site Location:

Project Number: | Date:

Client Name: | Prepared by:

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft) or	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
						34-36 gray fossil rock						
						36-44 SAND/Broken rock f-coarse mostly coarse loose moist subr-subr						
1045		12-15	36		0.1	0-12 SAND vf-coarse mostly f tr silt little v. coarse broken rock						
						loose dry round-subr						
					0.1	12-36 reworked mottled CLAY med stiff no plasticity/dilatency tr organics						
						rust colorations @ 21.5" mixed w/ sandy silt tr small-med pebbles						
						21.5-30 black sandy silt no plasticity/dilatency						
						vf-coarse little v. coarse subr-round						
						30-32.5 sandy silt vf-f no plasticity/dilatency 10YR 3/3						
						tr clay						
						15" EOB						

OED 37.33 E9 116

NC 32.490 N 41

GPS 32.438 W 42

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-198
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	11/4/11
Prepared by	KAH
Start Time and Date	11/4/11
Finish Time and Date	11/4/11
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.0 ppm

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	—
Drop Height	—
Total Depth Drilled	
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	2" x 4'

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (in)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1147		0-0.5				HA						
1155		0.5-4	22		0.1	0-23 SANDY SILT vf-med little coarse to v coarse-med pebble no plasticity/dilatency dry soft round-subr to organics						10 YR 4/4
1200		4-8	43			0-7 sea						
					0.5	7-23 SANDY SILT vf-f little med to coarse-v coarse moist to granule-med pebble						
						to clay, organics blacker mark med wet @ 35" soft-med stiff						
					0.9	no plasticity/dilatency black @ 21"						2.5Y 3/1 to 21"
1213		8-12	39			0-9 sea						
						9-12 SAND/gravel rock transition to						
					0.4	12-31 reworked CLAY mottled med/stiff-stiff to organics no plasticity/dilatency						
						little f-coarse sand to v. coarse-small pebble subr-subr-angular slightly moist						
						23-27" sandy silt vf-med mottling fine to clay no plasticity/dilatency med stiff-stiff						
					0.3	31-39 SANDY SILT little clay no plasticity/dilatency stiff-hard						10 YR 5/4 4/6
						black slightly moist low plasticity vf-med rnd-subr						
						little coarse-granules subr-angular						
1224		12-15	38		0.6	0-21 sea						
					0.1	21-32 SILTY SAND vf-med some coarse-granule to small pebble slightly moist med hard round-angular 10 YR 4/6						

32-38 SAND f-v. coarse, mottling med round-subr loose to little v. coarse-granule slightly moist 10 YR 5/4

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-199
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	11/4/11
Prepared by	KAH
Start Time and Date	11/4/11 1330
Finish Time and Date	11/4/11 1348
PID or FID with Lamp Size	
Calibration Gas/Time/Results	100.0

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1335		0-4	37		0.2	0-21	SANDY SILT	black	ltl	dry-slightly moist	vf-f	trace med-coarse
							pockets rock @ 10" black					
						21-27	SILTY SAND	f-coarse	mostly f-med	Sltl subr-subr	slightly moist	10 YR 3/4
					0.1	27-37	SAND,	f-granule	mostly coarse-v. coarse	to small pebble	r-subr	
							loose	dry-slightly moist		tr silt		
1342		4-7	18			0-6½	Saw					
					0.1	6½-14	SILTY SAND	vf-coarse	mostly coarse	wet/moist	r-subr	
							loose					
						14-18	CLAY	low plasticity	no dilatancy	moist		
							some vf-f sand	little med	tr silt	Sltl	mottled	
						7'	Bedrock refusal					

ARCADIS

Unconsolidated Boring Log

Boring/Well	ASB-200
Project Number	DE000440.0001
Client Name	Ford TCAP
Site Location	St. Paul, MN
Date	11/4/11
Prepared by	KAH
Start Time and Date	11/4/11 1440
Finish Time and Date	11/4/11
(PID) or FID with Lamp Size	
Calibration Gas/Time/Results	100.0 ppm

Boring Location Sketch

Drilling Contractor	SDE
Driller & Helper	Dan Hunter
Drilling Method	geoprobe
Sampling Interval	4'
Hammer Weight	
Drop Height	
Total Depth Drilled	
Borehole Diameter	2"
Drilling Fluid Used	none
Sample Device	macrocore
Dimensions	

A	B	C	D	E	F	G						
Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Blow Count	PID (ppm)	1 Density/ Consistency	2 Soil Color	3 Grain Size Modifier	4 Grain Size	5 Secondary Characteristics	6 Moisture Content	7 to 9 Remarks and Other Characteristics
1442		0-4	25		0.1	0-15 SAND f-v. coarse mostly med-coarse little granule tr small pebbles moist r-subr v. loose						
					0.0	15-25 CLAY some sand moist soft-med stiff low plasticity no dilatency tr silt f-v.f rnd-subr tr granule-med pebble 2.5Y 5/3						
1450		4-8	48		0.0	0-6 slough						
						6-30 saa v. soft v. moist becomes AND SAND gray/white discoloration @ 26-27"						
					0.0	30-43 SAND med-v. coarse mostly coarse rnd-subr trace-little silt-f wet loose-med dense						
						43-47 CLAY AND SAND vf-coarse mostly f-med moist med stiff tr silt med plasticity no dilatency						
						8' Bedrock refusal Limestone						

Appendix B

Borehole Sealing Records and MDH Well Logs

Arcadis / Ford

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes, Chapter 1031

Minnesota Well and Boring Sealing No. H 289646
Minnesota Unique Well No. or W-series No. (Leave blank if not known)

WELL OR BORING LOCATION

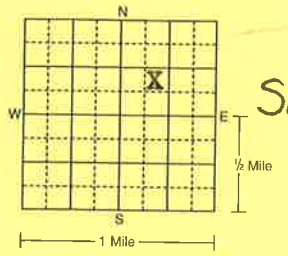
County Name: Ramsey

Township Name	Township No.	Range No.	Section No.	Fraction (sm. → lg.)
St. Paul	28N	23W	17	NE¼ SW¼ NE

GPS LOCATION: Latitude_____ degrees_____ minutes_____ seconds
Longitude_____ degrees_____ minutes_____ seconds

Numerical Street Address or Fire Number and City of Well or Boring Location: 966 Mississippi River Blvd, St. Paul

Show exact location of well or boring in section grid with "X."



Sketch map of well or boring location, showing property lines, roads, and buildings.

See attached map.

PROPERTY OWNER'S NAME/COMPANY NAME: Ford Motor Company

Property owner's mailing address if different than well location address indicated above:
966 Mississippi River Blvd
St. Paul, MN 55115

WELL OWNER'S NAME/COMPANY NAME: Ford Motor Company

Well owner's mailing address if different than property owner's address indicated above:

Date Sealed: Sept 9, 2011
Date Well or Boring Constructed: Sept 9, 2011

Depth Before Sealing: 12 ft.
Original Depth: 12 ft.

AQUIFER(S): [X] Single Aquifer [ ] Multiaquifer

WELL/BORING: [ ] Water-Supply Well [ ] Monit. Well [ ] Env. Bore Hole [X] Other temp.

STATIC WATER LEVEL: [ ] Measured [X] Estimated Date Measured 9/9/11
8 ft. [X] below [ ] above land surface

CASING TYPE(S): [ ] Steel [ ] Plastic [ ] Tile [ ] Other

WELLHEAD COMPLETION
Outside: [ ] Well House [ ] At Grade [ ] Pitless Adapter/Unit [ ] Buried [ ] Well Pit [ ] Other
Inside: [ ] Basement Offset [ ] Well Pit [ ] Buried [ ] Other

CASING(S)

Diameter	Depth	Set in oversize hole?	Annular space initially grouted?
_____ in.	from _____ to _____ ft.	[ ] Yes [ ] No	[ ] Yes [ ] No [ ] Unknown
_____ in.	from _____ to _____ ft.	[ ] Yes [ ] No	[ ] Yes [ ] No [ ] Unknown
_____ in.	from _____ to _____ ft.	[ ] Yes [ ] No	[ ] Yes [ ] No [ ] Unknown

SCREEN/OPEN HOLE: Screen from _____ to _____ ft. Open Hole from _____ to _____ ft.

OBSTRUCTIONS: [ ] Rods/Drop Pipe [ ] Check Valve(s) [ ] Debris [ ] Fill [ ] No Obstruction
Type of Obstructions (Describe):
Obstructions removed? [ ] Yes [ ] No Describe:

PUMP: Type: [ ] Removed [ ] Not Present [ ] Other:

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:
[X] No Annular Space Exists [ ] Annular Space Grouted with Tremie Pipe [ ] Casing Perforation/Removal
_____ in. from _____ to _____ ft. [ ] Perforated [ ] Removed
_____ in. from _____ to _____ ft. [ ] Perforated [ ] Removed
Type of Perforator:
[ ] Other:

GROUTING MATERIAL(S) (One bag of cement = 94 lbs., one bag of bentonite = 50 lbs.)
Grouting Material: bentonite from 0 to 12 ft. _____ yards 1 bags
_____ from _____ to _____ ft. _____ yards _____ bags
_____ from _____ to _____ ft. _____ yards _____ bags

OTHER WELLS AND BORINGS: Other unsealed and unused well or boring on property? [ ] Yes [ ] No How many?

GEOLOGICAL MATERIAL	COLOR	HARDNESS OR FORMATION	FROM	TO
If not known, indicate estimated formation log from nearby well or boring.				
asphalt	black	hard	0	6"
sand/clay	dk brown		6"	6'
sand gravel	brown		6'	10'
clay	grey		10'	12'

REMARKS, SOURCE OF DATA, DIFFICULTIES IN SEALING
*eight test borings were completed to collect water samples and were grouted up immediately after sampling

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION
This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

Stevens Drilling & Environmental Services, Inc. 2255
Licensee Business Name *License or Registration No.*

Certified Representative Signature 556 *Certified Rep. No.* 9/23/11 *Date*

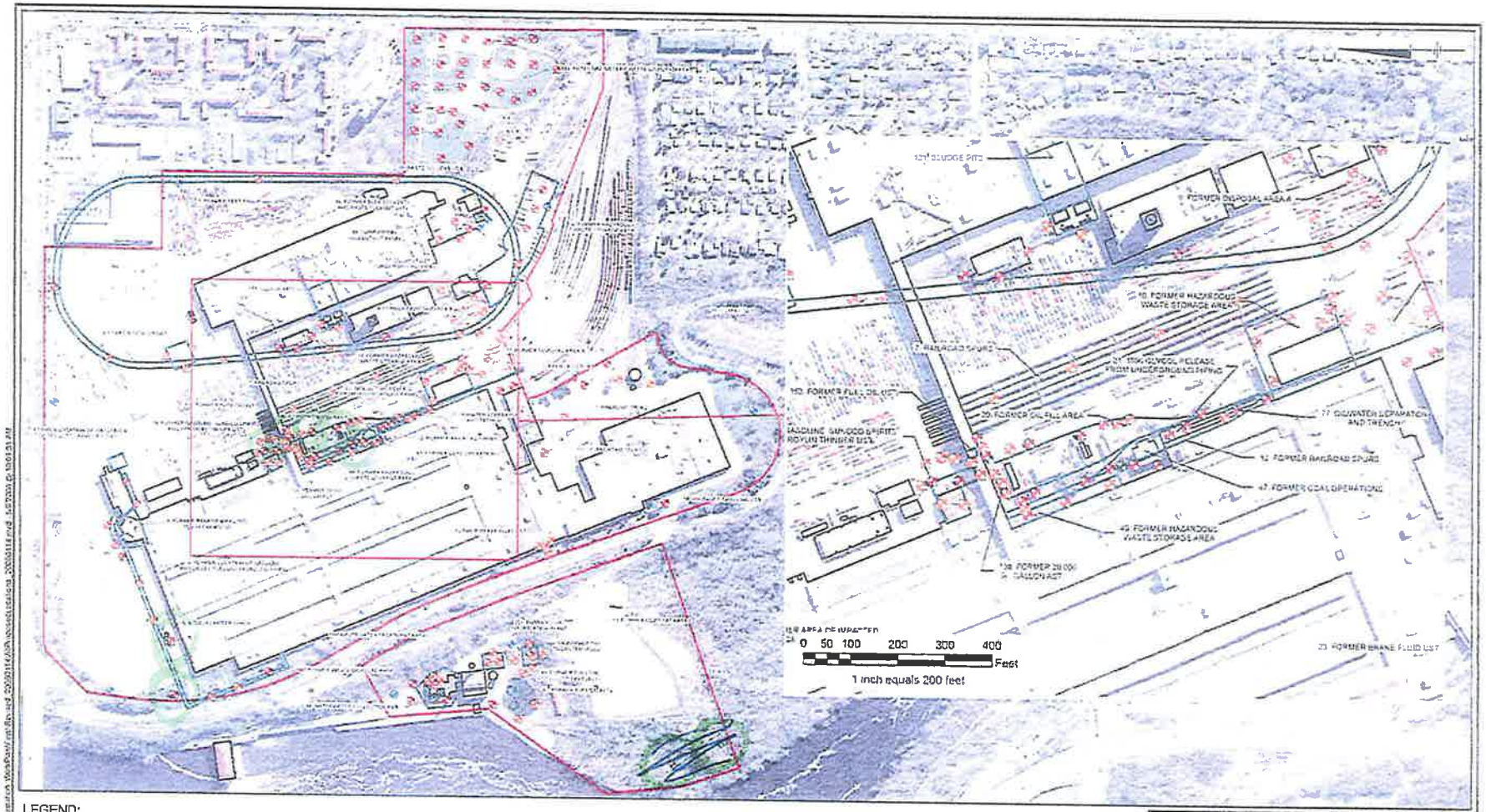
Dan Hunter
Name of Person Sealing Well or Boring

IMPORTANT-FILE WITH PROPERTY PAPERS-WELL OWNER COPY

H 289646

HE-01434-12 IC# 140-0423

9/09R



LEGEND:

Completed Locations
- Monitoring Well
- Soil Boring

Proposed Locations
- Monitoring Well
- Soil Boring

Exterior Feature

Ford Property Boundary

0 200 400 600 800 1,000 1,200
Feet

1 inch equals 400 feet

NOTE:
Imagery Source: United States Geological Survey High Resolution Orthoimagery for the Minneapolis-St. Paul, Minnesota Urban Area

Twin Cities Assembly Plant
Ford Motor Company
St. Paul, Minnesota

Proposed Soil and Groundwater Sampling Locations

ARCADIS

FIGURE
33

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes, Chapter 103I

MINNESOTA UNIQUE WELL AND BORING NO. 784720

WELL OR BORING LOCATION

County Name: Ramsey

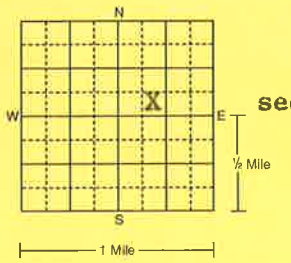
Township Name	Township No.	Range No.	Section No.	Fraction
St Paul	28N	23W	17	SE ¼ SW ¼ NE ¼

GPS LOCATION: Latitude ____ degrees ____ minutes ____ seconds ____ Longitude ____ degrees ____ minutes ____ seconds ____

House Number, Street Name, City, and Zip Code of Well Location: 966 Mississippi River Blvd St Paul 55116

or Fire Number:

Show exact location of well/boring in section grid with "X". Sketch map of well/boring location. Showing property lines, roads, buildings, and direction.



AMW 11

see attached map

PROPERTY OWNER'S NAME/COMPANY NAME: Ford Motor Company

Property owner's mailing address if different than well location address indicated above.
966 Mississippi River Blvd.
St. Paul, MN 55116

WELL OWNER'S NAME/COMPANY NAME: Ford Motor Company

Well/boring owner's mailing address if different than property owner's address indicated above.

GEOLOGICAL MATERIALS	COLOR	HARDNESS OF MATERIAL	FROM	TO
black top			0	1
gravel	yellow		1	3
silty sand	gray		3	9½

Use a second sheet, if needed.

REMARKS, ELEVATION, SOURCE OF DATA, etc.

IMPORTANT - FILE WITH PROPERTY PAPERS WELL OWNER COPY 784720

WELL/BORING DEPTH (completed): 9 1/2 ft. DATE WORK COMPLETED: Sept 13, 2011

DRILLING METHOD: [x] Cable Tool [x] Auger [ ] Driven [ ] Rotary [ ] Dug [ ] Jetted

DRILLING FLUID: ---

WELL HYDROFRACTURED? [ ] Yes [x] No From ____ ft. To ____ ft.

USE: [ ] Domestic [x] Monitoring [ ] Heating/Cooling [ ] Noncommunity PWS [ ] Environ. Bore Hole [ ] Industry/Commercial [ ] Community PWS [ ] Irrigation [ ] Remedial [ ] Elevator [ ] Dewatering [ ]

CASING MATERIAL: [ ] Steel [x] Plastic Drive Shoe? [ ] Yes [x] No [x] Threaded [ ] Welded

CASING Diameter	Weight	Specifications	HOLE DIAM.
2 in. to 4½ ft.	____ lbs./ft.	____	8¼ in. to 9½ ft.
____ in. to ____ ft.	____ lbs./ft.	____	____ in. to ____ ft.
____ in. to ____ ft.	____ lbs./ft.	____	____ in. to ____ ft.

SCREEN: Make Johnson Type PVC Diam. 2" Slot/Gauze 10 Length 5' Set between 4½ ft. and 9½ ft. FITTINGS thread

OPEN HOLE: From ____ ft. To ____ ft.

STATIC WATER LEVEL: 6½ ft. [x] Below [ ] Above land surface Measured from grade Date measured 9/16/11

PUMPING LEVEL (below land surface): ____ ft. after ____ hrs. pumping 3 g.p.m.

WELLHEAD COMPLETION: [ ] Pitless/adapter manufacturer ____ Model ____ [ ] Casing Protection ____ [ ] 12 in. above grade [x] At-grade (Environmental Well and Boring ONLY)

GROUTING INFORMATION: Well grouted? [ ] Yes [x] No Grout materials [ ] Neat cement [ ] Bentonite [ ] Concrete [ ] Other ____

neat cement bent.

From 0	To 2½ ft.	½	[ ] Yds.	[x] Bags
From 2½	To 3 ft.	1/3	[ ] Yds.	[ ] Bags
From ____	To ____ ft.	____	[ ] Yds.	[ ] Bags

NEAREST KNOWN SOURCE OF CONTAMINATION: ____ feet ____ direction ____ type

Well disinfected upon completion? [ ] Yes [x] No

PUMP: [x] Not installed Date installed ____ Manufacturer's name ____ Model Number ____ HP ____ Volts ____ Length of drop pipe ____ ft. Capacity ____ g.p.m. Type: [ ] Submersible [ ] L.S. Turbine [ ] Reciprocating [ ] Jet [ ]

ABANDONED WELLS: Does property have any not in use and not sealed well(s)? [ ] Yes [x] No

VARIANCE: Was a variance granted from the MDH for this well? [ ] Yes [x] No TN# ____

WELL CONTRACTOR CERTIFICATION

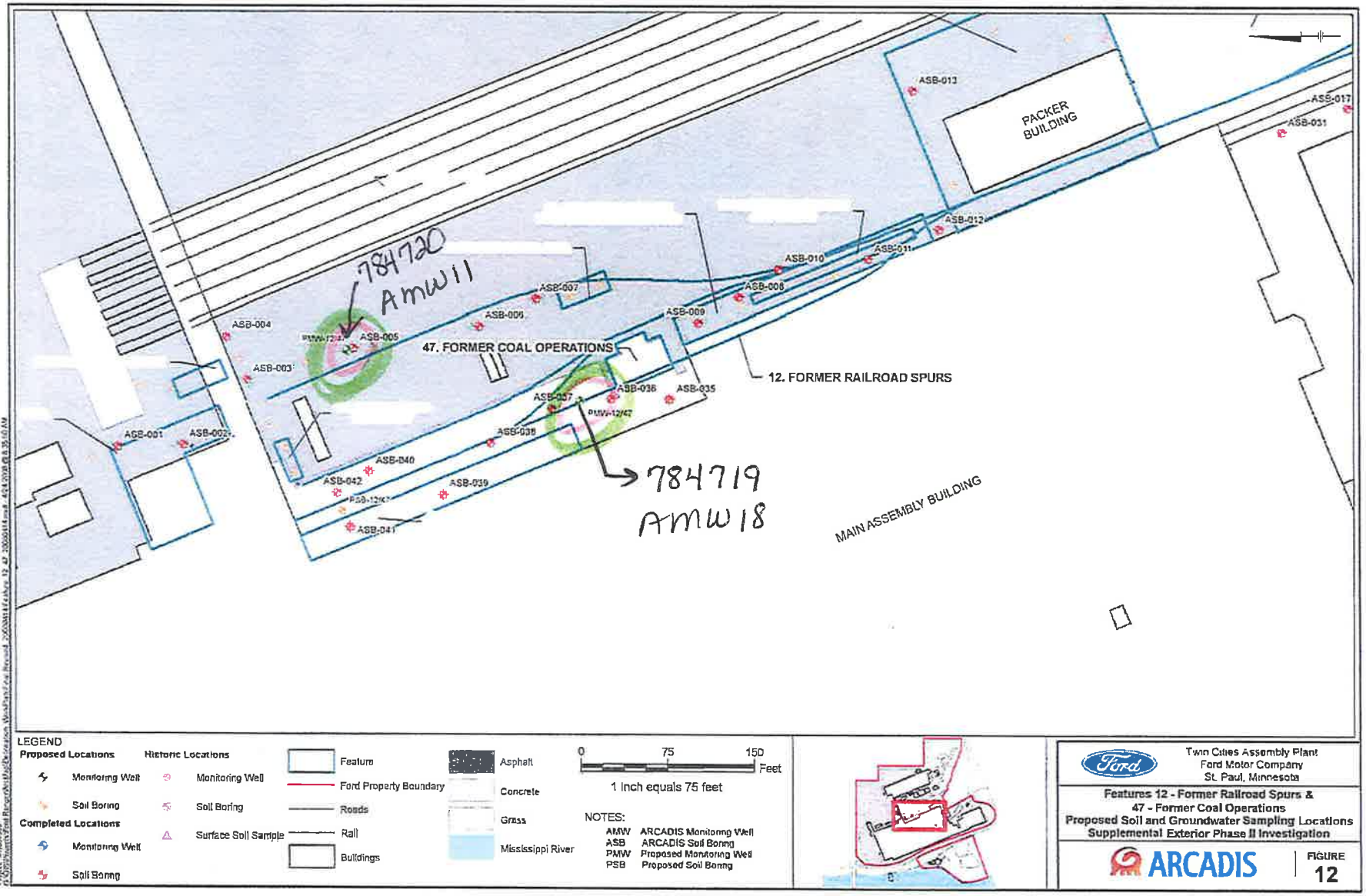
This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

Stevens Drilling & Env. Svc. Inc. 2255
Licensee Business Name Lic. or Reg. No.

Certified Representative Signature 556 9/26/11
Certified Rep. No. Date

Randy Johnson
Name of Driller

IC 140-0020 HE-01205-12 (Rev. 12/08)



W GLL

AT - GRADE

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes, Chapter 103I

MINNESOTA UNIQUE WELL AND BORING NO.: 784724

WELL OR BORING LOCATION

County Name: Ramsey

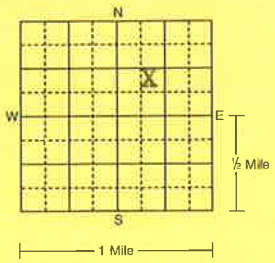
Township Name	Township No.	Range No.	Section No.	Fraction
St. Paul	28N	23W	17	NE¼ SW¼ NE¼

GPS LOCATION: Latitude ____ degrees ____ minutes ____ seconds ____ Longitude ____ degrees ____ minutes ____ seconds ____

House Number, Street Name, City, and Zip Code of Well Location: 966 Mississippi River Blvd St Paul 55116

or Fire Number:

Show exact location of well/boring in section grid with "X."



Sketch map of well/boring location. Showing property lines, roads, buildings, and direction.

AMW 12

see attached map

PROPERTY OWNER'S NAME/COMPANY NAME: Ford Motor Company

Property owner's mailing address if different than well location address indicated above.

966 Mississippi River BLvd
St. Paul, MN 55116

WELL OWNER'S NAME/COMPANY NAME: Ford Motor Company

Well/boring owner's mailing address if different than property owner's address indicated above.

GEOLOGICAL MATERIALS	COLOR	HARDNESS OF MATERIAL	FROM	TO
blacktop			0	1
gravel	yellow		1	3
silty sand	gray		3	11

Use a second sheet, if needed.

REMARKS, ELEVATION, SOURCE OF DATA, etc.

IMPORTANT - FILE WITH PROPERTY PAPERS
WELL OWNER COPY

784724

WELL/BORING DEPTH (completed): 11 ft.

DATE WORK COMPLETED: Sept 13, 2011

DRILLING METHOD: ☐ Cable Tool ☐ Driven ☐ Dug ☒ Auger ☐ Rotary ☐ Jetted ☐ ____

DRILLING FLUID: ---

WELL HYDROFRACTURED? ☐ Yes ☒ No From ____ ft. To ____ ft.

USE: ☐ Domestic ☒ Monitoring ☐ Heating/Cooling ☐ Noncommunity PWS ☐ Environ. Bore Hole ☐ Industry/Commercial ☐ Community PWS ☐ Irrigation ☐ Remedial ☐ Elevator ☐ Dewatering ☐ ____

CASING MATERIAL: ☐ Steel ☒ Plastic — Drive Shoe? ☐ Yes ☒ No — ☒ Threaded ☐ Welded ☐ ____

CASING Diameter / Weight / Specifications:
- 2 in. to 6 ft. ____ lbs./ft. ____
- ____ in. to ____ ft. ____ lbs./ft. ____
- ____ in. to ____ ft. ____ lbs./ft. ____

HOLE DIAM.:
- 8¼ in. to 11 ft.
- ____ in. to ____ ft.
- ____ in. to ____ ft.

SCREEN: Make Johnson; Type PVC; Slot/Gauze 10; Set between 6 ft. and 11 ft.; Diam. 2"; Length 5'; FITTINGS thread

OPEN HOLE: From ____ ft. To ____ ft.

STATIC WATER LEVEL: 6' 8" ft. ☒ Below ☐ Above land surface; Measured from grade; Date measured 9/16/11

PUMPING LEVEL (below land surface): ____ ft. after ____ hrs. pumping 5 g.p.m.

WELLHEAD COMPLETION
- ☐ Pitless/adapter manufacturer ____ Model ____
- ☐ Casing Protection ____ ☐ 12 in. above grade
- ☒ At-grade (Environmental Well and Boring ONLY)

GROUTING INFORMATION: Well grouted? ☐ Yes ☐ No — Grout materials ☐ Neat cement ☐ Bentonite ☐ Concrete ☐ Other ____

neat cement bent.

From 0	To 2	1	☐ Yds.	☒ Bags
From 2	To 4	1	☐ Yds.	☐ Bags
From ____	To ____ ft.	____	☐ Yds.	☐ Bags

NEAREST KNOWN SOURCE OF CONTAMINATION: ____ feet ____ direction ____ type

Well disinfected upon completion? ☐ Yes ☒ No

PUMP: ☒ Not installed Date installed ____

Manufacturer's name ____

Model Number ____ HP ____ Volts ____

Length of drop pipe ____ ft. Capacity ____ g.p.m.

Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐ ____

ABANDONED WELLS: Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

VARIANCE: Was a variance granted from the MDH for this well? ☐ Yes ☒ No TN# ____

WELL CONTRACTOR CERTIFICATION

This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

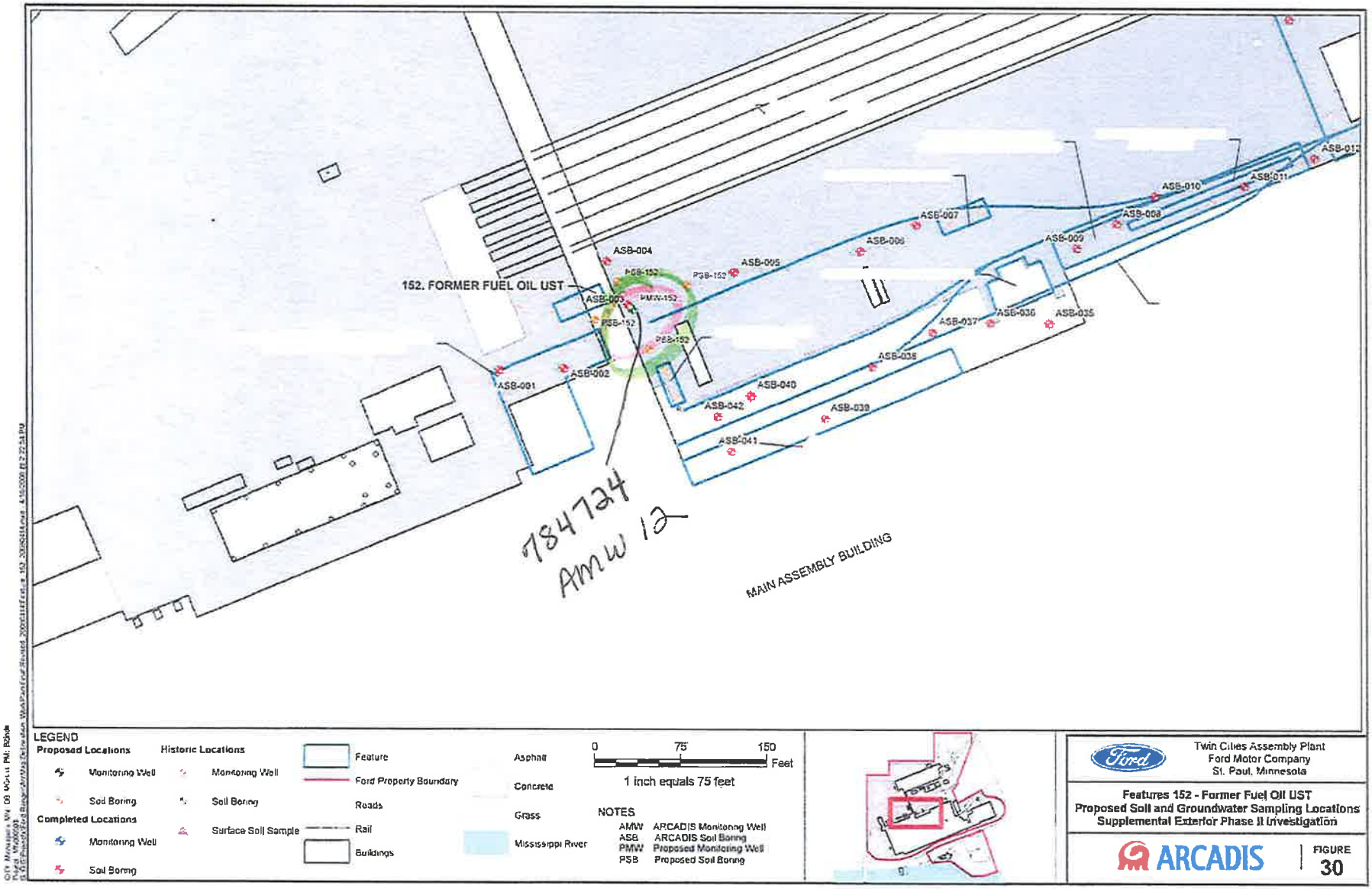
Stevens Drilling & Env. Svc. Inc. 2255
Licensee Business Name — Lic. or Reg. No.

Certified Representative Signature — 556 Certified Rep. No. — 9/26/11 Date

Randy Johnson
Name of Driller

IC 140-0020

HE-01205-12 (Rev. 12/08)



Twin Cities Assembly Plant
Ford Motor Company
St. Paul, Minnesota

Features 152 - Former Fuel Oil UST
Proposed Soil and Groundwater Sampling Locations
Supplemental Exterior Phase II Investigation

ARCADIS | FIGURE 30

WELL

AT-GRADE

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes, Chapter 103I

MINNESOTA UNIQUE WELL AND BORING NO. 784723

WELL OR BORING LOCATION

County Name: Ramsey

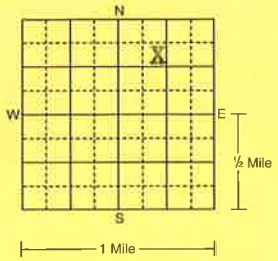
Township Name	Township No.	Range No.	Section No.	Fraction
St. Paul	28N	23W	17	SE, NW, NE

GPS LOCATION: Latitude ____ degrees ____ minutes ____ seconds ____ Longitude ____ degrees ____ minutes ____ seconds ____

House Number, Street Name, City, and Zip Code of Well Location: 966 Mississippi River Blvd St Paul 55116

or Fire Number:

Show exact location of well/boring in section grid with "X." Sketch map of well/boring location. Showing property lines, roads, buildings, and direction.



AMW 13

see attached map

PROPERTY OWNER'S NAME/COMPANY NAME: Ford Motor Company

Property owner's mailing address if different than well location address indicated above.: 966 Mississippi River Blvd St. Paul, MN 55116

WELL OWNER'S NAME/COMPANY NAME: Ford Motor Company

Well/boring owner's mailing address if different than property owner's address indicated above.:

GEOLOGICAL MATERIALS	COLOR	HARDNESS OF MATERIAL	FROM	TO
black top			0	1
fill gravel	yellow		1	3
silty sand	gray		3	12

Use a second sheet, if needed.

REMARKS, ELEVATION, SOURCE OF DATA, etc.:

IMPORTANT - FILE WITH PROPERTY PAPERS WELL OWNER COPY 784723

WELL/BORING DEPTH (completed): 12 ft. DATE WORK COMPLETED: Sept 14, 2011

DRILLING METHOD: [ ] Cable Tool [ ] Driven [ ] Dug [X] Auger [ ] Rotary [ ] Jetted [ ]

DRILLING FLUID: ---

WELL HYDROFRACTURED? [ ] Yes [X] No From ____ ft. To ____ ft.

USE: [ ] Domestic [X] Monitoring [ ] Heating/Cooling [ ] Noncommunity PWS [ ] Environ. Bore Hole [ ] Industry/Commercial [ ] Community PWS [ ] Irrigation [ ] Remedial [ ] Elevator [ ] Dewatering [ ]

CASING MATERIAL: [ ] Steel [X] Plastic Drive Shoe? [ ] Yes [X] No [X] Threaded [ ] Welded [ ]

CASING Diameter	Weight	Specifications	HOLE DIAM.
2 in. to 7 ft.	____ lbs./ft.	____	8¼ in. to 12 ft.
____ in. to ____ ft.	____ lbs./ft.	____	____ in. to ____ ft.
____ in. to ____ ft.	____ lbs./ft.	____	____ in. to ____ ft.

SCREEN Make Johnson Type PVC Diam. 2" Slot/Gauze 10 Length 5' Set between 7 ft. and 12 ft. FITTINGS thread

OPEN HOLE From ____ ft. To ____ ft.

STATIC WATER LEVEL 6½ ft. [X] Below [ ] Above land surface Measured from grade Date measured 9/16/11

PUMPING LEVEL (below land surface) ____ ft. after ____ hrs. pumping 3 g.p.m.

WELLHEAD COMPLETION: [ ] Pitless/adapter manufacturer ____ Model ____ [ ] Casing Protection [ ] 12 in. above grade [X] At-grade (Environmental Well and Boring ONLY)

GROUTING INFORMATION: Well grouted [ ] Yes [X] No Grout materials [ ] Neat cement [ ] Bentonite [ ] Concrete [ ] Other neat cement bent.

From 0	To 2	ft. 1	Yds. [ ]	Bags [X]
From 2	To 5	ft. 1	Yds. [ ]	Bags [X]
From ____	To ____	ft. ____	Yds. [ ]	Bags [ ]
From ____	To ____	ft. ____	Yds. [ ]	Bags [ ]

NEAREST KNOWN SOURCE OF CONTAMINATION: ____ feet ____ direction ____ type

Well disinfected upon completion? [ ] Yes [X] No

PUMP: [X] Not installed Date installed ____ Manufacturer's name ____ Model Number ____ HP ____ Volts ____ Length of drop pipe ____ ft. Capacity ____ g.p.m. Type: [ ] Submersible [ ] L.S. Turbine [ ] Reciprocating [ ] Jet [ ]

ABANDONED WELLS: Does property have any not in use and not sealed well(s)? [ ] Yes [X] No

VARIANCE: Was a variance granted from the MDH for this well? [ ] Yes [X] No TN# ____

WELL CONTRACTOR CERTIFICATION

This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

Stevens Drilling & Env. Svc. Inc. 2255

Licensee Business Name Lic. or Reg. No.

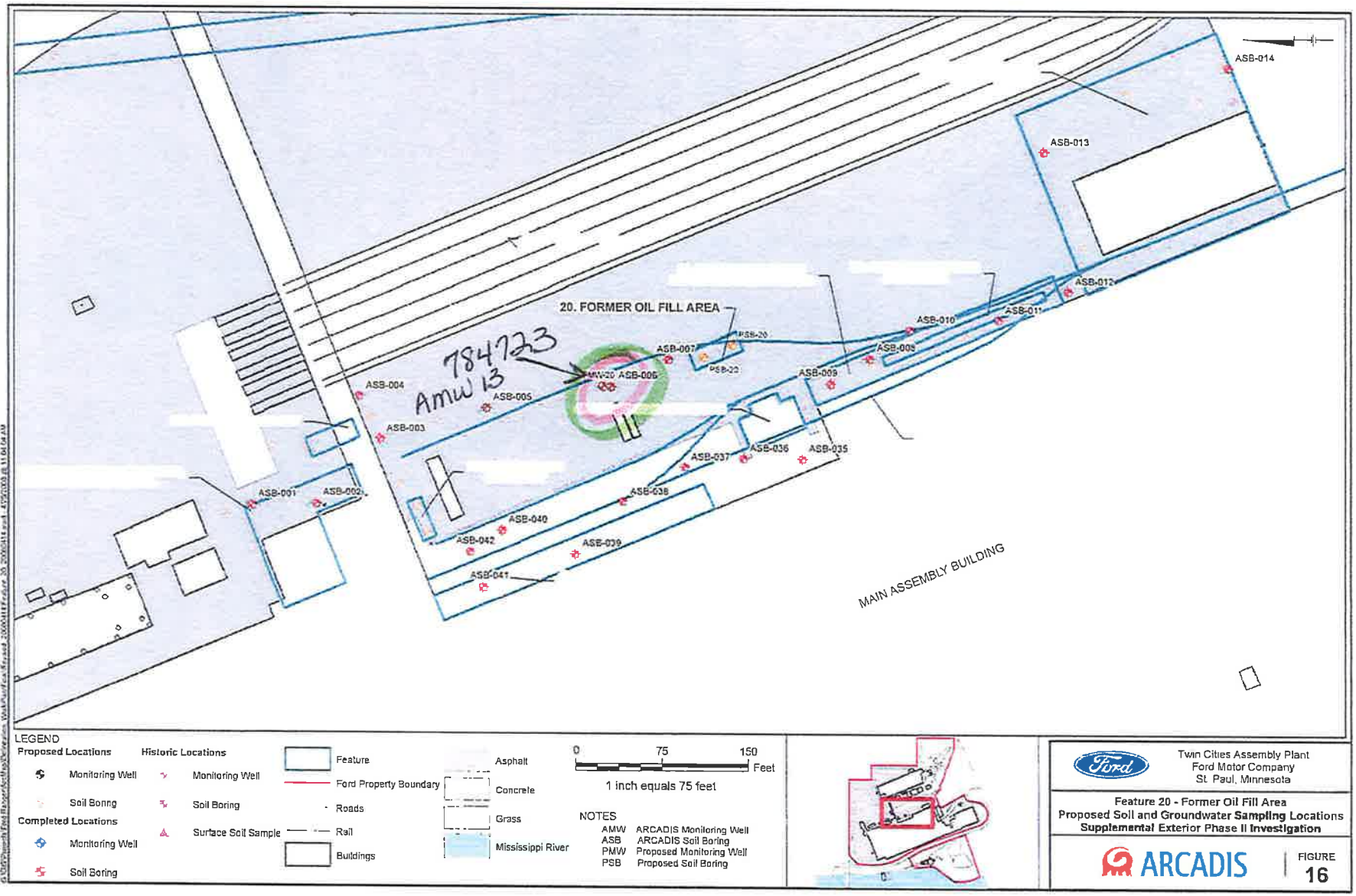
Certified Representative Signature 556 Certified Rep. No. 9/26/11 Date

Randy Johnson

Name of Driller

IC 140-0020

HE-01205-12 (Rev. 12/08)



Twin Cities Assembly Plant
Ford Motor Company
St. Paul, Minnesota

Feature 20 - Former Oil Fill Area
Proposed Soil and Groundwater Sampling Locations
Supplemental Exterior Phase II Investigation

ARCADIS

FIGURE
16

WELL

AT GRADE

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING RECORD

Minnesota Statutes, Chapter 103I

MINNESOTA UNIQUE WELL AND BORING NO. 784726

WELL OR BORING LOCATION

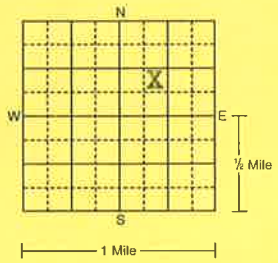
County Name: Ramsey

Township Name	Township No.	Range No.	Section No.	Fraction
St. Paul	28N	23W	17	NE SW NE ¼

GPS LOCATION: Latitude ____ degrees ____ minutes ____ seconds ____ Longitude ____ degrees ____ minutes ____ seconds ____

House Number, Street Name, City, and Zip Code of Well Location: 966 Mississippi River Blvd St. Paul, MN 55116 | or Fire Number

Show exact location of well/boring in section grid with "X". Sketch map of well/boring location. Showing property lines, roads, buildings, and direction.



AMW 14

see attached map

PROPERTY OWNER'S NAME/COMPANY NAME: Ford Motor Company

Property owner's mailing address if different than well location address indicated above.
966 Mississippi River Blvd
St. Paul, MN 55116

WELL OWNER'S NAME/COMPANY NAME: Ford Motor Company

Well/boring owner's mailing address if different than property owner's address indicated above.

GEOLOGICAL MATERIALS	COLOR	HARDNESS OF MATERIAL	FROM	TO
blacktop			0	1
gravel	yellow		1	3
silty sand	gray		3	12

Use a second sheet, if needed.

REMARKS, ELEVATION, SOURCE OF DATA, etc.

IMPORTANT - FILE WITH PROPERTY PAPERS WELL OWNER COPY 784726

WELL/BORING DEPTH (completed): 12 ft | DATE WORK COMPLETED: Sept. 14, 2011

DRILLING METHOD: ☐ Cable Tool ☐ Driven ☐ Dug ☒ Auger ☐ Rotary ☐ Jetted ☐ ____

DRILLING FLUID: --- | WELL HYDROFRACTURED? ☐ Yes ☒ No From ____ ft. To ____ ft.

USE: ☐ Domestic ☒ Monitoring ☐ Heating/Cooling ☐ Noncommunity PWS ☐ Environ. Bore Hole ☐ Industry/Commercial ☐ Community PWS ☐ Irrigation ☐ Remedial ☐ Elevator ☐ Dewatering ☐ ____

CASING MATERIAL: ☐ Steel ☐ Plastic | Drive Shoe? ☐ Yes ☒ No ☐ Threaded ☐ Welded ☐ ____

CASING Diameter	Weight	Specifications	HOLE DIAM.
2 in. to 7 ft.	____ lbs./ft.	____	8½ in. to 12 ft.
____ in. to ____ ft.	____ lbs./ft.	____	____ in. to ____ ft.
____ in. to ____ ft.	____ lbs./ft.	____	____ in. to ____ ft.

SCREEN: Make Johnson | Type PVC | Diam. 2" | Slot/Gauze 10 | Length 5' | Set between 7 ft. and 12 ft. | FITTINGS thread

OPEN HOLE: From ____ ft. To ____ ft.

STATIC WATER LEVEL: 6' 6" ft. ☒ Below ☐ Above land surface | Measured from grade | Date measured 9/16/11

PUMPING LEVEL (below land surface): ____ ft. after ____ hrs. pumping 4 g.p.m.

WELLHEAD COMPLETION
☐ Pitless/adapter manufacturer ____ Model ____
☐ Casing Protection ____ ☐ 12 in. above grade
☒ At-grade (Environmental Well and Boring ONLY)

GROUTING INFORMATION: Well grouted ☐ Yes ☐ No | Grout materials ☐ Neat cement ☐ Bentonite ☐ Concrete ☐ Other neat cement bent. 0 3 1 1/2 x

From 3 To 5 ft.	1	☐ Yds.	☒ Bags
From ____ To ____ ft.	____	☐ Yds.	☐ Bags
From ____ To ____ ft.	____	☐ Yds.	☐ Bags

NEAREST KNOWN SOURCE OF CONTAMINATION: ____ feet ____ direction ____ type

Well disinfected upon completion? ☐ Yes ☒ No

PUMP: ☒ Not installed | Date installed ____
Manufacturer's name ____
Model Number ____ HP ____ Volts ____
Length of drop pipe ____ ft. Capacity ____ g.p.m.
Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐ ____

ABANDONED WELLS: Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

VARIANCE: Was a variance granted from the MDH for this well? ☐ Yes ☒ No TN# ____

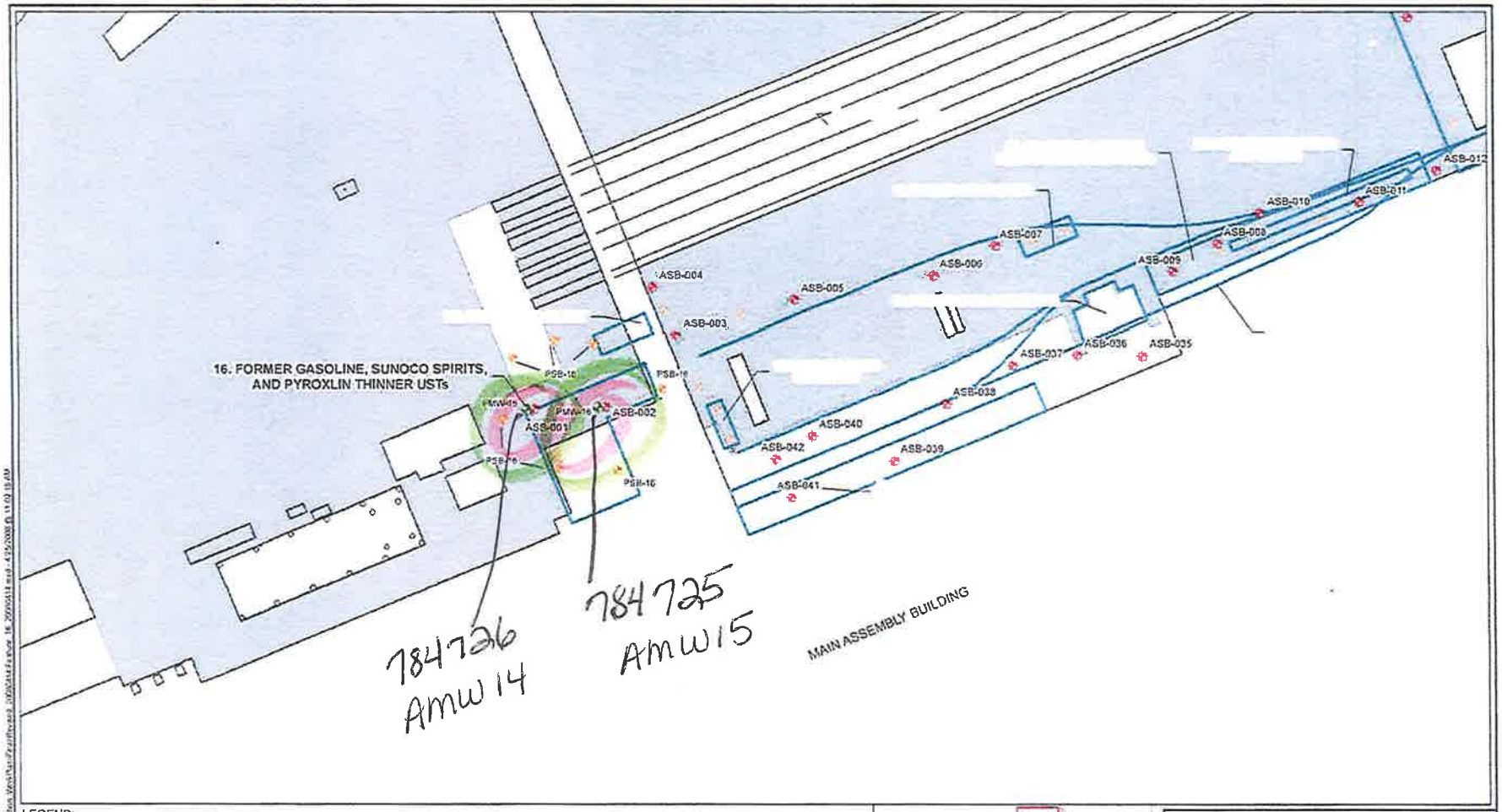
WELL CONTRACTOR CERTIFICATION
This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

Stevens Drilling & Env.Svc. Inc. 2255
Licensee Business Name | Lic. or Reg. No.

Certified Representative Signature | 556 Certified Rep. No. | 9/26/11 Date

Randy Johnson
Name of Driller

IC 140-0020 HE-01205-12 (Rev. 12/08)



LEGEND:

Proposed Locations
- Monitoring Well
- Soil Boring

Completed Locations
- Monitoring Well
- Soil Boring

Historic Locations
- Monitoring Well
- Soil Boring
- Surface Soil Sample

- Feature
- Ford Property Boundary
- Roads
- Rail
- Buildings
- Asphalt
- Concrete
- Grass
- Mississippi River

0 75 150 Feet

1 inch equals 75 feet

NOTES:
AMW ARCADIS Monitoring Well
ASB ARCADIS Soil Boring
PMW Proposed Monitoring Well
PSB Proposed Soil Boring

Twin Cities Assembly Plant
Ford Motor Company
St. Paul, Minnesota

Feature 16 - Former Gasoline, Sunoco Spirits, and Pyroxlin Thinner USTs
Proposed Soil and Groundwater Sampling Locations
Supplemental Exterior Phase II Investigation

ARCADIS

FIGURE 15

WELL AT-GRADE

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes, Chapter 103I

MINNESOTA UNIQUE WELL AND BORING NO. 784725

WELL OR BORING LOCATION

County Name: Ramsey

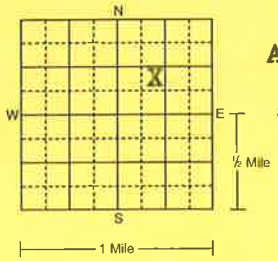
Township Name	Township No.	Range No.	Section No.	Fraction
St. Paul	28N	23W	17	NE SW¼ NE ¼

GPS LOCATION: Latitude ____ degrees ____ minutes ____ seconds ____ Longitude ____ degrees ____ minutes ____ seconds ____

House Number, Street Name, City, and Zip Code of Well Location: 966 Mississippi River Blvd St. Paul 55116

or Fire Number:

Show exact location of well/boring in section grid with "X."



Sketch map of well/boring location. Showing property lines, roads, buildings, and direction.

AMW 15

see attached map

PROPERTY OWNER'S NAME/COMPANY NAME: Ford Motor Company

Property owner's mailing address if different than well location address indicated above.
966 Mississippi River Blvd
St. Paul, MN 55116

WELL OWNER'S NAME/COMPANY NAME: Ford Motor Company

Well/boring owner's mailing address if different than property owner's address indicated above.

GEOLOGICAL MATERIALS	COLOR	HARDNESS OF MATERIAL	FROM	TO
blacktop			0	1
gravel	yellow		1	4
silty sand	gray		4	13

Use a second sheet, if needed.

REMARKS, ELEVATION, SOURCE OF DATA, etc.

IMPORTANT - FILE WITH PROPERTY PAPERS
WELL OWNER COPY

784725

WELL/BORING DEPTH (completed): 13 ft.

DATE WORK COMPLETED: Sept. 14, 2011

DRILLING METHOD: ☐ Cable Tool ☐ Driven ☐ Dug ☒ Auger ☐ Rotary ☐ Jetted ☐

DRILLING FLUID: ---

WELL HYDROFRACTURED? ☐ Yes ☒ No From ____ ft. To ____ ft.

USE: ☐ Domestic ☒ Monitoring ☐ Heating/Cooling ☐ Noncommunity PWS ☐ Environ. Bore Hole ☐ Industry/Commercial ☐ Community PWS ☐ Irrigation ☐ Remedial ☐ Elevator ☐ Dewatering ☐ ____

CASING MATERIAL: ☐ Steel ☒ Plastic — Drive Shoe? ☐ Yes ☒ No — ☒ Threaded ☐ Welded ☐ ____

CASING Diameter	Weight	Specifications	HOLE DIAM.
2 in. to 8 ft.	____ lbs./ft.	____	8½ in. to 13 ft.
____ in. to ____ ft.	____ lbs./ft.	____	____ in. to ____ ft.
____ in. to ____ ft.	____ lbs./ft.	____	____ in. to ____ ft.

SCREEN — OPEN HOLE From ____ ft. To ____ ft.
Make Johnson
Type PVC Diam. 2"
Slot/Gauze 10 Length 5'
Set between 8 ft. and 13 ft. FITTINGS thread

STATIC WATER LEVEL: 6' 4" ft. ☒ Below ☐ Above land surface Measured from grade Date measured 9/16/11

PUMPING LEVEL (below land surface): ____ ft. after ____ hrs. pumping 4 g.p.m.

WELLHEAD COMPLETION
☐ Pitless/adapter manufacturer ____ Model ____
☐ Casing Protection ☐ 12 in. above grade
☒ At-grade (Environmental Well and Boring ONLY)

GROUTING INFORMATION
Well grouted ☐ Yes ☐ No
Grout materials ☐ Neat cement ☐ Bentonite ☐ Concrete ☐ Other ____
neat cement bent.

From	To	ft.		
0	4	2	x	☐ Yds. ☐ Bags
4	6	1	x	☐ Yds. ☐ Bags
____	____	____	____	☐ Yds. ☐ Bags
____	____	____	____	☐ Yds. ☐ Bags

NEAREST KNOWN SOURCE OF CONTAMINATION: ____ feet ____ direction ____ type

Well disinfected upon completion? ☐ Yes ☒ No

PUMP
☒ Not installed Date installed ____
Manufacturer's name ____
Model Number ____ HP ____ Volts ____
Length of drop pipe ____ ft. Capacity ____ g.p.m.
Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐ ____

ABANDONED WELLS
Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

VARIANCE
Was a variance granted from the MDH for this well? ☐ Yes ☒ No TN# ____

WELL CONTRACTOR CERTIFICATION
This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

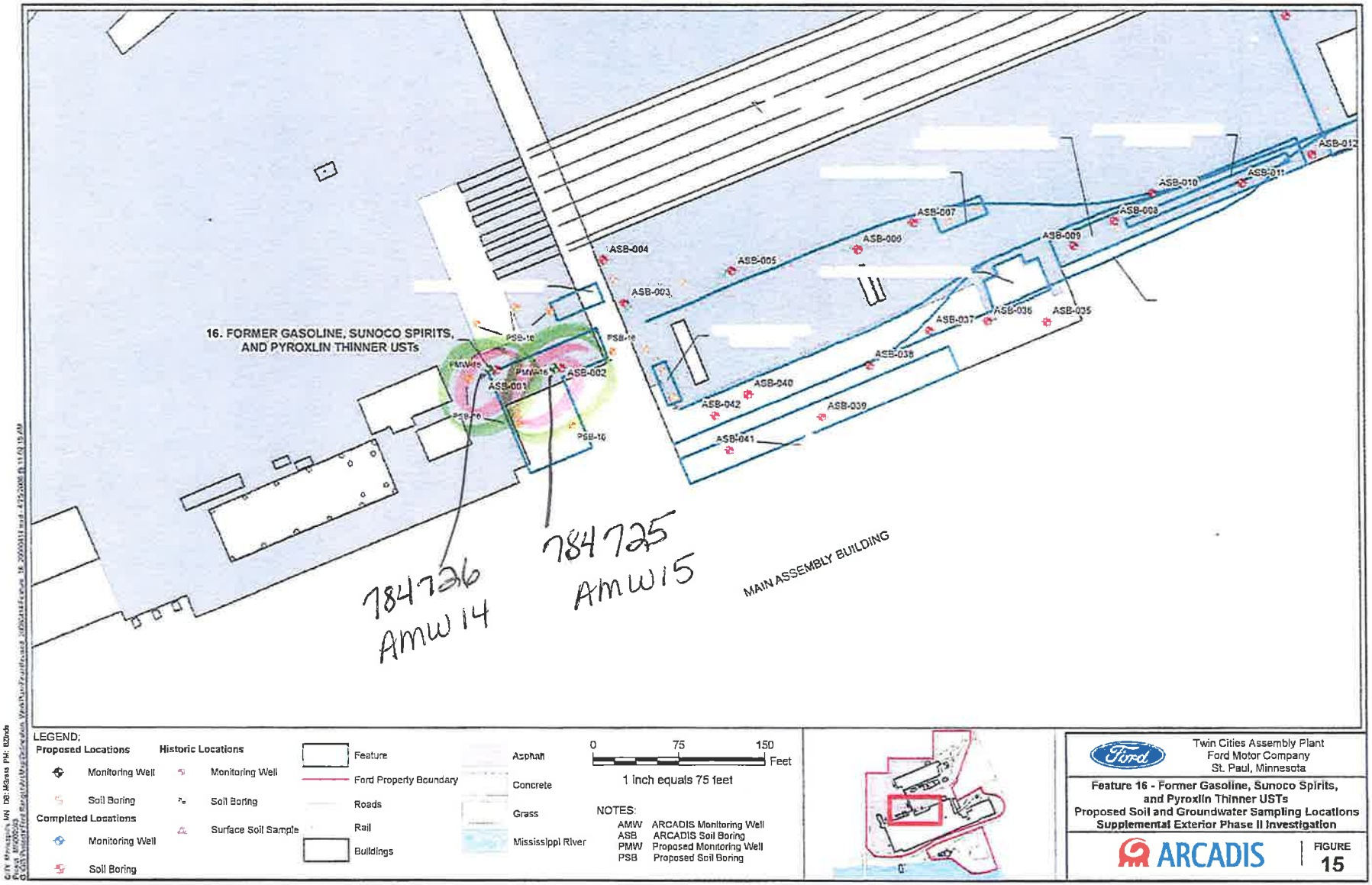
Stevens Drilling & Env. Svc. Inc. 2255
Licensee Business Name — Lic. or Reg. No.

Certified Representative Signature — 556 Certified Rep. No. — 9/16/11 Date

Randy Johnson
Name of Driller

IC 140-0020

HE-01205-12 (Rev. 12/08)



Twin Cities Assembly Plant
Ford Motor Company
St. Paul, Minnesota

Feature 16 - Former Gasoline, Sunoco Spirits, and Pyroxlin Thinner USTs
Proposed Soil and Groundwater Sampling Locations
Supplemental Exterior Phase II Investigation

ARCADIS

FIGURE 15

WELL AT-GRADE

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes, Chapter 103I

MINNESOTA UNIQUE WELL AND BORING NO. 784721

WELL OR BORING LOCATION

County Name: Ramsey

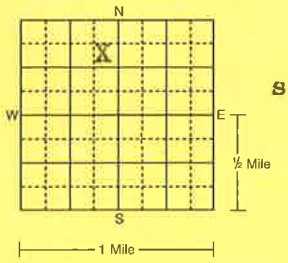
Township Name	Township No.	Range No.	Section No.	Fraction
St. Paul	28N	23W	17	SE ¼ NE ¼ NW ¼

GPS LOCATION: Latitude ____ degrees ____ minutes ____ seconds ____ Longitude ____ degrees ____ minutes ____ seconds ____

House Number, Street Name, City, and Zip Code of Well Location: 966 Mississippi River Blvd, St Paul 55116

or Fire Number:

Show exact location of well/boring in section grid with "X." Sketch map of well/boring location. Showing property lines, roads, buildings, and direction.



AMW 16

see attached map

PROPERTY OWNER'S NAME/COMPANY NAME: [redacted] Ford Motor Company

Property owner's mailing address if different than well location address indicated above.
966 Mississippi River Blvd
St. Paul, MN 55116

WELL OWNER'S NAME/COMPANY NAME: Ford Motor Company

Well/boring owner's mailing address if different than property owner's address indicated above.

GEOLOGICAL MATERIALS	COLOR	HARDNESS OF MATERIAL	FROM	TO
blacktop			0	1
gravel	yellow		1	3
silty sand	gray		3	8

Use a second sheet, if needed.

REMARKS, ELEVATION, SOURCE OF DATA, etc.

IMPORTANT - FILE WITH PROPERTY PAPERS
WELL OWNER COPY 784721

WELL/BORING DEPTH (completed): 8 ft. DATE WORK COMPLETED: Sept 14, 2011

DRILLING METHOD: [x] Auger [ ] Cable Tool [ ] Driven [ ] Dug [ ] Rotary [ ] Jetted

DRILLING FLUID: ---

WELL HYDROFRACTURED? [ ] Yes [x] No From ____ ft. To ____ ft.

USE: [x] Monitoring [ ] Domestic [ ] Noncommunity PWS [ ] Community PWS [ ] Elevator [ ] Environ. Bore Hole [ ] Irrigation [ ] Dewatering [ ] Heating/Cooling [ ] Industry/Commercial [ ] Remedial

CASING MATERIAL: [x] Plastic [ ] Steel
Drive Shoe? [ ] Yes [x] No
[x] Threaded [ ] Welded

CASING Diameter	Weight	Specifications	HOLE DIAM.
2 in. to 3 ft.	____ lbs./ft.		8¼ in. to 8 ft.
____ in. to ____ ft.	____ lbs./ft.		____ in. to ____ ft.
____ in. to ____ ft.	____ lbs./ft.		____ in. to ____ ft.

SCREEN: Make Johnson; Type PVC; Slot/Gauze 10; Set between 3 ft. and 8 ft.
OPEN HOLE: From ____ ft. To ____ ft.
Diam. 2"; Length 5'; FITTINGS thread

STATIC WATER LEVEL: 3 ft. [x] Below [ ] Above land surface; Measured from grade; Date measured 9/16/11

PUMPING LEVEL (below land surface): ____ ft. after ____ hrs. pumping 5 g.p.m.

WELLHEAD COMPLETION
[ ] Pitless/adapter manufacturer ____ Model ____
[ ] Casing Protection [ ] 12 in. above grade
[x] At-grade (Environmental Well and Boring ONLY)

GROUTING INFORMATION
Well grouted [ ] Yes [ ] No
Grout materials [ ] Neat cement [ ] Bentonite [ ] Concrete [ ] Other

neat cement	0	1	1/2	x
bent.	1	2	1/2	[x] Bags
From ____	To ____ ft.		____	[ ] Yds. [ ] Bags
From ____	To ____ ft.		____	[ ] Yds. [ ] Bags

NEAREST KNOWN SOURCE OF CONTAMINATION: ____ feet ____ direction ____ type

Well disinfected upon completion? [ ] Yes [x] No

PUMP
[x] Not installed Date installed ____
Manufacturer's name ____
Model Number ____ HP ____ Volts ____
Length of drop pipe ____ ft. Capacity ____ g.p.m.
Type: [ ] Submersible [ ] L.S. Turbine [ ] Reciprocating [ ] Jet [ ] ____

ABANDONED WELLS
Does property have any not in use and not sealed well(s)? [ ] Yes [x] No

VARIANCE
Was a variance granted from the MDH for this well? [ ] Yes [x] No TN# ____

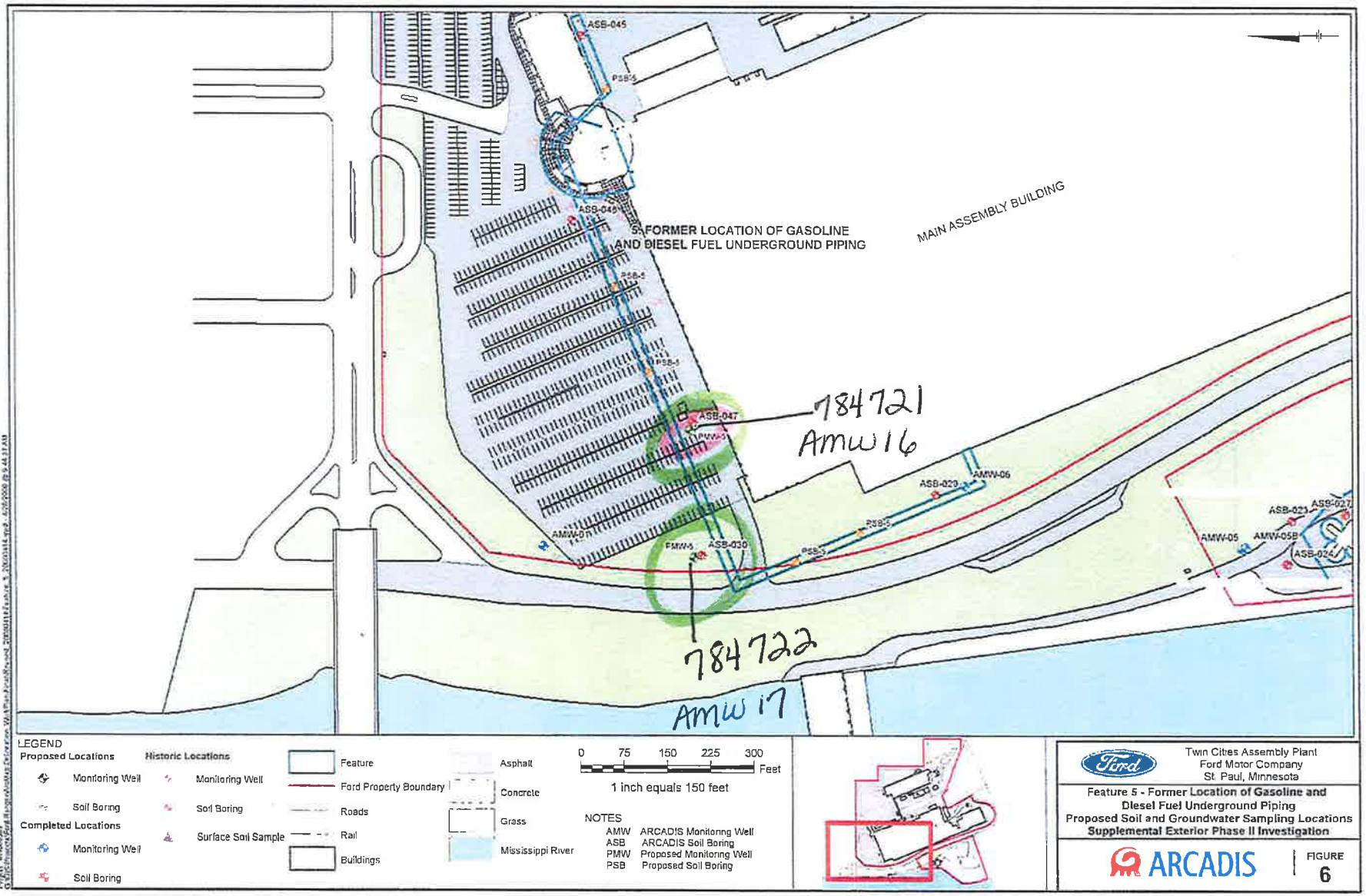
WELL CONTRACTOR CERTIFICATION
This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

Stevens Drilling & Env. Svc. Inc. 2255
Licensee Business Name — Lic. or Reg. No.

Certified Representative Signature — 556 — 9/26/11
Certified Rep. No. — Date

Randy Johnson
Name of Driller

IC 140-0020 HE-01205-12 (Rev. 12/08)



AT-GRADE

WELL

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes, Chapter 103I

MINNESOTA UNIQUE WELL AND BORING NO. 784722

WELL OR BORING LOCATION

County Name: Ramsey

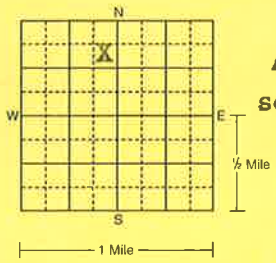
Township Name	Township No.	Range No.	Section No.	Fraction
St. Paul	28N	23W	17	SE ¼ NE ¼ NW ¼

GPS LOCATION: Latitude ____ degrees ____ minutes ____ seconds ____ Longitude ____ degrees ____ minutes ____ seconds ____

House Number, Street Name, City, and Zip Code of Well Location: 966 Mississippi River Blvd St Paul 55116

or Fire Number:

Show exact location of well/boring in section grid with "X." Sketch map of well/boring location. Showing property lines, roads, buildings, and direction.



AMW 17
see attached map

PROPERTY OWNER'S NAME/COMPANY NAME: Ford Motor Company

Property owner's mailing address if different than well location address indicated above.
966 Mississippi River Blvd
St Paul, MN 55116

WELL OWNER'S NAME/COMPANY NAME: Ford Motor Company

Well/boring owner's mailing address if different than property owner's address indicated above.

GEOLOGICAL MATERIALS	COLOR	HARDNESS OF MATERIAL	FROM	TO
top soil	black		0	2
silty sand	gray		2	11

Use a second sheet, if needed.

REMARKS, ELEVATION, SOURCE OF DATA, etc.

IMPORTANT - FILE WITH PROPERTY PAPERS
WELL OWNER COPY 784722

WELL/BORING DEPTH (completed): 11 ft. DATE WORK COMPLETED: Sept. 14, 2011

DRILLING METHOD: [X] Cable Tool [X] Auger [ ] Driven [ ] Rotary [ ] Dug [ ] Jetted

DRILLING FLUID: ---

WELL HYDROFRACTURED? [ ] Yes [X] No From ____ ft. To ____ ft.

USE: [ ] Domestic [X] Monitoring [ ] Heating/Cooling [ ] Noncommunity PWS [ ] Environ. Bore Hole [ ] Industry/Commercial [ ] Community PWS [ ] Irrigation [ ] Remedial [ ] Elevator [ ] Dewatering [ ] ____

CASING MATERIAL: [ ] Steel [X] Plastic Drive Shoe? [ ] Yes [X] No [X] Threaded [ ] Welded [ ] ____

CASING Diameter	Weight	Specifications	HOLE DIAM.
2 in. to 6 ft.	____ lbs./ft.	____	8¼ in. to 11 ft.
____ in. to ____ ft.	____ lbs./ft.	____	____ in. to ____ ft.
____ in. to ____ ft.	____ lbs./ft.	____	____ in. to ____ ft.

SCREEN Make Johnson Type PVC Slot/Gauze 10 Set between 6 ft. and 11 ft.
OPEN HOLE From ____ ft. To ____ ft.
Diam. 2" Length 5' FITTINGS thread

STATIC WATER LEVEL: 3 ft. [X] Below [ ] Above land surface Measured from grade Date measured 9/16/11

PUMPING LEVEL (below land surface): ____ ft. after ____ hrs. pumping 4 g.p.m.

WELLHEAD COMPLETION
[ ] Pitless/adapter manufacturer ____ Model ____
[X] Casing Protection 6" x 6' [X] 12" above grade
[ ] At-grade (Environmental Well and Boring ONLY) 24"

GROUTING INFORMATION
Well grouted [ ] Yes [ ] No
Grout materials [ ] Neat cement [ ] Bentonite [ ] Concrete [ ] Other ____
neat cement bent.

From 0 To 2 ft.	X			
From 2 To 4 ft.	X	1	[ ] Yds.	[X] Bags
From ____ To ____ ft.		____	[ ] Yds.	[ ] Bags
From ____ To ____ ft.		____	[ ] Yds.	[ ] Bags

NEAREST KNOWN SOURCE OF CONTAMINATION: ____ feet ____ direction ____ type

Well disinfected upon completion? [ ] Yes [X] No

PUMP
[X] Not installed Date installed ____
Manufacturer's name ____
Model Number ____ HP ____ Volts ____
Length of drop pipe ____ ft. Capacity ____ g.p.m.
Type: [ ] Submersible [ ] L.S. Turbine [ ] Reciprocating [ ] Jet [ ] ____

ABANDONED WELLS
Does property have any not in use and not sealed well(s)? [ ] Yes [X] No

VARIANCE
Was a variance granted from the MDH for this well? [ ] Yes [X] No TN# ____

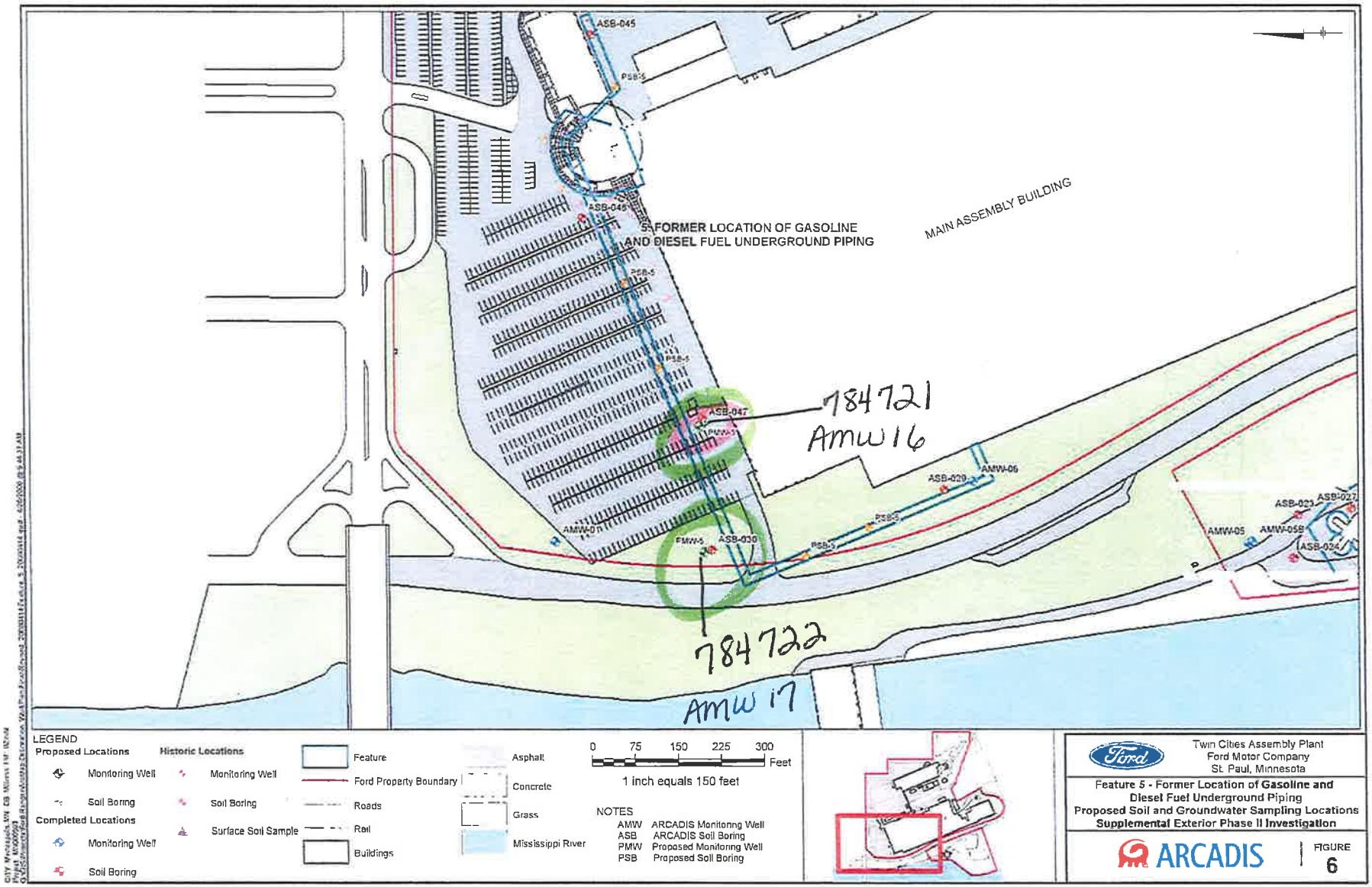
WELL CONTRACTOR CERTIFICATION
This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

Stevens Drilling & Env. Svc. Inc. 2255
Licensee Business Name Lic. or Reg. No.

Certified Representative Signature 556 Certified Rep. No. 9/26/11 Date

Randy Johnson
Name of Driller

IC 140-0020 HE-01205-12 (Rev. 12/08)



AT-GRADE WELL

Arcadis / Ford

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes, Chapter 103I

MINNESOTA UNIQUE WELL AND BORING NO. 784719

WELL OR BORING LOCATION

County Name: Ramsey

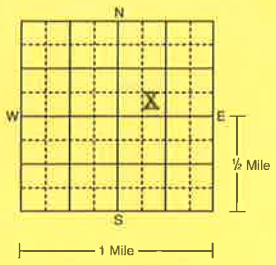
Township Name	Township No.	Range No.	Section No.	Fraction
St. Paul	28N	23W	17	SE ¼ SW ¼ NE ¼

GPS LOCATION: Latitude ____ degrees ____ minutes ____ seconds ____
Longitude ____ degrees ____ minutes ____ seconds ____

House Number, Street Name, City, and Zip Code of Well Location: 966 Mississippi River Blvd, St. Paul 55116

or Fire Number:

Show exact location of well/boring in section grid with "X." Sketch map of well/boring location. Showing property lines, roads, buildings, and direction.



AMW 18

see attached map

PROPERTY OWNER'S NAME/COMPANY NAME: Ford Motor Company

Property owner's mailing address if different than well location address indicated above.
966 Mississippi River Blvd
St. Paul, MN 55116

WELL OWNER'S NAME/COMPANY NAME: Ford Motor Company

Well/boring owner's mailing address if different than property owner's address indicated above.

GEOLOGICAL MATERIALS	COLOR	HARDNESS OF MATERIAL	FROM	TO
blacktop & cement			0	1
gravel	yellow		1	4
silty sand	gray		4	14½

Use a second sheet, if needed.

REMARKS, ELEVATION, SOURCE OF DATA, etc.

IMPORTANT - FILE WITH PROPERTY PAPERS
WELL OWNER COPY 784719

WELL/BORING DEPTH (completed): 14 1/2 ft.

DATE WORK COMPLETED: Sept. 15, 2011

DRILLING METHOD: ☐ Cable Tool ☐ Driven ☐ Dug ☒ Auger ☐ Rotary ☐ Jetted ☐ _____

DRILLING FLUID: ----

WELL HYDROFRACTURED? ☐ Yes ☒ No From _____ ft. To _____ ft.

USE: ☐ Domestic ☒ Monitoring ☐ Heating/Cooling ☐ Noncommunity PWS ☐ Environ. Bore Hole ☐ Industry/Commercial ☐ Community PWS ☐ Irrigation ☐ Remedial ☐ Elevator ☐ Dewatering ☐ _____

CASING MATERIAL: ☐ Steel ☒ Plastic
Drive Shoe? ☐ Yes ☒ No ☒ Threaded ☐ Welded ☐ _____

HOLE DIAM.

CASING Diameter	Weight	Specifications	HOLE DIAM.
2 in. to 9 1/2 ft.	_____ lbs./ft.	_____	8¼ in. to 14½ ft.
_____ in. to _____ ft.	_____ lbs./ft.	_____	_____ in. to _____ ft.
_____ in. to _____ ft.	_____ lbs./ft.	_____	_____ in. to _____ ft.

SCREEN
Make Johnson
Type PVC Diam. 2"
Slot/Gauze 10 Length 5'
Set between 9½ ft. and 14½ ft. FITTINGS thread

OPEN HOLE From _____ ft. To _____ ft.

STATIC WATER LEVEL: 11 ft. ☒ Below ☐ Above land surface Measured from grade Date measured 9/16/11

PUMPING LEVEL (below land surface): _____ ft. after _____ hrs. pumping 4 g.p.m.

WELLHEAD COMPLETION
☐ Pitless/adapter manufacturer _____ Model _____
☐ Casing Protection _____ ☐ 12 in. above grade
☒ At-grade (Environmental Well and Boring ONLY)

GROUTING INFORMATION
Well grouted ☐ Yes ☐ No ☒0
Grout materials ☐ Neat cement ☐ Bentonite ☐ Concrete ☐ Other neat cement bent. x

From 5	To 7 ft.	1	☐ Yds.	☒ Bags
From _____	To _____ ft.	_____	☐ Yds.	☐ Bags
From _____	To _____ ft.	_____	☐ Yds.	☐ Bags

NEAREST KNOWN SOURCE OF CONTAMINATION: _____ feet _____ direction _____ type

Well disinfected upon completion? ☐ Yes ☒ No

PUMP
☒ Not installed Date installed _____
Manufacturer's name _____
Model Number _____ HP _____ Volts _____
Length of drop pipe _____ ft. Capacity _____ g.p.m.
Type: ☐ Submersible ☐ L.S. Turbine ☐ Reciprocating ☐ Jet ☐ _____

ABANDONED WELLS
Does property have any not in use and not sealed well(s)? ☐ Yes ☒ No

VARIANCE
Was a variance granted from the MDH for this well? ☐ Yes ☒ No TN# _____

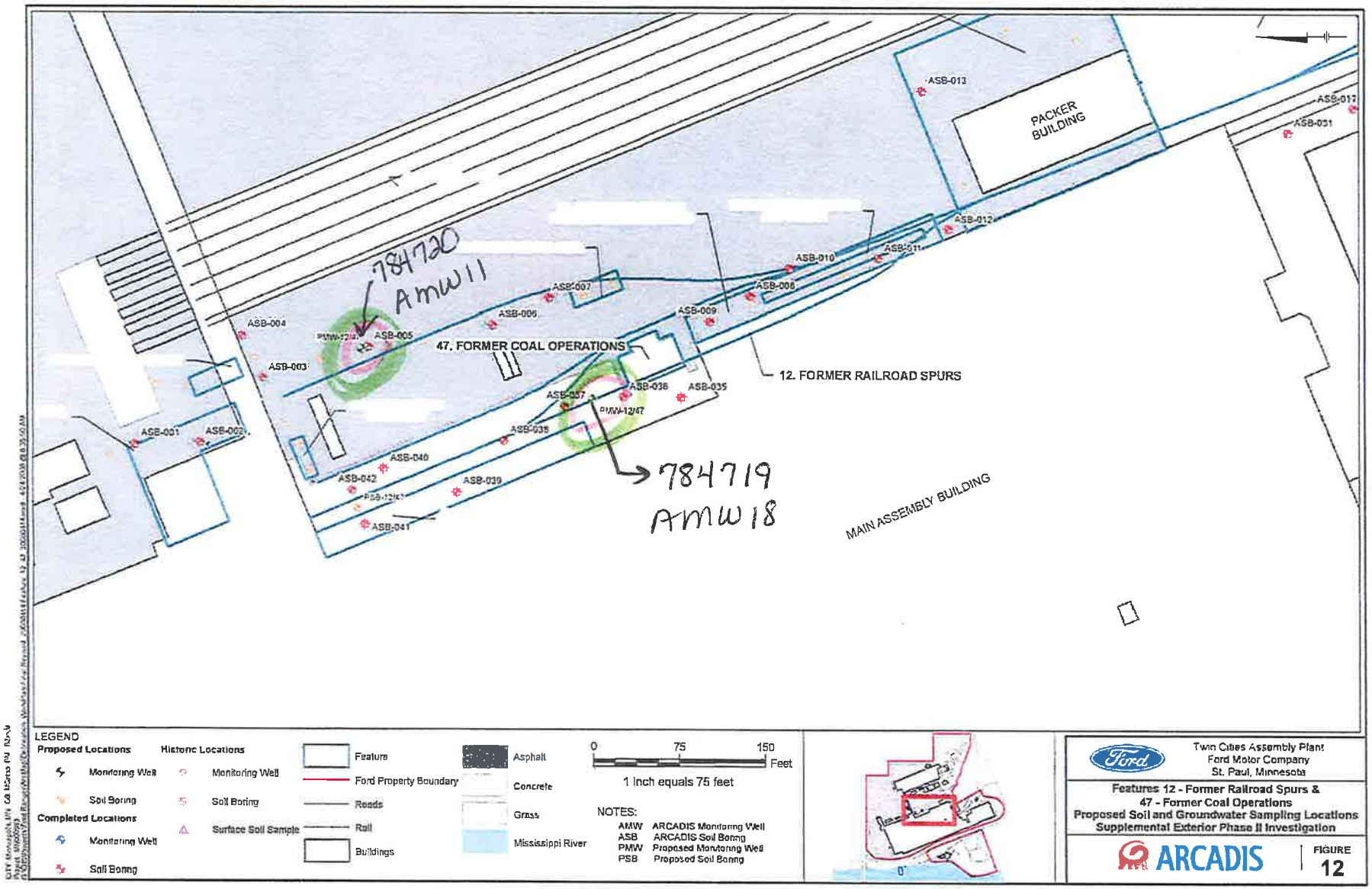
WELL CONTRACTOR CERTIFICATION
This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

Stevens Drilling & Env. Svc. Inc. 2255
Licensee Business Name Lic. or Reg. No.

Certified Representative Signature 556 Certified Rep. No. 9/26/11 Date

Randy Johnson
Name of Driller

IC 140-0020 HE-01205-12 (Rev. 12/08)



Twin Cities Assembly Plant
Ford Motor Company
St. Paul, Minnesota

Features 12 - Former Railroad Spurs & 47 - Former Coal Operations
Proposed Soil and Groundwater Sampling Locations
Supplemental Exterior Phase II Investigation

ARCADIS

FIGURE 12

Appendix C

Groundwater Sampling Logs

ARCADIS

Water Sampling Log

Project	Ford TCAP	Project No.	DE000440	Page	1 of 1
Site Location	St Paul, MN			Date	10/31/11
Site/Well No.	AMW-11	Replicate No.	DUP-002	Code No.	
Weather	Sunny 80s	Sampling Time: Begin	1445	End	1515 ST 1457

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	9.59
Depth to Water (ft bmp)	5.79
Water-Level Elevation (ft)	
Water Column in Well (ft)	3.80
Casing Diameter/Type	
Gallons in Well	0.608
Gallons Pumped/Bailed Prior to Sampling	3x 1.824 / 5x 3.04
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 1436 end 1442
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Color	Slightly grey/brown
Odor	petrol odor
Appearance	turbid
pH (s.u.)	6.93
Conductivity (mS/cm)	0.859
(µmhos/cm)	
Turbidity (NTU)	~~NM~~ ~~NR~~ 233
Temperature (°C)	12.89
Dissolved Oxygen (mg/L)	~~NM~~ 11.13
ORP (mV)	-77
Sampling Method	YSI 556
Remarks	

Constituents Sampled	Container Description	Number	Preservative
VOC	40 ml vial	3	HCl
PAH	1 L amber	2	none
Diss. RCRA Metals	500 ml	1	HNO_3
GRO	40 ml vial	2	HCl
DRO	1-L amber	2	HCl

Sampling Personnel ~~ND/TNK~~ KH

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds
		NM	Not Measured		

ARCADIS

Water Sampling Log

Project	Ford TCAP	Project No.	DE000440	Page	1 of 1
Site Location	St Paul, MN			Date	11/1/11
Site/Well No.	AMW-12	Replicate No.		Code No.	
Weather	Sunny 40/50s	Sampling Time: Begin	1620	End	1628 ST 1625

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	11.44
Depth to Water (ft bmp)	6.45
Water-Level Elevation (ft)	
Water Column in Well (ft)	4.99
Casing Diameter/Type	
Gallons in Well	0.7984
Gallons Pumped/Bailed Prior to Sampling	3x 2.3952 5x 3.992
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 1613 end 1618
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Color	
Odor	petrol
Appearance	
pH (s.u.)	6.70
Conductivity (mS/cm)	0.989
(µmhos/cm)	
Turbidity (NTU)	~~XXX~~ 782
Temperature (°C)	14.30
Dissolved Oxygen (mg/L)	~~12.25~~ 12.25
ORP (mV)	-86
Sampling Method	YSI 556
Remarks	SI sheen in bail bucket

Constituents Sampled	Container Description	Number	Preservative
VOC	40 ml vial	3	HCl
PAH	1 L amber	2	none
Diss. RCRA Metals	500 ml	1	HNO_3
GRO	40 ml vial	2	HCl
DRO	1 L amber	2	HCl

Sampling Personnel ~~NDVENIK~~ KH

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds
		NM	Not Measured		

ARCADIS

Water Sampling Log

Project	Ford TCAP	Project No.	DE000440	Page	1	of	1
Site Location	St Paul, MN			Date	10/31/11		
Site/Well No.	AMW-13	Replicate No.		Code No.			
Weather	Sunny 50s	Sampling Time:	Begin 1405	End	1420	ST	1415

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	11.97
Depth to Water (ft bmp)	6.80
Water-Level Elevation (ft)	
Water Column in Well (ft)	5.17
Casing Diameter/Type	
Gallons in Well	0.8272
Gallons Pumped/Bailed Prior to Sampling	2.481 (3x) ~~4.136~~ 4.136 (5x)
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 1359 end 1404
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Color	brown
Odor	/
Appearance	turbid
pH (s.u.)	7.21
Conductivity (mS/cm)	1.11
(µmhos/cm)	
Turbidity (NTU)	~~800+~~ 800+
Temperature (°C)	11.64
Dissolved Oxygen (mg/L)	14.30
ORP (mV)	-32
Sampling Method	YSI 556
Remarks	

Constituents Sampled	Container Description	Number	Preservative
PAH	1 L amber	2	None
Diss RCRA metals	500 mL	1	HNO_3
DRO	1 L amber	2	HCl
GRO	~~500~~ 40 mL vials	3	HCl

Sampling Personnel ~~NDZ/NK~~ KH

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	mililiter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds
		NM	Not Measured		

ARCADIS

Water Sampling Log

Project	Ford TCAP	Project No.	DE000440	Page	1 of 1
Site Location	St Paul, MN			Date	11/7/11
Site/Well No.	AMW-14	Replicate No.		Code No.	
Weather	Sunny 50s	Sampling Time:	Begin 1435	End	1525 ST 1500

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	12.00
Depth to Water (ft bmp)	6.72
Water-Level Elevation (ft)	
Water Column in Well (ft)	5.28
Casing Diameter/Type	
Gallons in Well	0.8448
Gallons Pumped/Bailed Prior to Sampling	3x 2.534 5x 4.224
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 1428 end 1434
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Color	black
Odor	petrol
Appearance	turbid
pH (s.u.)	7.58
Conductivity (mS/cm)	2.52 ms/cm
(µmhos/cm)	
Turbidity (NTU)	~~>1000~~ 800+
Temperature (°C)	15.17
Dissolved Oxygen (mg/L)	13.27
ORP (mV)	-138
Sampling Method	~~YSI 556~~
Remarks	

Constituents Sampled	Container Description	Number	Preservative
VOC	40 ml vial	3	HCl
PAH	1 L amber	2	none
Diss RCRA Metals	500 ml	1	1+NO3
GRO	~~1 L amber~~ 40 ml vials	2	1+Cl
DRO	1 L amber	2	1+Cl

Sampling Personnel: ND/TNK

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds
		NM	Not Measured		

ARCADIS

Water Sampling Log

Project	Ford TCAP	Project No.	DE000440	Page	1 of 1
Site Location	St Paul, MN			Date	11/3/11
Site/Well No.	AMW-15	Replicate No.		Code No.	
Weather	Sunny 50s	Sampling Time:	Begin 1345	End	1603 ST 1600

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	13.05
Depth to Water (ft bmp)	6.70
Water-Level Elevation (ft)	
Water Column in Well (ft)	6.35
Casing Diameter/Type	
Gallons in Well	1.016
Gallons Pumped/Bailed Prior to Sampling	3x: 3.048 5x: 5.08
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 1348 end 1512
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Color	gray/black
Odor	petrol
Appearance	turbid
pH (s.u.)	7.05
Conductivity (mS/cm)	1.27
(µmhos/cm)	
Turbidity (NTU)	337
Temperature (°C)	11.89
Dissolved Oxygen (mg/L)	13.32
ORP (mV)	-123
Sampling Method	Bailer
Remarks	bailed dry, moved to AMW-14
	Resume bailing @ 1530
	bails dry again

Constituents Sampled	Container Description	Number	Preservative
VOC	40 ml vials	3	HCl
PAH	1 L amber	2	none
Diss RCRA metals	500 ml	1	HNO_3
GRO	40 ml vials	2	HCl
DRO	1 L amber	2	HCl

Sampling Personnel: ND/TNK

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	mililiter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds
		NM	Not Measured		

ARCADIS

Water Sampling Log

Project	Ford TCAP	Project No.	DE000440	Page	1 of 1
Site Location	St Paul, MN			Date	11/07/11
Site/Well No.	AMW-16	Replicate No.		Code No.	
Weather	Sunny 40/50s	Sampling Time:	Begin 1055	End	1108 ST 1100

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	10.66
Depth to Water (ft bmp)	5.60
Water-Level Elevation (ft)	
Water Column in Well (ft)	5.06
Casing Diameter/Type	
Gallons in Well	0.8096
Gallons Pumped/Bailed Prior to Sampling	7x 2.4288 5x 4.048
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 1045 end 1052
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Color	black
Odor	petrol
Appearance	turbid
pH (s.u.)	7.59
Conductivity (mS/cm)	0.339
(µmhos/cm)	
Turbidity (NTU)	~~1000~~ 800+
Temperature (°C)	15.12
Dissolved Oxygen (mg/L)	13.91
ORP (mV)	-122
Sampling Method	YSI 556
Remarks	

Constituents Sampled	Container Description	Number	Preservative
VOCs	40 mL vial	3	HCl
PAH	1-L amber	2	None
Dissolved Lead	500 mL	1	HNO_3
GRO	40-mL vial	2	HCl
DRO	1-L amber	2	HCl

Sampling Personnel ~~[illegible]~~ KH

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds
		NM	Not Measured		

ARCADIS

Water Sampling Log

Project	Ford TCAP	Project No.	DE000440	Page	1 of 1
Site Location	St Paul, MN			Date	11/7/11
Site/Well No.	AMW-17	Replicate No.		Code No.	
Weather	Sunny 50s	Sampling Time:	Begin 1202	End	1223 ST 1220

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	9.89
Depth to Water (ft bmp)	5.85
Water-Level Elevation (ft)	
Water Column in Well (ft)	4.04
Casing Diameter/Type	
Gallons in Well	0.6464
Gallons Pumped/Bailed Prior to Sampling	3x 1.94 5x 3.23
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 1125 end 1202
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Color	brown
Odor	slightly petrol
Appearance	turbid
pH (s.u.)	7.16
Conductivity (mS/cm)	1.08
(µmhos/cm)	
Turbidity (NTU)	458
Temperature (°C)	11.99
Dissolved Oxygen (mg/L)	6.05
ORP (mV)	-101
Sampling Method	YSI 556
Remarks	bailed dry, recovers relatively quickly

Constituents Sampled	Container Description	Number	Preservative
VOCs	40 mL vial	3	HCl
PAH	1-L amber	2	None
Diss. Lead	500 mL	1	HNO_3
GRO	40 mL vial	2	HCl
DRO	1-L amber	2	HCl

Sampling Personnel ~~ND/TNK~~ KH

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds
		NM	Not Measured		

ARCADIS

Water Sampling Log

Project	Ford TCAP	Project No.	DE000440	Page	1	of	1
Site Location	St Paul, MN			Date	10/31/11		
Site/Well No.	AMW-18	Replicate No.		Code No.			
Weather	Sunny 50s	Sampling Time:	Begin 1340	End	1340	ST	1335

Evacuation Data

Measuring Point	TOC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	14.48
Depth to Water (ft bmp)	10.24
Water-Level Elevation (ft)	
Water Column in Well (ft)	4.24
Casing Diameter/Type	
Gallons in Well	0.6784
Gallons Pumped/Bailed Prior to Sampling	3x 2.035 5x 3.392
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin 1320 end 1325
Pumping Rate (gpm)	
Evacuation Method	

Field Parameters

Color	brown
Odor	slight
Appearance	turbid
pH (s.u.)	6.89
Conductivity (mS/cm)	0.597
(µmhos/cm)	
Turbidity (NTU)	800+
Temperature (°C)	12.13
Dissolved Oxygen (mg/L)	14.90
ORP (mV)	114
Sampling Method	YSI 556
Remarks	

Constituents Sampled	Container Description	Number	Preservative
VOC	40 ml vial	3	HCl
PAH	1-L amber	2	None
Diss. RCRA metals	500 ml	1	HNO_3
GRO	40 ml vial	2	HCl
DRO	1-L amber	2	HCl

Sampling Personnel ~~NDITNK~~ KH

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds
		NM	Not Measured		